

**The extent to which Community Service Occupational Therapists are  
equipped to treat patients with hand injuries and conditions**

**by**

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## **Definition of Terms**

### **Cultural competence**

“The ability of an individual to understand and respect values, attitudes, beliefs, and mores that differ across cultures, and to consider and respond appropriately to these differences in planning, implementing, and evaluating health education and promotion programmes and interventions” (Joint Committee on Health Education and Promotion Terminology, 2002).

### **Disability Adjusted Life Years (DALYs)**

A summary metric of a population’s health. DALYs measure the gap between a population’s health and a normative goal of all individuals living an average life expectancy in full health. The measurement is a sum of years lost due to premature mortality and years lived with a disability (Murray et al., 2012).

### **Equipped**

As defined by the Oxford Dictionary (2014) refers to “supply(ing) with the necessary (items) for a particular purpose” and to “prepare someone...for a particular situation or task”. Within this research being equipped thus refers to a combination of necessary preparation and provision of required resources.

### **Full-house injury**

Used to refer to a complex hand injury with tendon, nerve and blood vessel involvement (Pietrobon, 1996) or multiple tissue types.

### **Hand care**

Used to refer to the management of hand conditions at all levels of care, from basic principles of practice within the primary setting to advanced surgery and therapy at the end of the referral pathway.

### **Multi-skilling**

As described by Wong (1996) and cited by Salvatori (1997, p.50) refers to “Cross-training of a service provider to perform procedures and functions in two or more disciplines”.

### **Upper limb injuries and conditions**

Used within this study to refer to any condition affecting the function of the upper quarter including upper motor neuron lesions (e.g. cerebral palsy, CVA) and lower motor neuron lesions and injuries to other systems.

### **Upper Limb Rehabilitation**

This term has been chosen instead of the term *Hand Therapy* which may imply treatment of the hand only or suggest a specialization within occupational or physiotherapy practice that requires certification within various countries. It is used within this study, within an occupational therapy theoretical framework, to refer to the holistic assessment and treatment of patients or communities at risk of, or suffering from, conditions or injuries affecting the entire upper limb. It does not exclude preventive, promotive or curative aspects of care.

**Practice context**

Used within the study to refer to a work environment that presents unique demands on the worker, and provides various barriers and enablers that impact on the ability of the individual to meet this demand. The practice context is defined by various temporal, geographic, cultural, social and physical properties.

**Practice learning**

“The process of acquiring professional competence by defining the aspirations and addressing the needs of individuals, groups or communities using professional actions with the guidance of a university practice educator and/or site learning facilitator” (Lorenzo, Duncan, Buchanan, & Alsop, 2006).

**Preparedness**

Depending on the context in which it is used, this term may be used to refer to participants’ perceived preparation for practice or may be used interchangeably with *equipped* as defined above.

**Professional competence**

Professional competence refers to “the habitual and judicious use of communication, knowledge, technical skills, clinical reasoning, emotions, values, and reflection in daily practice for the benefit of the individual and the community being served” (Epstein & Hundert, 2002, p. 226).

**Professional confidence**

Professional competence has been defined as “a personal belief maturing over time with exposure to determinants that positively influence this growth process” (Holland, Middleton, & Uys, 2012).

**Service learning**

An educational technique that uses real-life encounters to enhance classroom learning (Nathan & Kielsmeier, 1991). Service learning facilitates students developing insight into their own experience and values, as well as those of individuals, groups or communities. Service learning involves service in the community, reflection, and conversation around experiences. It also provides opportunity for students to perceive and resolve ethical issues (Greene, 1997).

## **Abbreviations**

<b>ADLs</b>	Activities of daily living
<b>APT</b>	Appropriate paper-based technology
<b>CPD</b>	Continuous professional development
<b>CS</b>	Community Service
<b>CSOT</b>	Community Service occupational therapist
<b>DOH</b>	Department of Health
<b>EBP</b>	Evidence-based practice
<b>MDT</b>	Multi-disciplinary team
<b>NHI</b>	National Health Insurance
<b>OT</b>	Occupational therapist
<b>PHC</b>	Primary Health Care
<b>UL</b>	Upper Limb

## **A note from the researcher**

I completed my Community Service (CS) in the Matzikama and Cedarberg sub-districts of the Western Cape's west coast in 2006. It was a privilege to serve the communities of Vredendal, Vredendal Noord, Klawer, Lutzville, Ebenhaesar, Strandfontein, Van Rhynsdorp, Bitterfontein, Rietpoort, Stofkraal, Molsvlei, Lamberts Bay, Graafwater and Clan William. I can relate to many of the experiences shared by participants in this study having completed my service without any supervision and with no rehabilitation or medical officer colleagues. The needs of these communities and the potential for development was staggering for eager eyes and novice skills. It birthed in me a passion for supporting and empowering CS practitioners who were taking health care where services were bare, cellphone reception was rare and rocky terrain shortened the life of many a government vehicle.

Although terrified of hand therapy practice at university, I was given the opportunity to develop a love for UL rehabilitation at Groote Schuur Hospital Hand Clinic from 2008. It was here that I made the transition from novice to competent practitioner – hurried along by one of the busiest outpatient clinics in the hospital. Hand conditions often presented as just symptoms of far greater social problems and inequalities. Through this I came to appreciate the unique contribution that occupational therapy can make to the lives of individuals and communities.

It is my hope that the findings of this project will contribute, albeit in a small way, to the improvement of health care – and *hand care* - services in South Africa.

## **Abstract**

South Africa is one of the most violent nations in the world and has an extremely high incidence of road accidents and work place injuries. The precise effect of this on upper limb injury statistics is not known as the incidence and prevalence of these conditions has yet to be determined. Hand injuries are, however, common worldwide and, in South Africa, may be complex in nature. This places a demand on occupational therapy services to provide comprehensive upper limb rehabilitation, a responsibility that inevitably falls on novice occupational therapists at some point. Occupational therapists in South Africa are required to complete a year of compulsory Community Service after graduating before they are permitted to practice independently. These placements are often in rural, under-resourced areas and graduates are faced with multiple new roles while negotiating the transition into practice. No published research to date has described the general experience of Community Service occupational therapists in South Africa or the extent to which these therapists are equipped to treat patients with upper limb injuries and conditions. The study sought to determine the extent to which Community Service occupational therapists are equipped to treat patients with upper limb injuries and conditions.

A cross-sectional survey design was employed with two stages of data collection. In the first stage, an online questionnaire was sent to all CSOTs completing Community Service in 2013 (n=240). The second stage involved an online/emailed questionnaire about the content of the curriculum related to upper limb rehabilitation offered at the eight South African universities providing occupational therapy education. Data were analysed using *Stata 12* and *IBM SPSS Statistics 21.0*. Frequencies and percentages were obtained for categorical variables and associations were tested with Odds Ratios and the Pearson's Chi square test. A logistic regression analysis was conducted to develop a profile of Community Service occupational therapists that felt confident and competent within upper limb rehabilitation. Responses to open ended survey questions were postcoded.

Response rates were 44.3% (n=104) from the community service occupational therapist population, and 100% (n=8) from the universities. Results revealed that 73.9% (n=68) of participants reported communication problems. This was significantly associated with feeling *challenged* (p=0.014) and *frustrated* (p=0.012). The majority of participants had a supervisor (n=86; 89.6%) although 65.9% (n=60) reported dissatisfaction with supervision. A majority (n=61; 63.5 %) perceived occupational therapy to be poorly recognised and 75.0% (n=72) derived a sense of satisfaction from interaction with their patients. Participants reported treating an average of 20 patients requiring upper limb rehabilitation per month and 73.0% (n=65) delivered this service without adequate equipment. Despite this, and other barriers, perceived confidence and competence in upper limb rehabilitation was reported by 64.4% (n=58) and 78.9% (n=71) respectively. Multivariate regression revealed that *enjoying treating upper limb patients* (p=0.003) and *having an undergraduate upper limb practice learning placement* (p=0.042) were significantly associated with competence. Therapists who felt confident were significantly more likely to report *having adequate skills (e.g. splinting)* (p=0.010), *enjoying upper limb rehabilitation* (p=0.007) and *having had an upper limb rehabilitation practice learning placement as a student* (p=0.051). Undergraduate upper limb rehabilitation curricula varied considerably in content and teaching hours, with a median of 30 hours being spent on upper limb assessment and treatment knowledge, and 22 hours dedicated to developing splinting skills.

The majority of Community Service occupational therapists were confident and perceived themselves to be competent within upper limb rehabilitation practice. Undergraduate programmes need to ensure that they prepare graduates for working in rural, under-served and under-resourced settings and that language and cultural competency is included in curricula. Community Service occupational therapists work in complex practice contexts and support structures need to be implemented by key role players to facilitate competent practice and to ensure quality, sustainable service delivery that is aligned to national health policy.



# **Chapter 1: Introduction**

This chapter provides the context for the development of the research project. The history of health care in South Africa will briefly be described into which Community Service (CS) as a strategy to improve health care, will be situated. Undergraduate preparation for occupational therapy practice will be introduced and upper limb (UL) rehabilitation in South Africa will be explored. This background will provide the rationale for the research project and will identify the problem and purpose that the research sought to address. The research question, aim and objectives will be stated.

## **1.1 Context and rationale**

### **1.1.1 Health Care in South Africa**

The democratically elected government that assumed leadership of South Africa in 1994 inherited a health care system characterised by extreme inequality. Factors that contributed towards this state of health care, rooted in apartheid policy and prior colonial rule, include racial and gender discrimination, high levels of violence across centuries, the destruction of family life, income inequality and migrant labor (Coovadia, Jewkes, Barron, Sanders, & McIntyre, 2009). By the early 1990's, public health services in South Africa were dominated by a curative, hospital-based approach. In 1992/1993, 76% of public health expenditure supported acute care hospitals with only 11% of funds going towards health care at a primary level. Resources were also distributed inequitably amongst provinces and within different areas within these provinces. Health care expenditure per person in the wealthiest districts was reported as being more than 3.6 times that in the poorest districts. Inequalities between private and public health sectors were also marked with almost three fifths of health care expenditure going to the private sector which was being accessed on a regular basis by only 23% of the population. The majority of medical professionals (doctors, dentists and pharmacists) were also practicing within this sector. Within the public sector, provinces that had large urban hospitals attracted more

staff and doctors favored hospital-based jobs over primary level care (Coovadia et al., 2009).

The health system prior to 1994 was also significantly fragmented. Hospitals were the responsibility of provincial governments and preventive and promotive health care was given to local authorities. Fourteen separate health departments existed to service the bantustans<sup>1</sup> and the rest of South Africa (Coovadia et al., 2009). Furthermore 400 local authorities had health departments. This system led to duplication and poor co-ordination of services (Bloom & McIntyre, 1998).

In 1994 the African National Congress released their National Health Plan for South Africa describing their approach for the restructuring and transformation of the health system based on a Primary Health Care (PHC) approach. A Provincial Health Authority was established in each of the nine provinces and a central National Health Authority was established to strategically plan and coordinate the management of the overall service. Priority was given in the health plan to PHC facilities and personnel in rural and impoverished urban areas (African National Congress, 1994).

Policy to further address the health care inequalities was described in the White Paper for the Transformation of Health Services (Department of Health, 1997). Goals and objectives included *unifying the fragmented health system, improving the availability and appropriateness of services and promoting equity, accessibility and utilisation of services*. The equitable distribution of health personnel throughout the country and a focus on the rural, peri-urban, urban poor and aged was described as one of the target areas for achieving this goal. Strategies employed included the building and upgrading of PHC facilities, the introduction of a rural allowance for health professionals and the implementation of CS for graduating health professionals (Reid, 2000).

Since 1994 the extensive impact of HIV and other chronic diseases on the health system has eclipsed the successes of the new health care policy.

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<sup>1</sup> 'Partially self-governing area set aside during the period of apartheid for a particular indigenous African people' (Oxford Dictionary, 2014b)

Insufficient control of epidemics, a continued skewing of resource allocation towards the private sector, and flaws within health systems management present a great challenge to policymakers. Despite this, achievements within health systems management and developments at a policy and legislation level have been acknowledged as accomplishments of the Department of Health (Harrison, 2010). One of these policies ratified by the Medical, Dental and Supplementary Health Service Professions Amendment Act of 1997 introduced Compulsory Community Service (CS) for graduating health professions (Government Gazette of the Republic of South Africa, 1997).

### **1.1.2 Compulsory CS**

Compulsory CS was implemented for doctors in 1998 and other health professional groups, including occupational therapists, in 2003. The system was implemented by the Department of Health to improve the provision of health care for all South Africans (Reid, 2002), particularly those in rural and previously under-served areas (Reid, 2001). In a discussion paper published by the Department of Health in 2009, compulsory CS is considered to be one of the ten most effective health strategies implemented by the government since 1994. The strategy increased the number of general medical practitioners in the public sector by 20 % in 2006 and 2007. The report suggests that the number of occupational therapists and physiotherapists practicing within the public sector increased by 33% and 40 % respectively through the implementation of CS (Harrison, 2010).

CS has been successful in improving the availability of human resources in the public sector (Harrison, 2010) although the allocation to rural versus urban settings, and the nature and quality of services being delivered by this set of novice practitioners needs to be examined. Whether the preparation received by health professions at an undergraduate level prepares them for CS, and whether the contexts in which they work support their practice, are important aspects to explore when considering the nature and quality of services being offered.

### **1.1.3 Preparation for occupational therapy practice in South Africa**

The goal of occupational therapy undergraduate curricula at South African universities is to prepare graduates with an in-depth knowledge of the relationship between engagement in occupation and health as well as the complex effect of the environment in which engagement occurs (The Health Professions Council of South Africa, 2008). Programmes are not specifically focused on preparing graduates for CS, where they may be required to work across multiple domains of practice, including *child learning, development & play, physical health, mental health, work practice* and *community development practice*<sup>2</sup>.

One area of practice within the *physical health* practice domain in which CS occupational therapists (OTs) may be required to provide services is *hand therapy* or *UL rehabilitation*. According to the Hand Therapy Certification Commission in the United States, rehabilitating UL injuries and conditions successfully, requires a sound knowledge of, amongst other subjects, the anatomy and physiology of the upper quarter, an understanding of wound healing, kinesiology, biomechanics, posture and patho-mechanics, and behavioural science. The aetiology and pathology of medical conditions and their management should be understood as well as the expected functional prognosis of treatment and the expected physiological and psychological response to treatment. Indications and contra-indications, safety techniques and procedures also need to be applied. Skill in appropriate selection and use of various assessment and treatment modalities, techniques and tools is a basic requirement (Muenzen et al., 2002). This is applied within an occupational therapy process which is adapted to the needs of individuals, groups and communities who are experiencing occupational dysfunction (The Health Professions Council of South Africa, 2008). Furthermore the PHC approach requires therapists to adopt a comprehensive approach that includes health promotion and prevention (Muir, 2012) of upper limb injuries and conditions.

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<sup>2</sup> Domains of practice as described by The University of Cape Town

#### **1.1.4 UL Rehabilitation in South Africa**

Understanding the South African context and the incidence and nature of UL injuries and conditions in South Africa is important when considering the role CS occupational therapists (CSOT) may need to play in the rehabilitation of UL injuries.

South Africa is ranked as one of the most violent nations in the world (Norman, Matzopoulos, & Bradshaw, 2007). Interpersonal violence is the fifth highest contributor to the burden of disease in Southern Sub-Saharan Africa, as reported by the Global Burden of Disease Study of 2010 (Murray et al, 2012). Norman et al (2006, cited by Norman *et al*, 2007) reported that in the year 2000, interpersonal violence caused 6.5% (1 000 000) of all Disability Adjusted Life Years (DALYs). Road accidents in South Africa were responsible for around 3% (500 000) of DALYs. Intentional and unintentional injuries combined were second only to HIV/AIDS in being responsible for 14.3% of all DALYs. The extent to which interpersonal violence, road accidents and various other intentional and unintentional injuries in South Africa result in injuries to the UL is difficult to quantify from available research. Dias & Garcia-Elias (2006) stated however that hand injuries are common worldwide and make up 20% of all injuries presenting at hospital emergency units. Dias (2006) noted that injuries, including those sustained to the hand, are linked to deprivation and poverty. A review of traumatic hand injuries treated at a South African tertiary hospital between 1992 and 1994 revealed a high incidence of violence related injuries many of which were complex in nature. Knife injuries accounted for the greatest number of assault-related injuries with motor vehicle accidents being the cause of most non-assault based injuries (Pietrobon, 1996). Flexor tendon injuries accounted for 33% of cases treated with 12% of these classified as complex (e.g. replants & ‘full-house’ injuries).

South Africa also carries a high level of workplace injuries and illnesses according to available evidence. A full view of the situation is however concealed by poor statistics and extreme underreporting of incidents (Industrial Health Resource Group, 2011). Although limited data is

available, research suggests that repetitive strain injury-related symptoms have a high prevalence in the South African population. For example, in a population of 15 664 South African employees, 24 % experienced discomfort or stiffness in the hands, wrist, forearms and elbows 'sometimes' or 'frequently' (Schultz, Mostert, & Rothmann, 2012). Of the work accidents reported in South Africa in 1993, the most frequently reported injuries were those to fingers (24%), which led to permanent disability in 57% of the cases reported (Jeebhay & Jacobs, 1999). Jeebhay and Jacobs (1999) further highlighted the significant impact that the high percentage of finger injuries has on rehabilitation services in South Africa given its large manual labour population. The high levels of disability related to hand injuries underlines the importance of UL rehabilitation.

## **1.2 Problem and purpose**

The practice of CSOTs is situated within a history of health care in South Africa that is complex. Significant reform of the health system continues 20 years after the change of government. The reengineering of PHC and the imminent introduction of the NHI demonstrate ongoing change (Department of Health, 2011). Whether undergraduate education prepares new graduates for treating upper limb conditions within this context, and whether these settings support effective and appropriate intervention, needs to be considered. Given the high percentage of permanent disability related to finger injuries alone, it can be assumed that the health and employability of a significantly large population of South Africans is at stake. There are also crucial social and economic ramifications. An increase in the number of individuals who are no longer fit to work within the open labour market contributes to the substantial state spending on social grants (Coovadia et al., 2009). If healthy individuals have great difficulty entering the labour market (Mcintyre, Doherty, Bloom, & Brijlal, 1995), it is likely that individuals with UL conditions, not permanently disabled, will struggle to compete for jobs and avoid a state of poverty. The role of competent occupational therapists is therefore essential in assisting the restoration of function.

Various professional bodies offer support to CSOTs, of which the Occupational Therapy Association of South Africa (OTASA), the South African Society of Hand Therapists (SASHT) and Rural Rehabilitation South Africa (RuReSa) are probably the most active. Understanding the experience of CSOTs will assist these bodies in understanding the needs that exist in order to provide appropriate support and guidance to new graduates.

### **1.3 Research question**

To what extent are CSOTs *equipped*<sup>3</sup> to treat patients with UL injuries and conditions?

### **1.4 Research aim**

The aim of the research project was *to determine the extent to which CSOTs were equipped to treat patients with UL injuries and conditions.*

### **1.5 Research objectives**

The research objectives sought to:

1. Determine the demographic and practice characteristics of occupational therapists doing their CS
2. Determine the approximate number of patients with UL injuries/conditions being treated by CSOTs each month<sup>4</sup>
3. Determine which UL injuries/conditions are seen most commonly by CSOTs<sup>5</sup>
4. Determine which competency areas of UL rehabilitation CSOTs feel equipped/ill-equipped to perform
5. Determine the perceived barriers and facilitators to treating patients with UL injuries/conditions

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<sup>3</sup> See Definition of terms. Based on this definition, the research question captures aspects of preparation (which in this study will focus on CSOTs' *perceived* preparation) as well as the provision for, and facilitators of, practice.

<sup>4</sup> This informs undergraduate preparation and support after graduation

<sup>5</sup> To assist development of a profile of hand injuries commonly seen to ensure adequate preparation for this

6. Determine the factors that CSOTs perceive will assist them in providing a more effective service to patients with UL injuries/conditions
7. Determine CSOT's perceived levels of competence for treating patients with UL injuries and conditions
8. Determine CSOT's perceived levels of confidence for treating patients with UL injuries and conditions
9. Identify the factors that predict CSOTs feeling competent and confident within UL rehabilitation
10. Describe the undergraduate preparation for the treatment of patients with UL injuries and conditions.
11. Explore the relationship between undergraduate preparation in UL rehabilitation and CSOTs perceived sense of preparedness for UL rehabilitation practice



## **Chapter 2: Literature review**

In this chapter, literature is considered under six main subject headings. Firstly the experience of CS practitioners (2.1) will be explored and key themes emerging from this literature extracted. Rural practice (2.2), as the work destination of a percentage of CS health professionals, will be examined. The nature of rural practice as well as the opportunities and challenges it presents will be considered in conjunction with strategies to manage these demands. Novice practitioners' experience of practice (2.3) will be reviewed as well as undergraduate preparation for practice and the nature of undergraduate curricula (2.4). An examination of the concepts of professional competence and confidence (2.5) builds on the content of the preceding sections as they relate to the health sciences, and more specifically, occupational therapy. Finally, these strongly interconnected subjects will form the background against which UL rehabilitation practice (2.6) will be considered. The chapter concludes by identifying gaps in the literature (2.7).

Articles included in this literature review were identified through searches of *Medline*, *Pubmed*, *African Wide Information*, *Cinahl*, *Science Direct*, *Academic Source Premier*, *Health Source: Nursing / Academic Edition* and *Google Scholar*, from inception until November 2014. A summary of the search strategy is contained in Appendix 1.

### **2.1 CS Experience**

A search was conducted for both published and unpublished studies that reported the experience of CS health professional groups. Opinion pieces were also included in the search in order to capture a range of accounts from multiple perspectives. The findings of the search will be discussed per profession. A summary of key articles and the aim of each study are contained in Table 1.

**Table 1: Summary of studies reporting the CS experience of various health professional groups**

Professional group	Author/s & Date	Source	Research Aim
Occupational Therapists	Flieringa (2006)	MSc OT Minor Dissertation (UCT)	"To indiscriminately examine the impact of occupational therapy student service learning experiences at role-emerging, primary level health care sites on the adjustment of graduates at similar sites during compulsory CS" (p.37).
	Holland, Middleton, & Uys (2013)	<i>Occupational Therapy International</i>	"To explore how novice occupational therapists conceptualised professional confidence" (p.105).
	Hess (2014)	PhD Dissertation Occupational Therapy (UWC) (L. Hess-April, personal communication, January 14, 2014).	To explore CSOTs conceptualisation of occupational justice.
	CSOTs (Multiple authors, n=23) (2004 – 2014)	Focus (Official newsletter of OTASA)	Not applicable: opinion piece.
Doctors	Reid (2001)	<i>South African Medical Journal</i>	"To evaluate the effects and impact of the first year of CS intervention against (DOH objectives)" (p. 329).
	Kolosa (2003)	<i>South African Medical Journal</i>	Not applicable: opinion piece.
	Nemutandani, Maluleke, & Rudolph (2006)	<i>South African Medical Journal</i>	"To assess the work experiences of (CS doctors) in the public hospitals of Limpopo Province during 2003" (p 180).
	Ross & Reid (2009)	<i>South African Family Practice</i>	"To gain understanding of the motivations of CS officers to continue working in the same DH for a subsequent year after their obligatory year is over" (p. 249).
PTs	Ramklass (2009)	<i>Health and Social Care in the Community</i>	" (To explore) how the first cohort of physiotherapists experiences their year-long CS and how they felt their undergraduate training prepared them for practice" (p.522).
Nurses	Thopola, Kgole, & Mamogobo (2013)	<i>African Journal for Physical Health Education, Recreation &amp; Dance</i>	" To explore and describe the experiences of newly qualified nurses who were trained in the University of Limpopo...CSs within public health establishments of Limpopo Province..." (p.169).
	Beyers (2013)	Magister Curatoris Minor Dissertation (UWC)	"To describe the experiences of CS practitioners during their CS at a rural health facility" (p.9).
SLTs & As*	Wranz (2011)	MPhil (Health Science Education) Dissertation (SU)	"To identify the potential gaps that exist between (CS) professionals' perceived readiness and the demands of the reality (context) in which they have to function" (p.12).
Dieticians	Visser, Marais, Du Plessis, Steenkamp, & Troskie, (2006).	<i>South African Journal of Clinical Nutrition</i>	"To investigate the experiences and attitudes of CS dieticians (2003)... to determine their perception of the success of the year as a whole and to assess whether the knowledge and skills of graduates improved" (p.10).
	Paterson, Green, & Maunder, (2007)	<i>Health Policy</i>	"To examine and explore the factors affecting the professional development of dieticians during CS" (p.288)
	Parker et al (2012)	<i>Public Health Nutrition</i>	"To evaluate the successes and shortcomings of the CS programme implemented by the DOH in South Africa by evaluating CS dieticians experiences and challenges during the 2009 CS year" (p.1411).
Clinical psychologists	Rohleder, Miller, & Smith (2006)	<i>South African Journal of Psychology</i>	Not applicable: opinion piece.
	Pillay & Harvey (2006)	<i>South African Journal of Psychology</i>	"To survey the experiences of the country's entire first group of CS clinical psychologists" (p. 259).
	Swarts (2013)	<i>South African Journal of Psychology</i>	Not applicable: opinion piece.

\* Speech language therapists and audiologists

### **2.1.1 CS experience of occupational therapists**

To contextualize the study within previous reports of CSOTs' experience or preparation for practice, a thorough review of the literature was conducted. This revealed that no research had explored the experiences of CSOTs. However, one article was found in which CSOTs participated in a phenomenographic study on conceptions of professional confidence held by eight novice occupational therapists in KwaZulu Natal, South Africa (Holland, Middleton, & Uys, 2013). The authors stated that within the KwaZulu Natal province, CSOTs are often sole-practitioners or work in a small team of occupational therapists. They may work within well-established departments, be involved in re-establishing departments or be responsible for starting new occupational therapy services. Other rehabilitation staff completing their CS may work alongside these novice occupational therapists. Informal support structures have been developed in KwaZulu Natal but the National Department of Health (DOH) considers practitioners to be qualified and thus fit-for-practice. They consequently do not provide any formal mentorship. No citation accompanied this information reported by Holland et al (2013) and it is thus not clear whether it was anecdotal or part of the authors' research findings. The findings of this study will be explored further in section 2.5 as they relate to the concepts of professional confidence.

In order to check for unpublished studies or studies in progress, enquiry was made with the eight South African universities that offer occupational therapy programmes. Email correspondence confirmed that no studies on this particular topic had been conducted although two related studies were identified. One doctoral thesis was in the process of exploring CSOTs conceptualisation of occupational injustice (L. Wegner, personal communication, March 25, 2013). Email correspondence with the researcher revealed that preliminary findings had highlighted the severe constraints participants experienced in applying the concept of occupational justice in their practice due to the dominance of the medical model within the health system (L. Hess-April, personal communication, January 14, 2014). The other study completed at the University of Cape Town explored the perceptions of final year occupational therapy students about practice learning in role-

emerging placements to prepare them for CS. The study concluded that students perceived that these placements better equipped them to manage the challenges of CS (Flieringa, 2006). The relevance of the study was limited due to participants being fourth year occupational therapy students who had not yet entered CS.

Articles written by CSOTs on their experiences are periodically published in the official newsletter (*Focus*) of the Occupational Therapy Association of South Africa (OTASA). Publications from 2004 to 2014 were hand searched and the experiences of 23 CSOTs were reviewed. Therapists reflected on the various challenges that the service year presented. These included working with limited resources (Gonlag, 2009; Millan, 2012; Roane, 2010; Roux, 2012; Stanton & De Villiers, 2010; Sweidan, 2009; Tauby, 2009), working around language barriers (Bierman & Burger, 2013; Gonlag, 2009; Roux, 2012; Stanton & De Villiers, 2010; Sweidan, 2009) and working with a patient population faced with costly travel to health care facilities (Barnes, 2007; Gonlag, 2009; Roane, 2010). Facing the needs of communities was reportedly overwhelming or difficult to manage at times (Bierman & Burger, 2013; Davies, 2014; Nicolson, 2009; Tauby, 2009; Thomas, 2009) but provided the graduates with the opportunity to *make a difference* (Hackner, 2005; Millan, 2012). Challenges encouraged resourcefulness and an ability to adapt. (De Wit, 2012; Gonlag, 2009; Roane, 2010; Roux, 2012; Wright, 2008). The service year facilitated the development of experience, knowledge and confidence as well as the exposure to learn from colleagues who graduated from other universities (Barnard, 2007; Davies, 2014; De Wit, 2012; Hackner, 2005; Joshi, 2008; Marshall & Hawett, 2008; Stanton & De Villiers, 2010; Tauby, 2009; Wright, 2008). The expression of gratitude of patients, their families and communities was identified repeatedly as a highlight of the CS experience (Barnes, 2007; Hackner, 2005; Millan, 2012; Roane, 2010; Stanton & De Villiers, 2010; Tauby, 2009; Thomas, 2009). Two therapists emphasised the crucial role that occupational therapy assistants played in their practice (Hackner, 2005; Thomas, 2009). A number of CSOTs emphasised the importance of realising that the view and approach that therapists take to CS is a choice and that therapists need to take responsibility to continue their learning and make valuable contributions to the communities in which they work (Bierman & Burger, 2013; De Wit, 2012; Gonlag, 2009; Thistlethwaite et

al., 2012; Venter, 2007). While the experiences shared by the CSOTs communicate important views, they cannot be simply generalised to the CSOT population in any given year. The contributions that spanned 10 years were written by therapists who were either approached by the OTASA to share their experience, or spontaneously submitted an article. Their experiences may vary considerably to therapists who were not approached or would not be inclined to share their experience.

### **2.1.2 CS experience of other health professionals**

In order to further understand the experience of novice health professionals, working within one of the government's strategies to improve *health care for all*, articles on the experiences of other health professional groups were reviewed.

#### ***Doctors***

The first group of doctors began CS in 1998 followed by a larger group in 1999. A mixed methods study was used to evaluate the effects and impact of the first year of CS against the objectives which CS was intended to achieve (Reid, 2001). The first phase of this study used interviews and focus groups to capture data in the provinces in which the largest proportion of the population live rurally, namely KwaZulu-Natal, the Eastern Cape and the Northern Cape. Participants in this initial phase included hospital managers, senior nurses, CS doctors and their colleagues. A questionnaire, developed from the themes in the phase one study, was used in a cross-sectional analytical study that formed the second phase. Around 24 % of the 1999 CS doctors were stationed in facilities that qualified for a rural allowance and 55% of this group was placed in large hospitals. Thus the achievement of the Department of Health's aim to distribute health personnel equitably was significantly limited in the early phases of CS implementation. Levels of support and supervision available to CS doctors varied, ranging from teaching hospitals where independent decisions did not have to be made, to working independently with a sessional doctor present occasionally. Learning exposure similarly varied with some participants describing gains in confidence and professional insight, while others reported that, mostly due to a lack of appropriate supervision, their year had been more about serving than learning. Attitudes

towards the service year and coping varied considerably from being able to develop self-confidence to being situated within “insurmountable difficulties in isolated circumstances” (p. 31). As a low response rate was achieved (27%) for the quantitative phase of the research, the generalisability of the findings is limited. This considered, 59% of the sample reported being well orientated, 65% labeled the experience as worthwhile, 70% perceived they had *made a difference* and 64% developed professionally. Clinical supervision was reported as absent or poor by 23%, with greater dissatisfaction with supervision reported by doctors in rural posts (Reid, 2001).

Further enquiry into the experience of CS doctors was conducted in Limpopo province in 2003 (Nemutandani et al., 2006). Of the CS doctors (n=103) placed in this province, 70% participated in a structured telephonic interview covering a range of topics including supervision, workload and service conditions. All doctors were placed in district or regional hospitals. Most participants (97%) worked more than a 40-hour week due to, amongst other reasons, staff shortages and perceived patient need. Some participants (35.7%) reported not receiving feedback from senior doctors or reportedly received feedback that was sparse or unhelpful (32.9%). Others (31%) felt that feedback was useful and sufficient. Support, feedback and supervision were identified as one of the main challenges to CS doctors’ development, competence and ability to cope. Other challenges included a lack of medical equipment and demanding workload. Participants reported making medical errors due to excessive workload and pressure to meet patient needs.

Ross and Reid (2009) explored the retention of CS doctors in KwaZulu Natal, the Eastern Cape and Limpopo provinces using a mixed methods approach. More than two-thirds (between 67% and 76%) of participants perceived that they were delivering quality care. Over 80% felt that their confidence in independent decision-making had grown, that they were able to make a valuable contribution to services and obtained valuable work experience. Fewer participants reported adequate staffing in their facilities (29%), adequate equipment (38%), a helpful mentor (37%) and circumstances supporting personal growth (52%).

These studies highlight both the challenges and opportunities of South African compulsory state service. A doctor, reflecting on CS, highlighted the opportunity that the year presented in coming to understand the needs and fortitude of deprived communities, in serving and developing the necessary survival strategies needed for rural practice, and the deep satisfaction of receiving the gratitude of patients and “making a difference” (Kolosa, 2003). As this was a letter to a journal, it expresses a personal opinion and may not represent the views of the group of CS doctors at that time. The account acknowledged the harsh conditions of service but processed these circumstances largely as an opportunity to grow. The need for basic amenities (for example good accommodation, recreation and telecommunication facilities) was highlighted as basic pre-requisites for “maintenance of sanity and professional integrity within these settings” (Kolosa, 2003, p.556).

### ***Physiotherapists***

A study by Ramklass (2009) explored the CS experience of the first group of physiotherapists from one South African university in relation to their undergraduate preparation. Twenty physiotherapists (n=23) completed a self-administered, open-ended questionnaire. Participants felt that community-based physiotherapy within under-resourced settings was under-emphasised in the curriculum and did not advance the role of the physiotherapist as a socially responsive agent. It was felt that the curriculum gave little attention to the knowledge necessary for socio-cultural and inter-professional relations. Furthermore it was felt that academic knowledge alone was inadequate to sustain the practice of novice physiotherapists working within multiple roles in low-resource settings (Ramklass, 2009).

### ***Nurses***

CS was initiated for nurses in 2008 (Beyers, 2013). The experiences of CS nurses who graduated in 2009 and 2010 and were undertaking their service year in Limpopo province were explored using a qualitative, exploratory, descriptive and contextual research design (Thopola et al., 2013). A purposive sample of eight graduates was used and their experience within public health settings was scrutinised phenomenologically. Two themes that emerged

described the challenges that the graduates faced as well as the positive factors they encountered. Participants felt that the service year provided an opportunity to grow and develop professionally. Challenges that they described included poor orientation and supervision, the absence of teamwork, low remuneration (in relation to debts and study loans that needed to be settled), shortage of human resources, an absence of material resources, and rejection by hospital staff experienced by some of the participants. Beyers (2013) similarly explored the experiences of ten CS nurses placed at a rural health facility in the Western Cape using an exploratory descriptive design. Findings highlighted the adjustments participants had to make to remote rural practice from their urban university experience. Not all participants received an orientation to their setting but most perceived the year to be a learning experience. For some participants, being placed in a rural setting facilitated learning opportunities that were not available to them as undergraduates in urban settings.

### ***Dieticians***

Three studies reported the experiences of CS dieticians. Visser et al (2006) used a questionnaire to collect information from the first group of dieticians (n=126) that completed CS in 2003. The questionnaire focused on demographic and logistical information, professional duties and competencies, and personal experience. Most participants reported an improvement in knowledge (91%) and skill (95%) and a perception that CS was a successful strategy. A majority (74%) reported communication difficulties when consulting with patients. A qualitative study conducted with thirteen 2005 CS dieticians in KwaZulu-Natal, reported many barriers to service delivery and professional development (Paterson et al., 2007). These included a lack of supervision and support, institutions being unprepared for their arrival (largely related to a lack of basic facilities and resources, poor communication and bureaucratic and administrative problems), lack of clarity on the role of the CS dietician, dissatisfaction with being far from home, work and role overload, not being part of a team and the under-utilisation of CS dietician services. These findings suggested a more challenging set of experiences than those reported by participants who were working throughout South Africa in the study by Visser et al (2006). Paterson et al (2007) obtained greater depth of information through the focus group discussions. These also centered, in part,



on the constraints and obstructions experienced, which likely contributed to their centrality to the findings. In a third study (Parker et al., 2012), a mixed methods study design was used to evaluate the successes and shortfalls of CS by looking at the experiences and challenges of the 2009 CS dieticians. A national survey that received an 80% response rate (n=134) was first done to elicit information on the CS dieticians' working contexts and challenges experienced. Five dieticians in each province were then purposively selected and interviewed around issues that surfaced in the survey. Many participants reported a positive CS experience with 34% being able to gain practical experience and 30 % experiencing it as a professional development and personal growth opportunity. Significant challenges were reported around an orientation program, supervising and mentoring, patient referrals, resources and communication. The sample within this study was arguably more representative of the population and thus findings from this study may be more generalisable.

### ***Speech-language therapists and Audiologists***

The first study to assess the perceptions, attitudes and experiences of speech language and hearing professionals was completed in 2011 (Wranz, 2011). A mixed methods study used a questionnaire to collect data from therapists who had graduated from Stellenbosch University in 2008. Seventeen of the 18 graduates responded to the questionnaire and completed their service in six different provinces within varying levels of health care. Perceptions of this group revealed that they possessed sufficient knowledge to embark on CS but did not necessarily feel that they possessed adequate skill. The entire group felt they had made a positive contribution through their service year. The general shortage of speech-language and hearing services was highlighted as well as the absence of mentors and supervision, and insufficient budgets and resources. More than half the participants reported difficulty communicating with their patients and this was linked mainly to language difficulty. Almost all participants (94%) reported an increase in knowledge and confidence after completing their compulsory year, and 90% reported developing personally and professionally. More than 75% reported frustration, stress and negative emotional experiences.

## ***Clinical psychologists***

The experience of the first group of clinical psychologists completing CS in 2003 was published by Pillay and Harvey (2006). A survey was used to obtain a representative view of the population's experience and a 67.5% response rate achieved. Around two-thirds of participants (65.4%) were placed in hospitals and 90% of participants felt that they had made a difference in the communities in which they served and that the service year contributed to improving their confidence. Difficulties reported by the psychologists included being unable to find accommodation (>50%), resource limitations, role uncertainty and lack of proficiency in the language of their patients (>50%). Close to 75% of participants were not proficient in the language of their patients. Rohleder, Miller, & Smith (2006) described their personal experiences of working as CS practitioners within prisons. The challenges that they encountered included working with limited resources, in an uncertain professional role, in an environment which was not perceived as being safe, and without appropriate institutional support and supervision. They reflected on the anxiety, fear, isolation, anger and helplessness that they dealt with as a result. Acknowledging the role that CS practitioners play in improving access to health care, the authors strongly questioned whether placing novice practitioners in demanding settings without supervision and institutional support was appropriate.

A lack of institutional support was also highlighted by Swarts (2013) in a personal reflection on her CS year. Other difficulties that she reported included patient transport difficulties (due to financial constraints and limited public transport) and burdensome work environments. Attempting to practice mental health care within a medical model, in the absence of mental health specialists, and with nursing staff that lacked training in mental health care, was perceived as challenging. Although not generalisable to the entire CS psychologist population, the accounts of Swarts (2013) and Rohleder, Miller and Smith (2006), provide insight into the depth and range of experiences encountered by CS psychologists.

## **Summary of key themes**

Several common themes related to the experiences of CS health professionals emerged from the literature review. Firstly, CS settings were often extremely challenging for new graduates, and also revealed the hardship experienced by the communities they served. The importance of CS orientation was highlighted repeatedly, either due to practitioners' positive experience of this process or because of the gap experienced due to orientation not being provided. The service year was commonly perceived as being a positive and *worthwhile* experience in which one had the opportunity to "make a difference". Communication with patients, often due to language barriers, was highlighted as a common difficulty. Other challenges included insufficient or absent supervision, mentorship and support and the absence, or limited availability of resources. Despite this, the service year was frequently reported as a learning opportunity through which knowledge, skill and confidence developed.

## **2.2 Rural practice**

As part of the purpose of CS was to improve the provision of health care in rural areas and those underserved during the apartheid era (Reid, 2001), it was important to consider rural occupational therapy practice (and rural health care practice in general). In seeking to define "rural", Reid (2006) suggests that rural location and being 'underserved' are inextricably linked given the legacy left in these areas by apartheid's homeland system. He highlights that pervasive poverty and inequity are more central to a definition of *rural* within a South African context than geographical location. This is particularly relevant given that 52% of the South African population live in rural areas and 75% of those living in poverty are located rurally (Reid, 2006). This part of the literature review outlines the nature and demands of rural practice, opportunities and challenges presented when working rurally as well as strategies used within rural practice.

### **2.2.1 The nature and demands of rural health care practice**

In South Africa, a large burden of disease is carried by the rural population and a minority of health professionals is responsible for delivering services where the greatest need exists (Reid, 2006). This inequity is common, but is not limited to developing countries (Lehmann, Dieleman, & Martineau, 2008). Rural Canadians, for example, have poorer health than those living in urban areas and this is due, in part, to health staff shortages (Wielandt & Taylor, 2010). Rural practice may also be characterised by the need to service vast geographical areas (Boshoff & Hartshorne, 2008; Gaede, Mahlobo, Shabalala, Mloi, & Deventer, 2006; Stagnitti, 2008). A further characteristic central to rural practice is the demand for practitioners to possess a wide range of skills to address the diverse needs of a population (Lannin & Longland, 2003; Stagnitti, 2008). Beyond this they also need to be equipped to adopt a population-based approach (Reid, 2006) that is holistic and involves a comprehensive package of care within contexts previously dominated by a medical model of health care (Gaede et al., 2006). For this to be possible Stagnitti (2008) highlighted the need for practitioners to possess an in-depth knowledge of the community and the resources within the community. A *Lancet* report (Baleta, 2009) described the re-development of a rural hospital in an area of the Eastern Cape that was previously classified for underdevelopment during the apartheid regime. The report cited a hospital doctor who stated that commitment to excellence, care, fairness and hard work was required to build trust with a previously ill-treated rural community. This alludes to the potential vulnerability of rural populations, which reinforces the need for a unique skill set by health professionals. An occupational therapy article similarly recognised the unique set of skills required to meet rural health needs, and called for rural, or general occupational therapy practice, to be considered an area of specialisation (Lannin & Longland, 2003; Roots, Brown, Bainbridge, & Li, 2014).

### **2.2.2 Opportunities and barriers in rural practice**

Challenges to service delivery highlighted by two staff members in Baleta's (2009) Eastern Cape report included perceived incompetent administration, nepotism, bureaucracy and budget cuts. Similar challenges were identified by

Gaede (2006) who used a participatory action approach to explore the challenges to holistic health service delivery in a rural KwaZulu Natal sub-district. Barriers were classified as those *within* the health system and those *outside* of it. The former included limited resources (specifically related to time and energy spent on individual patients), poor training in, and knowledge of, holistic practice, poor supervision (leading to inconsistent performance), bureaucracy, distance from the community, the referral system and intersectoral work. Barriers *outside* of health services included poverty, nutrition, HIV/AIDS and the cultural context. For those who pursued holistic practice, these aspects were considered to contribute to the risk of burnout. Findings suggested that the health care system within this district was not aligned to holistic health practice and depended on individual clinicians' commitment to practice beyond the scope of a medical model approach. Reid (2006) suggested that health care throughout South Africa remained dominated by a curative rather than a holistic approach 12 years after the change of government. This conclusion is corroborated by the findings of a doctoral study that identified the persisting dominance of this approach (L. Hess-April, personal communication, January 14, 2014). An occupational therapy study conducted in Australia reported some similar challenges to those reported in South African research. Eighteen therapists working in rural and remote areas reported a demand to deliver a wide range of services to patients with diverse needs, limited staff, and a high patient-to-therapist ratio (Boshoff and Hartshorne, 2008).

### **2.2.3 Strategies to address the challenges of OT rural practice**

Various strategies used by occupational therapists to manage the challenges of rural practice have been described in the literature. Problem solving methods, networking and multi-skilling was reported by Boshoff and Hartshorne (2008) as common strategies used in rural practice. Adequate workplace support was also implied to be essential. A qualitative study that explored the perspectives of 6 occupational therapists and 13 physiotherapists working in rural Canada described various strategies to overcome resource shortages of rural practice (Roots et al., 2014). These included "stretching their role" within their scope of practice and practicing in partnership with the communities in which they were working. Networking, collaboration and

reflective practice were considered to be vital to competent rural practice. Caseload prioritisation was highlighted in an Australian study as a key strategy that is considered to be essential for rural practice (Lannin & Longland, 2003).

The recruitment and retention of experienced occupational therapists has also been identified as an essential strategy within rural practice due to the very specific competencies required. Given that rural recruitment and retention is a global problem (Lehmann et al., 2008), the need for greater preparation of undergraduates for rural practice has been highlighted (Lannin & Longland, 2003; Roots et al., 2014). These authors similarly drew attention to the need for continuous professional development opportunities for rural therapists to develop the competencies required.

#### **2.2.4 Rural practice and the novice occupational therapist**

Considering that rural settings become the practice destinations of many CSOTs, studies on novice practitioners' experience of rural practice were reviewed. A qualitative study that explored the experiences of five newly graduated occupational therapists starting registered practice in rural Australia, found that the process of becoming an occupational therapist was characterised by initial low self-confidence which improved with time through feedback from others (Lee & Mackenzie, 2003). A progression was also noted from initial distress at a lack of knowledge and skills, to becoming comfortable with their level of competence, and an ability to appraise competence as a novice clinician. Interestingly, participants declining requests or referrals that they did not have the resources to meet was considered to be evidence of developing confidence. Challenges of practice included working with limited resources and receiving minimal support. Participants identified a need for support through personal contact with a more experienced clinician, to facilitate their transition into practice. Contact with another therapist allowed participants to seek affirmation, confirmation or constructive feedback, and advice as well as an opportunity to debrief. Other professional networks were pursued via telephonic or email contact. Participants perceived the variation in their caseload as a challenge but also as an opportunity to obtain broad experience. They reported feeling "overwhelmed" by the limited resources at

their disposal. This was perceived by some as an opportunity to develop various skills; some responded by being resourceful while others worked at accessing resources through management. Participants generally perceived their experience as positive and reflected on the fulfillment that interaction with clients brought.

### **2.3 Novice practitioners**

The transition from student to practicing occupational therapist is not only challenging for rurally situated therapists. It is known to be a complex process (Tryssenaar, 1999) that may be characterised by significant stress and extensive professional development (Tryssenaar & Perkins, 1997). Tryssenaar (1999) studied the lived experience of one new therapist using a qualitative case study design, and the themes describe the initial enthusiasm and excitement of the participant on commencing employment (*'through rose-coloured glasses'*). This faded quickly as a reorientation to the specific realities and challenges of practice was revealed (*'the impact of reality'*). The final theme, *'onward and upward'*, described the rallying process of reflecting on the impact of reality on initial enthusiasm and the participant's growth in an approach for personal development and coping.

A similar transition process was evident in a phenomenological study of six occupational therapy and physiotherapy graduates in Canada (Tryssenaar & Perkins, 1997). Their experiences during their final undergraduate clinical placements and first year of registered practice were explored by analysing their journal entries. Four successive stages of transition were identified. The *transition* phase occurred during the final clinical placement and involved an eagerness to finish undergraduate study. *Euphoria and Angst* described the early stages of registered practice with both anticipation and reservation evident for the reality that lay ahead. *Reality of practice* captured the realisation that practice was often challenging and this was later responded to with *Adaptation* - a stage in which participants learnt to respond to these realities. Within each of these stages, and across stages, various themes further characterised participants' experiences. These themes included *great expectations, competence, politics, shock, education and strategies*. *Great expectations* were evident early in the transition from student to clinician and

this theme encompassed the many expectations that were unmet in practice. The early phases were also characterised by participants doubting themselves and their ability, echoing the experience of rural-based participants in Lee and Mackenzie's (2003) study. As their first year of practice progressed, however, a sense of *competence* developed allowing therapists to shift their concentrated focus from their perception of their ability to the needs of their patients. The experience of *politics* within the work setting dominated most stages of participants' experience. Participants' descriptions of the first few months of work contained a strong element of *shock* that appeared to impact significantly on their personal and professional lives. Observing various ethical, professional and interpersonal aspects of work life as well as specific demands of clinical practice was unexpected for graduates. Acceptance of these aspects as a normal part of work life began to reflect in journal entries approximately half way through the first year of participants' practice as a qualified clinician. Reflections on *education* highlighted the expected gaps that participants' perceived in their undergraduate education as well as aspects of work for which they felt well prepared. One third of the way into the first year of practice, *strategies* to adapt to the demands of their new working environments began to emerge. These strategies included attending CPD courses, approaching supervisors and seeking out mentors. Both studies identified the need for various preparation strategies to be included in undergraduate education as well as identifying the need for various supports after graduation.

Toal-Sullivan (2006) explored the experiences of six occupational therapy students transitioning to practice and collected data through interviews and journal entries at intervals during their first year of practice. Similar to the aforementioned findings, participants reflected on a difference between initial expectations and the reality of practice. They also echoed previous findings that highlighted gaps between skills taught at an undergraduate level and those demanded in practice. They felt ill-equipped for some interventions (for example, wheelchair prescription, hand therapy and cognitive rehabilitation), struggled with clinical reasoning and had difficulty adopting a holistic and client centred approach. Where participants in Tryssenaar and Perkin's (1997) study reflected that an ability to improve a focus on client needs was enabled by a growth in competence and confidence, participants in this study



described other barriers to client centered practice. These included limited time, waiting lists, budget restrictions and a difference in practice priorities between the therapist and management. Experiences around professional identity emerged during analysis. Participants had difficulty understanding their role in their clinical context and were concerned about the multidisciplinary team's perception of occupational therapy. Another challenge was the perceived weight of client responsibility. Concurring with other findings, support of colleagues and peers was a facilitator of adaptation to role demands.

The need for support and supervision was reiterated by Hummell and Koelmeyer (1999) who studied the perceptions of 74 Australian occupational therapy graduates of their first job (69% response rate). Eighty-nine percent found the transition stressful despite most participants (85%) being satisfied in their first job. Participants named factors that they perceived to have helped them in transitioning from student to practicing therapist. Support within and outside the workplace was considered most often to assist the transition. Personal characteristics that were linked to assisting the transition included self-confidence, enthusiasm, resourcefulness and motivation. Recommendations emphasised the role of regular support and supervision by a skilled clinician to ease the transition to practice.

It has been suggested that new graduates need to meet the demands of increasingly complex practice contexts (Fortune, Ryan, & Adamson, 2013; Morley, 2009). Morley (2009) evaluated the contextual factors that affect the transition of new graduate occupational therapists that were part of a preceptorship programme<sup>6</sup>. Semi-structured interviews with recent graduate clinicians and their supervisors were conducted within a mixed methods approach. Findings revealed that a number of therapists worked alone in a clinical unit and some of these settings had not previously employed new graduates given that the work was considered to be complex in nature. All participants highlighted the need to have access to senior colleagues for support. The structure of the preceptorship programme facilitated a measure of supervision that graduates felt that they may not have otherwise received. Supervisors reported human resource shortages and other workplace factors

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<sup>6</sup> A support programme of observed practice and joint reflection

that affected new graduates. Graduates in turn reported feeling unprepared for the expectations that were placed on them including demanding workloads. Working effectively within a multidisciplinary team was highlighted as another challenge. Findings in this study again highlighted the process of establishing a professional identity. Graduates struggled with this when working within generic teams, receiving limited feedback and not having access to senior occupational therapy colleagues. Strategies used by supervisors to facilitate graduates' transition included structured orientations and role modeling. An open and supportive work culture was reported to be valuable as well as opportunity to engage with other new graduates.

## **2.4 Undergraduate preparation**

Undergraduate preparation forms the foundation of learning on which novice practitioners continue to build. In this section the appropriate orientation of health science undergraduate curricula towards priority practice settings will be described. The necessary content and evidence-based teaching strategies to prepare students for practice will be discussed. On this foundation, the preparedness of health science graduates for practice (and occupational therapists in particular) will be described.

### **2.4.1 Undergraduate curricula**

The content of undergraduate programmes is considered globally to be an important issue when considering the preparation of health professionals for complex practice contexts (Adamson, Hunt, Harris, & Hummel, 1998). It has been suggested that preparation for rural and urban environments may require different focus areas within an undergraduate curriculum (Brockwell, Wielandt, & Clark, 2009).

The severe inequitable distribution of health professionals in South Africa required health science faculties to strategically consider how they prepare their graduates to work effectively within rural and other underserved communities (Reid & Cakwe, 2011). This agenda is strongly challenged by financial restrictions, logistical implications, risk management of students and

intricate relationships with the South African Department of Health. Despite these challenges, Reid and Cakwe (2011) encourage faculties to explicitly prioritise the health of rural and underserved communities. Early exposure to these settings and significant involvement in community settings is important for students to gain practical experience and to contribute to service delivery. Furthermore, positioned as a driving force in learning, assessments need to focus on skills that are required for rural practice including language competency (Reid & Cakwe, 2011). Research suggests that exposure to rural practice as a student in South Africa is associated with choosing rural practice as a qualified practitioner, although the specific aspects of the undergraduate programme that contribute towards this association are not yet known (Reid, Couper, & Volmink, 2011). The Best Evidence in Medical Education (BEME) Collaboration identified that early exposure of students to clinical and community practice contributed towards this association within United States based studies. This early exposure assisted health profession students to socialise to their profession, develop reflective skills, improve confidence when interacting with patients and made learning applicable and relevant (Dornan et al., 2006).

Student clinical practice in South Africa is often largely located in tertiary and teaching hospitals (Reid & Cakwe, 2011). Barriers to educational experience within community and district settings include a lack of physical space to accommodate students, clinicians managing heavy workloads and limited academic staff. These barriers should be addressed in order to adequately prepare students for practice at various levels of care and develop sustainable and beneficial services (Burch & Reid, 2011).

### ***Teaching and learning techniques***

The approach used to present educational content when preparing health science graduates for practice realities needs to be considered along with the teaching and learning techniques utilized within programs. A search for evidence to support various teaching strategies identified thirteen studies. A review on the effectiveness of case-based learning in health professional education found inconclusive results to support this strategy compared to other teaching methods (Thistlethwaite et al., 2012). It was an approach,

however, considered by students to facilitate their learning and often chosen by teachers due to its perceived ability to engage and motivate students. Similarly evidence for the use of portfolios as a teaching method is limited although, when used appropriately, this method may contribute towards improvements in knowledge, understanding, reflection, self-awareness and student-tutor relationships (Buckley et al., 2009). Early undergraduate community and clinical work has been found to be beneficial in medical education (Dornan et al., 2006) and the importance of clinical role models within the early years of problem-based learning curricula has been identified (McLean, 2006). Appropriate implementation of customised interprofessional courses, presented by trained educators, may contribute to developing the knowledge and skills required to work within a multidisciplinary team (Hammick, Freeth, Koppel, Reeves, & Barr, 2007). Simulation has also been described as a useful educational technique to complement clinical practice and advance student learning within a safe environment (Khan, Pattison, & Sherwood, 2011).

Within occupational therapy education, a South African study explored the teaching strategies used at universities to present paediatric curricula (Brown, Brown, & Roever, 2006). Six of the eight universities that offer occupational therapy education responded to a questionnaire. All universities reported using traditional lectures and practical demonstrations. Five programmes used tutorials, problem-based learning methods and groupwork while four used experiential learning, case histories and self-study. Three universities used simulated patients, role-playing and reflective activities. It is, however, not known which teaching strategies are used within UL rehabilitation curricula. Research abroad has found that problem-based learning techniques within OT curricula can improve the clinical reasoning of senior students (Scaffa & Wooster, 2004). Fieldwork had been found to be central to the application of knowledge and the development of clinical skill (Costa & Burkhardt, 2003). The use of simulation as a teaching technique is widely used in entry level occupational therapy programmes in the United States and further research into the effectiveness of this strategy has been recommended (Peterson Bethea, Castillo, & Harvison, 2014). Interactive journals are frequently used to promote reflection and develop clinical reasoning (Tryssenaar, 1995). Techniques are diverse and the American Journal of

Occupational Therapy have recently developed a research agenda for occupational therapy education in order to inform best educational practices (Burke & Harvison, 2014).

#### **2.4.2 Perceived preparedness for practice**

Limited literature that discusses occupational therapy graduates' *overall* perception of their undergraduate curriculum and preparedness for practice was found. Hodgetts et al (2007) reported a similar finding. When looking more broadly at the experience of other health professional graduates, Hill et al (1998) investigated the preparedness of a group of junior Australian doctors for hospital practice. Participants reported feeling *somewhat adequately equipped* for most areas of practice. Participants from non-traditional medical schools perceived themselves to be better prepared in some categories of interpersonal skills, coping and confidence, life-long learning and holistic care. This study suggests that learning experiences and curricula priorities *might* impact on perceived preparedness for practice within a specific practice setting. Hart and Macnee (2007) found that 51% of a sample of 562 nurse practitioners from across the United States attending a national nursing conference felt *somewhat* or *minimally* prepared for practice, and 10% felt *very well prepared*.

The perceived preparedness for undergraduate clinical practice of a group of third year South African physiotherapy students was assessed with results demonstrating high levels of perceived preparedness matched by satisfactory clinical marks suggesting accurate estimations of skill (Talberg & Scott 2014). This study however, reflects readiness for undergraduate clinical practice rather than readiness for the realities encountered after graduation and registration where support is dramatically reduced and responsibility increases (Kasar & Muscari, 2000; Morley, Rugg, & Drew, 2007). Ramklass (2009) found that a group of qualified novice physiotherapists did not feel sufficiently equipped for the community-based and under-resourced settings in which they had to work after graduation. Based on reported perceptions of community physiotherapy practice, a study was conducted to guide curriculum reform (Mostert-Wentzel, Frantz, & Van Rooijen, 2013). It was recommended that service learning in varied settings would assist in

developing necessary professional skills and cultural competence. The need for therapists to develop the ability to educate their patients appropriately in order to complement strong clinical competence was highlighted. Furthermore, the need to develop reflective skills to support on-going learning, adaptability and coping skills needed for low-resource settings was found to be important.

No published literature on the perceived preparedness for practice of occupational therapists in South Africa was found. The perceptions of 144 graduate occupational therapists from an Australian university around their undergraduate preparation was examined by Adamson et al (1998). Similar to the experiences of novice therapists reviewed above (Toal-Sullivan, 2006), these participants found a gap between the environmental demands of practice and the knowledge and skills taught at university. Specific areas of concern were communication with the multidisciplinary team and the public, management functions and knowledge of the health industry. The authors of this study suggested that facilitating self-directed learning within undergraduate preparation was potentially as important as tailoring a curriculum when considering how to prepare therapists to meet workplace demands.

Hodgetts et al (2007) explored the preparedness for practice and satisfaction with undergraduate curricula of a group of Canadian occupational therapy students and new graduates. The findings of this mixed methods study revealed that students and graduates (approximately 10 months after graduation) felt generally satisfied with their undergraduate education although they perceived that they lacked various treatment skills. It appeared to take between six and 24 months for graduates to start reporting a sense of competence.

A New Zealand study that explored the perceptions around preparedness for practice of approximately 20 newly graduated occupational therapists in New Zealand was reviewed (Robertson & Griffiths, 2009) revealing themes that centered around supervision, the transition from “knowing about” to “knowing how” (p.130), and the need for extensive communication skills. Clear challenges for the participants included attempting to understand their role, insufficient supervision, lack of clarity with regards to responsibility within a

team, and inadequate skills. The authors highlighted a need for specific support after graduation and supervision to facilitate the transition, as well as for opportunities within undergraduate teaching for therapists to learn to contextualise and reconstruct their knowledge. These findings represent the perceptions of a group of students from one university limiting the generalisability of findings. As data were collected retrospectively the accuracy of data may be questionable and findings need to be applied with caution.

Differences between the perceptions on preparation for practice of graduates who ended up working in urban areas and those working in rural areas have been examined (Brockwell et al., 2009). All therapists found fieldwork courses to have best prepared them for practice. Specific courses were mentioned as being most valuable however rural-based therapists reported that *all* subjects had been useful in their preparation for practice. This study suggests that practice context may affect what should be included in an undergraduate curriculum although the limited sample size (n=15) restricts the generalisability of findings.

## **2.5 Professional competence and confidence**

Undergraduate preparation initiates the development of professional competence and confidence in students. Fitness for occupational therapy practice requires that therapists are both professionally competent and confident (Holland et al., 2013). These concepts are intimately linked and are also closely related to professional identity (Holland et al., 2012). It is a responsibility of universities and the profession to ensure that graduates, and thus CSOTs, are both competent for, and confident in their practice. These two concepts are explored in depth.

### **2.5.1 Professional competence**

Professional competence involves the acquisition and prudent application of knowledge as well as an ability to integrate competencies within different areas of practice. Competence is both developmental and context specific (Epstein & Hundert, 2002). Competence also relates to health professionals being able to

accurately identify their own learning needs and select and access development opportunities to address these needs (Davis et al., 2006). Therapeutic relationships are central to competence and involve moral and affective components (Epstein & Hundert, 2002). Mindful practice is also central to competence and enables critical reflection, values clarification, active listening, recognition of error, and technical skill development, and contributes to evidence-based reasoning (Epstein, 1999). Literature suggests that thorough assessment of competence may be complex but in order for it to be comprehensive it needs to be accompanied by feedback, mentoring and remediation (Epstein & Hundert, 2002).

Competencies needed for specific areas of occupational therapy practice have been identified in literature. Competencies for *upper limb rehabilitation practice* are explored in other sections (see 1.1.3, 1.1.4 & 2.6). Therapists working within *work practice* need effective communication skills as well as various consolidated skills (Adam, Gibson, Strong, & Lyle, 2011). Within a South African context, some of these skills can be acquired in undergraduate education while others require postgraduate development (Buys, 2007; Casteleijn, 2007). The development of competency requires more than formal education. The role of peer review, mentors and clinical experience have also been highlighted as necessary to support the development of professional competence within work practice (Buys, 2007).

A study of competencies required to work in *emerging occupational therapy practice* contexts identified 104 competencies and characteristics using the Delphi method (Holmes & Scaffa, 2009). Items relevant to the South African context included an understanding of core philosophical and theoretical foundations of the profession, and those needed to envisage and implement services in various contexts. Other essential skills identified included attentive listening and communication skills for marketing and community partnerships. Flexibility, initiative and being comfortable with working in non-medical model settings were found to be essential along with strong clinical reasoning skills.

The subjective appraisal of competence may not necessarily align with the objective measurement of competence (Davis et al., 2006). Literature has given



little attention to the objective assessment of occupational therapists' (particularly novice therapists) competence (Nayar, Gray, & Blijlevens, 2013) although the perceptions of competence of novice therapists has been studied (refer to 2.3 and 2.4). It has been recommended that further studies into preparedness for practice of graduates be conducted but that this be considered from various perspectives including that of the educator and manager (Nayar et al., 2013).

### ***Cultural competence***

Cultural competence is an essential aspect of professional competence and is required across domains of practice. Occupational therapy has developed from a distinctly western worldview (Awaad, 2003). This has led to rising concern in the profession for patients and communities who do not share this perspective given the impact that cultural identities have on treatment. Awaad's review (2003) of occupational therapy literature on culture and cultural competency elicited three key themes. The first theme encompassed comprehending the nature and concept of culture and highlighted the complexity of the concept. The second theme spoke to skillfully using specific cultural knowledge to enable successful engagement with clients and communities. The role of effective communication was highlighted exploring the link between language proficiency and cultural competence. The final theme was the importance of having insight into one's own culture as a practicing occupational therapist as well as the prevailing culture of occupational therapy. The concepts of "personal autonomy, performance and achievement and goal-directed intervention" (p.359) were identified as being situated within the culture of the profession and may espouse assumptions that pose problems to culturally competent practice. Various methods may be used at an undergraduate level to build basic cultural competence including interdisciplinary courses (Davis & Smith, 2009; Hawala-Druy & Hill, 2012), population-based projects (Fahrenwald, Boysen, Fischer, & Maurer, 2001), and service learning (Chen, McAdams-Jones, Tay, & Packer, 2012). However, the development of cultural competence is ongoing (Campinha-Bacote, 2002; Epstein & Hundert, 2002) and various strategies have been studied to facilitate this continued development after graduation (Delgado et al., 2013; Levin, 2011). The diversity of the South African population (Statistics South Africa (STATSSA), 2014)

necessitates that health professionals, including CS professionals, are able to demonstrate culturally competent practice.

### **2.5.2 Professional confidence**

Professional competence is closely linked to the concept of professional confidence, as well as professional identity (Holland, Middleton, & Uys, 2013). In a study of the development of confidence in students completing a nursing degree programme (Crooks et al., 2005), a qualitative analysis of focus group discussions described a transition from obtaining knowledge and to being able to critically appraise practice, to “finding a voice of my own” (p.363). This involved being able to communicate an evidence-based position that was consistent with participants’ values. The development of confidence was further characterised by “feeling, knowing, doing and reflecting” (p.360). Support through the described phases was key to the development of confidence. The need for support, to nurture professional confidence was reiterated by Holland, Middleton and Uys (2012), after completing a concept analysis of professional confidence.

How professional confidence is conceptualised by novice practitioners was explored with a group of eight CSOTs in 2011 (Holland, Middleton, & Uys, 2013). Phenomenographic analysis of semi-structured interviews revealed three different understandings of professional confidence. “Knowing as an occupational therapist” (p. 108) described an internal perception of confidence that involved how knowing themselves, their competence (knowledge and skills) and their role worked together. The second conception also related to an internal sense: “believing you are an occupational therapist” (p.109). This involved a sense of certainty, trusting themselves and not doubting their reasoning, or faking a sense of confidence. “Being an occupational therapist” (p. 110) represented an external demonstration of confidence. This theme described therapists’ professional presentation (appearance and communication) and their ability to assert themselves and advocate for occupational therapy services. These findings cannot be generalised to all novice therapists but represent an understanding of professional confidence held by CS therapists working in KwaZulu Natal in 2011. They do, however, contribute to a developing understanding of

conceptions of professional confidence that bear particular relevance to the subject under investigation in this dissertation.

### **Summary**

The literature reviewed clearly demonstrates that professional competence is multifaceted and developmental (Campinha-Bacote, 2002; Epstein & Hundert, 2002). Literature on professional competence strongly relates to the concept of preparation for practice explored in 2.4. Competency begins with an appropriate undergraduate training that explicitly considers practice destinations of graduates (Burch & Reid, 2011) and should continue to develop through feedback, mentorship, (Epstein & Hundert, 2002), supervision and support (Lee & Mackenzie, 2003), and ongoing professional development (Davis et al., 2006). Similarly, professional confidence is developmental and needs to be cultivated (Holland et al., 2012). Both competence and confidence are essential to all domains and areas of practice, including upper limb rehabilitation.

## **2.6 UL rehabilitation education and practice**

UL rehabilitation, often referred to as *hand therapy* has been described as an art and a science (Parry, 1997) that takes into consideration the physiologic stages of healing that occur after injury to the hand (Dorf, Blue, Smith, & Koman, 2010). Hand therapy is concerned with assisting individuals in gaining optimal use of the UL after surgery, injury or illness (SASHT, 2014). Therapy, as defined by the American Hand Therapy Certification Commission in 2002, is focused on prevention of dysfunction, restoration of function and the reversal of the progression of pathology in order to enable those with UL injury or disease to optimise their participation in life situations (Muenzen et al., 2002). Although UL rehabilitation can be practiced by both occupational therapists and physiotherapists (Frampton, 1998), when it is situated within an occupational therapy frame of reference, rehabilitation is framed within an understanding of patients (or patient populations) as occupational beings who have a biological need to engage in occupations that are specific to a temporal context (Clark, 1997).

UL rehabilitation began to develop as a specialised area of physical rehabilitation following accelerated advances in hand surgery after World War II. This built on significant contributions made in the 1800s and early 1900s towards the development of techniques to restore function (Parry, 1997). In 1946 and 1947 two rehabilitation centers were opened in England recording some of the earliest hand rehabilitation (British Association of Hand Therapy (BAHT), 2014). In the 1950s a specialised hand rehabilitation unit was developed in the United Kingdom and physical medicine specialist Wynn Parry published the clinical experience gained in this unit within the book, *Rehabilitation of the Hand. Pioneer hand surgery and rehabilitation* (in particular for patients with leprosy) was undertaken by Paul Brand in various countries at a similar time (Parry, 1997). Hand surgery societies were established in the United States in 1946 (American Society of Surgery to the Hand (ASSH), 2014) and in Britain in 1964, along with similar organisations in Europe and Scandinavia. Hand therapy associations were established in the United States in 1977 (Parry, 1997) and the United Kingdom in 1984. In South Africa a hand surgery society was established in 1969 (South African Society of Surgery to the Hand (SASSH), 2014) and the South African Society of Hand Therapy in 1988 (SASHT, 2014). The purpose of the latter is to “encourage the development of skilled hand and UL therapists in South Africa”. This is situated within the intention to facilitate quality service delivery.

Post-graduate hand rehabilitation education programmes exist throughout the world. In the United States there are various postgraduate programmes and fellowships along with a formal certification process with re-certification being required every five years. In the United Kingdom occupational and physiotherapists are able to work towards a fellowship by completing three levels of training that include structured courses (Level I and II) and self-directed research (Level III). The fourth level is a Masters programme. Various postgraduate diploma and Masters programmes are offered in UL rehabilitation in countries such as Australia, New Zealand, France and Sweden. In South Africa Masters degrees specializing in hand therapy are offered at various universities (Frampton, 1998) as well as a postgraduate diploma in hand therapy at the University of Pretoria (UP, 2014).

In response to an extensive call for an international hand certification process and after an analysis of hand therapy worldwide, Frampton (1998) highlighted that UL rehabilitation practice is pervasively impacted by the context in which it is practiced. Some factors that affect that nature of therapy include access (distance) to services, availability and nature of surgery, financial (and other) resources and the environment (agricultural, urban/rural, industrial). This makes a uniform international certification procedure impractical. According to the president of the OTASA, there is no formal recognition of postgraduate qualification in South Africa at the moment but the HPCSA is considering the issue of specialisation (H. Buchanan, personal communication, November 18, 2014).

In many contexts it is likely that therapists treating patients with UL injuries and conditions have little to no postgraduate training in UL rehabilitation. In a study of the views of 15 therapists (occupational or physiotherapists) working in UL rehabilitation in India (Nandgaonkar, 2014), one therapist stated, “I am posted in this department where this work (hand rehabilitation) has automatically come to me...I never got any specialised training” (p. 515). Other participants highlighted the fact that structured training programmes for UL rehabilitation in India was not available. Although limited evidence is available to support this assertion, it is likely that, particularly within developing nations, many therapists with limited experience and little or no postgraduate education are required to treat patients with UL injuries and conditions. They would thus have to respond to presenting need with the knowledge and skill obtained at an undergraduate level and using other forms of support and development opportunities accessible to them.

A review of the literature produced no published work on the nature or extent of upper limb rehabilitation education presented at an undergraduate level. UL rehabilitation involves holistic assessment including thorough evaluation of the UL, an ability to develop a prognosis and plan of care, an ability to implement therapeutic modalities appropriately and an ability to integrate multiple professional skills (Dimick et al., 2009). In a practice analysis of hand therapists in the United States, many occupational and physiotherapists identified that most of the knowledge they used had been obtained after their undergraduate education (Dimick et al., 2009). There is however no

information about what aspects of upper limb therapy are taught or learnt in entry-level occupational therapy programmes.

A study on preparedness for practice reported that graduates did not feel prepared for “complex” areas of clinical practice including splinting and UL rehabilitation (Toal-Sullivan, 2006). Novice therapists who underwent a six-month rotation through a hand therapy department in the United Kingdom reported viewing UL rehabilitation as being a “specialised area” and felt a “heightened sense of responsibility” as they feared harming their patients (Fitzpatrick, 2006). Although “enthusiastic”, new therapists felt “overwhelmed” by the information they needed to assimilate in order to function within the unit. They also identified a need to “learn by doing”. To assist these therapists in meeting the demands of their clinical context, 12 learning modules were developed which focused on assessment and treatment themes within UL rehabilitation and were facilitated by senior therapists. Pre- and post self-rated tests were completed for each module and therapists completed the programme having compiled their own resource packs. This strategy affirmed the need for structured educational input after graduation in order for new graduates to meet the demands of their practice contexts.

Little is known of the UL rehabilitation demands in the South African public health system. A search failed to reveal any incidence and prevalence studies for upper limb injuries in South Africa, and therefore a picture of the hand care needs in the country have to be extrapolated from other local and international studies (as outlined in Chapter 1). Evidence suggests that assaults are the most common cause of injury, tendon injuries are most frequently treated and that injuries are often complex in nature. This information is however outdated and reflects only a three year retrospective review of records at one public hand unit in South Africa (Pietrobon, 1996). It is difficult to predict, beyond clinician opinion, what the UL rehabilitation demands are of the public health context in South Africa. It is also unclear what specific support is available to new graduates within this practice area.

## **2.7 Conclusion**

The CS experience of most health professional groups has been published in the last 12 years but apart from anecdotal evidence, little is known about the experience of CSOTs. Both locally and abroad, the nature and demands of rural practice on health professionals has been written about. Rural occupational therapy practice in South Africa has, however, not been documented in peer-reviewed publications. It is also not known how adequately South African undergraduate occupational therapy curricula have prepared graduates for their early practice contexts and whether resources are present to support their ongoing competency development. Furthermore, little is known about the hand care and UL rehabilitation needs within the public sector in South Africa. Literature provides limited insight into the UL rehabilitation competencies that are required of therapists within the public sector, and the extent to which resources are available to nurture and develop competencies. It is within these areas of limited evidence that this dissertation project will be situated.

## **Chapter 3: Methodology**

The context in which this project is situated was described in earlier chapters. This chapter describes the research methods used to answer the research question. The research design, study populations and approach to sampling are firstly outlined. The chapter demonstrates how *two* survey questionnaires were developed to collect data to enable the research aim and objectives to be comprehensively addressed. The validity and reliability of these instruments is described as well as the pilot process that assisted in the development of the questionnaires. The recruitment and data collection procedure is discussed and methods used for data analysis described. Finally, consideration of ethical issues is addressed.

### **3.1 Research design**

A quantitative descriptive cross-sectional survey research design was used to answer the research question. Due to the brevity of the service period of the population, a *cross-sectional* design was appropriate to enable data collection at one point in time. Surveys are flexible and versatile (Alreck & Settle, 1995) and therefore allow for many questions to be asked across a variety of areas related to the research objectives.

### **3.2 Population and sample**

#### ***Survey 1***

The research population consisted of all occupational therapists that had been allocated CS placements for 2013. A list of 241 CSOTs was obtained from the National Department of Health and was considered to be the study population. One potential participant was excluded as her allocated service site reported that she was not completing CS in 2013. To determine if other participants who had been allocated positions had not graduated, or had chosen not to complete their service year in 2013, an attempt was made to obtain a list of all CSOTs registered for practice in 2013 from the HPCSA. This was difficult to



extract from available occupational therapy registration statistics<sup>7</sup>, although it appeared that 232 graduates started CS in 2013. Because the number of individuals who had not started CS in 2013 could not be verified, the population was considered to be 240.

A number of variables within the CSOT population had to be considered, including undergraduate education facility, location of CS placement (urban/rural), level of care of placement (primary, district, tertiary) and nature of placement (facility or community-based). In order to capture a broad spectrum of experience (Parker et al., 2012), *the entire population* formed the sample. This was also done so that a representative sample would enable various generalisations about the population to be made (Bartlett, Kortlik, & Higgins, 2001).

## **Survey 2**

Eight universities provide occupational therapy undergraduate education in South Africa. Completion of *Survey 2* by a representative from each of these institutions was sought to ensure a comprehensive picture of undergraduate UL rehabilitation curricula in South Africa.

### **3.3 Sample size**

In order to inform the sample size calculation, previous studies that reported new graduates' preparedness for practice were reviewed. Toal-Sullivan (2006) reported that graduates did not feel prepared for complex areas of clinical practice including splinting and hand therapy. In a study on perceived competency and preparedness for practice of Australian and New Zealand new graduate occupational therapists, hand rehabilitation was the area of practice that Australian graduates felt least prepared for practice in hand rehabilitation. Feeling unprepared was reported by 33% of these graduates (Gray et al., 2012). Apart from this, a thorough review of the literature revealed no other research that quantified or qualified new graduates' preparation for

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<sup>7</sup> OTs who had completed CS in 2012 or before, who had not gone on to register for independent practice, were still registered as CSOTs although they were no longer practicing in this capacity and obscured how many therapists were registered for CS practice in 2013.

UL rehabilitation practice. Within other areas of practice, Meredith (2010) reported 75% of occupational therapy graduates feeling totally or generally unprepared to work within palliative care after undergraduate training. Craik & Austin (2000) reported that 37% of graduates considered their undergraduate preparation *sufficient* for practice in mental health settings in the United Kingdom (with a further 44% reporting it to have been *partly sufficient*). Gray et al (2012) reported that 17.1% of New Zealand graduate occupational therapists and 8.5% of Australian graduates feeling *very well prepared* for practice in general. The extent to which similarities can be drawn from preparedness in these practice areas in developed contexts to the practice of upper limb rehabilitation in South Africa is unclear. With previous studies on CS experiences reporting a lack of supervision and support, and resources (Paterson et al., 2007), it was assumed that this would substantially decrease the percentage of therapists that report feeling equipped. Taking these factors into account the expected frequency of therapists who *would* report being *equipped* to treat patients with upper limb injuries and conditions was *estimated* at 10%. Krejcie and Morgan (1970 As cited in Bartlett, Kortlik, & Higgins, 2001), stated that for categorical variables (as have predominantly been used within this study), a 5% margin of error is an acceptable parameter. With this margin of error, a population of 240 and a confidence level of 95%, a sample size of 88 was required (Raosoft®, 2014), which represented a 36.7% response rate.

### **3.4 Inclusion and exclusion criteria**

#### ***Survey 1***

All occupational therapists registered with the DOH and completing CS in 2013 were included in the study. CSOTs who were registered and allocated placements for 2013 but did not take up these posts (e.g. those who chose not to complete their service time in 2013 or were unable to do so due to not completing their undergraduate education in 2012) were excluded.

## ***Survey 2***

All tertiary education institutions that provide undergraduate training for occupational therapists in South Africa were included in the study. Occupational therapy educators employed at their university from 2011 or before were requested to complete the survey questionnaire on behalf of the university (to ensure that they were employed during the final 2 years of the 2013 CSOTs undergraduate studies). These educators needed to be *currently* responsible for, or part of developing and implementing, the UL rehabilitation curriculum.

### **3.5 Instrumentation**

As no previous studies on the research topic had been done, no appropriate instrument existed. Two surveys were thus designed for the project. Both questionnaires were self-administered and created with *Fluidsurvey* software (Fluidsurveys, 2014). This online survey tool provided templates for the creation of a user-friendly online questionnaire. For CSOTs who did not have access to the internet, email and hardcopy versions of the survey were made available.

## ***Survey 1***

A review of the literature guided the development of the CSOTs questionnaire. The survey questionnaire (Appendix 3) was divided into two sections. *Section A* consisted of demographic information, practice profile items as well as items related to participants' general CS experience. The purpose of this section was to understand features of their practice, aspects of their practice context and how this was experienced. Practice profile items included the number of patients seen monthly, common reasons for referrals, the number of sites at which the CSOT delivers services, items related to supervision and the presence or absence of multi-disciplinary team members. Items that related to participants' general CS experience included their experience of communication problems, their perceived cultural competence and one

particular question allowed them to select from a list and explain various experience descriptors that they felt expressed their CS experience. The list was compiled based on the feelings and experiences reported by novice practitioners in other studies (see Appendix 2). *Section B* contained items pertaining to CSOTs' UL rehabilitation practice. This section sought to capture how many UL rehabilitation patients were treated monthly, perceived preparedness for treating various conditions, use of intervention modalities, and how equipped CSOTs felt within specific competency areas of UL rehabilitation practice. A practice analysis of UL rehabilitation compiled by the American Hand Therapy Certification Commission (Muenzen et al., 2002) was used extensively to develop this section. In keeping with the objectives of the research, various questions were included regarding the contextual barriers and facilitators of practice that impact on how equipped CSOTs report being. Types of questions used depended on the data the question intended to capture. These included numerical items, yes/no responses, multiple response items and linear numeric scales. Open-ended questions were used where appropriate and provision was made for CSOTs to add comments to close-ended question selections. A rationale for inclusion of specific questions, the literature on which questions were based, as well as classification of each question, is included in Appendix 2, and a copy of *Survey 1* is included in Appendix 3. The survey was available in English or Afrikaans as these are the languages of teaching within the eight occupational therapy programmes in South Africa. A bilingual physiotherapist completed the translation of the questionnaire from English to Afrikaans, and a bilingual OT educator was consulted for assistance with translation of occupational therapy terminology.

## ***Survey 2***

To develop an understanding of the context of CSOTs' perceived preparedness, the undergraduate preparation that they had received for UL rehabilitation practice had to be explored. *Survey 2* was thus designed to determine the nature and extent of the UL rehabilitation curricula at each of the eight universities providing undergraduate occupational therapy education. Questions explored conditions covered, treatment modalities taught, time spent on various knowledge and skill components, the proportion of students who had UL practice learning placements and the teaching strategies used.

Question types varied according to the data that was required. Appendices 4 and 5 contain the rationale for inclusion of these questions and a copy of the survey respectively.

## **3.6 Reliability and validity**

### **3.6.1 Validity**

*Content validity* refers to the extent to which an instrument assesses that which it claims, or is purposed, to measure (Patrick et al., 2011). The *content validity* of both survey instruments was partly addressed by building questions on validated descriptions in literature as well as building questions around issues previously raised in research findings and bearing relevance to the questions under investigation (See Appendices 1 and 3). The piloting process, described below, further contributed to the *content* and *face validity* of the instrument. The process also assisted in the refinement of survey items, survey structure and the scaling (Cresswell, 2009).

### ***Pilot testing of the questionnaires***

#### ***Survey 1***

To strengthen the content validity, face validity and utility of this instrument, the same pilot draft of the questionnaire was sent to three groups of therapists: expert UL rehabilitation OTs, fourth year OT students and occupational therapists who had previously completed community service. This was done undertaken in September – October 2013 and electronic or hard copies<sup>8</sup> of the questionnaire were used in this process. The purpose for seeking feedback from these groups is described below as well as the process that was followed:

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<sup>8</sup>This was done due to the monthly subscription fee for the use of *Fluidsurveys* prohibiting its use beyond the period necessitated by data collection.

1) Expert UL rehabilitation occupational therapists (n=6)

Six expert UL rehabilitation occupational therapists were contacted via email requesting their participation in the pilot project. These therapists had postgraduate qualifications in UL rehabilitation, had extensive clinical experience in South Africa and abroad, and had worked within both state and private settings. They had also all been involved in teaching UL rehabilitation within different contexts. Five of the therapists approached indicated their willingness to participate. An electronic copy of the survey was sent to the five consenting therapists along with a covering letter and list of questions they were requested to answer (Appendix 6). These questions sought to elicit whether the questionnaire effectively probed the extent to which CSOTs were prepared for UL rehabilitation practice and whether all competency areas for practice in the South African context had been adequately covered. Questions included whether the survey adequately interrogated all necessary knowledge, skill and behavior components of practice including competencies required for population-based services. Therapists were requested to suggest any additions. Opportunity was also given for these therapists to comment on the structure and format of the questionnaire. Four therapists provided their input by answering the list of questions (Appendix 6). One therapist chose not to use this format and emailed her comments. Feedback included suggestions of modalities that had been omitted in the pilot draft of the questionnaire. Additional competency areas were suggested and included in the revised draft of the questionnaire. The need for a definition of a term and for consistency in terminology use was also highlighted. Comments provided were discussed with the research supervisor. Therapists' comments and the changes made by the researcher are contained in Appendix 7.

2) Fourth year occupational therapy students (n=5)

To ensure that all questions could be easily understood and to contribute to the development of the utility of the instrument, five fourth year occupational therapy students from the University of Cape Town were asked to complete the survey. This group was expected to possess a similar level of professional development/understanding as the CSOTs completing the survey. Students were recruited in the following way: one student known by the researcher was approached via email and asked if she would be interested in being a part of

the pilot. This student invited 4 of her peers to participate. Students were asked to complete a hardcopy of the questionnaire based on their practice learning experience to date. Students were requested to provide verbal feedback and/or written feedback on their questionnaire, on any aspect of the survey that was difficult to understand or that they considered to be confusing. Minimal questions or feedback arose from this group but students recommended that textboxes be increased in size to allow adequate space for the writing of comments. The time taken for completion of the questionnaire by these therapists guided the researcher in changing the expected time for questionnaire completion mentioned in the research information sheet. All feedback provided by the students and actions taken by the researcher are contained in Appendix 8.

### 3) Occupational Therapists who had previously completed CS (n=7)

To further assist the development of content and face validity, a convenience sample of six occupational therapists employed at Groote Schuur Hospital was requested to review the questionnaire (role of seventh therapist described below). Therapists had been educated at three different South African Universities and had completed their CS in the Western Cape and Mpumalanga. Therapists were emailed the questionnaire and requested to complete it independently. A meeting was then held with all six therapists. The researcher worked through each question with the group noting the feedback they provided around content, format, scaling difficulties, errors, omissions or ambiguity. Not all of the therapists had completed the survey before discussion of the questionnaire in the group that may have restricted the feedback that they were able to provide. Comments, however, highlighted the need to define various terms, to improve the clarity of questions by providing examples or editing text. A full list of comments and actions taken by the researcher (after discussion with the research supervisor) are contained in Appendix 9. Once the questionnaire had been refined and the survey had been developed on *Fluidsurvey*, one further therapist who had previously completed CS completed the questionnaire online to determine any need for further clarification, formatting or editing.

## **Survey 2**

To determine whether this instrument effectively assessed the nature and extent of UL rehabilitation curricula, three expert practitioners with clinical and education experience reviewed the questionnaire commenting on its *content validity* and suggesting various changes. Suggestions were limited but were discussed with the research supervisor. These, along with actions taken by the researcher, are contained in Appendix 10.

### **3.6.2 Reliability**

*Inter-rater reliability* did not apply considering that *Survey 1* was a self-report questionnaire. For the *Educator Survey*, where more than one staff member was responsible for the UL rehabilitation programme at a university, the participants were asked to consult their relevant colleagues when completing the questionnaire. *Intra-rater reliability* of the CSOT survey may be affected by a number of variables impacting upon the participant. Completion of the questionnaire on an isolated '*bad day*', for example, may have elicited responses that are very different to the participants *experience in general*. In order to limit this as far as possible, the instructions given for the questionnaire requested that the CSOTs base their responses across their CS experience rather than the specific day on which they completed the questionnaire or isolated incidences and experiences. For the educator survey, educators were asked to focus their comments on the UL rehabilitation programme received by the 2012 Occupational Therapy graduates should recent changes have taken place in the curriculum



## 3.7 Procedure

### 3.7.1 Recruitment

#### *Survey 1*

Several methods of recruitment of CSOTs were used to offer all CSOTs the opportunity to participate in the research and to maximise the response rate. This is summarised in Table 2 below:

**Table 2: Recruitment mediums and information communicated**

Medium	Potential participant	Communication
Text Message	CSOTs for whom a cellular number was available	<ul style="list-style-type: none"><li>- Purpose of contact explained</li><li>- Requested CSOT to forward email contact address; forward information sheet and consent form forwarded</li></ul>
Landline Call to Hospital	CSOTs for which a cellular number was not available	<ul style="list-style-type: none"><li>- Purpose of contact explained</li><li>- Requested CSOT to forward email contact address; forward information sheet and consent form forwarded</li></ul>
Post	CSOTs who did not have internet access / not contactable telephonically	<ul style="list-style-type: none"><li>- Information sheet, Informed consent form, survey questionnaire and pre-paid envelope posted to hospital address obtained online.</li></ul>
<i>Facebook</i>	CSOTs for whom alternative contact details could not be found.	<ul style="list-style-type: none"><li>- Purpose of contact explained</li><li>- Requested CSOT to forward email contact address; forward information sheet and consent form forwarded</li></ul>
Email	All CSOTs for whom email addresses were available	<ul style="list-style-type: none"><li>- Information Sheet, Informed consent form and survey questionnaire emailed along with online survey URL.</li></ul>

#### *Survey 2*

The survey for educators was sent to the head of the occupational therapy department at each of the eight universities. Email addresses for these staff members were obtained from the university websites or from the researcher's colleagues. Participation was requested and an information sheet provided. On approval by the head of department, it was requested that the staff member responsible for the undergraduate UL rehabilitation curriculum complete the survey and the link to the online survey was provided.

### **3.7.2 Data collection**

#### ***Survey 1***

Data Collection from CSOTs commenced in November 2013 and was completed by the end of January 2014 to allow participants to base their responses on at least 10 months of their 12-month contract. Where participants did not have telephone or email contact details available, hard copies of questionnaires were posted to their hospitals. Completed questionnaires were to be posted back to the researcher using a pre-paid envelope provided with each questionnaire. Both internet and postal distribution were chosen due to their relative cost effectiveness, efficiency and practicality given that participants were dispersed throughout South Africa. It also allowed for a relatively larger sample size (Alreck & Settle, 1995).

In order to increase the response rate, the researcher sent an email reminder to participants to submit their questionnaires. An incentive to participate was also provided. On submission of a completed questionnaire, participants were entered into a draw and the winner presented with an upper limb rehabilitation textbook sponsored by a book company. All participants received a discount voucher for splinting material from a splinting material supplier that was emailed to them after submission of their completed questionnaire.

#### ***Survey 2***

Collection of the educator survey data was completed during December 2013 and January 2014. An email reminder was sent to universities from which responses were not received. An incomplete response was received from one university, but email contact with the educator who had completed this questionnaire enabled the missing information to be obtained. At another university responses from two educators involved in the UL rehabilitation programme was received and some disagreement in answers was noted. Email contact with the university allowed for clarification of these ambiguities and one response to each question was generated.

### **3.7.3 Procedure for managing potential ill-effect**

At the end of the CSOT questionnaire, the researcher addressed the potential that completion of the questionnaire may have elicited distress or identified a need that the participant may have for support. Participants who left their details were contacted via email and/or telephonically by the researcher and directed to resources that they required.

### **3.8 Data management**

Data was stored using *Fluidsurvey* software with its guaranteed security settings protecting the confidentiality of the data. It also allowed for the exporting of data in various accessible formats (e.g. *Microsoft Excel*).

Questionnaires were allocated a number (1-240) using the numbered list of registered CSOTs provided by the Department of Health. Each response received was allocated the number that correlated with their name on the list held by the researcher. This enabled the researcher to ensure that only one response per CSOT was allowed. Any additional responses were deleted (the response submitted last was retained as earlier responses were incomplete or the informed consent section had not been completed). Once this process was completed, participants' names were removed from their responses before being exported for analysis. The list held by the researcher that linked names to numbers (and thus responses), was securely stored on the researcher's password protected computer and will be destroyed when the research project has been completed.

Data was initially stored using *Fluidsurvey* and later exported to *Excel* for cleaning and coding, and to *Stata 12* and *IBM SPSS Statistics 21.0*. for analysis. Data capture of manually completed questionnaires or those received via email were entered into *Fluidsurvey* by the researcher. Accuracy of data capturing was checked with the help of a research assistant by comparing entered data with answers recorded on the manually completed questionnaires. Similarly the assistant checked that the codes assigned to

data were correct. Data were stored on the researcher's password protected personal laptop and back-up documents saved in *Dropbox*. Regular virus/threat scans were performed using *McAfee Antivirus Protection* (<http://www.mcafee.com/us/products/virusscan-for-mac.aspx>).

### **3.9 Data analysis**

The researcher used *IBM SPSS Statistics 21.0* to analyse data (as this programme was available through the University of Cape Town, at no cost, and was compatible with MAC computers). *Stata 12* was used for the uni- and multivariate analyses for which the researcher received assistance from a colleague with statistical expertise.

In order to thoroughly examine individual variables before examining relationships between variables, data descriptions were run for each categorical variable, and frequency and percentage tables compiled (Alreck & Settle, 1995).

In order to make sense of the relationship between variables, *Pearson's Chi-square* tests of association were used. *Odds ratios* were calculated to further explore associations. Where necessary, categories were collapsed before analysis; this is reported for each question<sup>9</sup>. In order to develop a profile of therapists who reported being confident and competent within UL rehabilitation practice, a logistic regression was performed. Variables that demonstrated statistically significant univariate association to competence and confidence at a 0.1 significance level ( $p\text{-value} \leq 0.1$ ) were included in a logistic regression model. Logistic regression is a means of analysing a dataset in which there are multiple independent variables that determine an outcome (MedCalc, 2014).

Responses to open-ended questions were post-coded by the researcher and data grouped into categories and further organised into themes. These

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<sup>9</sup> For example, perceived competence within UL rehabilitation had a 6-point scaling system (ranging from extremely incompetent to extremely competent). When exploring factors associated with competence, these 6 categories were collapsed into two categories, namely *competent* and *incompetent*.

categories and themes were presented to the research supervisor who checked the logic of the analysis and highlighted where further clarity or analysis was required. The frequency of responses in each category as well as a description of the content of themes and categories is reported.

### **3.10 Ethical considerations**

The Declaration of Helsinki's Ethical Principles for Medical Research involving Human Subjects (World Medical Association, 2013) were used to frame the ethical considerations of the research (Cresswell, 2009) and discussion of these ethical constructs were used to further assist the researcher in anticipating/addressing ethical issues involved in the study<sup>10</sup>. The University of Cape Town Human Research Ethics Committee approved the study proposal (HREC Approval Number: 551/2014) and notice of the approval is contained in Appendix 11. The following ethical considerations were explored:

#### **3.10.1 Confidentiality**

Participants were asked to provide their names only to ensure that multiple responses from the same participants were not included in the data analysed. In order to protect confidentiality, each CSOT was allocated a number according to the list provided by the DOH. Once the researcher had checked that only one questionnaire had been submitted for each participant, the participants' names were deleted from their responses. The list held by the researcher linking participant names to numbers was securely stored on a password-protected computer and will be destroyed on completion of the study.

As a minority of 2013 CSOTs were male and thus their responses may have been easy to identify despite their names being dissociated from responses, participants were thus allowed to choose whether or not they wished to disclose their gender.

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<sup>10</sup> Where *not specified*, these considerations relate to the CSOT population and collection, management, analysis and reporting for Survey 1. All considerations related to Survey 2 (Educator Survey) will be specified.

Various internet-based systems were used during the research process as well as some responses being submitted via email. This posed a potential risk to the security of information. For this reason, systems were used where companies overtly state that careful consideration had been made for the safety of information e.g. *Dropbox*<sup>11</sup> and *Fluidsurvey*<sup>12</sup>. Security systems are fallible and thus the commitment to security was outlined in the information sheet and limitations made clear (Cresswell, 2009).

The researcher's personal computer was used for storing information. The device is password protected and used solely by the researcher. On completion of the project, all data and project information will be removed from electronic devices and saved on a compact disc with no identifying information being linked to the data. Furthermore, where an assistant was used for data and coding checks, a signed statement agreeing to protect the security and confidentiality of identifiable information was completed (see Appendix 12).

*In Survey 2*, the name of the participating university was requested to ensure that only one response had been received from each university and to allow a profile of the undergraduate UL curriculum offered at each university. Names of universities were then removed and were randomly allocated a number (1-8) to protect confidentiality when the research supervisor and research assistant were appraising data.

### **3.10.2 Anonymity**

An information sheet (see Appendix 13) provided comprehensive details of the project pertaining to participants for both surveys and allowed for potential participants to make an educated, independent decision whether to be involved or not. *Survey 1* commenced with an informed consent section (see Appendix 3). Participants were informed of their right to withdraw from participation even if they had previously submitted written consent. A date was given to all participants for the submission of their completed questionnaires. Beyond this date submitted, data formed part of the analysis.

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<sup>11</sup> See <https://www.dropbox.com/help/27/en>

<sup>12</sup> See [www.fluidsurvey.com](http://www.fluidsurvey.com)

When data was exported from *Fluidsurvey* for analysis, participants' names were dissociated from their responses and were no longer identifiable as their own in order to protect confidentiality. Participants were thus no longer able to withdraw once they had submitted their completed survey. This was clearly communicated in the information sheet.

For *Survey 2*, the information letter provided to the occupational therapy departments with a request to participate highlighted that the names of the universities would not be reported during the dissemination of findings. In this way anonymity was maintained. Universities were informed that if they wish to receive specific results that pertained their university, this would be provided.

### **3.10.3 Beneficence and non-maleficence**

The research allowed CSOT participants to express their experiences, and feelings related to this experience, and for this to be communicated to important stakeholders. The research allowed educator participants to share the nature and extent of the upper limb rehabilitation curricula that they offer and the challenges that this presents. Participants were thanked for their valuable contribution to the research in terms of the potential for improvement of the experience of future CSOTs. A short summary report of the research findings will be emailed to participants from both survey groups on completion of the research. The research population may be considered *vulnerable* in that they were in their first year of professional practice. The researcher committed herself to avoiding taking advantage of this vulnerability by refraining from using her position as a researcher or more experienced occupational therapist to coerce participation.

### **3.10.4 Justice**

The research question sought to explore an issue focused on the correct preparation and support of a group of novice health professionals that is right and fair given the responsibility that they are given within their first year of practice. Furthermore, the research question seeks to support the rights of South Africans for effective health care services. As far as possible, all CSOTs

and education facilities were given the opportunity to participate in the research to allow for all experiences, across contexts, to be reflected.

### **3.10.5 Possible risks/benefit from the research**

Participation in the research presented various risks and benefits to CSOTs. It provided CSOTs with the opportunity to contribute to a body of knowledge that may assist CSOTs in the future and aid in service delivery development and improvement. It also provided participants with the opportunity to participate in a research process and well as the opportunity to express their experiences, opinions and feelings. Participants will also receive a summary of research findings on completion of the project in January 2015.

A potential risk of participation is that completing the questionnaire may elicit unwanted feelings or memories of difficult experiences. In the event that this occurred, the researcher offered to contact the participant, and gave her contact details (should the participant prefer) at the end of the questionnaire. Email or telephonic contact would seek to determine the need to need of the participant and assist him/her in finding the assistance that they required.

### **3.10.6 Veracity**

The researcher committed to clearly and accurately conveying the purpose of her research to participants to ensure authenticity (Cresswell, 2009). She anticipated that it might be easy to skew or underreport / over-report findings in such a way that true findings are obscured. She thus committed herself to avoid doing this and remaining accountable to her supervisor in this regard (Cresswell, 2009). In order to optimise the objectivity of findings, the researcher attempted at all times to avoid leading or loaded questions within the survey questionnaire (Alreck & Settle, 1995).

Research findings will be submitted for publication to a relevant journal, along with a description of the study design to allow readers to assess the validity, applicability and generalisability of research findings (Cresswell, 2009).



### **3.11 Summary**

A cross-sectional survey design was employed with two stages of data collection. In the first stage, an online questionnaire was sent to all CSOTs completing CS in 2013 (n=240). The second stage involved an online/emailed questionnaire about the content of the curriculum related to UL rehabilitation offered at the eight universities providing occupational therapy education in South Africa. Data were analysed using *Stata 12* and *IBM SPSS Statistics 21.0*. Frequencies and percentages were obtained for categorical variables, and associations were tested with Odds Ratios and Pearson's Chi square test. A logistic regression analysis was conducted to develop a profile of CSOTs who felt confident and competent within UL rehabilitation. Responses to open ended survey questions were postcoded.

## Chapter 4: Results

The results of *Survey 1* are reported first in this chapter under 4.1. Demographic and practice profile items are reported, followed by findings related to general CS practice features and experience. The latter section includes: reasons for which referrals were received; the observation of other therapists' practice; supervision, communication, perceived cultural competence and descriptors that CSOTs used to capture their general CS experience. This section is followed by participants' experience of UL rehabilitation. Perceptions of undergraduate preparation for this area of practice are described first. The frequency with which CSOTs are treating various conditions and using modalities is reported followed by how equipped they feel for this, and for specific competency areas of UL rehabilitation practice. Their perceived competence and confidence, and descriptors that captured their UL treatment experience are reported. Perceived barriers and facilitators are reported along with the evidence CSOTs are currently using to support their practice. Finally desired resources to support practice will be reported.

*Survey 2* findings are reported under 4.2. What educators perceive to be the most important aspects of an undergraduate UL rehabilitation curriculum is described. This will be followed by assessments, conditions and modalities (including specific splints) taught. Teaching strategies used, methods used to encourage EBP, and finally educators' perception of graduates' preparedness for practice is reported.

## **4.1 Survey 1: CSOT survey**

As recorded by the researcher, and according to the contact details available, 244 invitations were sent to all 240 potential participants via email (136), *Facebook* (6), text message (sms) (87) and post (15). Four participants, due to an oversight by the researcher, received invitations/questionnaires via two mediums. Three posted copies were returned undelivered. A total of 106 responses were received. These were received via online completion or email. Two participants each submitted two questionnaires. Earliest submissions from these participants were excluded and the most recent submissions included in analysis<sup>13</sup>. A response rate of 43.3% was obtained. One response was excluded from analysis as no questions beyond the informed consent section had been answered. One hundred and three responses were therefore analysed representing 42.9% of the population. Where 103 responses are reported per question, zero missing responses can be assumed.

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<sup>13</sup> See Chapter 3 for reasoning

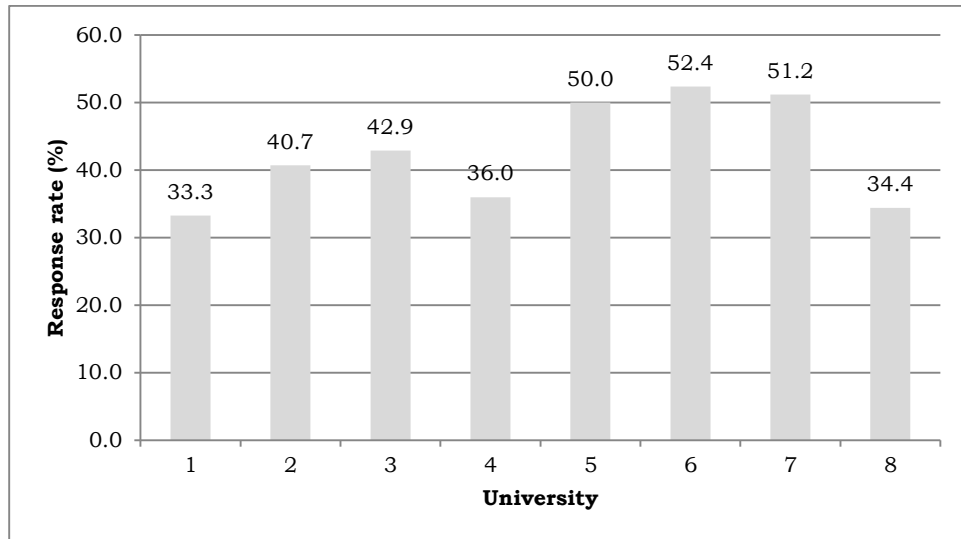
#### **4.1.1. Demographic and practice profile of participants**

The demographic and practice profile of participants is listed in Table 3. There were no missing responses. Most participants were female (100/103, 44% response rate) and had graduated in 2012. The median age (range: 21 – 30) was 23 years. Participants from each university varied between 9 and 21. The greatest percentage of responses was received from therapists placed in Gauteng (26.2%) while the lowest percentage came from the North West province (1%). It is not known how many therapists were allocated to each province. Within these provinces, 32.0 % (n=33) were placed at a primary level of care with a further 17.5 % (n=18) working at both primary and secondary levels of care. There were fewer responses received from participants working in rural areas (n=46; 44.7) than urban areas (n=57; 55.3%). Around one third (n=36; 35.0%) of participants reported working within facility-based services, 10.7% (n=11) in the community and 54.5% (n=56) worked within both facility and community-based services. The number of patients seen by participants each month varied considerably (median: 83; range: 6 – 500). Services were reportedly delivered at a median of three sites with some CSOTs servicing up to 26 sites.

**Table 3: Demographic and practice profile of CSOTs, 2013 (n=103)**

<b>Variable</b>	
Gender	<b>No. (response rate)</b>
Male	3 (21.4)
Female	100 (44.2)
	<b>Median (Min-max)</b>
Age	23.0 (21.0 – 30.0)
Graduation Year	2012 (2008 – 2013)
University	<b>No. (%)</b>
University 1	11 (10.7)
University 2	11 (10.7)
University 3	9 (8.7)
University 4	9 (8.7)
University 5	20 (19.4)
University 6	11 (10.7)
University 7	21 (20.4)
University 8	11 (10.7)
Total	103 (100.0)
Province	<b>No. (%)</b>
Eastern Cape	17 (16.5)
Gauteng	27 (26.2)
Free State	4 (3.9)
KwaZulu Natal	20 (19.4)
Limpopo	8 (7.8)
Mpumalanga	14 (13.6)
North West	1 (1)
Northern Cape	5 (4.9)
Western Cape	7 (6.8)
Total	103 (100.0)
Service Level	<b>No. (%)</b>
Primary	33 (32.0)
Secondary	32 (31.1)
Tertiary	13 (12.6)
Primary & Secondary	18 (17.5)
Secondary & Tertiary	2 (1.9)
Primary & Tertiary	1 (1)
Primary, Secondary & Tertiary	1 (1)
Other (psychiatric facility, provincial hospital or military services)	3 (2.9)
Total	103 (100.0)
Location	<b>No (%)</b>
Rural	46 (44.7)
Urban	57 (55.3)
Total	103 (100.0)
Setting	<b>No (%)</b>
Facility (services delivered at DOH facility)	36 (35.0)
Community (services delivered in the community)	11 (10.7)
Both	56 (54.4)
Total	103 (100.0)

To determine the representativeness of the distribution of participants by university, the proportion of participants per university<sup>14</sup> is illustrated in Figure 1.



**Figure 1: Response rate per university**

CSOTs worked with a median of 3 other occupational therapists and 2 physiotherapists in their clinical team. Each of the following team members was reported by one participant: podiatrist, optometrist, child psychiatrist, paediatrician and an orientation and mobility instructor. The median, minimum and maximum number of practitioners per profession in the rehabilitation team is illustrated in Table 4.

**Table 4: Minimum, median and maximum no. of practitioners per profession in team**

	Occupational Therapists	Occupational Therapy Technician/Assist.	Physiotherapists	Physiotherapy Technician / Assist.	Speech therapist-Audiologist	Speech Therapists	Audiologists	Social workers	Psychologists	Dieticians
Minimum	1	0	0	0	0	0	0	0	0	0
Maximum	26	4	30	4	4	25	3	10	25	8
Median	<b>3</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

<sup>14</sup> The number of therapists from each university allocated a CS placement for 2013 was available on the list of graduates obtained from the DOH.

## **4.1.2. General CS practice features and experience**

### **4.1.2.1 Common reasons for referral**

Common reasons for referrals were analysed and grouped predominantly according to domains of practice. Categories developed are shown in Table 5. Within the *physical Health* theme, referrals were most commonly received for wheelchair related services (n=63), adult neurological disorders (n=41) and UL injuries and conditions (n=31). *Work practice* emerged as another theme within which disability grant assessments were the most commonly highlighted reason for referral (n=38). Within the theme of *child learning and development*, patients were most commonly referred for developmental delay, developmental stimulation or early childhood intervention (n=51). Within *mental health*, patients were referred for general mental health services (n=16). Within the field of *community development practice*, one participant mentioned that she received referrals for community-based rehabilitation and programmes. Listed under the theme of *other*, 20 participants mentioned that they received referrals for *rehabilitation* but did not specify the nature of this rehabilitation. The final theme was used to group referrals that potentially did not reflect services rendered within the scope of occupational therapy practice. Three CSOTs mentioned that patients were commonly referred for the issue of walking assistive devices (walking frame or crutches). Two therapists commonly received referrals for mobilisation. It was not specified if this was bed/wheelchair mobilisation or walking rehabilitation.

**Table 5: Reasons for referrals (n=103)**

<b>Theme</b>	<b>Category</b>	<b>No. (%)</b>
Physical Health	• Wheelchair related services	63 (61.2)
	• Adult Neurological disorders e.g. CVA	41 (39.8)
	• Paediatric Neurology e.g. CP	21 (20.4)
	• UL injuries & conditions	31 (30.1)
	• Splinting	18 (17.5)
	• Physical Rehabilitation	11 (10.7)
	• Burns	9 (8.7)
	• Spinal Cord Injuries	8 (7.8)
	• Amputations	6 (5.8)
	• Arthritis	4 (3.9)
	• TBI	4 (3.9)
	• Assistive Devices	3 (2.9)
Work Practice	• Work Assessment / FCE	5 (4.9)
	• DG assessment	38 (36.9)
	• Vocational Rehabilitation	4 (3.9)
Child Learning & Development	• Developmental delay/stimulation / ECI	51 (49.5)
	• School-related assessment/intervention	13 (12.6)
	• Barriers to learning / learning disability	8 (7.8)
	• Congenital abnormalities	4 (3.9)
	• Paediatrics	4 (3.9)
	• Malnutrition	2 (1.9)
	• Sensory integrative dysfunction	1 (1.0)
	• KMC training	1 (1.0)
	• HIV exposed	1 (1.0)
	• HIE	1 (1.0)
• Autism	1 (1.0)	
Mental Health	• Mental Health Services	16 (15.5)
	• Life-skills	2 (1.9)
	• Stress Management	2 (1.9)
	• Counseling	1 (1.0)
CDP*	• CBR & Programmes	1 (1.0)
Other	• Rehabilitation (Unspecified)	20 (19.4)
	• Functional Assessments	5 (4.9)
	• Education	3 (2.9)
	• Home Visits	1 (1.0)
	• Home programmes	1 (1.0)
	• Care Dependency Grant Screening	1 (1.0)
	• Group-based intervention (crèche, OAH etc.)	1 (1.0)
Non OT Services	• Mobilisation	2 (1.9)
	• Issuing of walking assistive devices	3 (2.9)

\*Community development practice



#### 4.1.2.2 Observation of other therapists' practice

Forty-four participants (67.7%) reported being able to observe other occupational therapists treat patients (missing responses=38). Themes that emerged from participants' comments (n=44) (See Table 6), suggested that *enabling/enriching* and *limiting factors* existed. Observation being encouraged, enabled or allowed in their clinical setting was reported by 19 therapists. Other therapists reported seeking out opportunity beyond their facility to observe (n=3) and two therapists reported being able to observe therapists with expertise or experience. Limiting factors included time, workload or distance to closest therapist minimising the frequency of observation (n=17). Three therapists reported that when able to observe, they were often requested to assist and the potential for learning from these opportunities was limited. Around 20% of participants reported being unable to observe other OTs treating. Comments (n=21) suggested that this was related to practical limitations including being the only occupational therapist at the treatment site (n=10), or having an excessive workload that did not allow for this learning opportunity (n=6). *Attitude and opportunity* represented the other theme that emerged from coded comments. Two therapists reported that they had limited to no opportunities to observe others and a further two participants reported that observation was not allowed or discouraged in their practice setting.

**Table 6: Observation of other OTs treating (n=65)**

	<b>Theme</b>	<b>Category</b>	<b>No. (%)</b>
Able to Observe (n=44)	Enabling & enriching factors	• Observation encouraged, enabled or allowed by setting	19 (29.2)
		• OT seeks out opportunity beyond setting/facility for observation	3 (4.6)
		• Observation of OT with experience/expertise	2 (3.1)
	Limiting factors	• Time/workload/distance minimise frequency	17 (26.2)
• Observe OT with minimal experience / expertise		8 (12.3)	
• Requested to assist and potential for learning limited		3 (4.6)	
Unable to observe (n=21)	Practical limitations	• Only OT in treatment area/site	10 (15.4)
		• Excessive workload	6 (9.2)
	Attitude and opportunity	• Limited to no opportunity presented	2 (3.1)
		• Observation not allowed or discouraged	2 (3.1)

### 4.1.2.3 Supervision

Eighty-six participants (89.6%) reported having a supervisor with 10.4 % (n=10; missing responses=7) reporting having no supervisor. Satisfaction with supervision was reported by 34.1% (n=31) with 65.9% (n=60; missing responses=12) being dissatisfied. A median of 1 hour (range: 0-120) of supervision was received per month (missing responses=20).

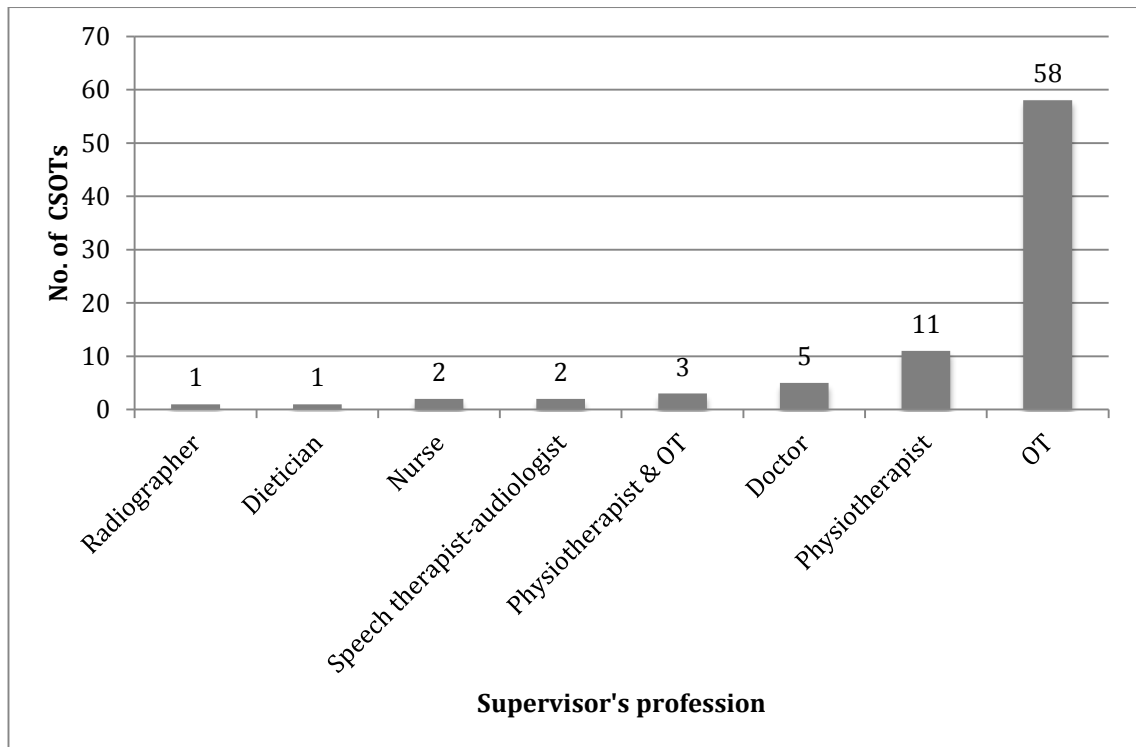
Comments related to what is covered in supervision time (n=83) were coded and are listed in Table 7. Administration and management-related content was reported most frequently, with patient care, development and care, and informal supervision forming other themes.

**Table 7: Content covered in supervision (n=83\*)**

<b>Themes</b>	<b>Categories*</b>	<b>No. (%)</b>
Administration and Management	<ul style="list-style-type: none"> <li>• Policy, administration &amp; general management</li> <li>• Management of OTAs/OTTs</li> <li>• Performance Management</li> <li>• Report Writing</li> </ul>	23 (27.7) 2 (2.4) 6 (7.2) 1 (1.2)
Patient Care	<ul style="list-style-type: none"> <li>• Clinical</li> <li>• Challenges encountered</li> </ul>	19 (22.9) 2 (2.4)
Development and care	<ul style="list-style-type: none"> <li>• In-service training/ Peer learning</li> <li>• Personal &amp; professional development</li> <li>• Checking in (“How are you doing?”)</li> </ul>	6 (7.2) 2 (2.4) 3 (3.6)
Informal	<ul style="list-style-type: none"> <li>• Responding to questions or emerging needs (clinical or other)</li> </ul>	21 (25.3)

\* 3 of the 86 participants who reported receiving supervision did not comment on content covered

CSOTs were sometimes supervised by senior staff from other professions but the majority (n=58; 62.4%) were supervised by occupational therapists as illustrated in Figure 2.



**Figure 2: Supervisor's profession**

Around one third (34.1%) of participants reported being satisfied with supervision. Therapists explained reasons for their satisfaction or dissatisfaction with supervision (n=91). Their responses were coded and categories and themes are listed in Table 8. Satisfaction with supervision (n=31) was largely related to supervisor characteristics and approach. The content and characteristics of the supervisor were also linked to satisfaction, including when a focus of supervision was on clinical issues or patient care. Various contextual issues further contributed to the reasons for satisfaction. Dissatisfaction with supervision (n=60) was related firstly to the content and extent of supervision. Participants' (n=39) dissatisfaction was linked to supervision being absent or perceived to be insufficient, while a further 12 comments reflected being dissatisfied because patient care / clinical issues were not included in supervision. Supervisor characteristics constituted another theme with some categories being *supervisor not an OT* (n=10), supervisor being a *poor role-model* or demonstrating an *inappropriate approach* (n=9), supervisor having *limited availability* (n=7) (this related to practical issues), being *unapproachable* (n=3) (this related to the attitude or demeanor of the supervisor) or possessing *insufficient expertise* (n=3). Various contextual factors also contributed to participant's dissatisfaction.

**Table 8: Reasons for satisfaction / dissatisfaction with supervision**

	<b>Themes</b>	<b>Categories</b>	<b>No. (%)</b>
Dissatisfied with supervision (n=60)	Supervisor characteristics	<ul style="list-style-type: none"> <li>• Supervisor not an OT</li> <li>• Poor role model /inappropriate approach</li> <li>• Limited availability</li> <li>• Unapproachable</li> <li>• Insufficient expertise</li> </ul>	10 (11.0) 9 (9.9) 7 (7.7) 3 (3.3) 3 (3.3)
	Content & extent of supervision	<ul style="list-style-type: none"> <li>• Clinical content &amp; patient care not covered</li> <li>• Absent or insufficient (perceived to be)</li> <li>• Insufficient formal supervision</li> <li>• Lack of guidance on administrative tasks</li> </ul>	12 (13.2) 39 (42.9) 2 (2.2) 2 (2.2)
	Contextual Factors	<ul style="list-style-type: none"> <li>• Limited opportunity to learn from others</li> <li>• Forced to access support outside own placement</li> <li>• Poor management</li> </ul>	2 (2.2) 5 (5.5) 1 (1.1)
Satisfied with supervision (n=31)	Supervisor characteristics & approach	<ul style="list-style-type: none"> <li>• Approachable &amp; eager to assist</li> <li>• Available or accessible</li> <li>• Addressed challenges or responded to needs</li> <li>• Competent or experienced supervisor</li> <li>• Balances trust or freedom with support</li> <li>• Supports learning, development &amp; achievement</li> <li>• Conveyed respect of CSOT as colleague</li> </ul>	7 (7.7) 5 (5.5) 6 (6.6) 2 (2.2) 5 (5.5) 5 (5.5) 1 (1.1)
	Supervision content	<ul style="list-style-type: none"> <li>• Helpful supervision tools used</li> <li>• Performance evaluated</li> <li>• Assistance with patient care / challenging cases</li> </ul>	2 (2.2) 1 (1.1) 1 (1.1)
	Contextual supports	<ul style="list-style-type: none"> <li>• Limited supervision facilitated self-directed learning</li> </ul>	1 (1.1)
		<ul style="list-style-type: none"> <li>• Support from colleagues</li> </ul>	1 (1.1)

#### 4.1.2.4 Communication with patients

Difficulties with communication with patients were reported by 73.9% (n=68) of participants with 26.1% (n=24) reporting that communication difficulties were not experienced (missing responses=11). Reasons given for these difficulties were mostly attributed to a *language barrier* (see Table 9). Twenty-one participants reported that language differences (i.e. language discordance) resulted in this barrier. Ten therapists chose to describe the barrier as being unable to speak the language of their patients, while the majority (n=30) attributed the theme to patients being unable to speak the language of the therapist. *Attempts at overcoming barrier insufficient* was described limited to no adequate translation (n=14), the loss of meaning or therapeutic properties when only basic communication was possible (n=15), the

language/communication skills of therapists still developing (n=8) and a lack of shared understanding around health care (n=2). The final theme suggested that patient and contextual factors augmented the language barrier. Patients not having access to telephone resources (n=3), perceived cultural differences (n=1) and various patient factors (e.g. age and diagnosis) further complicated communication.

Those who commented on an absence of communication difficulties (n=24) qualified their selection by explaining that there was a *shared language* between them and their patients (or colleagues). This may have been because they shared a basic literacy in a common language (n=6), they shared a first language with their patients (n=3) or they (the therapist) were multi-lingual (n=5). Others described *communication supports* that facilitated communication.

**Table 9: Descriptions of communication difficulties (CD) (n=92)**

	<b>Themes</b>	<b>Categories</b>	<b>No. (%)(n)</b>
Presence of CD (n=68)	Language Barrier	<ul style="list-style-type: none"> <li>• Therapist unable to speak patient's language</li> <li>• Patient unable to speak therapist's language</li> <li>• Language difference</li> </ul>	10 (10.9) 30 (32.6) 21 (22.8)
	Attempts at overcoming barrier insufficient	<ul style="list-style-type: none"> <li>• Limited to no adequate translation</li> <li>• Basic communication across barrier but meaning/therapeutic properties lost</li> <li>• Therapist language/communication skills developing</li> <li>• Lack of shared understanding around health care</li> </ul>	14 (15.2) 15 (16.3) 8 (8.7) 2 (2.2)
	Barrier augmented by factors	<ul style="list-style-type: none"> <li>• Barrier affected by patient factors e.g. Diagnosis (TBI) or age (pediatric patients)</li> <li>• Culture (perceived by therapist)</li> <li>• Patients do not have access to telephones</li> </ul>	5 (5.4) 1 (1.1) 3 (3.3)
	Shared Language	<ul style="list-style-type: none"> <li>• Basic literacy in common language</li> <li>• Shared first language</li> <li>• Multilingual</li> </ul>	6 (6.5) 3 (3.3) 5 (5.4)
Absence of CD (n=24)	Communication Supports	<ul style="list-style-type: none"> <li>• Translation available and/or sourced informally</li> <li>• Non-verbal communication techniques used</li> </ul>	11 (12.0) 2 (2.2)

### ***Factors associated with communication difficulties***

Communication difficulties characterised many of the CSOTs' experiences. To develop further insight into these difficulties, factors potentially associated with communication difficulties were considered in a univariate analysis (i.e. considering the relationship between communication difficulties and a single

predictor) and logistic regression (i.e. considering the relationship between communication difficulties and numerous predictors) (see Table 10). As reasonably expected, being able to communicate effectively in the patients' language was highly protective against experiencing communication difficulties ( $p=0.001$ ). Being able to relate to patients' beliefs and location (Rural/Urban) were not significantly associated with communication difficulties within a multivariate analysis.

**Table 10: Factors associated with communication difficulties**

Communication Difficulties	Predictors		No	Yes	Univariate Analysis	Multivariate Analysis		
					Univariate P-value	Adjusted Odds Ratio	Adjusted P-value	95%CI
Communication Difficulties	Speak patients' language	No Yes	6 16	49 14	<0.001	0.15	<b>0.001</b>	0.05 – 0.48
	Urban/Rural	Rural Urban	7 17	36 32	0.049	0.39	0.142	0.11 – 1.37
	Relate to patient beliefs	No Yes	2 20	19 44	0.064	0.42	0.312	0.08 – 2.28

The relationship between communication difficulties and province was tested. Although the calculation was underpowered by a small sample size (e.g. only 1 participant from North West Province) Table 11 shows that therapists placed in KwaZulu Natal, the Eastern Cape and Mpumalanga were more likely to report communication problems ( $p=0.024$ ).

**Table 11: Incidence of reporting communication difficulties (CD) per province**

Province	EC	GP	FS	KZN	LP	MP	NW	NC	WC	P-value
CD No	1	11	0	3	3	1	1	1	3	<b>0.024</b>
CD Yes	15	13	3	16	4	10	0	4	3	

#### 4.1.2.5 Cultural Competence

A majority (n=95; 92.2%) of CSOTs responded to being asked how culturally competent they perceived themselves to be. Responses were separated into categories of competence. Some responses (n=46) could not be accurately separated into clear levels of competence. Despite this, more than half of the responses (n=49) indicated at least a basic perceived level of cultural competence with 4 participants indicating that they felt incompetent in this area (see Table 12).

**Table 12: Perceived cultural competence (n=95)**

Category	No. (%)
• Incompetent	4 (3.9)
• Basic Competence	18 (17.5)
• Competent	18 (17.5)
• Very Competent	9 (8.7)
• Undefined	46 (48.4)
Total	95 (100)

Participants justified their perceived level of competence and described how they felt that this impacted on their practice. Analysis of this data is summarised in Table 13 and data revealed that showing respect for diverse values, beliefs, traditions and practices (n=20) were central to participants' understanding of culturally competent practice. For other participants, client centredness (n=1) and mutual sharing with patients across cultural differences (n=1) expressed cultural competence.

For a significant proportion of participants (21.1%) the CS year itself was considered to be central to developing their cultural competence to its current proficiency. Some participants (12.6%) acknowledged that they are in an ongoing process of learning that was contributing to their cultural competence. Needing to adapt within different cultural contexts, was reported by 2 therapists and learning about cultural norms and values from others (patients, community members and therapy assistants) was reported by 3 CSOTs.

Another theme identified the role that pre-CS experience played in contributing towards cultural competence. Nine therapists mentioned the

preparation that they had received at university although one participant mentioned that she was working within a community of a different language and culture than what she had learnt about at university. Two participants stated that previous life experiences contributed towards the development of their cultural competence.

Participants described other factors that assisted their cultural competency. Personal factors described (n=6) included being open-minded, empathetic, being able to ask the right questions and being honest with patients regarding a lack of knowledge of their culture. Contextual factors (n=9) included being assisted by others, receiving a period of orientation, and working in a rehabilitation setting where extended time with patients allowed therapists to learn about patients' cultures. Culture and language factors (n=8) were also described as assisting factors including being of the same culture as patients or having grown up within the same cultural context or in a multi-cultural context. Being exposed to multiple cultures in CS was identified as an assisting factor as well as when a language barrier was not present.

The link between cultural and language competence was made by other participants. One participant described how learning the patients' language was used as a means to build trust and 5 other participants felt that language competence was closely linked to developing cultural competence.

A group of participants reflected on their cultural competency and identified challenges, errors and new insights that had been part of their experience. Twelve (12.6%) therapists either did not feel competent, had made errors 'along the way' or still felt challenged within the area of cultural competence. Five therapists (5.3%) struggled with understanding and responding to situations where traditional treatments were used with adverse health outcomes. Three therapists queried the appropriateness of their intervention and when occupational therapy theory appeared incongruent with cultural values and norms. Contextual factors, reported by 4 therapists, included not having enough time with patients to come to an understanding of their culture, and working within multicultural settings.



Three responses appeared to demonstrate a restricted understanding of cultural competence. Two responses suggested that if a holistic, individually tailored clinical approach is used, cultural competence is not required. A further response appeared to minimise the challenge of remaining competent in multicultural settings.

**Table 13: Cultural competence categories & themes (n=95)**

<b>Theme</b>	<b>Category</b>	<b>No. (%)</b>
Respect & relationship	• Respect for diverse values, beliefs, traditions & practices	20 (21.1)
	• Client centredness & mutual sharing	2 (2.1)
A learning Process	• CS central to developing CC	20 (21.1)
	• Ongoing learning	12 (12.6)
	• A need to adapt	2 (2.1)
	• Learning from others	3(3.2)
Preparation	• University preparation	9 (9.5)
	• Previous life experience	2 (2.1)
Assisting factors	• Personal factors	6 (6.3)
	• Culture & Language	8 (8.4)
	• Contextual factors	9 (9.5)
Language & Communication	• Language competence related to cultural competence	5 (5.3)
	• Learning language to build trust	1 (1.2)
Recognising challenges, errors or new insights	• Traditional treatment and negative patient outcomes	5 (5.3)
	• Appropriateness of theory and intervention questioned	3 (3.2)
	• Competence a challenge	12 (12.6)
	• Contextual factors	4 (4.2)
Restricted understanding	• Perceived limited impact on practice	2 (2.1)
	• Challenge mimimised	1 (1.2)

Only one participant reported that cultural issues did not impact on her practice because she was fully competent in this area. Other participants described an extensive impact that cultural competency has on practice (see Table 14). Most frequently mentioned was the perception that cultural competency increases the effectiveness of treatment (n=10). It was also felt that it increases the meaning and appropriateness (n=6) of interventions as well as improving interpersonal relationships (n=5). It was thought to contribute to facilitating trust, respect, acceptance, and shared power (n=5). Furthermore it enabled therapists to understand patients' views and preferences (n=3) and improve the quality of services delivered (n=2). Positive patient feedback (n=1), personal satisfaction (n=1) and being a benefit to rural practice (n=1) were also mentioned as positive impacts of cultural competence on CS practice.

**Table 14: Perceived impact of cultural competence (n=31)**

<b>Theme</b>	<b>Category</b>	<b>No. (%)</b>
Impact on practice	• Trust, respect, acceptance & shared power	5 (5.3)
	• Understanding patient view & preference	3 (3.2)
	• Improved IPRs	5 (5.3)
	• Quality of service	2 (2.1)
	• Meaning and appropriateness	6 (6.3)
	• Effectiveness of intervention	10 (10.5)
	• Positive patient feedback	1 (1.2)
	• Personal Satisfaction	1 (1.2)
	• Benefit to rural practice	1 (1.2)
	• No impact	1 (1.2)

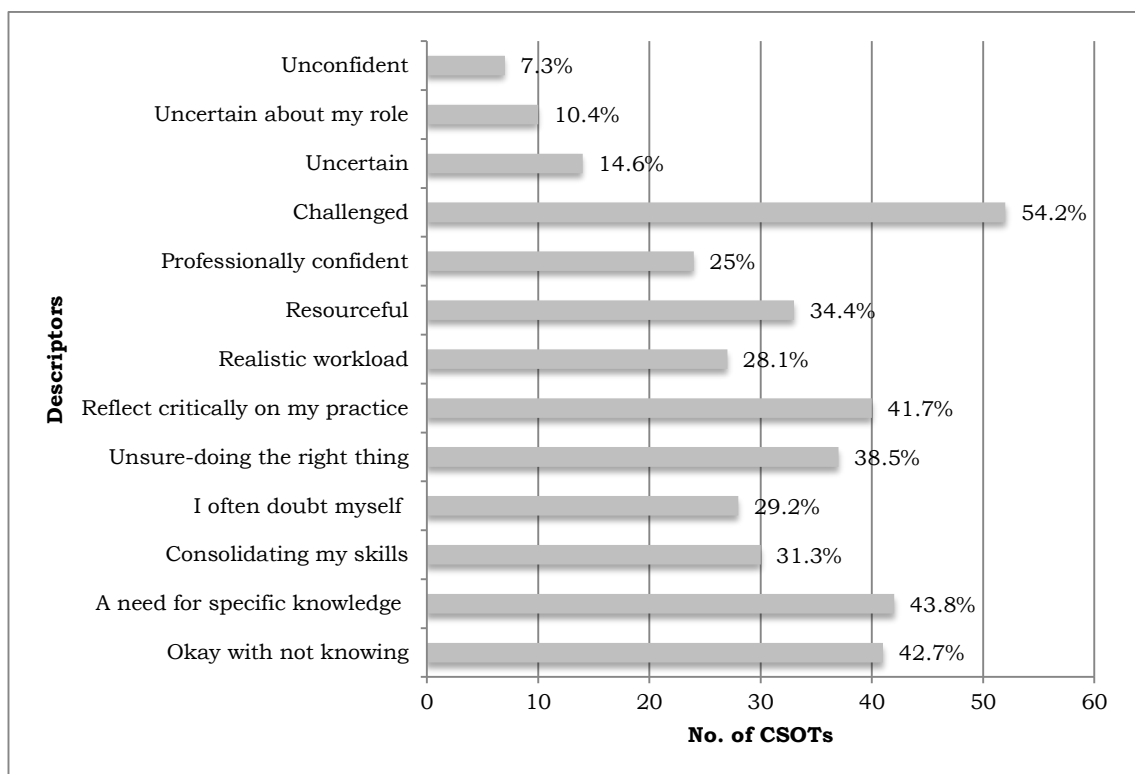
#### **4.1.2.5 Descriptors of general CS experience**

Participants were presented with a list of 48 descriptors of feelings that were extracted from literature on novice practitioners' experiences. CSOTs were able to select as many as applied to them, or that they felt captured their CS experience. They then had the opportunity to explain their choice. Frequencies (n=96; 7 missing responses) for all descriptors were obtained (See Appendix 14). Descriptors related to various aspects of CSOTs professional experience. They were grouped into the following areas: *knowledge and skill in practice*, *professional identity and recognition*, *supervision and support*, *positive personal descriptors* and *negative personal descriptors*. Each of these areas will be reported as subsections. Figures will demonstrate the frequencies obtained for

descriptors and the reasons for CSOTs selections will then be described in depth.

### ***Knowledge and skill in practice***

Descriptors related to putting knowledge and skill into practice, and the frequency with which they were selected, are illustrated in Figure 3. Comments that were used to explain selections were organised into categories and are described below.



**Figure 3: Frequencies of knowledge and skill descriptors**

The descriptor most frequently selected was feeling *challenged* (n=52). Language and culture (n=5), lack of resources (n=8), lack of treatment space (n=1), understaffing and high workload (n=3), waiting excessively long for wheelchairs to be delivered (n=1) and clinical challenges (n=8) contributed towards this experience.

Also experienced often by CSOTs was *a need for specific knowledge in assessment and treatment* (n=42). Comments suggested a need for modality-

and condition-specific knowledge and skill including wheelchair seating and issue (n=2), treatment of children with CP (n=2), disability grant screening (n=2), child learning and development related skills (n=2), depression (n=1), UL rehabilitation skill (n=6) and neurological assessment and treatment (n=3). Contextual factors presented a challenge including late presentation of injuries when surgery is no longer an option (n=1), when resources are limited (n=3), when access to information or professional development is restricted (n=2) and when not receiving guidance from senior therapists (n=1). The breadth of knowledge across conditions demanded could not always be met by knowledge gained at university that was thought to lack detail or depth (n=6). Experience gained across conditions and within various settings (acute and chronic) was found by others to be limited (n=2). Although many CSOTs identified a need for greater knowledge, they also became *okay with not knowing everything* (n=41). One therapist stated that she felt that this was too often used as an excuse by therapists. Most other comments linked this descriptor to their understanding of being a life-long learner (n=11) with one therapist stating, “I have learnt to stop "comparing my beginning to someone else's middle" - I am only just starting out in the OT profession, with time I will grow in knowledge”. Three participants considered this descriptor as natural to navigating the broad field of occupational therapy while others (n=4) highlighted the value of knowing what you don’t know and two of these participants identifying this as the place from which one can broaden one’s knowledge through research and asking for assistance.

Despite a growing comfort with a lack of knowledge, many CSOTs described being *unsure whether I am doing the right thing* (n=37). This was linked to not having feedback or someone to answer questions (n=7). Some participants reported that this occurred “sometimes” (n=6). One CSOT reported that the language barrier she encountered resulted in her feeling unsure. Two further participants linked this feeling to clinical or ethical uncertainties. Similarly 28 participants felt “*like I often doubt myself*”. Comments linked this sense to lacking colleagues/supervision to affirm or confirm clinical decisions (n=7). New clinical challenges contributed to this sense (n=2) and one participant routinely sought out confirmation of her decisions. A lack of confidence in what one does know, and difficulty absorbing and retaining new information, were aspects that contributed to feeling this way (n=1).

Being *uncertain* was reported by 14.6 % (n=14) of participants. This uncertainty was associated with implementing optimal intervention (n=3). One therapist stated, “I don’t know everything so uncertainty is guaranteed”. One therapist was uncertain about her future. More specifically, ten CSOTs felt *uncertain about (their) role*. Inexperience with the absence of a role model (n=1), treating acute neurologically impaired patients (n=1) and needing to, at times perform social worker functions in the absence of a social worker (n=1) were linked by comments to a sense of uncertainty.

Seven CSOT’s (7.3%) indicated that they felt *unconfident*. Comments revealed that this was linked for some to a lack of skill (n=1), to another it related to treating UL injuries (n=1) and one other participant indicated that this was ‘sometimes’ the case. One quarter of participants felt *professionally confident* (n=24). For some (n=3) this described their confidence within their current role. Others (n=2) felt professionally confident despite not knowing everything and three other participants stated how their confidence developed throughout the year.

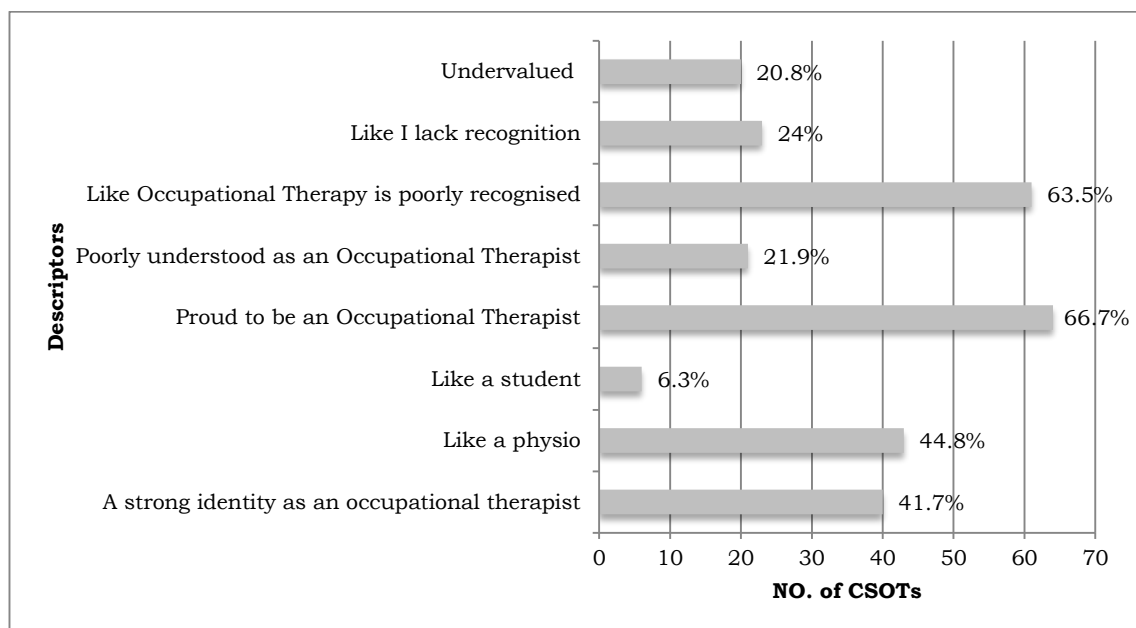
While some grew in confidence, others felt as if they were *consolidating (their) skills* (n=30). Comments suggested that this was associated with the process of making sense of theory through practice (n=7) and the practicing of skills (n=5). The breadth of consolidation across fields of practice, however, reportedly varied (n=2) with one participant reporting being able to revise knowledge across fields of practice and another participant’s consolidation being limited to a few conditions.

*My workload is realistic* was a descriptor selected by 27 participants. Two participants felt that the workload was too light and that this was due to a lack of awareness in the community of the role of occupational therapy or having too many occupational therapists at a small hospital. Another CSOT felt that the workload was much lighter than a university workload with another similarly reporting that there is no need to take any work home. Another participant described that her small hospital’s workload matched her capacity with a further therapist stating that she merely did what she could manage.

Fourty participants (41.7%) reported being *encouraged to reflect critically on (their) practice*. Comment suggested that this was motivated by the need to ensure quality service delivery (n=7) or due to the absence of feedback and direction provided by supervision and guidance (n=6). Opportunity to reflect with colleagues (n=7) supported participants' critical reflection. One participant indicated that critical reflection was facilitated by the responsibilities that she was given. Finally, 33 CSOTs viewed themselves as *resourceful*. This was largely linked by comments (n=14) to resourcefulness being necessitated by limited budget and lack of resources. Two participants felt confident with the resources that they were able to access.

### **Professional identity and recognition**

Descriptors related to the recognition that CSOTs received and their professional identity is illustrated in Figure 4 Comments explaining therapists' selection are presented below.



**Figure 4: Frequencies of professional identity and recognition descriptors**

A majority of CSOTs were *proud to be an occupational therapist* (n=64). This pride was associated with bringing meaning, meeting need and making a difference in patients' lives (n=8). Some articulated this sense despite the challenges that they encountered (n=2) and others linked it to their growing

identity as an occupational therapist or awareness of the unique contribution of the profession (n=4). One comment described how the CSOT took pride in the profession *at times*. Slightly fewer therapists felt *a strong identity as an occupational therapist* (n=40). CSOTs linked this identity to an experience of developing pride, passion and confidence in the profession (n=5) and appreciating the unique perspective that occupational therapy brings (n=2). Other participants found that a limited understanding of the role of the occupational therapist provided challenges to this identity and necessitated promotion and education around the profession (n=4). One participant described a lack of conviction around being an occupational therapist and her struggle to ‘feel at home’ in the profession. One further participant stated that she ‘sometimes’ felt a strong identity while another linked her strong identity as an occupational therapist to her use of activities within treatment.

“Yes!” and “Definitely” were two comments used to qualify selecting the descriptor: *occupational therapy is poorly recognized* reported by 61 CSOTs (63.5%). This was linked by comments to there being a limited understanding of the role and value of occupational therapy in the health care team and the community (n=14). Two of these comments suggested that some of the meaning of occupational therapy may get lost in translation:

“There is no Zulu name for OT which makes it challenging to explain what we do or our role in the hospital. We often have to refer to ourselves as dokatela wamatambo (doctor of the bones i.e. physio) or dokatela wesingane (doctor of the children)”

“In the rural areas people only recognise dieticians, speech therapists and physiotherapists as members of rehab team because they use association to identify professions e.g. physio (bones) dieticians (food) speech and audiology (ears)... so as OTs we (lack) that one specialty that singles us out”.

For others (n=9), the lack of recognition of the profession was due to being identified by the public and health professionals as physiotherapists. Two participants felt occupational therapy clinicians themselves were responsible for this lack of recognition although specific reasons for this conclusion were not described. One participant linked this descriptor to having her clinical reasoning constantly challenged by a senior speech therapist while another

participant felt that this description was particularly relevant to working in psychiatry. Being *poorly understood as an occupational therapist* was selected by a further 21.9% (n=21) of participants. This was evident to some through inappropriate referrals (n=5) and to others when they were identified as physiotherapists (n=2).

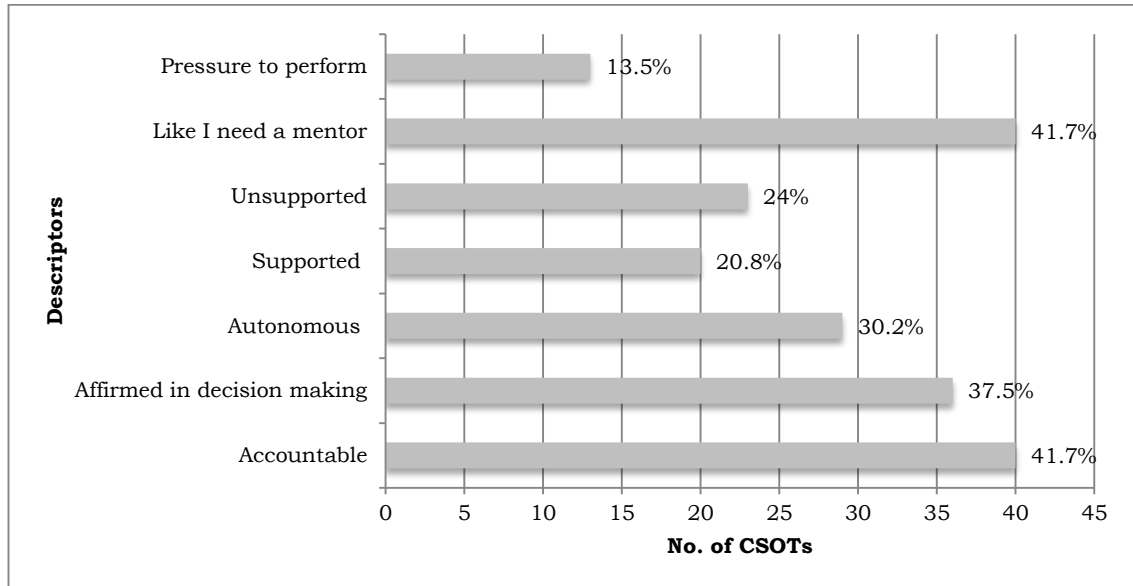
A quarter of participants reported feeling like “*I lack recognition*” (n=23). Comments suggested that this was linked to a limited understanding by colleagues and communities on the role of the occupational therapist (n=3). For others this experience was linked to working without acknowledgement or affirmation (n=5). Feeling *undervalued* was reported by 20 participants (20.8%). Some felt undervalued by patients (n=1), by their supervisor or members of their occupational therapy team (n=5), or by members of the multidisciplinary team (n=3).

Surprisingly, almost half of the sample (n=43) felt, at least at times, *like a physio*. For some (n=7) this was linked to not having activities with which to treat, occupational therapy equipment or time to enable activity-based treatment. Limited patients and colleague understanding of the role of occupational therapy also contributed to this sense (n=5). Others (n=6) felt that various conditions (e.g. CP and CVA) and patients in very acute stages of care often required an approach that was similar to that of the physiotherapist. Where physiotherapy service was absent or limited, or where the CSOT worked closely with physiotherapy colleagues, participants reported feeling like a physiotherapist (n=5). This sense was linked by three participants to lacking an appropriate occupational therapy support or role model with a further two participants reporting that this feeling faded as they consolidated their identity as an occupational therapist and their occupation-centred practice grew. One participant explained that, “When communication is difficult I turn to exercises which I can easily show patients. This often makes me feel like a physio”. Six participants (6.3%) reported *feeling like a student* initially (n=1), because they possibly perceived that they were treated as such (n=1), because they were still learning (n=1) or felt that they had inadequate skill for a graduated occupational therapist (n=1).



## **Supervision and support**

The frequency with which various descriptors related to supervision and support was selected is illustrated in Figure 5. Comments provided insight into the reasoning for therapists' choices.



**Figure 5: Frequencies for supervision and support descriptors**

Many CSOTs considered themselves to be *accountable* (n=40) with varying reasons for their choice. Some participants (n=2) linked this with working alone and thus needing to be (solely) accountable for what is done. A further 3 participants linked a sense of accountability to their direct responsibility to patients. Others (n=4) suggested that they were in some way accountable to others. A sense of personal responsibility, rather than formal accountability structures, were reported by others (n=3).

Feeling *affirmed in decision-making* was reported by 37.5% (n=36) of participants. For some participants this came through the process of gaining experience and confidence in decision-making (n=9), rather than being directly linked to the affirmation provided by senior staff. Positive feedback from others may have contributed to this sense (n=1). Others reported feeling distinctly unsure and unaffirmed and related this to various interpersonal dynamics (n=4). Feeling *autonomous* was reported by 30.2% (n=29). Comment revealed that this was as a result of independence either being demanded by the

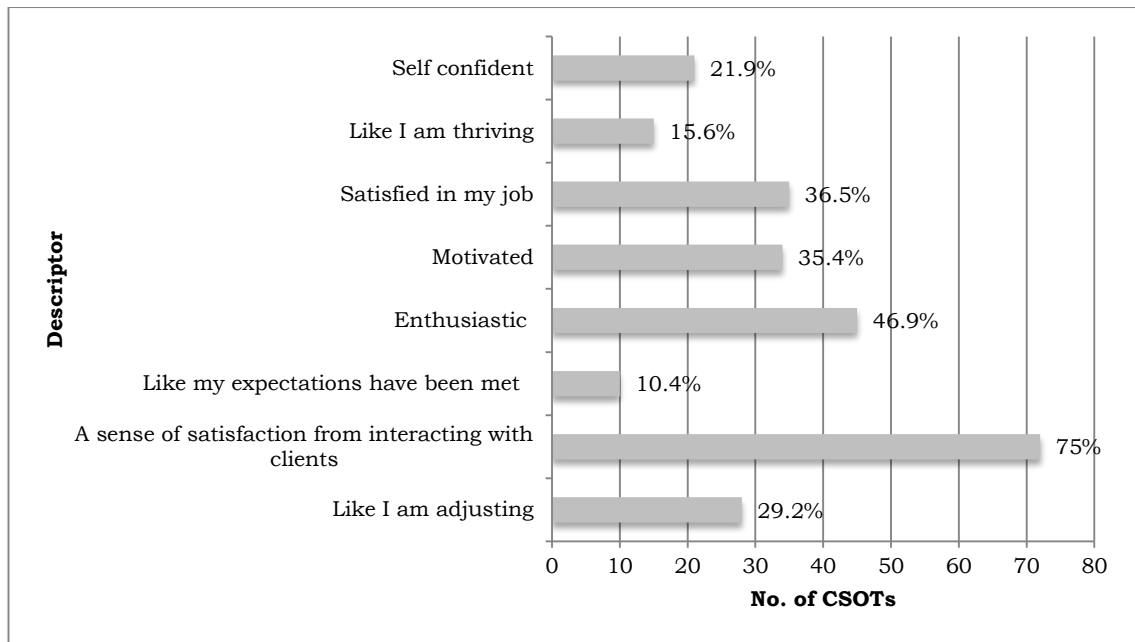
context (n=3), or developed through being allowed or supported within the context (n=7).

Forty participants (41,7%) stated, “*I feel like I need a mentor*”. Comments revealed that these participants coveted the guidance, advice, feedback and role-modeling that a mentor could provide in order for them to meet the demands of their work environments (n=16). Four participants reported making attempts at seeking out mentorship - with varying levels of success. Perceiving the need for mentorship may have contributed to a smaller group reporting that they felt *supported* (n=20). This support was experienced within the team (n=4), or within supervision (n=3). Interestingly, a similar number of CSOTs felt *unsupported* (n=23). Lack of support from supervision (n=3) and the clinical team (n=4) contributed to this sense.

*Pressure to perform* was experienced by 13.5 % (n=13) of participants. One comment linked this to the fact the occupational therapy statistics were compared to the statistics of other health professions. Being the only occupational therapist delivering services (n=1) and feeling the pressure to represent the profession well and facilitate improvement in patients’ lives while possessing minimal knowledge (n=1) was further linked to this descriptor.

### ***Positive personal descriptors***

Therapists selected various positive descriptors to describe their general CS experience (see Figure 6). Some therapists provided comment, providing insight into these descriptors.



**Figure 6: Frequencies for positive personal descriptors**

The descriptor selected with the greatest frequency overall was deriving *a sense of satisfaction from interacting with clients* (n=72). Comments suggested that this sense was linked with the opportunity to witness improvement in patients' functioning (n=5), receiving patient gratitude (n=5), being able to make meaningful contributions to patients' lives (n=6), receiving positive feedback from others (n=1) and experiencing good therapeutic relationships (n=4). Participants felt that this occurred despite the significant language barrier (n=6) and many of them linked this to being able to appreciate new culture/s (n=2). One participant indicated that this sense was linked to interaction with only *some* of her patients (n=1).

Very few CSOTs felt that *(their) expectations have been met* (n=10). One participant felt that she knew what to expect as her mother had worked at the same hospital and one other CSOT stated that her expectations had been exceeded. Unfortunately comments could not explain why the majority did not select this descriptor, whether it implies that their expectations were *not met* cannot be assumed.

Some participants felt like they were *adjusting* (n=28). Comments suggested that this occurred as the year progressed (n=2), was related at times to adjusting to rural living, culture and language differences (n=3) or adjusting to

working within or around contextual limitations (n=6). One participant stated the following:

“I did feel like this entire year was about adjusting. Adjusting to: working on my own (without supervision); working without equipment; working in an MDT; working with limited/no resources; and working with poor management and support from the clinic. And I feel that all of those were valuable learning experiences”.

Feeling *enthusiastic* was reported by 46.9% (n=45) of participants. Some of the participants (n=6) reported they felt enthusiastic at first, or only at times – depending on contextual factors and patients’ attitude towards treatment. For others their enthusiasm focused on the great need that they perceived existed for services and the potential for a significant occupational therapy contribution in the community (n=6) despite the challenges experienced. A growing regard for the profession was linked to the enthusiasm described by 3 participants while satisfaction obtained from interpersonal interactions was the source of this descriptor for others (n=5). A further 3 participants commented that their enthusiasm was associated to the learning opportunities that they had during the year.

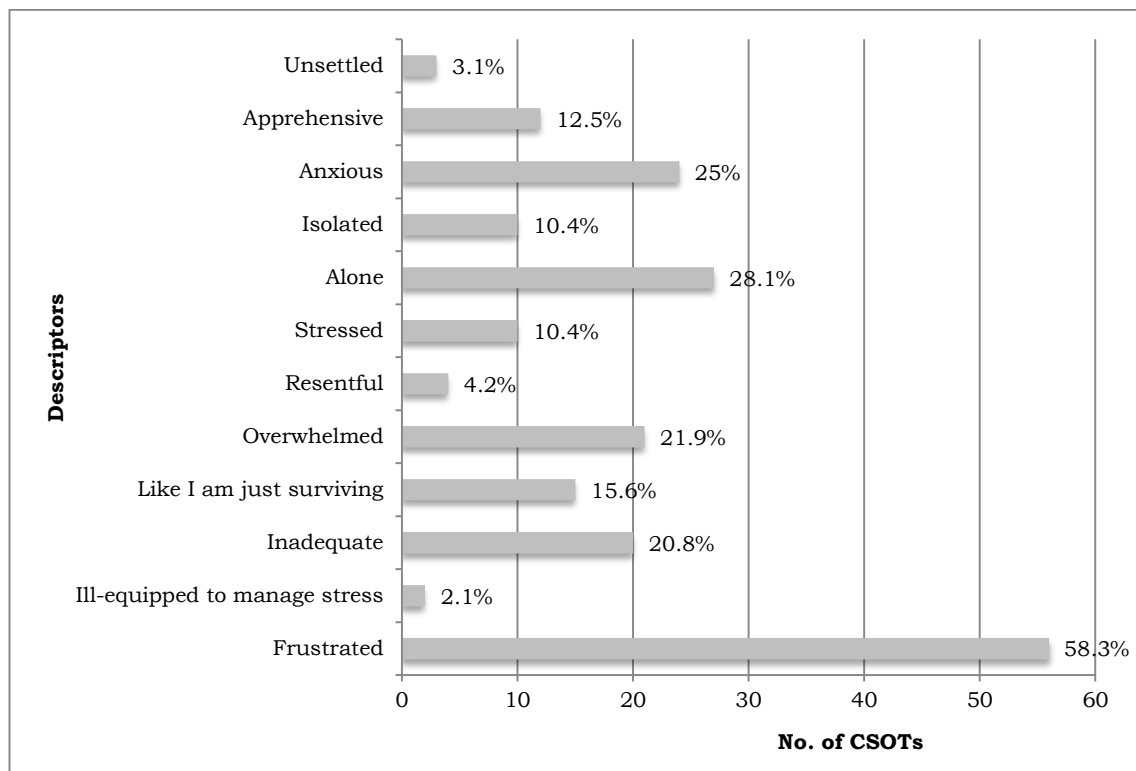
Feeling *motivated* was a descriptor selected by 34 participants. For two participants this was linked to the learning opportunities they were receiving while others (n=2) experienced this when patients improved or engaged co-operatively in treatment. Some CSOTs highlighted their feeling of motivation despite challenges experienced (n=2) while others linked this experience to the passion that they felt in response to perceiving need and potential in the communities in which they worked (n=5). A further two participants qualified their selection by saying that they were motivated *sometimes*.

*Satisfaction in my job* was reported by 36.5% (n=35) of participants. This was related to patient interaction (n=3), a good relationship with the clinical team (n=1) or a satisfaction with the choice of profession (n=1). Satisfaction was linked to loving your job (n=3) and the opportunity to learn (n=1). One participant felt satisfied when she was busy while another stated that she was satisfied “most of the time”.

Around one fifth (n=21; 21.9%) of participants reported feeling *self-confident*. Some CSOTs felt this at times or within specific areas of practice (n=3) while being acknowledged contributed to this sense for one CSOT. Working alone was perceived to allow two therapists to develop self-confidence. Pride in the profession contributed to self-confidence for another therapist.

### ***Negative personal descriptors***

Various negative descriptors were selected by CSOTs (see Figure 7) with some participants providing comment to explain their selections.



**Figure 7: Frequencies obtained for personal negative descriptors**

*Frustration* was a common experience (n=56). One participant stated, “This is the most true feeling I experienced - with language, resource availability, staff attitudes, etc.”. Coding of comments revealed that frustrations were often linked to resource limitations (n=17) including equipment, materials, absent or limited budgets, waiting times for the arrival of equipment, assistive devices or wheelchairs, limited transport and limited working space. One participant

described her frustration: “equipment needed is refused and instead we are provided with unnecessary equipment. The BASICS are not provided and it is extremely frustrating, also those who are ill/disabled are constantly disadvantaged by certain members who are of higher power”. This comment suggests another source of frustration reported: Unprofessional and unethical practice. This series of comments (n=12) made reference to perceived attitudes and behavior of clinical (occupational therapy and other), administrative and managerial staff that did not support quality service delivery and teamwork. The negative impact that this was perceived to have on patient rights and services was highlighted by two participants. Communication difficulty across language barriers was a further source of frustration (n=3) as well as poorly operating administrative and managerial systems (n=11). Situations that were perceived to provide limited learning opportunity (n=2), lack of supervision and support (n=2) and the impact that CSOTs poor motivation had on their experience, were described as further sources of frustration. Frustration also arose from clinical challenges (n=4) including the unavailability of specialist services that result in a loss of patient function (e.g. orthopaedic surgery).

Other negative personal descriptors were less frequently selected. Some CSOTs felt *alone* (n=27). An absence of colleagues, minimal guidance and difficult interpersonal or management systems contributed to feeling alone at work (n=12). Feeling *alone* socially related to isolation from family, friends particularly at the beginning of the service year. One participant stated, “VERY! Cannot stress this enough!” while another commented, “At the beginning of the year I was incredibly alone, at work and after hours”. Participants who felt *alone*, did not necessarily feel *isolated* – an experience reported by 10.6% (n=10) of participants. This sense was linked to social isolation (n=1) and work isolation (n=2) when he/she did not have any occupational therapy colleagues.

Feeling *anxious* was reported by 25% (n=24) of participants. Comments indicated that this anxiety was at times related to applying knowledge and skill (n=6) (“afraid of my ability or inability”), being solely responsible for services (n=2) as indicated by the following quote:

“My first day at work went like this: the head physio greeted me, gave me a key and said, ‘Here are the keys for your department’. No other help or guidance was given and when I asked or phoned the district, I was just referred on to another person”.

Other explanations for anxiety included a high workload (n=3), communication difficulty (n=1) or future work after CS (n=3). *Apprehension* was reported by fewer participants (12.5%) but similarly this descriptor was also linked to knowledge and skill (n=6), workload (n=1) and future work (n=2). Being *stressed* was reported by 10.4% (n=10) of participants. This stress was linked with workload (n=2), being unable to provide what patients needed (n=1) and concern around being unemployed after completion of CS (n=1). Two participants (2.1%) reported that they were *ill equipped to manage stress* with one commenting that she had not managed to develop the coping strategies needed to cope with what she faced on a daily basis.

Comments made by some participants (20.8 %; n=20) who felt *inadequate* revealed that this feeling was at times linked to excessive workload (n=3) or not having the necessary skill, confidence, resources and support (n=8). Others felt inadequate only initially or occasionally (n=2) while one participant linked this feeling to the perception that she had not learnt anything during her service year.

“*I am just surviving*” was a descriptor chosen by 15 participants (15.6%). One comment revealed that this was related to severe staff shortages while another attributed it to the amount of “admin” that was required. A further participant stated that she was, “just hoping to make it through the year”. The same number of participants (15.6%) indicated that they were *thriving* as they found their feet and were able to meet the challenges presented by their context (n=5). Two further comments linked this feeling to discovering purpose and passion in their practice. Feeling *overwhelmed* was not uncommon (n=21). Two participants stated that this characterised their experience in the beginning of the year. Others (n=10) linked this sense to the need or workload that they were faced with. A lack of knowledge and experience contributed to this feeling for two participants and “all the change” was associated to this feeling for another.

Three participants (3.1%) reported feeling *unsettled*. The one comment explained how a CSOT felt unsettled with the way things operated within her clinical placement but she did not have the power to change this. Four participants (4.2%) reported feeling *resentful*. One participant was resentful of the poor management of the facility and the unprofessional behavior of staff. One further comment described resentment toward occupational therapy assistants for their criticism of the CSOT and their perceived poor work ethic.

### ***Additional comments***

Participants were given the opportunity to add any other terms or descriptions that had characterised their CS experience. Most responses were positive except for one CSOT who reported feeling *used*. Responses are tabulated below (Table 15):

**Table 15: Additional descriptors used by CSOTs**

<b>Descriptor: I feel...</b>	<b>Explanation / Comment</b>
<ul style="list-style-type: none"> <li>Like fourth year is worth all the sweat and tears</li> </ul>	CS is a breeze and you can enjoy being an OT
<ul style="list-style-type: none"> <li>Used</li> </ul>	As all work is handed down to CS and this is masked by saying it's for you to gain experience
<ul style="list-style-type: none"> <li>That CS has contributed greatly to my development and as individual and an OT</li> </ul>	
<ul style="list-style-type: none"> <li>Certain of my career choice</li> </ul>	Despite being left to feel frustrated and exhausted by the year
<ul style="list-style-type: none"> <li>I am given space &amp; opportunity to explore &amp; attempt new ideas</li> </ul>	
<ul style="list-style-type: none"> <li>I have learnt to value the service I am providing without external validation &amp; guidance</li> </ul>	It's just about my patient, what they need how they feel, I am the instrument, I am supposed to catalyse the process to independence to wellness through the engagement in occupation.
<ul style="list-style-type: none"> <li>Working in a rural setting is a valuable experience that all OT should have to do</li> </ul>	Those that work in tertiary hospitals are unaware of the challenges these individuals face being so rural. More should be done at varsity to equip therapists with actual community work and more focus placed on empowering individuals in the community with regards to skills training, job placements, and just community life in general - how to have a sustainable life (education on agriculture, proper pre-natal education and training etc.)



### ***Factors associated with general CS experience descriptors***

In order to develop further insight into why various experience descriptors were reported with a high frequency (>40%), the relationship of these factors to other variables were explored. Variables tested were either those with an expected (logical) association, or where an association had been suggested from the coding of responses to open-ended question data. Odds ratios were calculated and are recorded along with the p-values and confidence intervals in Table 16. The following significant associations were observed:

- Participants who did not report having *a strong identity as an Occupational Therapist* were three times more likely to be dissatisfied with supervision (OR 3.41; 95%CI 1.38 – 8.44; p=0.008).
- The relationships between feeling *challenged* and communication difficulties, sufficient equipment, sufficient work area, realistic workload and being able to relate to patients' beliefs were individually explored. Therapists who reported feeling *challenged* were approximately three times more likely to report communication difficulties (OR 3.44; 95%CI 1.29 – 9.18; p=0.014). No significant association was noted with the other factors tested.
- Being *encouraged to reflect critically on my practice* was compared against two other variables. Those who reported being dissatisfied with supervision were three times more likely to not report being encouraged to reflect critically on their practice (OR 3.17; 95%CI 1.29 – 7.79; p=0.012).
- Factors potentially related to *frustration* were explored. *Communication difficulties* (OR 3.48; 95%CI 1.32 – 9.20; p=0.012), *insufficient equipment to treat patients with UL injuries* (OR 0.33; 95% CI 0.14 – 0.81; p=0.016) and *dissatisfaction with supervision* (OR 0.33; 95% CI 0.14 – 0.82; p=0.017) were all significantly associated with *frustration*. Having a supervisor and having equipment was protective against reporting frustration while those reporting communication difficulties were more likely to report experiencing frustration. The narrow confidence intervals and low p-values suggest that it is improbable that this result is due to chance.
- Satisfaction with supervision was protective against reporting the *need for a mentor* (OR 0.11; 95% CI 0.03 – 0.34; p<0.001) with the narrow confidence interval suggesting that results are close to the true population

estimate. Participants who had a supervisor who was an occupational therapist were less likely to report a need for a mentor (OR 1.39; 95% CI 1.01 – 1.89; p=0.040).

- As expected, *feeling poorly understood as an OT* was significantly associated with *feeling that OT is poorly recognised* (OR 4.47; 95% CI 1.21 – 16.47; p=0.025).
- A significant association was also noted between being *proud to be an OT* and reported *a strong identity as an OT* (OR 4.91; 95% CI 1.78 – 13.54; p=0.002).

**Table 16: Factors associated with general experience descriptors**

Variable	Count / Median/IQR/Frequency			OR	P-value	95%CI
	<b>Strong Identity as an OT</b>					
Number of OTs	Median 3 (range 1 – 26)			1.0	0.734	0.93 – 1.11
	IQR 2 – 4					
OT supervisor	58 (70%) OT			0.82	0.222	0.59 – 1.13
	11 (13%) PT					
	14 (17%) Other					
Supervision satisfaction		No	Yes	3.41	<b>0.008</b>	1.38 – 8.44
	No	41	12			
	Yes	19	19			
Lack of recognition		No	Yes	1.39	0.493	0.554 – 3.57
	No	44	29			
	Yes	12	11			
	<b>Accountable</b>					
Satisfaction with supervision		No	Yes	1.84	0.173	0.77 – 4.44
	No	38	15			
	Yes	22	16			
	<b>Challenged</b>					
Communication difficulties		No	Yes	3.44	<b>0.014</b>	1.29 – 9.18
	No	16	25			
	Yes	8	43			
Equipment		No	Yes	0.69	0.403	0.299 – 1.64
	No	22	18			
	Yes	30	17			
Work area		No	Yes	21.0	0.976	0.42 – 2.43
	No	14	26			
	Yes	17	32			
Relate to beliefs and culture		No	Yes	1.15	0.778	0.43 – 3.07
	No	10	30			
	Yes	11	38			
Workload		No	Yes	1.33	0.532	0.54 – 3.28
	No	13	26			
	Yes	24	25			

	<b>Encouraged to reflect</b>					
Number of OTs	Median 3 (range 1 – 26)			1.02	0.636	0.94 – 1.12
	IQR 2 – 4					
Satisfaction with supervision		<i>No</i>	<i>Yes</i>	3.17	<b>0.012</b>	1.29 – 7.79
	<i>No</i>	40	20			
	<i>Yes</i>	12	19			
	<b>Frustrated</b>					
Equipment		<i>No</i>	<i>Yes</i>	0.33	<b>0.016</b>	0.14 – 0.81
	<i>No</i>	16	36			
	<i>Yes</i>	20	15			
Communication difficulties		<i>No</i>	<i>Yes</i>	3.48	<b>0.012</b>	1.32 – 9.20
	<i>No</i>	15	9			
	<i>Yes</i>	22	46			
Supervisor satisfaction		<i>No</i>	<i>Yes</i>	0.33	<b>0.017</b>	0.14 – 0.82
	<i>No</i>	19	41			
	<i>Yes</i>	18	13			
	<b>Feel like a PT</b>					
Communication difficulties		<i>No</i>	<i>Yes</i>	1.40	0.483	0.55 – 3.59
	<i>No</i>	14	10			
	<i>Yes</i>	34	34			
Supervisor profession	58 OT (62.37%)			0.97	0.850	0.73 – 1.29
	10 No Supervisor (10.75%)					
	25 Other (26.88%)					
Equipment		<i>No</i>	<i>Yes</i>	0.72	0.458	0.30 – 1.71
	<i>No</i>	27	25			
	<i>Yes</i>	21	14			
OT poorly recognised		<i>No</i>	<i>Yes</i>	1.75	0.197	0.75 – 4.09
	<i>No</i>	22	13			
	<i>Yes</i>	30	31			
Strong identity as an OT		<i>No</i>	<i>Yes</i>	0.56	0.168	0.24 – 1.28
	<i>No</i>	27	29			
	<i>Yes</i>	25	15			
Number of OTs	Median 3 (range 1 – 26)			0.97	0.544	0.89 – 1.06
	IQR 2 – 4					
Number of physios in the team	Median 2 (range 0-30)			1.07	0.372	0.93 – 1.22
	IQR 1 – 4					
	<b>Need a mentor</b>					
Satisfaction with supervision		<i>No</i>	<i>Yes</i>	0.11	<b>&lt;0.001</b>	0.03 – 0.34
	<i>No</i>	25	35			
	<i>Yes</i>	27	4			
Supervisor profession	58 OT (62.37%)			1.39	<b>0.040</b>	1.01 – 1.89
	10 No Supervisor (10.75%)					
	25 Other (26.88%)					
	<b>Like OT is poorly recognised</b>					
Poorly understood as an OT		<i>No</i>	<i>Yes</i>	4.47	<b>0.025</b>	1.21 – 16.47
	<i>No</i>	32	43			
	<i>Yes</i>	3	18			
Communication difficulties		<i>No</i>	<i>Yes</i>	1.96	0.164	0.76 – 5.03
	<i>No</i>	12	12			
	<i>Yes</i>	23	45			

	<b>Feel proud to be an OT</b>					
Strong identity as an OT		<i>No</i>	<i>Yes</i>	4.91	<b>0.002</b>	1.78 – 13.54
	<i>No</i>	26	30			
	<i>Yes</i>	6	34			

### **4.1.3 Experience of UL rehabilitation**

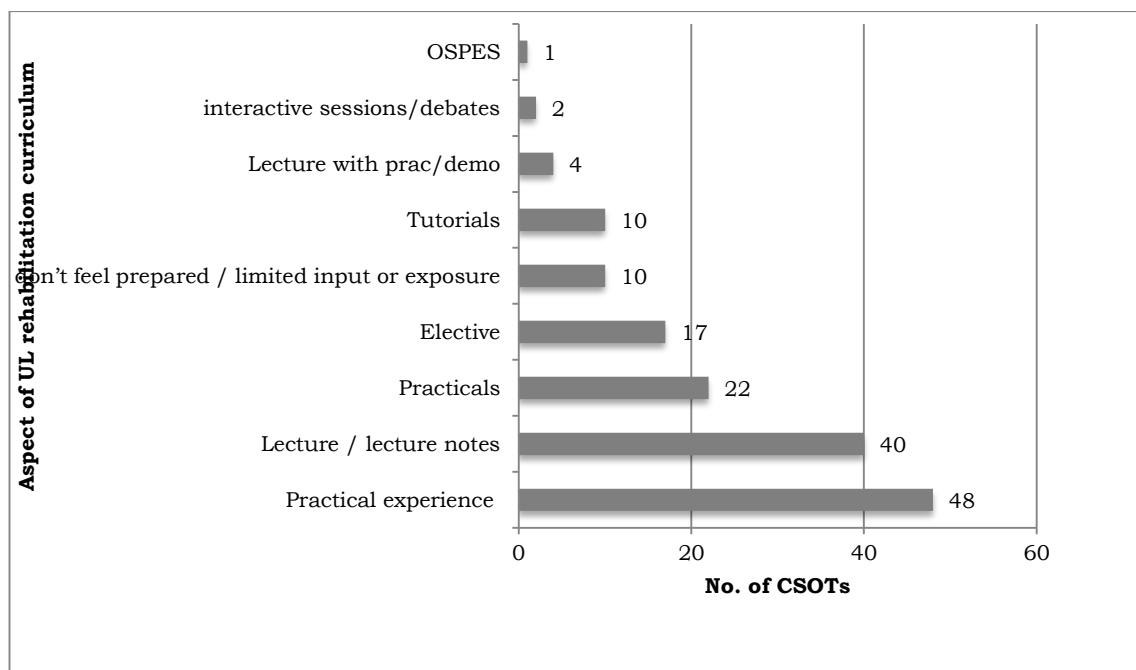
In this section, participants' perceptions of undergraduate preparation for UL rehabilitation practice will firstly be described. The frequency with which CSOTs treated various conditions and used intervention modalities will be reported followed by how equipped they feel for this, and various competency areas of UL rehabilitation practice. Their perceived competence and confidence, and descriptors that captured their UL treatment experience will be reported. Perceived barriers and facilitators will also be described along with the evidence CSOTs used to support their practice. Finally desired resources to support practice will be reported.

#### **4.1.3.1 Undergraduate curricula**

CSOTs that reported having an undergraduate practice learning placement in which they treated patients with UL injuries and conditions constituted 80.2% of the sample (n=73; missing responses=12). Comments revealed that a large percentage of patients treated within these practice learning placements required UL rehabilitation due to upper motor neuron lesions (cerebral palsy and cerebrovascular accidents) (n=24). Three participants reported treating patients with spinal cord injuries while another three therapists treated patients with burns of the UL. Some therapists treated a variety of UL conditions or did not specify the condition (n=5). Three participants stated explicitly that they did not have any exposure to treating patients with lower motor neuron lesions of the UL while eight participants reported having had a practice learning placement where they gained experience in "hand therapy" or lower motor neuron lesions of the UL.

Aspects of their UL rehabilitation curriculum that participants perceived to contribute most to their preparation for practice are illustrated in Figure 8.

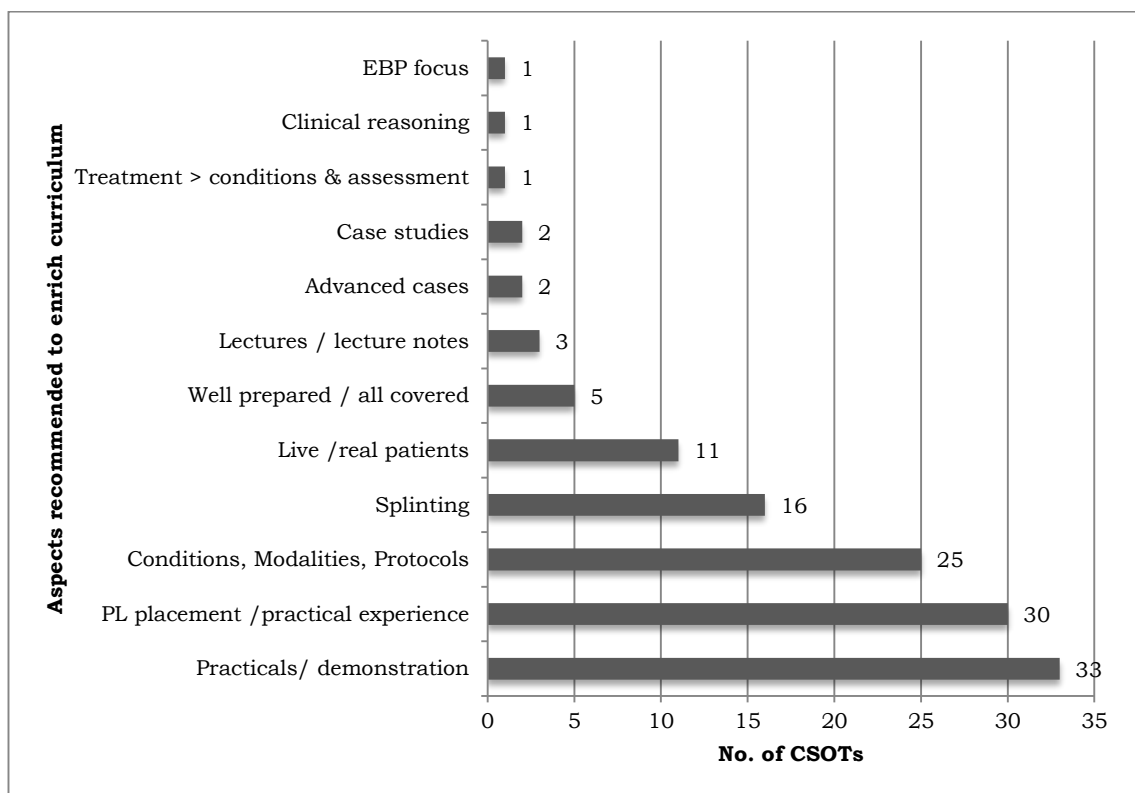
Practical experience was mentioned most frequently (n=48) as contributing substantially towards their preparedness. Two therapists qualified their response by saying that this needed to be done with close supervision. Forty participants stated that lectures largely contributed to their preparation while others (n=22) stated that practicals (classroom skill practice) helped. Electives (n=17), tutorials (n=10), lectures with practical components/demonstration (n=4), interactive sessions/debates (n=2) and OSPEs (n=1) were also mentioned. Ten participants (11%) felt that they were not prepared or that the input that they received was limited. Close to half of participants (48.4%) indicated that *a combination* of aspects contributed towards their sense of preparedness.



**Figure 8: Aspects of undergraduate curricula perceived to prepare participants most for practice**

CSOTs were asked what they thought *should* be included in an undergraduate UL rehabilitation curriculum to prepare for practice (see Figure 9). Practical or demonstrations were mentioned most frequently (n=33). Practical experience or a practice learning placement in UL rehabilitation was repeatedly mentioned (n=30) with four of these participants highlighting that this needed to occur with adequate supervision. Twenty five participants felt that more input on conditions, treatment modalities and treatment protocols was necessary while 16 participants felt more splinting input/practice was

required. It was highlighted (n=11) that “real” or “live” patients in demonstrations and practicals would further aid learning and skill development. Increased lectures/lecture notes (n=3), case-studies (n=2), input to develop clinical reasoning (n=1), time spent on more advanced cases (n=2) and an evidence-based practice focus (n=1) were other aspects suggested to improve preparation for practice. One participant recommended a greater focus on treatment, rather than assessment and conditions. Five participants felt that they were well prepared, or that all necessary elements were covered in undergraduate preparation.

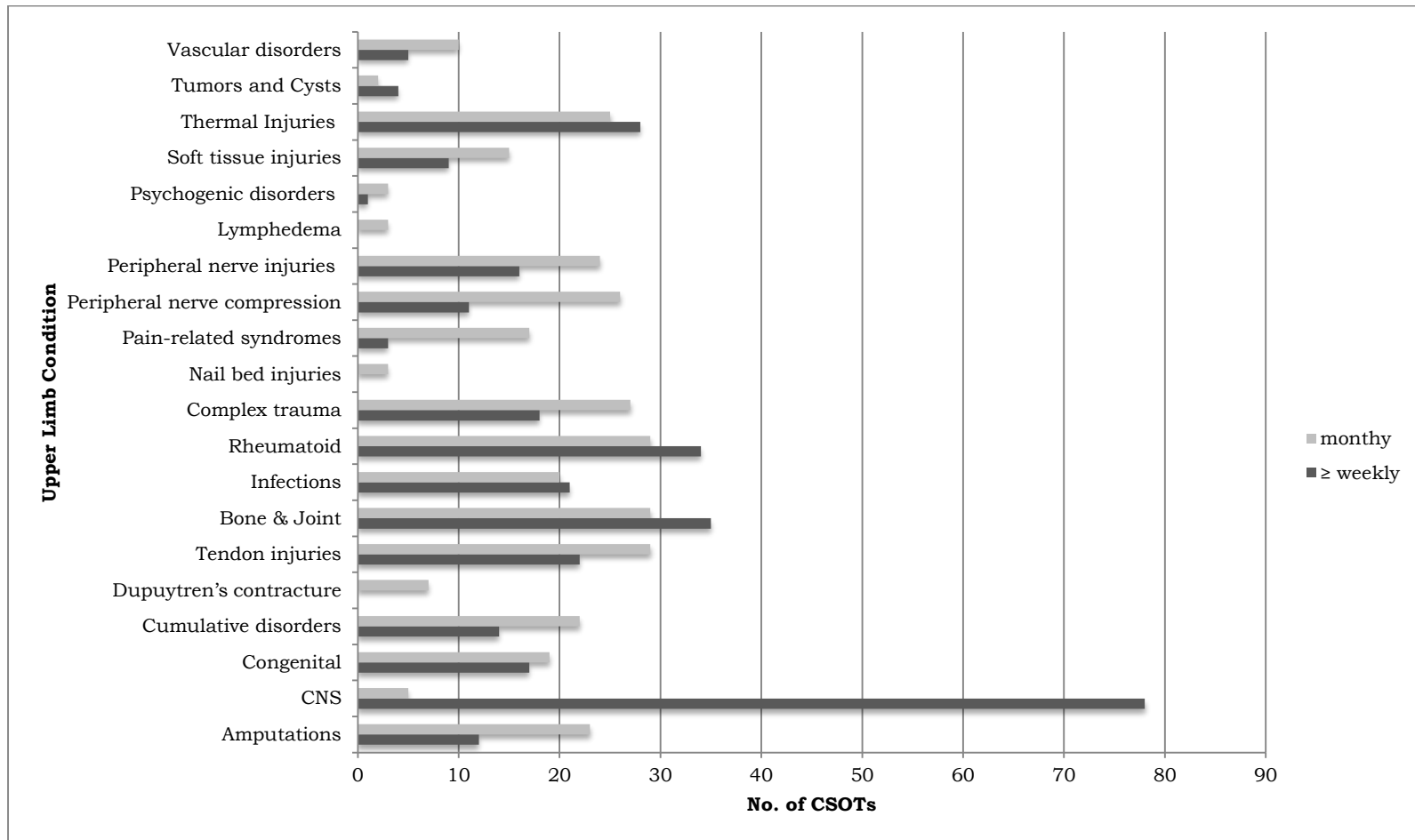


**Figure 9: Aspects recommended by CSOTs to enrich UL rehabilitation curricula**

#### **4.1.3.2 Frequency of treating UL conditions**

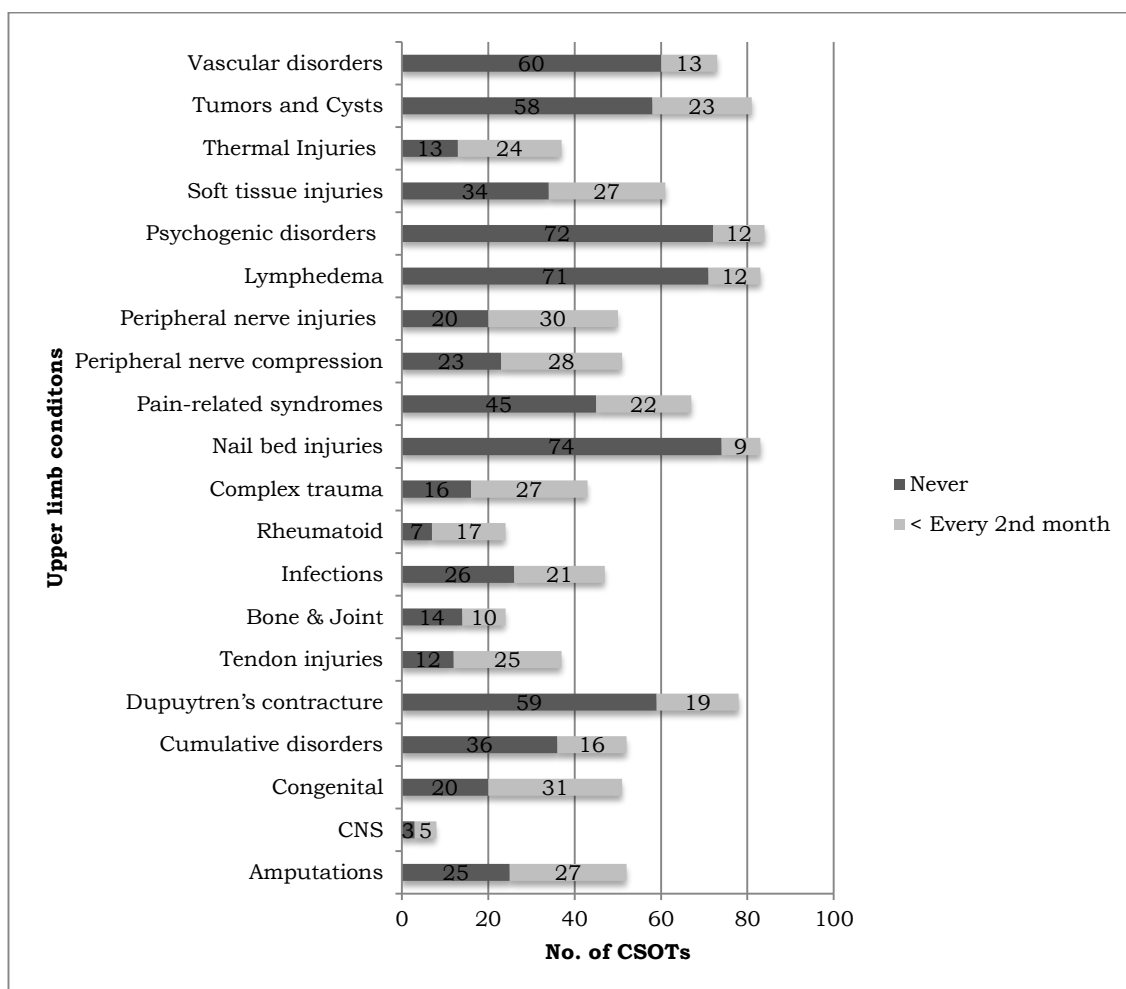
Participants (n=86; missing responses=17) reported treating a median of 20 UL rehabilitation patients each month although the range varied between 0 and 225. Frequencies and proportions calculated for each diagnosis are included in Appendix 15. To determine which conditions were seen on *at least a weekly* basis, the categories *daily* and *weekly* were collapsed. Central nervous system disorders (n=78), bone and joint conditions (n=35), arthritic conditions (n=34)

and thermal injuries (n=28) were the conditions that were seen at least weekly by the greatest number of participants. Figure 10 illustrates conditions that were seen by therapists at least weekly or monthly. Tendon injuries (n=29), complex trauma (n=27), peripheral nerve compression/disease (n=26) and peripheral nerve injuries (n=24) were other conditions seen monthly by a comparatively large number of participants. Conditions *rarely* seen (categories *never* seen or seen *every second month or less* were collapsed) by therapists are illustrated in Figure 11. Nail bed injuries (n=74), psychogenic disorders (n=72), post-mastectomy lymphoedema (n=71), vascular disorders (n=60), Dupuytren's contracture (n=59) and tumours and cysts (n=58) were conditions reported as being seen rarely by the greatest number of participants.



**Figure 10: Conditions seen at least weekly or monthly**





**Figure 11: Conditions seen rarely (every second month or less) or never seen**

#### **4.1.3.3 Frequency of UL rehabilitation treatment modality use**

The frequency with which various treatment modalities were reportedly used is listed in Appendix 16. Figure 12 illustrates a summary of the frequency with which modalities were used. Modality use categories *daily* and *weekly* were collapsed to form *at least weekly*. Categories *every second month or less* and *never* were collapsed to form the category *rarely*.

Modalities which were reported to be used at least weekly by more than 50 participants included home programmes (n=74), manual therapy (n=72), activity as a means/end (n=71), exercise (n=70), training in ADLs (n=70), strengthening (n=67), education (n=64) and adaptive/assistive devices (n=52).

Modalities that were reported by 50 participants or more as being *rarely* included electrical modalities (n=87), prosthetic training (n=81), APT (n=72), mirror therapy (n=64), work hardening (n=59) and compressive therapy (n=53).

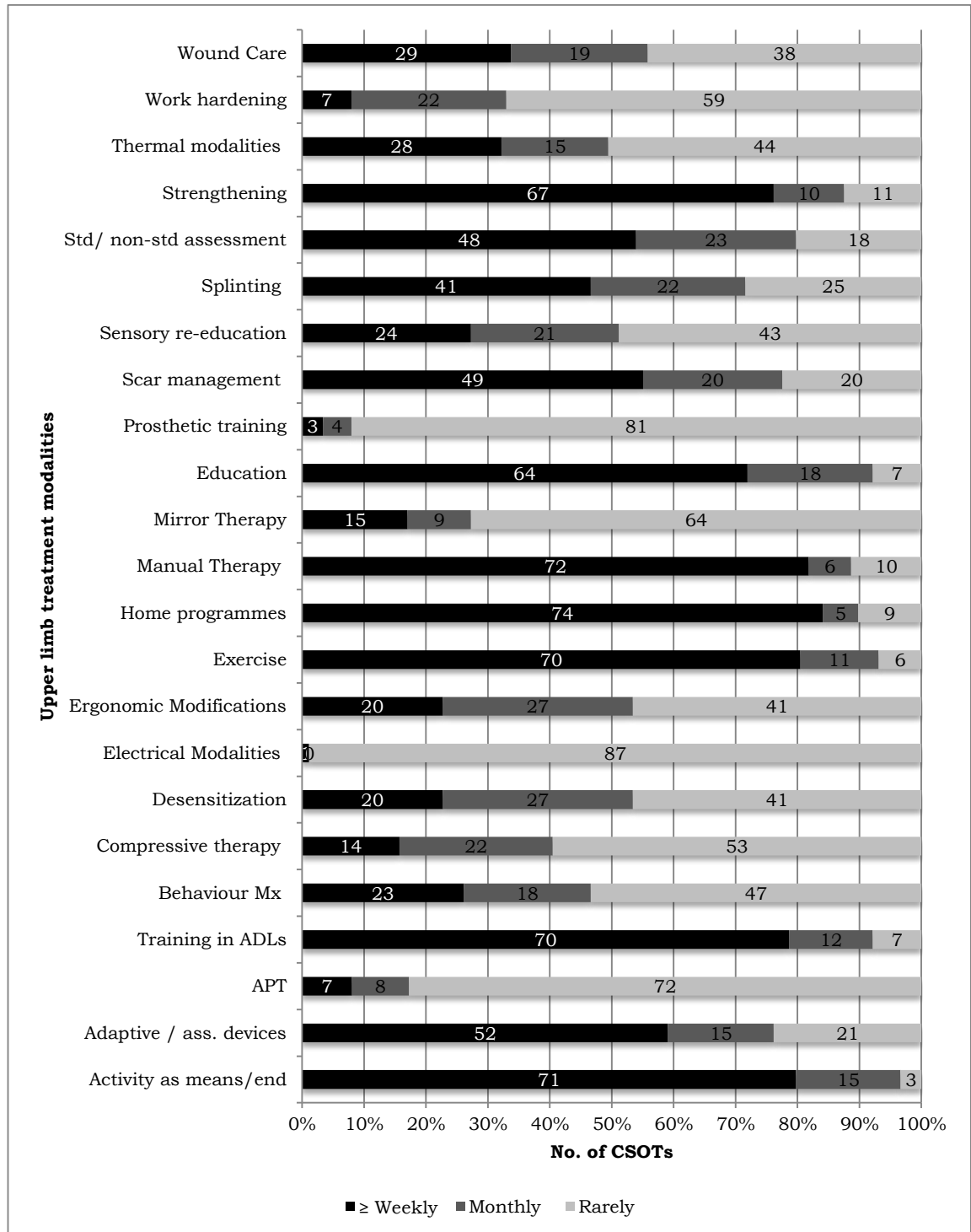


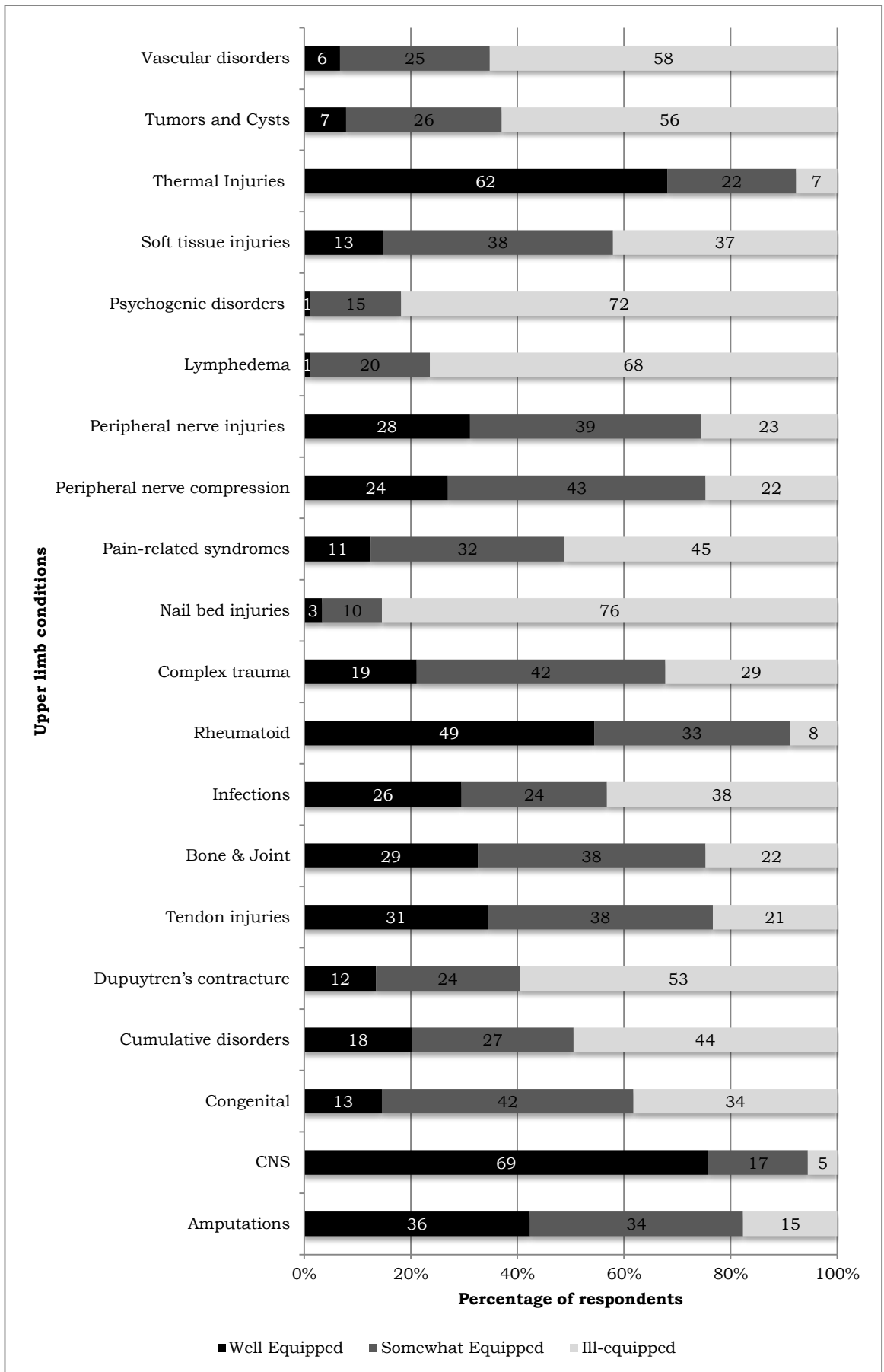
Figure 12: Frequency of modality use

Participants' were given the opportunity to qualify their selections in a *comment* section. Coding of these responses revealed that the use of activity as a treatment modality was limited by resource restrictions (n=4), patient's being too ill (n=1) and having limited space (n=1). Similarly resource limitations limited the use of assistive devices (n=7) with two participants mentioning that the devices that they used were self-made. Three participants stated that she did not know what APT was with one participant learning this skill at a cerebral palsy CPD course. Compressive therapy use was also limited by a lack of resources (n=9) as was splinting (n=7). Home programmes were considered important and used due to limited time with patients (n=2).

#### **4.1.2.4 Perceived preparedness for treatment of conditions**

Frequencies and percentages were calculated for how prepared CSOTs felt to treat common UL conditions (see Appendix 17). A summary of this data is illustrated in Figure 13. Within the figure the categories *extremely well equipped* and *well equipped* were collapsed and titled *well-equipped*. Similarly, the categories *poorly equipped* and *extremely ill-equipped* were collapsed and the category named *ill-equipped*.

Conditions for which more than 30 participants felt *well equipped* to treat were central nervous system conditions affecting the UL (n=69), thermal injuries (n=62), rheumatoid conditions (n=49), amputations (n=36) and tendon injuries (n=31). Conditions for which more than 50 participants felt *ill-equipped* included nail bed injuries (n=76), psychogenic disorders (n=72), lymphedema (n=68), vascular disorders (n=58), tumours and cysts (n=56) and Dupuytren's contracture (n=53),



**Figure 13: Frequencies for perceived preparedness to treat UL conditions**

In order to develop an impression of how equipped participants felt for treatment *across conditions*, the total number of selections for each of the five preparedness categories were combined. The number of selections per category was then divided by the total number of selections for all five categories. The results are illustrated in Figure 14 and show that 33% of all selections made for treatment of conditions fell into the *somewhat equipped* category.

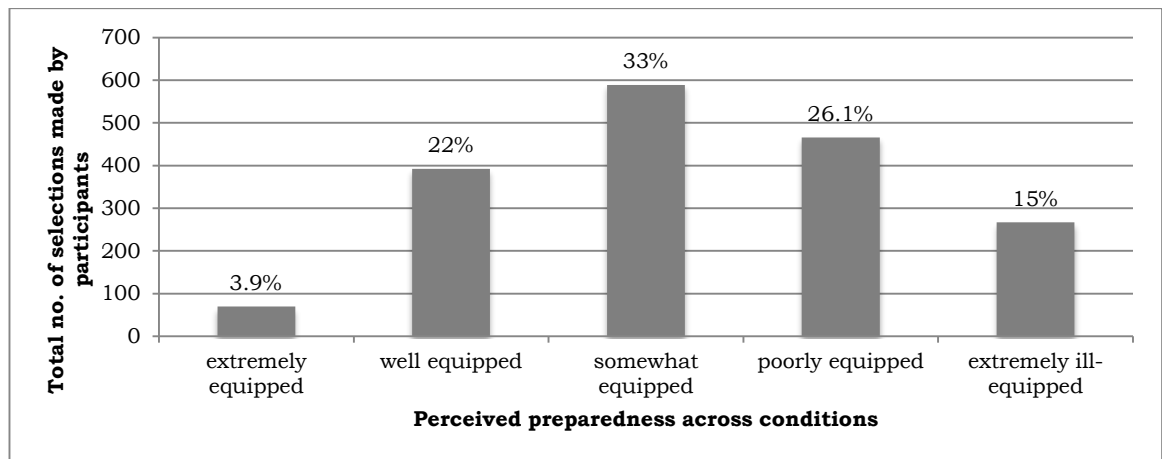


Figure 14: Total number of preparedness category selections, across conditions

### ***Relationship between perceived preparedness for treating conditions and participants' university***

The relationship between how prepared participants' perceived themselves to be to treat UL conditions and the university from which they graduated was explored. In order to do this, the 5 categories were collapsed into two categories: *equipped*<sup>15</sup> and *ill equipped*<sup>16</sup>. Pearson's Chi-squared test was used to compute statistical significance and p-values were recorded for each condition and included as an Appendix 18. Table 17 shows the conditions for which there was a significant relationship with university, and the counts for each of these conditions is included<sup>17</sup>. Data suggests that graduates from university 6 were more likely to report feeling equipped to treat patients with cumulative trauma disorders (p=0.030), infections (p=0.022) and Dupuytren's contracture (p=0.001). Graduates from

<sup>15</sup> *Extremely equipped, well-equipped, and somewhat equipped* categories collapsed

<sup>16</sup> *Poorly equipped and extremely ill-equipped* categories combined

<sup>17</sup> It is expected that, for each university, half of the responses would fall into the *no (ill-equipped)* and half would fall into the *yes (equipped)* category. When this is not the case (i.e. a majority of responses fall into either the *yes* or *no* category), this assists us in interpreting a significant p-value.

university 5 were more likely to report being *ill-equipped* to treat patients with Dupuytren’s contracture. Whether or not these conditions were covered in teaching time (or the time spent on coverage) could not comprehensively explain this association (see Table 28 and Figure 39).

**Table 17: Counts for university and conditions for which there was a statistically significant association**

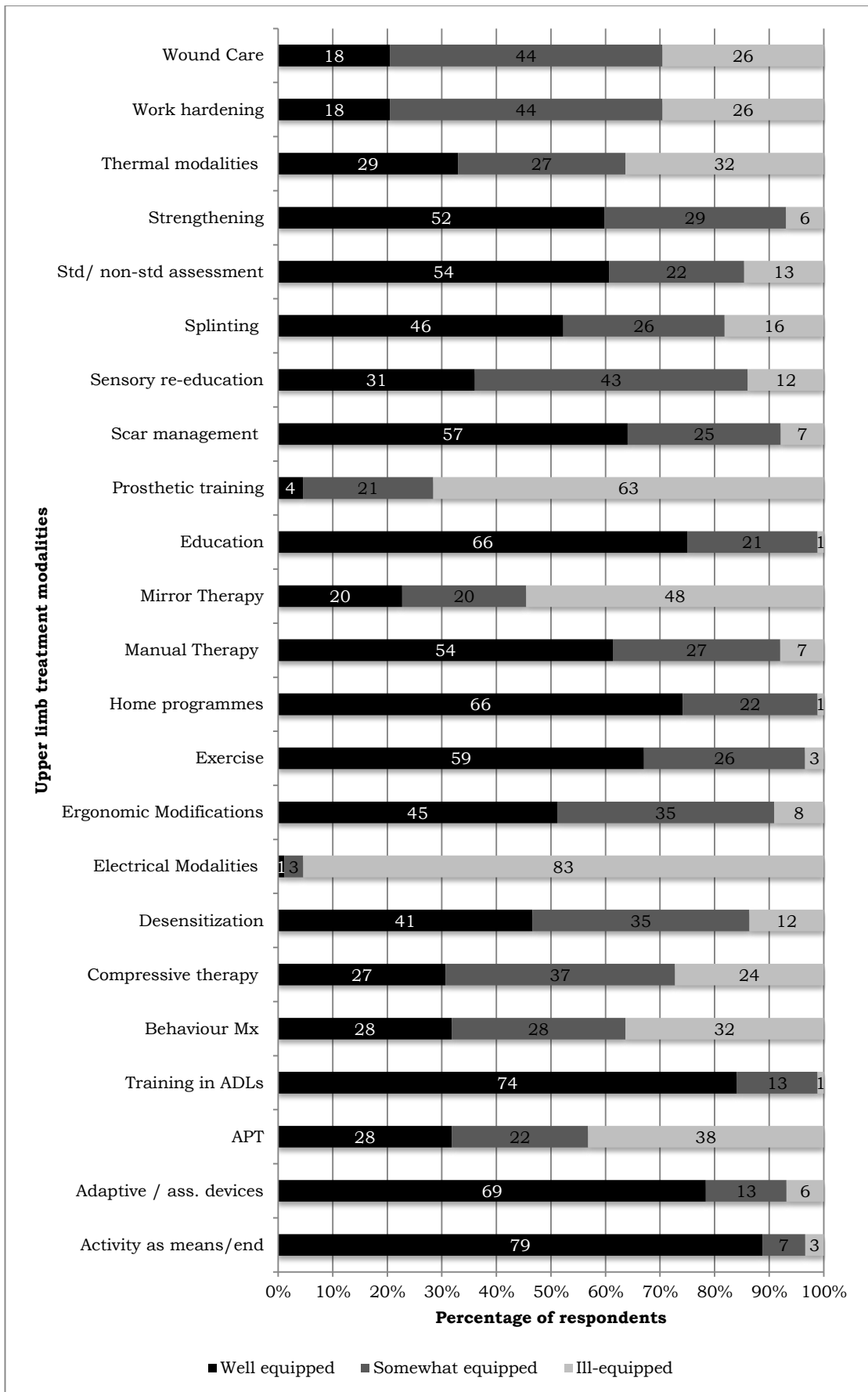
	University	1	2	3	4	5	6	7	8	Pearson’s Chi-square	P-value
Cumulative Trauma/RSI	No	4	3	5	5	11	0	10	6	15.50	<b>0.030</b>
	Yes	4	6	4	2	7	11	8	3		
Dupuytren’s	No	6	6	6	5	15	2	10	3	16.31	<b>0.022</b>
	Yes	2	3	3	2	3	9	8	6		
Infections	No	5	0	6	1	8	1	10	7	23.77	<b>0.001</b>
	Yes	3	9	3	6	10	10	7	2		

#### **4.1.3.5 Perceived preparedness for use of UL treatment modalities**

Participants rated how equipped they perceived themselves to be to use each of the UL treatment modalities. Missing responses (n=14) were noted and results are contained in Appendix 19. Figure 15 demonstrated a summary of the results. In this illustration the categories *extremely well equipped* and *well equipped* were combined and labeled, *well equipped*. *Poorly equipped* and *extremely ill-equipped* responses were collapsed into the category, *ill-equipped*.

More than 50 participants felt *well-equipped* for using *activity as a means/end* (n=79), *training in ADLs* (n=74), *adaptive/assistive devices* (n=69), *education* (n=66), *home programmes* (n=66), *exercise* (n=59), *scar management* (n=57), *standardized and non-standardised assessment* (n=54), *manual therapy* (n=54) and *strengthening* (n=52).

Modalities for which more than 50 participants felt *ill-equipped* included *electrical modalities* (n=83) and *prosthetic training* (n=63).



**Figure 15: Summary of how equipped CSOTs perceived themselves to be to use UL treatment modalities**

### ***Relationship between perceived preparedness for modality use and participants' university***

The relationship between how prepared participants' perceived themselves to be to use various UL treatment modalities and the university from which they graduated was explored. In order to do this, the 5 categories were collapsed into two categories: *equipped*<sup>18</sup> and *ill equipped*<sup>19</sup>. Results for the Pearson's Chi-square test for each modality are included in an Appendix 20. Table 18 shows the modalities for which there was a significant relationship with university. Data suggests that graduates from university 2 were less likely to report feeling equipped to use adaptive or assistive equipment (p=0.011). Graduates from university 1,3 and 7 were more likely to report being equipped to use APT (a low-cost paper-based modality) whereas graduates from 5 were more likely to report not being equipped to use this modality (p<0.001). Graduates from universities 1,4,5,6 and 7 were more likely to report being equipped to splint (p=0.033). This association could not be simply explained by whether or not the modality was covered during teaching time (see Table 29) or the length of time spent on the subject (see Figure 39).

**Table 18: Counts for universities and modalities for which there was a statistically significant association**

	<b>University</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>Pearson's Chi-square</b>	<b>P-value</b>
Adapted/assistive devices	No	0	3	1	0	0	0	0	2	18.26	<b>0.011</b>
	Yes	9	6	7	7	16	11	19	7		
APT	No	1	5	1	2	16	4	2	7	38.14	<b>0.000</b>
	Yes	7	4	7	5	1	7	17	2		
Splinting	No	0	2	3	0	3	1	2	5	15.25	<b>0.033</b>
	Yes	8	7	5	7	14	10	17	4		

<sup>18</sup> Extremely well-equipped, well-equipped and somewhat equipped combined.

<sup>19</sup> Poorly equipped and extremely ill-equipped combined

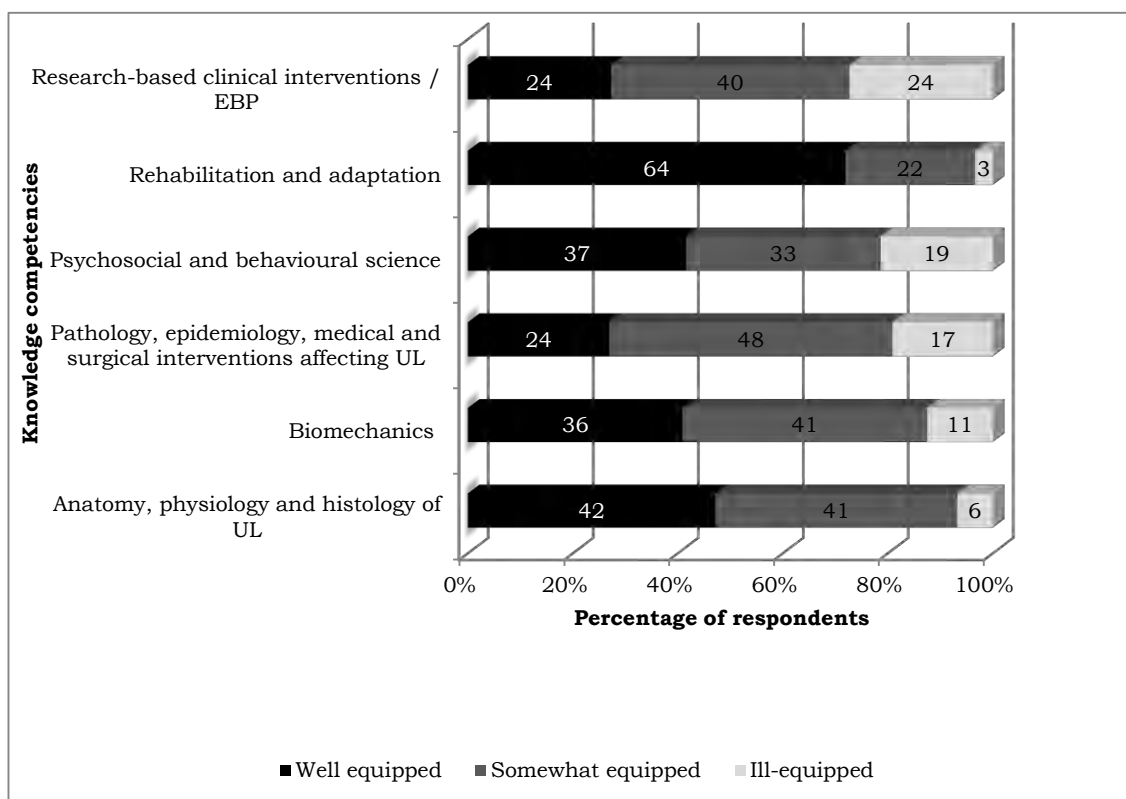


#### **4.1.3.6 Perceived preparedness for UL rehabilitation competencies**

Participants rated how equipped or prepared they felt within various competency areas required for UL rehabilitation practice. Detailed information of perceived preparedness across all competency areas has been included as Appendix 21. Results for each competency area are illustrated in separate bar graphs. Within these graphs, the *extremely prepared/equipped* and *well-prepared/equipped* categories have been collapsed and have been renamed *well-equipped*. Similarly the categories *poorly prepared/equipped* and *extremely unprepared/ill-equipped* were combined into one category and renamed *ill-equipped*. Thus, for each competency area *well-equipped*, *somewhat equipped* and *ill-equipped* responses have been represented.

#### ***Knowledge***

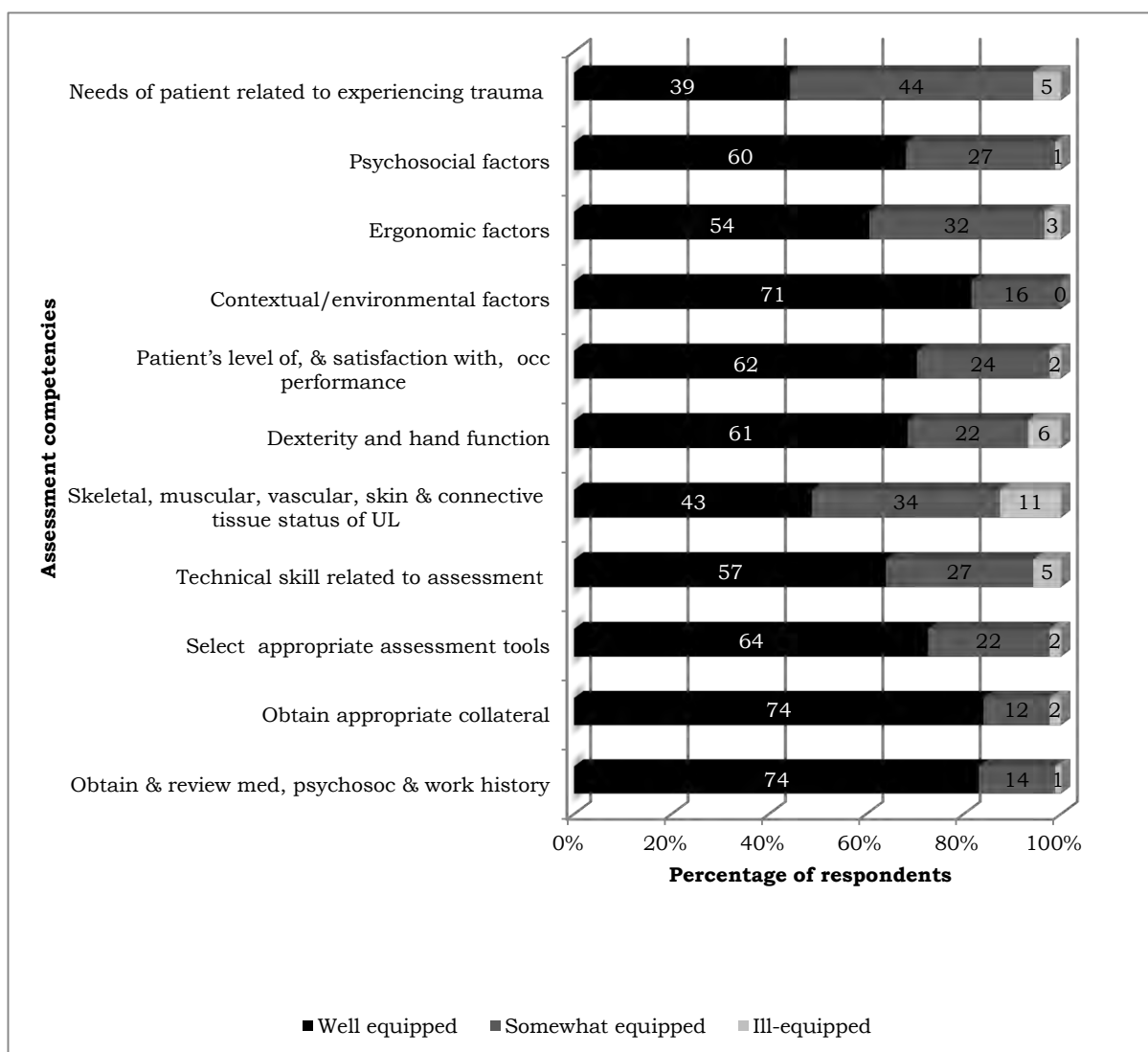
About their knowledge of anatomy, physiology and histology of the UL, participants mostly felt well equipped (n=42) or somewhat equipped (n=41). The majority of participants felt somewhat equipped (n=41) within the area of biomechanics as well as knowledge related to UL pathology, epidemiology and medical and surgical interventions (n=48). Within psychosocial and behavioural science, participants mostly felt well equipped (n=37) or somewhat equipped (n=33). The majority of participants felt *well-equipped* within knowledge of rehabilitation and adaptation (n=64). For research-based clinical interventions / EBP the majority of participants felt somewhat prepared (n=40). See Figure 16.



**Figure 16: Perceived preparedness within knowledge competencies**

### **Assessment**

Figure 17 demonstrates that the majority of participants felt *well-equipped* within the assessment competency area. An increased number of participants felt just *somewhat equipped* (n=35) or *ill-equipped* (n=11) for assessing skeletal, muscular, vascular, skin and connective tissue status of the UL. Similarly the majority of participants felt *somewhat equipped* to assess the needs of patients related to experiencing trauma (n=44).

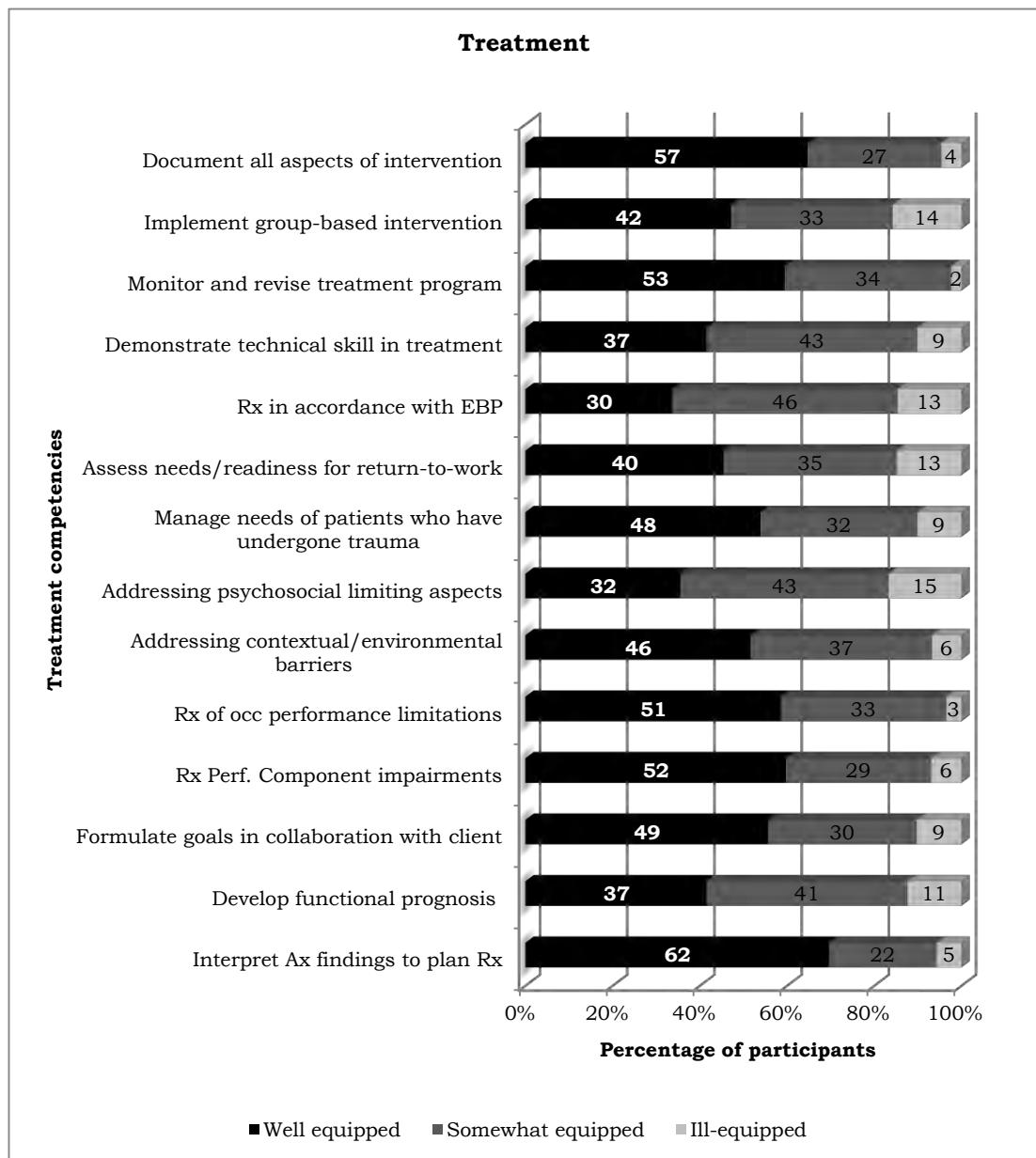


**Figure 17: Perceived preparedness for UL assessment**

### **Treatment**

The majority of participants felt *well-equipped* across various aspects of treatment. Aspects of treatment for which 50 or more participants reported feeling *well-equipped* included reviewing and interpreting assessment findings to guide treatment (n=62), accurately documenting all aspects of intervention (n=57), monitoring and revising treatment programmes (n=53), treatment of performance component impairments (n=52) and treatment of occupational performance limitations (n=51). Aspects of treatment for which more than 40 participants felt *somewhat equipped* included treatment in accordance with evidence-based practice (n=46), demonstrating technical skill in treatment (n=43), addressing psychosocial

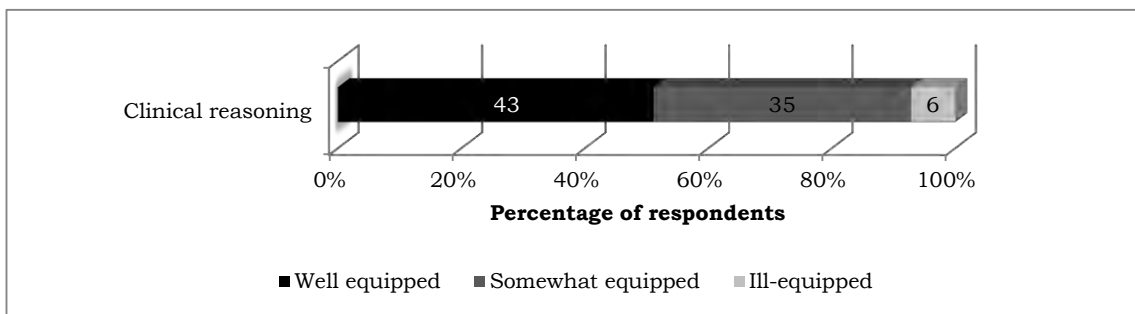
limiting aspects (n=43) and developing functional prognoses (n=41). The number of participants who felt *ill-equipped* within treatment varied across aspects between 2 and 15 participants. 15 Participants felt *ill-equipped* to address psychosocial limiting factors, while 13 participants felt *ill-equipped* to treat in accordance with EBP and assess the need and readiness for return-to-work of patients. See Figure 18.



**Figure 18: Perceived preparedness within UL treatment**

### **Clinical reasoning / judgment**

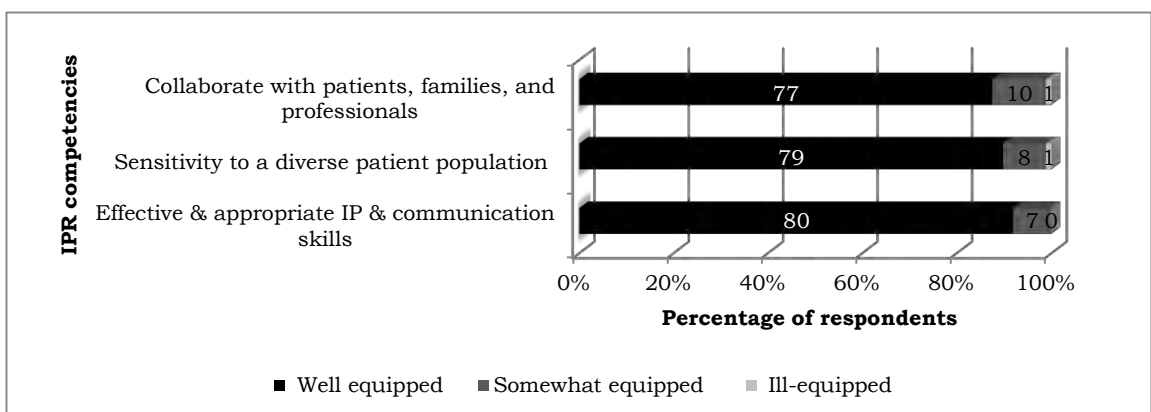
Participants were asked how equipped they perceived themselves to be to “Use theory, clinical science knowledge, and experience to collect and interpret pertinent clinical data; identifying and prioritising clinical problems and providing optimal patient care”. As illustrated in Figure 19, 51.2% (n=43) felt *well-equipped* while 41.7% (n=35) felt *somewhat equipped* with a further 7.1% (n=6) reporting that they were *ill-equipped*.



**Figure 19: Perceived preparedness for clinical reasoning / judgement**

### **Interpersonal skills and relationships**

The vast majority of participants felt largely *well-equipped* within the area of interpersonal skills and relationships as demonstrated in Figure 20. 87.5% (n=77) Of participants felt *well-equipped* to collaborate with patients, families and professionals. 90% (n=79) felt *well equipped* to show sensitivity to a diverse patient population and 92% (n=80) of participants felt *well-equipped* to demonstrate effective and appropriate interpersonal and communication skills.



**Figure 20: Perceived preparedness for interpersonal skills and relationships**

### Population-based services

Figure 21 shows that 50.6% (n=45) of participants felt *somewhat equipped* to “assess needs of identified population suffering from UL pathology or at risk of suffering from UL pathology (e.g. factory workers” while 30.3% (n=27) felt *well-equipped* and 19.1% (n=17) reported being *ill-equipped*. The majority of participants felt *well-equipped* to make intervention recommendations based on available resources (n=52), to intervene (e.g. education, prevention, ergonomic modifications) (n=56) and to monitor and adjust interventions as needed (n=52).

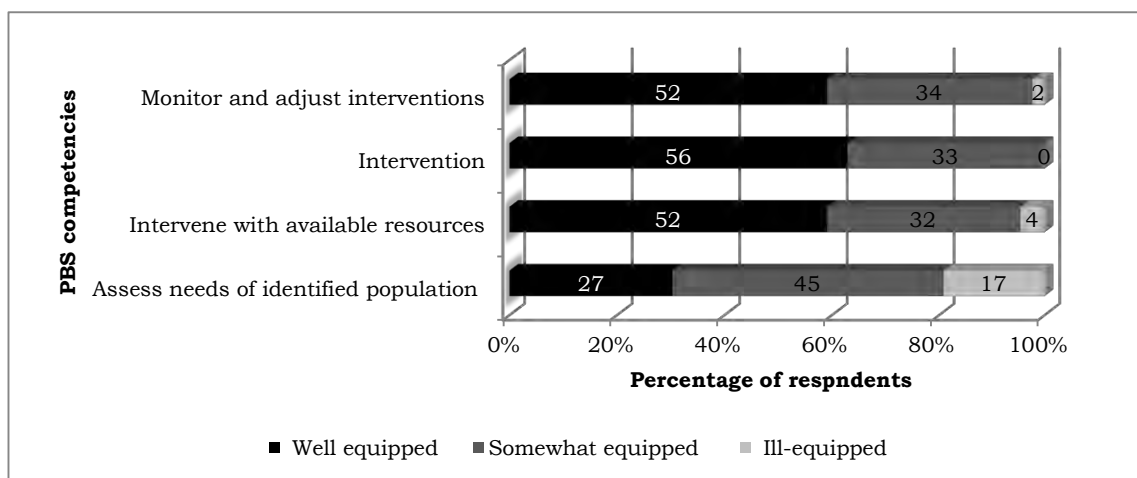
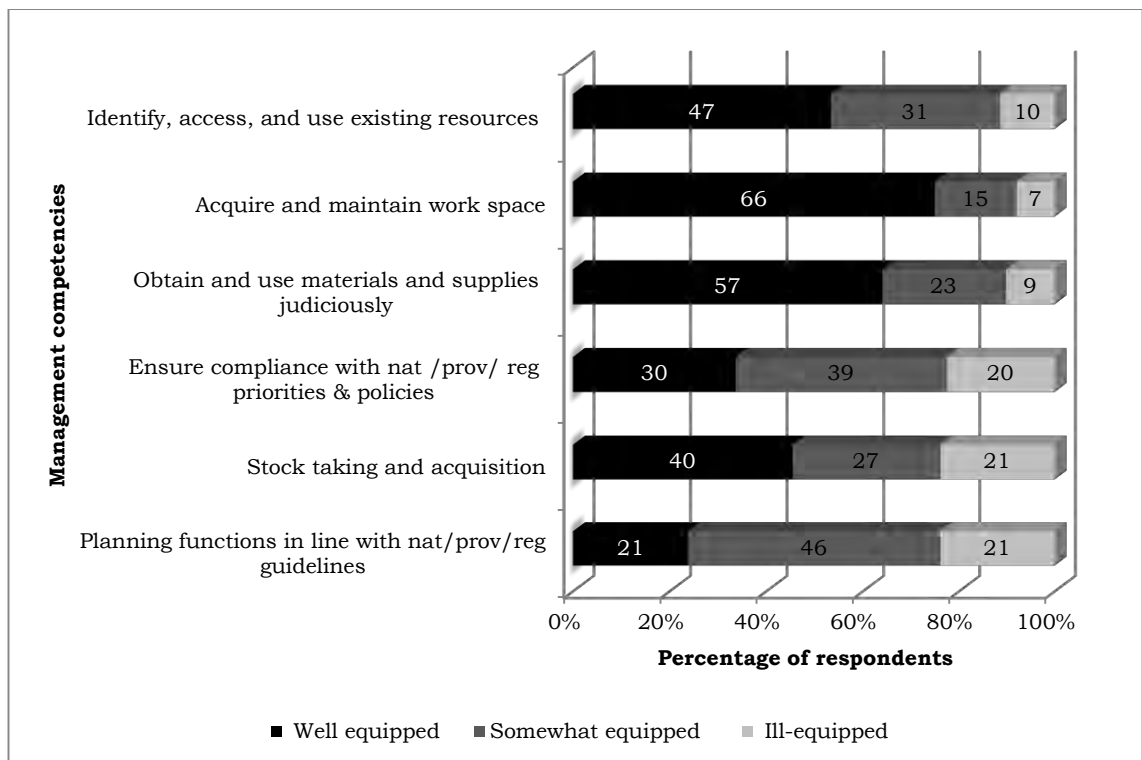


Figure 21: Perceived preparedness within population-based UL rehabilitation services

### Organise and manage services

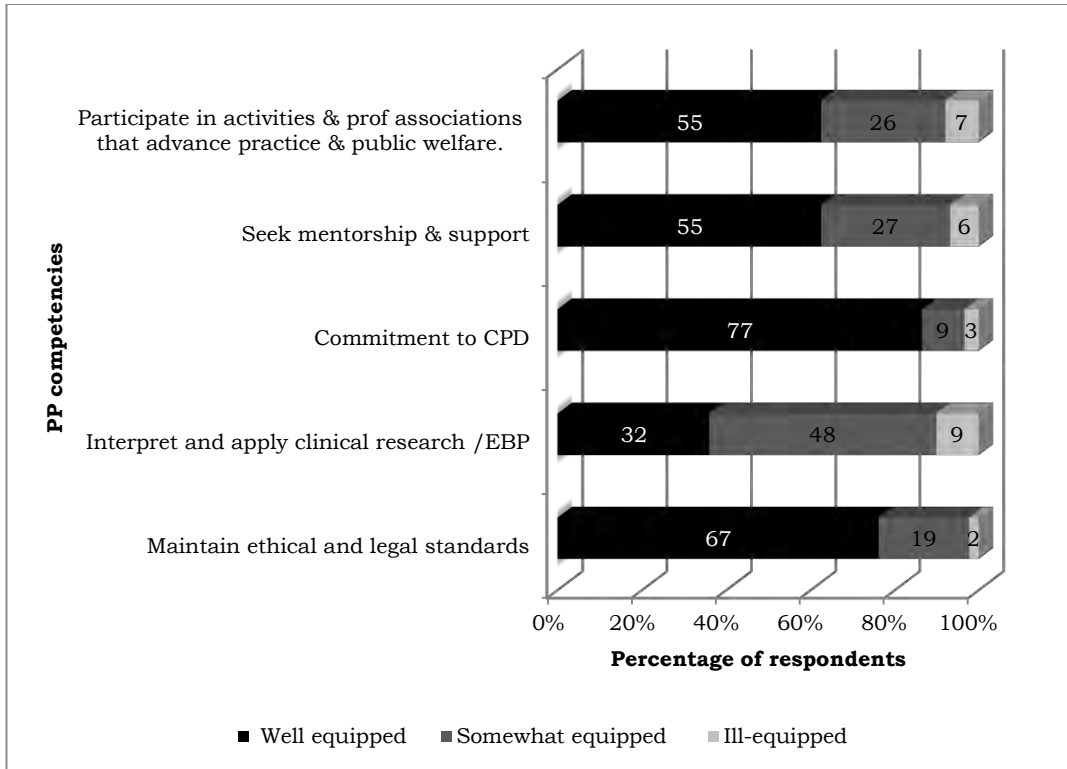
The aspect of organising and managing a service that the greatest number of participants felt *well-equipped* to perform was acquiring and maintaining work space (n=66). Planning functions in line with national, provincial and regional guidelines represented the aspect that the least number of participants felt *well equipped* to perform. Some participants (n=21) felt *ill-equipped* to manage stock-taking and acquisition (23.9%) and to plan functions in line with national, provincial and regional guidelines (23.9%). See Figure 22.



**Figure 22: Perceived preparedness for organisation and management of UL rehabilitation services**

### ***Professional practice***

Figure 23 illustrates that 86.5% (n=77) of participants felt *well-equipped* to demonstrate a commitment to continuous professional development as it relates to UL rehabilitation practice. A majority of participants (n=67; 76.1%) perceived themselves to be *well-equipped* to maintain ethical and legal standards within practice. More than half (n=48; 53.9%) reported feeling *somewhat equipped* to interpret and apply clinical research in practice.



**Figure 23: Perceived preparedness for UL rehabilitation professional practice**



***Relationship between perceived preparedness within UL rehabilitation competency areas and participants' university***

The relationship between how prepared participants' perceive themselves to be within the competency areas of UL rehabilitation and the university from which they graduated was explored. In order to do this, the 5 preparedness categories were collapsed into two categories: *equipped* and *ill-equipped*. Pearson's Chi-square values and p-values were recorded for each modality and have been included as Appendix 22 as no significant difference was noted between graduates from different universities for *most* items. Table 19 shows the 3 competency areas for which there was a significant difference and the counts for these items. Data in this table suggests that graduates from university 1, 4, 5 and 6 were more likely to report feeling equipped to *demonstrate knowledge of EBP / research-based clinical interventions* (p=0.050). Graduates from university 5 were more likely to report being ill-equipped to *formulate long, medium and short-term intervention goals in collaboration with the client*.

**Table 19: Counts for university and competency areas for which there was a statistically significant association**

	University	1	2	3	4	5	6	7	8	Pearson's Chi-square	P-value
Demonstrate knowledge of research-based clinical interventions / EBP	No	1	5	4	1	3	0	6	4	14.08	<b>0.050</b>
	Yes	8	4	4	6	14	11	12	5		
Formulate long, medium & short-term intervention goals in collaboration with client	No	0	1	1	0	6	0	2	1	24.50	<b>0.001</b>
	Yes	9	8	7	7	11	11	17	8		

#### 4.1.3.7 Perceived competence and confidence

##### Competence

As seen in Figure 24, 65.6% (n=59) of participants perceived themselves as *competent* to deliver UL rehabilitation services while 17.8% (n=16) felt *incompetent*. Eleven participants (12.2%) felt *very competent* and 1.1% (n=1) felt *extremely competent*, while 2.2% (n=2) felt *very incompetent* and 1.1% (n=1) felt *extremely incompetent*. Thus 78.9% (n=71) of participants perceived themselves to have some level of competence<sup>20</sup> while 21.1% (n=19) perceived themselves to be incompetent<sup>21</sup> (to varying degrees).

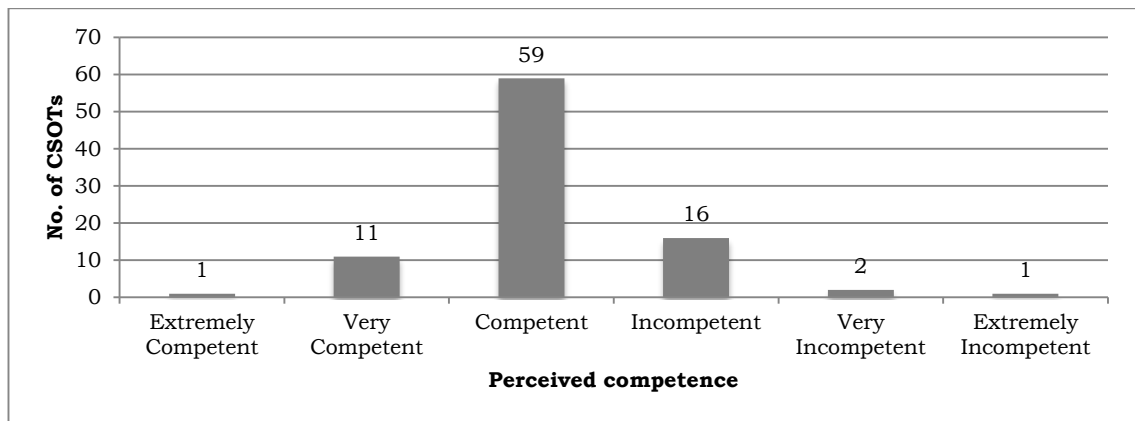


Figure 24: Perceived competence within UL rehabilitation

##### Confidence

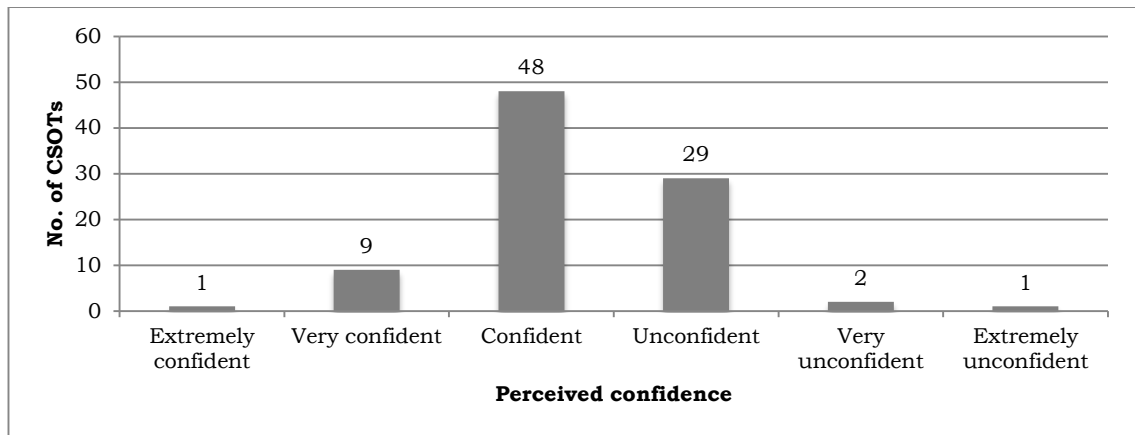
As illustrated in Figure 25, 53.3% (n=48) of participants felt *confident* in delivering UL rehabilitation services while 32.3% felt *unconfident*. Nine participants (10%) felt *very confident* and 1.1% (n=1) felt *extremely confident* while 2.2% (n=2) of participants felt *very unconfident* and 1.1% (n=1) felt *extremely unconfident*. Thus, when treating patients with UL injuries and conditions, 64.4% (n=58) of participants felt some level of confidence<sup>22</sup> while 35.5% (n=32) felt like they were unconfident<sup>23</sup>. See Figure 32.

<sup>20</sup> Extremely competent, very competent and competent categories combined

<sup>21</sup> Very incompetent and extremely incompetent categories combined

<sup>22</sup> Extremely confident, very confident and confident categories combined

<sup>23</sup> Very unconfident and extremely unconfident categories combined



**Figure 25: Perceived confidence within UL rehabilitation**

### ***Factors associated with perceived competence and confidence***

To develop a profile of a confident therapist who perceived himself / herself as competent, various participant and environment-related variables were selected and tested against perceived competence (see Table 20) and confidence (see Table 21) within UL rehabilitation (the 5 categories within both competence and confidence data were collapsed into two categories for each, namely competent/confident and incompetent/not confident). Variables that demonstrated statistically significant univariate association at a 0.1 significance level ( $p$ -value  $\leq 0.1$ ) were included in a logistic regression model to develop a profile of perceived competent and confident therapists.

Therapist who reported a level of competence were those more likely to report *enjoying treating patients with UL injuries/conditions* ( $p=0.003$ ) and those that had an *UL practice learning placement at university* ( $p=0.042$ ) (see Table 19). Confident therapists were similarly those that reported *enjoying treating patients with UL injuries/conditions* ( $p=0.007$ ) and those that had *UL practice learning placement at university* ( $p=0.051$ ) as well as those perceiving that their *practical skills are adequate* ( $p=0.010$ ) (see Table 20).

**Table 20: Factors associated with perceived competence in UL rehabilitation**

Variable	Univariate			Logistic Regression		
	OR	P-value	95 %CI	AOR	P-value	95%CI
Communication difficulties	0.28	0.109*	0.59 – 1.33	0.02	0.109	0.00 – 2.37
Satisfaction with supervision	2.96	0.114	0.77 – 11.35			
I have sufficient knowledge about UL rehabilitation	5	0.009	1.51 – 16.60	2.53	0.566	0.11 – 60.30
My practical skills (e.g. splinting) are adequate	8.46	0.002	2.24 – 32.03	9.11	0.185	0.35 – 238.10
My clinical reasoning within UL rehab is sufficiently developed	2.81	0.051	0.99 – 7.94	3.12	0.480	0.13 – 73.93
I'm able to adequately communicate with the referring Dr	2.93	0.047	1.01 – 8.45	0.18	0.414	0.00 – 10.73
I have convenient access to a computer	0.90	0.854	0.28 – 2.84			
I have convenient access to the internet	4.72	0.049	1.01 – 22.13	18.17	0.238	0.15 – 2238.90
I have convenient access to a telephone/fax	1.69	0.359	0.55 – 5.20			
I have an appropriate work area in which to treat patients with UL impairment	1.49	0.455	0.53 – 4.20			
I'm able to communicate effectively in language of my pts.	6.38	0.018	1.38 – 29.73	2.89	0.440	0.19 – 43.24
I am able to relate to the beliefs/values/traditions of my pts.	0.32	0.147	0.07 – 1.50			
I do not fear that I will injure my patients	11.72	0.002	2.51 – 54.75	7.57	0.336	0.12 – 469.38
I am not overwhelmed by the magnitude of the problems	5.6	0.003	1.80 – 17.46			
I enjoy treating patients/groups with UL pathology	35.20	0.000	8.70 – 142.53	85.94	0.003	4.72 – 1564.58
I have access to professional development opportunities within the field of UL rehabilitation	2.1	0.160	0.75 – 5.91			
I have access to up-to-date research/literature/evidence	2.04	0.194	0.70 – 6.00			
I received sufficient undergraduate preparation to treat patients with UL conditions	4.48	0.015	1.34 – 14.87	1.33	0.860	0.05 – 32.54
I am a member of a professional organisation that assists my practice	1.01	0.981	0.35 – 2.90			
UL Practice Learning placement at University	14.90	0.000	4.33 – 51.30	265.73	0.042	1.23 – 57548.3
Upper limb patients treated per month	1.02	0.168	0.99 – 1.05			
I have sufficient support at work	1.22	0.702	0.44 – 3.42			
I have sufficient supervision from colleagues with experience	2.08	0.227	0.62 – 6.96			
I have a mentor to guide my professional development	3.90	0.069	0.83 – 18.35	0.25	0.479	0.01 – 11.38
I have adequate equipment to treat patients with UL injuries	1.45	0.504	0.49 – 4.31			

\*included in logistic regression due to its strong association to other factors within the study (despite non-significant univariate association)

**Table 21: Factors associated with confidence in UL rehabilitation**

<b>Factors associated with perceived confidence in UL rehabilitation</b>						
<b>Variable</b>	<b>Univariate</b>			<b>Logistic Regression</b>		
	<b>OR</b>	<b>P value</b>	<b>95 %CI</b>	<b>AOR</b>	<b>P-value</b>	<b>95%CI</b>
Communication difficulties	0.57	0.304	0.20 – 1.66			
Satisfaction with supervision	3.09	0.034	1.09 – 8.76			
I have sufficient knowledge about UL rehabilitation	3.25	0.012	1.30 – 8.12	0.94	0.944	0.18 – 4.86
My practical skills (e.g. splinting) are adequate	10.68	0.000	3.69 – 30.88	7.86	0.010	1.63 – 37.82
My clinical reasoning within UL rehab is sufficiently developed	3.29	0.010	1.33 – 8.16	1.00	0.997	0.20 – 4.92
I am able to adequately communicate with referring Dr	2.09	0.130	0.81 – 5.41			
I have adequate equipment to Rx patients with UL injuries	1.56	0.343	0.62 – 3.93			
I have convenient access to a computer	1.22	0.681	0.47 – 3.15			
I have convenient access to the internet	3.39	0.028	1.14 – 10.13	1.26	0.810	0.22 – 6.97
I have convenient access to a telephone/fax	1.47	0.452	0.54 – 3.99			
I have an appropriate work area in which to treat patients with UL impairment	0.97	0.946	0.39 – 2.41			
I am able to communicate effectively in the language of my patients	2.18	0.110	0.84 – 5.68			
I am able to relate to the beliefs/values/traditions of my patients	0.65	0.422	0.22 – 1.88			
I do not fear that I will injure my patients	4.25	0.003	1.62 – 11.13	1.07	0.929	0.25 – 4.65
I am not overwhelmed by the magnitude of the problems	5.38	0.001	2.08 – 13.90	2.04	0.330	0.49 – 8.51
I enjoy treating patients/groups with UL pathology	55	0.000	6.76 – 447.16	28.21	0.007	2.47 – 322.74
I have access to CPD opportunities within the field of UL rehabilitation	1.99	0.136	0.81 – 4.93			
I have access to up-to-date research/lit/evidence	1.98	0.137	0.80 – 4.87			
I received sufficient undergraduate preparation to treat patients with UL conditions	4.5	0.002	1.71 – 11.81	1.90	0.464	0.34 – 10.58
I'm a member of a prof organise that assists my practice	1.2	0.693	0.49 – 2.96			
UL Practice Learning placement at University	6.36	0.002	1.99 – 20.35	8.23	0.051	0.99 – 68.62
Upper limb patients treated per month	1.01	0.298	0.99 – 1.03			
I have sufficient support at work	1.72	0.228	0.71 – 4.21			
I have sufficient supervision from colleagues with experience	2.24	0.111	0.83 – 6.06			
I have a mentor to guide my professional development	3.78	0.027	1.16 – 12.32	0.64	0.617	0.11 – 3.73

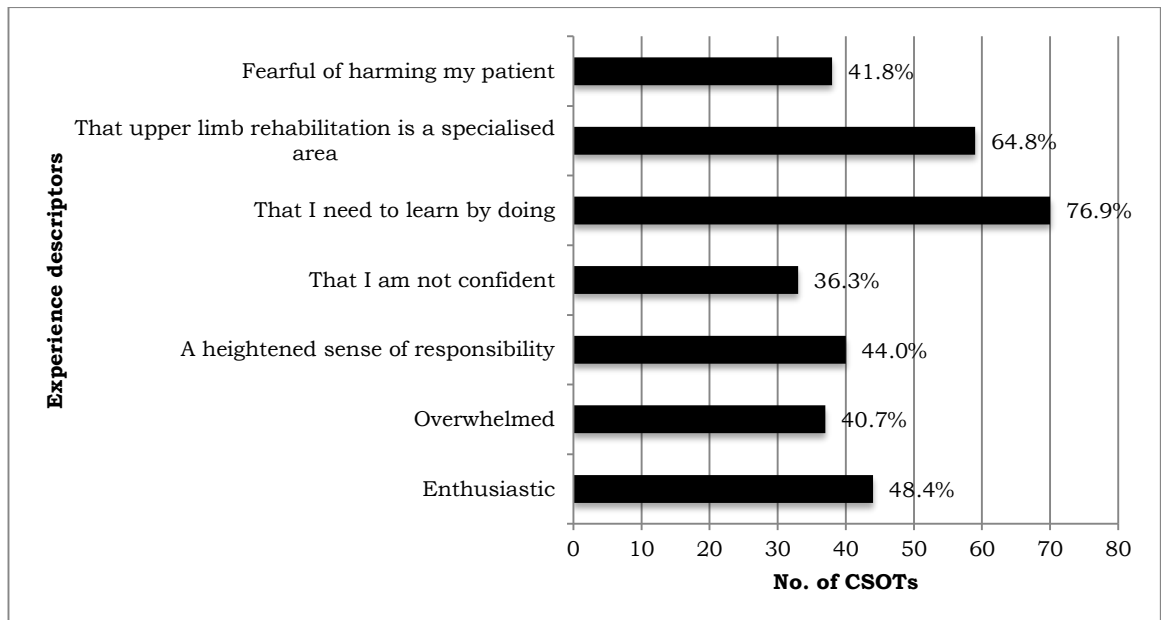
Finally the relationship between reported competence and confidence and the university of graduation was tested using Pearson's Chi-squared test (see Table 22). No significant association was noted with competence ( $p=0.230$ ) and confident ( $p=0.352$ ).

**Table 22: Counts for universities and perceived competence and confidence**

	University	1	2	3	4	5	6	7	8	Pearson's Chi-square	P-value
Competent	No	2	2	1	0	5	0	5	4	9.33	0.230
	Yes	7	7	8	7	12	11	14	5		
Confidence	No	3	4	2	0	8	3	7	5	7.79	0.352
	Yes	6	5	7	7	9	8	12	4		

#### 4.1.3.8 UL rehabilitation experience descriptors

Responses to items containing descriptors extracted from literature on the experience of novice therapists within UL rehabilitation were presented to participants who selected those they identified with. Responses by 91 participants (missing responses=12) are illustrated in Figure 26.



**Figure 26: Frequency of UL rehabilitation descriptors used**

Close to half of participants (48.4%; n=44) reported feeling *enthusiastic* about UL rehabilitation. They explained that this was due to it being an area of interest and enjoyment (n=21) or because it provided an opportunity to learn (n=3). For some therapists (n=9) their enthusiasm was linked to the reward of positive patient results or impact. Two therapists related their enthusiasm to treating neurologically impaired patients specifically, another felt that this was due to upper limb rehabilitation being unique to occupational therapy practice and another therapist linked her enthusiasm to occasions when patients were motivated.

A feeling of being *overwhelmed* by UL rehabilitation was reported by 40.7% (n=37). This was linked by some to possessing limited knowledge, skill or experience (n=18), being unsure of whether they were doing the right thing (n=3) or being required to treat complex injuries (n=2).

Participants (44%; n=40) who reported having a *heightened sense of responsibility* associated this with the risk of adverse effects (n=5), the sense of responsibility towards patient functioning and progress (n=7), the responsibility of using resources (n=1) and due to a lack of guidance and support (n=1). Another therapist related her sense to occupational therapists having a unique role in the multi-disciplinary team as far as UL rehabilitation was concerned. Others related this sense to UL rehabilitation being a challenge (n=1), to the realisation of how many people suffer from hand injuries (n=1) or to using available resources to learn (n=1).

Some participants (36.3%; n=33) reported *that I am not confident*. Comments related this to specific conditions (n=6), having limited knowledge and skill (n=8) or having a lack of supervision (n=2). This sense led others to seek support or knowledge (n=3). Not having the opportunity to treat lower motor neuron lesions of the UL during CS was linked to reduced confidence for one therapist while another linked her lack of confidence to often doubting herself.

Needing to *learn by doing* was selected by 76.9% (n=70) of participants. Three therapists clarified that this needed to be done with supervision. For others this was about developing knowledge, skill and confidence through

practice (n=9) or was related to splinting (n=5). Three participants clarified that their experience was more about trial and error than “learning by doing”. Two therapists felt that *learning by doing* had significant limitations and another therapist stated that this was the approach she used in the absence of other alternatives. Other therapists, when faced with the need to treat patients with UL injuries, sought support and researched conditions as needed (n=4). Others linked limited learning opportunities at university to the need to *learn by doing* (n=3). Comments made by others (n=8) linked this to their learning style and that theory alone was insufficient. A final comment conveyed a participant’s desire to become more competent within UL rehabilitation.

Many participants (64.8%; n=59) felt that *UL rehabilitation is a specialised area*. “Definitely” was a comment made by one therapist and another indicated that this was the impression that she got at university. Comments indicated that participants thought that this was the case for certain complex or complicated cases (n=5), Others linked the descriptor to the broad, yet very specific nature of UL rehabilitation (n=5) and stated that postgraduate education is either necessary or advantageous (n=8). Two therapists felt that it did not necessarily have to be a specialised area while five therapists felt that further development was definitely required for UL rehabilitation.

Participants that indicated that they were *fearful of harming (their) patient* (41.8%; n=38), linked this to the potential for adverse patient effects (n=10). Complexity, uncertainty and inexperience were further linked to this fear (n=6) and three therapists described the diligence with which they practiced, given this fear. For others (n=5) this fear was linked to treating only some conditions.

CSOTs added other descriptors that they thought applied to their upper limb rehabilitation practice. Notable comments included frustration or demotivation due to a lack of resources (n=2) or feeling ‘uninspired’ (n=2).

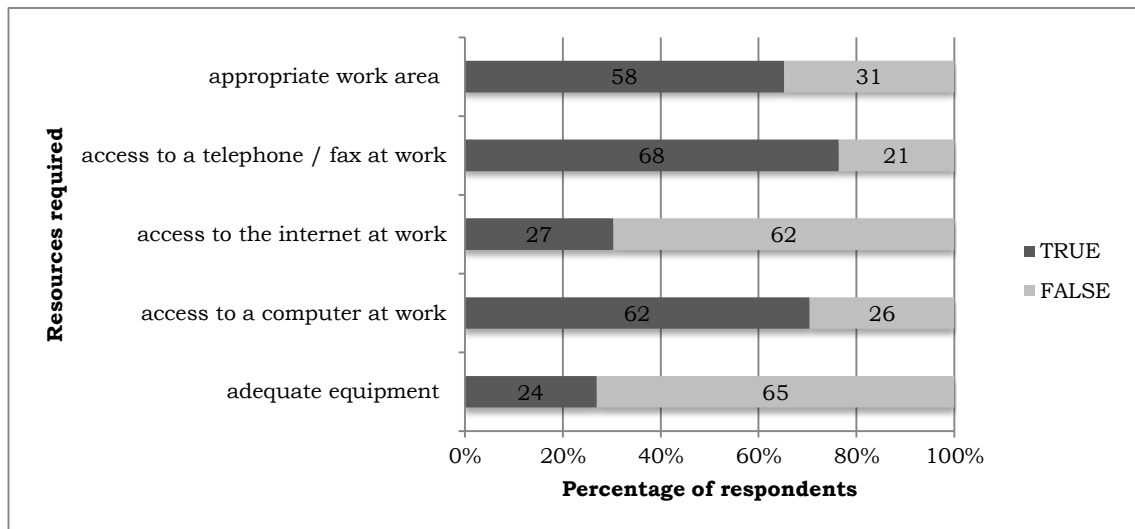


#### 4.1.3.9 UL rehabilitation opportunities and barriers

Participants indicated whether various opportunities and barriers related to upper limb rehabilitation resources and professional support and development were present or absent within their practice contexts. Results are described below:

##### **Resources**

A substantial majority (73%; n=65) reported *not* having adequate equipment to treat patients with UL injuries and 69.7% (n=62) *not* having access to internet at work. A majority (n=62; 70.5%) of participants reported having convenient access to a computer at work, 76.4% (n=68) had convenient access to a telephone or fax and 65.2% (n=58) of participants had an appropriate work area in which to treat patients with UL pathology. See Figure 27.



**Figure 27: Access to resources to support UL rehabilitation practice**

The relationship between access to resources and participants' location (rural / urban) (see Table 23) revealed that participants in urban locations were more likely to have access to adequate equipment to treat patients with UL conditions although statistical significance was not reached (OR 2.65, 95%CI 0.96 – 5.78,  $p = 0.061$ ). Location was not significantly associated with whether CSOTs had convenient access to a computer, a

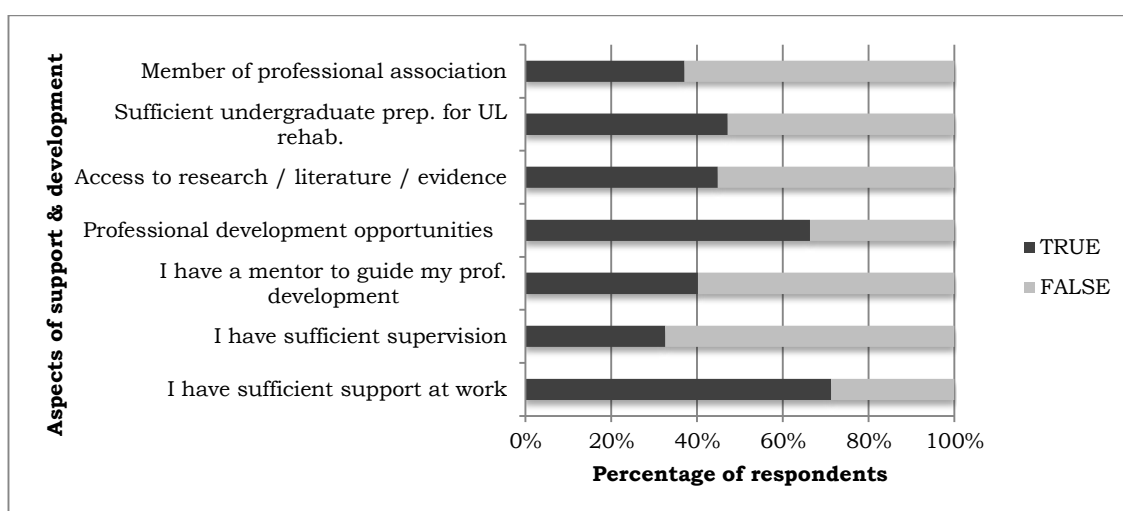
telephone/fax, internet or area in which to treat patients with UL dysfunction.

**Table 23: Factors associated with presence / absence of resources**

Outcome			False	True	Odds Ratio	P-value	95%CI
Resources	Equipment	Rural	27	11	2.65	0.061	0.96 – 5.78
		Urban	25	24			
	Computers	Rural	13	26	1.38	0.488	0.55 – 3.47
		Urban	13	36			
	Internet access	Rural	29	10	1.49	0.396	0.59 – 3.77
		Urban	33	17			
	Tel/ fax	Rural	11	28	1.57	0.368	0.59 – 4.20
		Urban	10	40			
Treatment area	Rural	16	23	1.62	0.280	0.67 – 3.91	
	Urban	15	35				

### **Professional support and development**

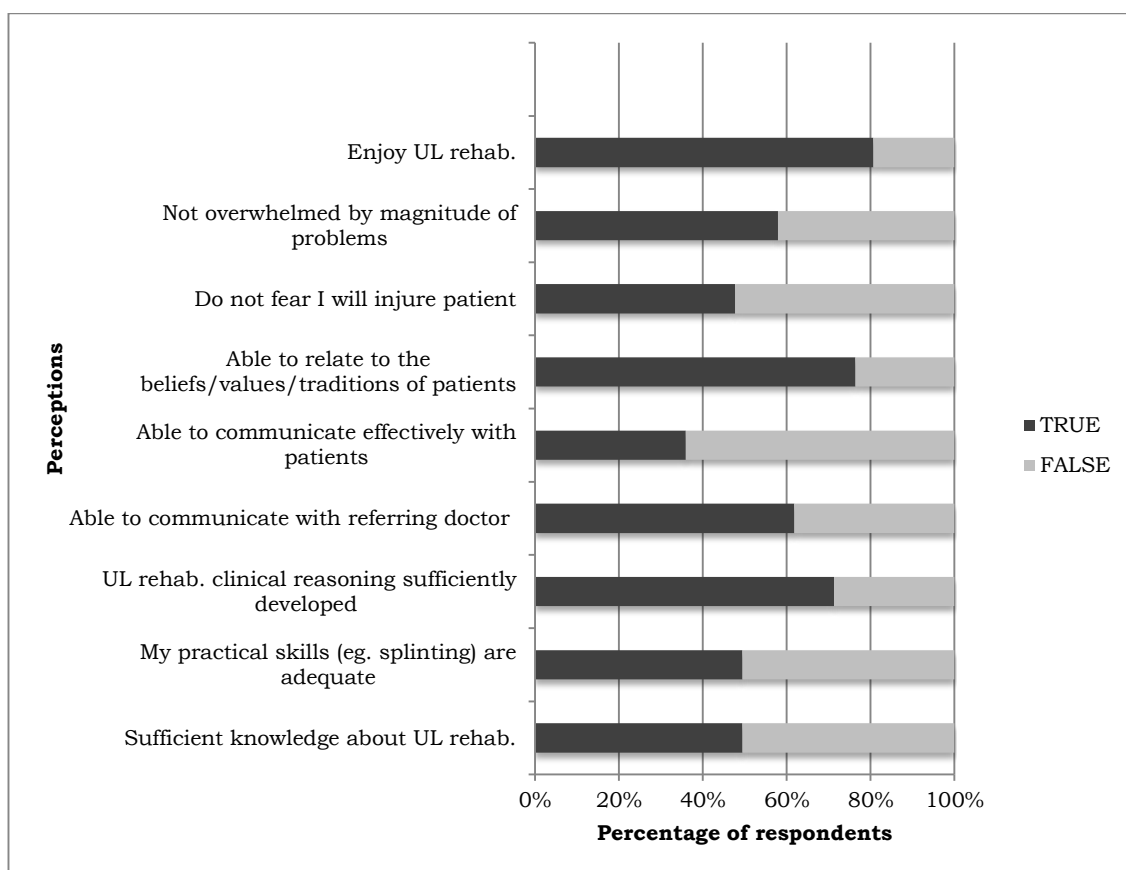
Most participants (71.3%; n=62) indicated that they had sufficient support at work but 67.4% (n=60) indicated that they did not have sufficient supervision from colleagues with experience, with 59.8 (n=52) reporting that they did not have a mentor to guide their professional development. More than half of participants (66.3%; n=59) reported having access to professional development opportunities within the field of UL rehabilitation with 44.8% (n=39) having access to up-to-date evidence. Around half (52.9%; n=46) felt that they did not receive sufficient undergraduate preparation to treat patients with UL injuries and conditions and 62.9 % (n=56) of therapists reported that they were not a member of a professional association that could assist their practice. See Figure 28.



**Figure 28: Access to professional support and development opportunities to support UL rehabilitation practice**

### ***Practice perceptions***

As illustrated in Figure 29, approximately half the participants felt that they had sufficient knowledge (49.4%) and skill (49.4%) for UL rehabilitation practice while 71.3 % (n=62) felt that their clinical reasoning within UL rehabilitation was sufficiently developed. A majority (61.8%; n=55) felt able to adequately and confidently communicate with referring doctors regarding patients, while 36 % (n=32) reported being able to communicate effectively in the language of their patients. Most (76.4%; n=68) felt able to relate to the beliefs, values and traditions of their patients. Around half of participants (47.7%; n=42) did not fear that they would injure their patients and 42% (n=37) of participants felt overwhelmed with the magnitude of the problems that they encountered.



**Figure 29: Perceptions around UL rehabilitation practice**

Most participants (80.7%; n=71) reported enjoying UL rehabilitation, a factor strongly associated (see Table 24) to having had an UL practice learning placement at university (p<0.001). Enjoying UL rehabilitation was not, however, significantly associated to university (p=0.386)(see Table 25).

**Table 24: Relationship between enjoying UL rehabilitation and having a UL rehabilitation practice learning placement (n=88)**

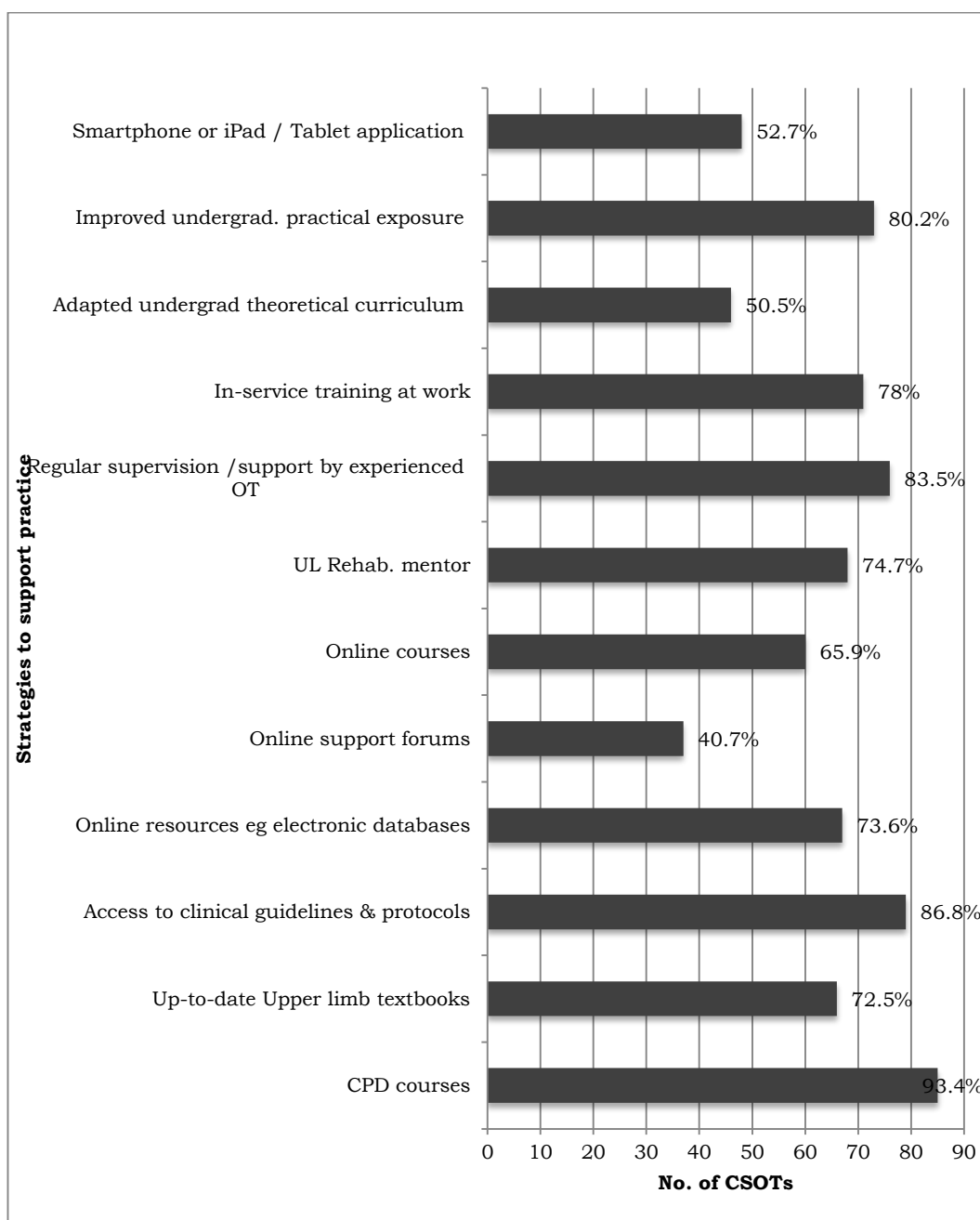
		Enjoy UL Rehabilitation		Pearson's Chi-Square	P-Value
		No	Yes		
UL Rehab. Practice learning placement	No	8	7	13.423	<0.001
	Yes	9	64		

**Table 25: Relationship between enjoying UL rehabilitation and university (n=88)**

	University	1	2	3	4	5	6	7	8	Pearson's Chi-square	P-value
Enjoying UL Rehab.	No	2	1	1	1	6	0	3	3	7.423	0.386
	Yes	7	8	7	6	11	11	15	6		

#### **4.1.3.10 Desired resources to support UL rehabilitation practice**

CSOTs (n=91; 12 missing responses) indicated resources that they desired to support their UL rehabilitation practice, which are illustrated below (Figure 30). The greatest percentage of participants (93.4%) felt that continuous professional development courses would assist them in delivering an UL rehabilitation service. Following this, access to clinical guidelines and protocols was considered by 86.8% of therapists to be important. Regular supervision and support by an experienced occupational therapist was selected by 83.5% of participants while 80.2% indicated that improved undergraduate practical exposure would support their UL rehabilitation service.

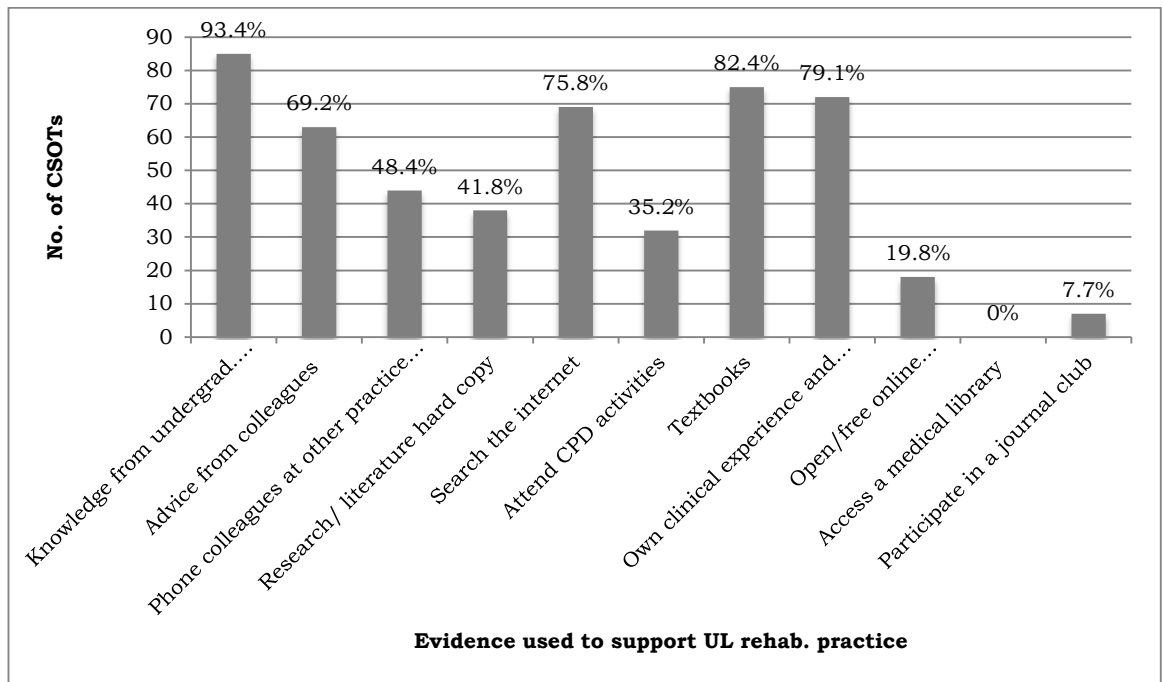


**Figure 30: Aspects that CSOTs perceived would assist UL rehabilitation practice**

#### **4.1.3.11 Evidence used to support UL rehabilitation practice**

CSOTs reported the evidence that they used to support their practice (n=91; 12 missing responses). Figure 31 demonstrates that evidence that was most frequently used included their knowledge from undergraduate education (93.4% of participants), textbooks (82.4%), their own clinical experience (n=79.1%) and searching the internet (75.8%). Evidence accessed

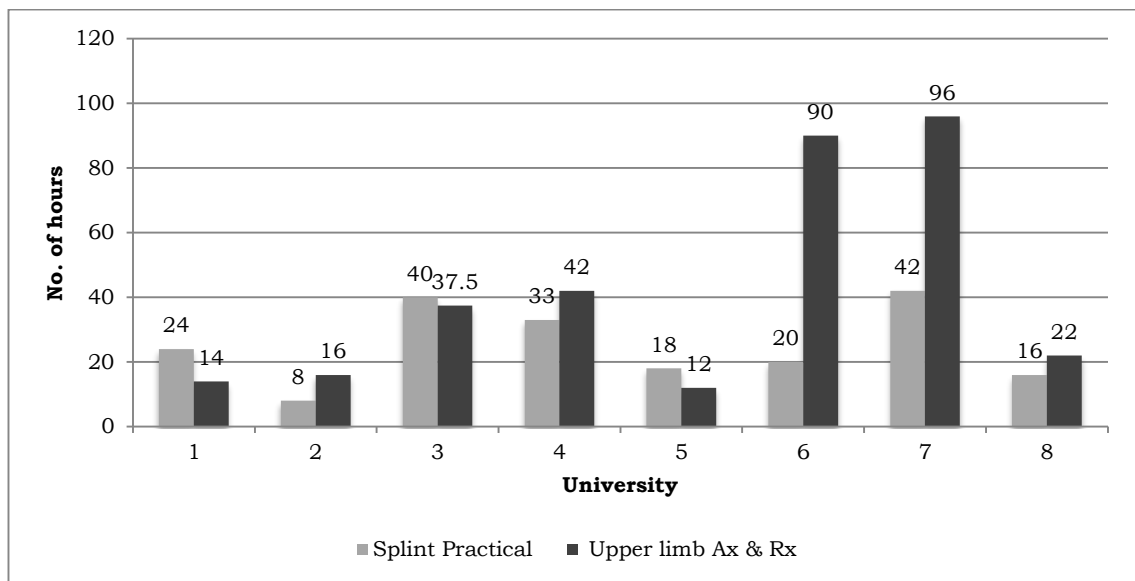
infrequently included medical library access (0%), participation in a journal club (7.7%) and open/free online databases/clinical guidelines (19.8%).



**Figure 31: Evidence used to support UL rehabilitation practice**

## 4.2 Survey 2: Educator survey

A 100% (n=8) response rate was achieved for this survey. Educators had been involved in teaching in the programmes for a median of 7 years (range: 2 to 28 years). More than one lecturer was responsible for the UL rehabilitation curriculum at some universities. The median number of teaching hours spent on UL assessment and treatment was 30 hours (range: 12 to 96 hours). Time spent on practical splinting varied between 8 and 42 hours across the universities with 22 hours being the median (see Figure 32). On average, 70 % of students would have a practice learning block where they are required to perform UL rehabilitation (related to upper or lower motor neuron injuries) although this varied between 8.5% and 100 %.



**Figure 32: No. of hours spent on splinting practicals and UL assessment and treatment at each university**



### 4.2.1 Most important aspects of UL rehabilitation curriculum

Educators shared which aspect of UL rehabilitation they felt was most important for undergraduates to learn (see Table 26). Coded responses revealed that assessment (n=5) and treatment of basic conditions (n=4) were most frequently mentioned. Other aspects reported, and the frequency with which they were mentioned is listed in Table 26.

**Table 26: Most important aspects of undergraduate curriculum**

<b>Important Aspects of curriculum</b>	<b>No. Of Universities</b>
Assessment	5
Intervention/treatment basic conditions	4
Protocols	2
Scientific Knowledge	2
Splinting	2
Clinical reasoning	2
Working with limited resources	2
Wound healing	1
Contextual and occupational considerations	1
OT Role in Hands MDT	1
Specialised Rx techniques/modalities	1
Prioritising Rx aims	1
Best / evidence-based practice	1
Know when to seek advice	1
Act as patient advocates	1

## 4.2.2 Assessments taught

Each of the eight universities covered the assessment of sensory-motor/neuromuscular performance components. Three universities taught students to perform clinical observations of the hand and various formal and informal objective assessments with two institutions teaching students to use subjective assessment tools e.g. the DASH. One university reported teaching students to perform diagnostic hand tests (see Table 27).

**Table 27: Assessments taught at each university**

<b>Assessment taught</b>	<b>No. Of responses</b>
Performance Components	8
Clinical observation of the hand	3
Diagnostic Tests	1
Standardised Tests	4
Non-standardised tests	4
Hand function	5
Patient-rated assessment	2

## 4.2.3 Conditions covered in curriculum

UL conditions covered at each of the eight universities are illustrated in Table 28. Conditions covered at all universities included *amputations, tendon injuries, fractures/dislocations/joint instabilities, pain related syndromes, peripheral nerve compressions, peripheral nerve injuries and thermal injuries*. Conditions least frequently covered included *psychogenic disorders (1/8), nail-bed injuries (2/8), tumours and cysts (2/8) and vascular disorders (2/8)*.

**Table 28: Conditions covered in curriculum (shaded area denotes coverage of conditions)**

UL conditions covered in curriculum	UNIVERSITY							
	1	2	3	4	5	6	7	8
Amputations								
CNS disorders as they relate to the UL. CP, CVA								
Congenital differences/anomalies								
Cumulative trauma disorders/RSIs								
Dupuytren's contracture								
Flexor/extensor tendon injuries								
Fractures/dislocations/joint instabilities								
Infections (e.g. human bite injury, cellulitis)								
Arthritis								
Complex trauma affecting multiple tissue types								
Nail bed injuries								
Pain-related syndromes								
Peripheral nerve compression and disease								
Peripheral nerve injuries								
Post-mastectomy/post-radiation lymphedema								
Psychogenic disorders involving the upper quarter								
Soft tissue injuries (e.g. acute ligament injuries)								
Thermal Injuries including burns, electrical injuries								
Tumors and Cysts (e.g. ganglions)								
Vascular disorders (e.g. aneurysm)								

## 4.2.4 Modalities covered in curriculum

Modalities covered in the curriculum at each of the 8 universities are represented in Table 29. Modalities covered by all 8 universities include *activity as a means/end, adaptive/assistive devices, training in ADLs, sensory re-education, splinting and strengthening*. Electrical modalities were the only modalities not covered by any of the institutions.

**Table 29: Modalities covered in curriculum (shaded area denotes coverage)**

Modalities Covered in Curriculum	UNIVERSITY							
	1	2	3	4	5	6	7	8
Activity as a 'means' and / or 'an end'	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded
Adaptive / assistive devices	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded
Appropriate paper-based technology (APT)	Shaded	White	Shaded	Shaded	White	Shaded	Shaded	White
Training in activities of daily living (ADLs)	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded
Behaviour Management e.g. CBT	White	White	Shaded	Shaded	Shaded	Shaded	Shaded	White
Compressive therapy e.g. pressure garments	Shaded	White	Shaded	Shaded	Shaded	Shaded	Shaded	White
Desensitisation	Shaded	White	White	Shaded	Shaded	Shaded	Shaded	Shaded
Electrical Modalities (e.g. Ultrasound)	White	White	White	White	White	White	White	White
Ergonomic Modifications	Shaded	White	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded
Exercise	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	White
Home programmes	Shaded	White	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded
Manual Therapy e.g. NDT, manual oedema mobilisation	Shaded	White	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded
Mirror Therapy (as part of a GMI programme)	Shaded	White	White	White	Shaded	Shaded	Shaded	Shaded
Patient, family, workplace education	Shaded	Shaded	White	Shaded	Shaded	Shaded	Shaded	Shaded
Prosthetic training	White	White	White	Shaded	Shaded	White	Shaded	White
Scar management techniques	White	Shaded	White	Shaded	Shaded	Shaded	Shaded	Shaded
Sensory re-education	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded
Splinting	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded
Standardised and non-standardised assessment tools	Shaded	White	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded
Strengthening	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded	Shaded
Thermal modalities e.g. icing, heat	White	White	White	White	Shaded	Shaded	Shaded	Shaded
Work hardening / retraining	Shaded	White	White	White	Shaded	Shaded	Shaded	Shaded
Wound Care / dressing	White	White	White	Shaded	White	White	Shaded	White

## 4.2.5 Splints fabricated by students

Wrist extension splints were fabricated at all eight universities. Students at seven universities made resting splints and dynamic extension splints. Five universities provide opportunity for their students to make mallet splints while students at four of the universities make a thumb splint / spica, soft splint and thumb opposition splint. Splints that were made less frequently are illustrated in Figure 33.

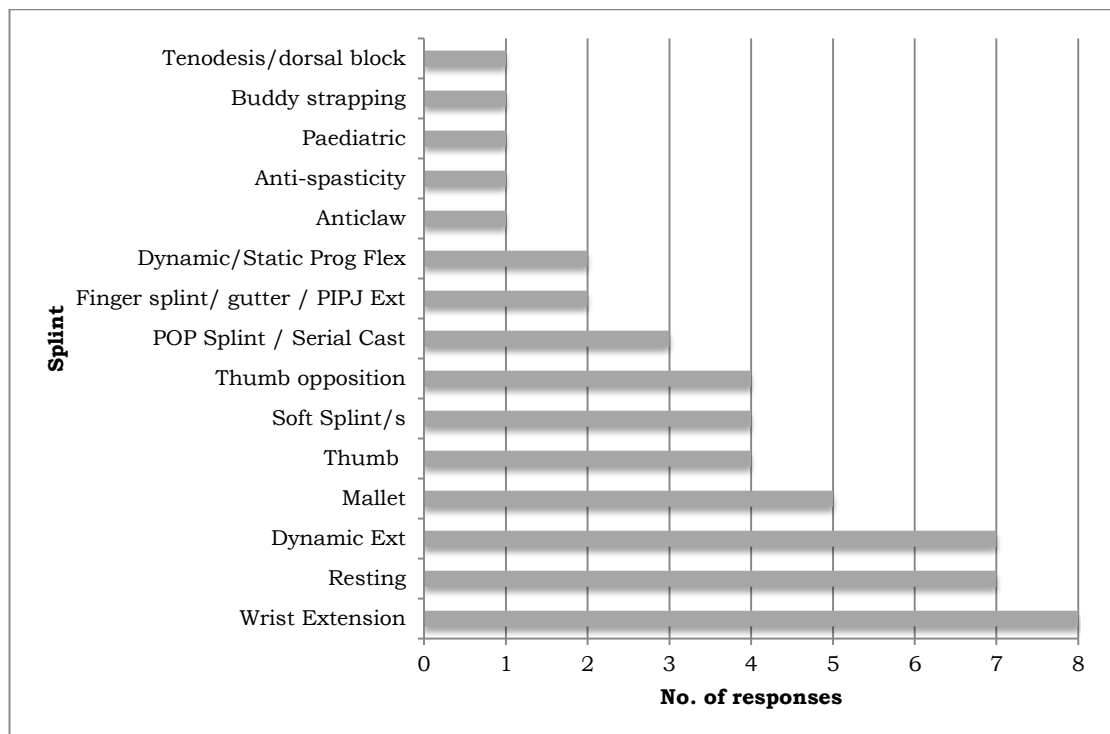


Figure 33: Splints fabricated by students

## 4.2.6 Teaching strategies

Teaching strategies, illustrated in Table 30, used *always* or *often* by 6 or more universities included *case histories*, *didactic teaching*, *experiential learning*, *groupwork*, *practical demonstration/laboratories*, and *practice learning*. Strategies used *sometimes*, *seldom* or *never* by five or more universities included *traditional lectures*, *simulated patients*, *role-playing* and *guest lecturers*.

University 1 used all teaching strategies *always* or *often* except for *guest lecturers* which were used *sometimes*. University 2 omitted 9 answers. It is

possible, but cannot be assumed, that omitted answers were strategies that they do not use. The only strategy that University 3 did not use is *clinical storytelling* and they reported using simulated patients *seldom*. University 4 omitted 5 answers, used *traditional lectures seldom* and other strategies *always* or *often*. University 5 *never* used *guest lectures*, *problem-based learning methods* and *simulated patients*. University 6 *always* used *clinical storytelling* and *experiential learning*. University 7 *seldom* used *role-playing* and *simulated patients* and used other strategies *sometimes* or *often*. University 8 used *traditional lectures always* and *didactic teaching* and *practice learning* often.

**Table 30: Frequency of teaching strategies used at each university**

University	Teaching Strategies															
	Case histories	Clinical storytelling	Didactic teaching	Experiential learning	Group work	Guest Lectures/presenters	Practical demonstration /labs	PBL methods	Reflective activities	Resource-based Learning	Role-playing	Self-study	Simulated patients	Traditional lecture	Tutorials	Practice Learning
8											x				x	
3		x														
6						x				m	x		x			
2	m			m		m			m	m	m		m		m	M
4		m				m		m	m	m						
7																
5						x		x					x		m	
1																

KEY										
m	Missing	x	Never		Seldom		Sometimes		Often	Always

#### 4.2.7 Learning resources used

Learning Resources used most frequently were journal articles and *The Hand Book* (South African textbook). See Table 31 for full results.

**Table 31: Learning resources used**

Theme	Category	No. Of responses
Textbooks	Hand Textbooks	5
	<i>The Handbook</i>	5
	Other Textbooks	1
	Anatomy	2
Internet-based resources	<i>YouTube</i>	5
	OER	1
	Databases	1
	American Society of Hand Therapists	1
	General	1
Scientific Journals	Journal articles	7
DVD or CD-based resources	Hand Therapy Tutor (C. van Velze)	1
	Biomechanics CD	1
	Anatomy DVD	1
Models	Anatomy	1

#### 4.2.8 Challenges to UL rehabilitation curricula

The most frequently mentioned challenge mentioned by 5 universities, was limited practice learning opportunities for students within UL rehabilitation. This challenge related both to the quantity and quality of practice learning opportunities to which students were exposed. Limited time allowed for the UL curriculum presented a challenge to 4 universities. Other challenges included resource limitations (n=3), large class sizes (n=1) and deciding what is essential in an undergraduate curriculum (n=1). One university stated that their challenge was that too much time was being spent on the UL rehabilitation curriculum.

**Table 32: Challenges to UL rehabilitation curriculum**

<b>Challenges</b>	<b>No. Of responses</b>
Limited practice learning opportunity (quantity and quality)	5
Limited credits/ teaching time	4
Resources limitations	3
Deciding what is essential at an UG level	1
Big Classes	1
Excessive time spent on hand rehab	1

#### **4.2.9 Strategies used to encourage evidence-based practice**

Table 33 contains the strategies described by educators that are used to promote EBP. Self-study tasks or assignments that promote literature searches were strategies used by five of the universities. Encouraging reflection, including latest evidence in teaching and an emphasis on life-long learning were used by two universities. Literature appraisal, treatment substantiated by evidence and application of evidence within practice learning supervision were each mentioned by one educator.

**Table 33: Strategies used to encourage EBP**

<b>Strategies to encourage EBP</b>	<b>No. Of responses</b>
Self-study /research of literature for tasks/assignments	5
Encouraging reflection	2
Inclusion of latest evidence/best practice in teaching	2
Emphasis on life-long learning	2
Appraise literature	1
Treatment substantiated by evidence	1
Application with Clients in PL supervision	1



#### 4.2.10 Educator perception on preparedness for practice

Five educators felt that graduates from their university were prepared for UL rehabilitation practice. Justification for their opinion is contained in Table 34. Two educators felt that preparedness depended on the individual student – whether they were interested in UL rehabilitation and /or whether they had a practice learning placement within UL rehabilitation.

**Table 34: Educators' perceptions on graduates' perceptions of practice**

Are graduates prepared for practice?	No. Of responses	Reason
Yes	5	<ul style="list-style-type: none"> <li>• They have basic skills for assessment and intervention and also have general OT skills that would enable them to problem-solve</li> <li>• They also learn some protocols e.g. flexor and extensor tendon injuries, PNI's etc. as a starting point should they face these in practice.</li> <li>• Because they are firstly introduced to anatomy of the hand starting from the bones, ligaments, nerves, blood vessels, and they are also taught different conditions of the hands.</li> <li>• The students are informed that some conditions will need to be learnt in practice</li> <li>• Students given opportunity to make splints following the basic principles</li> <li>• They have a sound grounding in the theory on basic hand conditions and injuries</li> <li>• Splints made in class are those most used in practice</li> </ul>
No	1	
Depends on student	2	Because: Some students are more exposed to hand conditions in their clinical blocks. Students who are interested in treating hand conditions also do additional reading and ensure that they know how to treat hand patients.

### 4.3 Summary

Response rates were 44.3% (n=104) from the CSOT population, and 100% (n=8) from the universities. Results revealed that 73.9% (n=68) of CSOT participants reported communication problems. This was significantly linked to feeling *challenged* (p=0.014) and *frustrated* (p=0.012). The majority of these participants had a supervisor (89.6%) although only 34.1% reported satisfaction with supervision. A majority (63.5%; n=61) perceived occupational therapy to be poorly recognised and 75.0% (n=72) derived a sense of satisfaction from interaction with their patients. Participants reported treating an average of 20 UL rehabilitation patients per month and 73.0% (n=65) of CSOTs delivered this service without adequate equipment. Despite this, and other barriers, perceived confidence and competence with UL rehabilitation was reported by 64.4% and 78.9% respectively. Multivariate regression revealed that *enjoying treating UL patients* (p=0.003) and having *an undergraduate UL practice learning placement* (p=0.042) were significantly associated with competence. Therapists who felt confident were significantly more likely to report *having adequate skills (e.g. splinting)* (p=0.010), *enjoying UL rehabilitation* (p=0.007) and *having had an UL rehabilitation practice learning placement as a student* (p=0.051).

Undergraduate UL rehabilitation curricula varied considerably in content and teaching hours, with a median of 30 hours being spent on UL assessment and treatment knowledge, and 22 hours dedicated to developing splinting skill.

The results from *Survey 2* will be used to assist in the interpretation of the results of *Survey 1* which will be explored in Chapter Five.

## **Chapter 5: Discussion**

Results of this study suggest that many factors contribute to CSOTs' perceptions of being equipped for UL rehabilitation practice. Insight has been gained into the exposure and education that students receive during their university education. A measure of understanding into the contextual demands on CSOTs has been gained and facilitators that support practice have been reported. Integrating these findings, the first section of this chapter will explore the extent to which CSOTs are equipped for UL rehabilitation practice (5.1). This will be situated within what is known of the context as well as the undergraduate preparation that they receive. Findings highlighted that CSOTs' practice often occurs within rural, underserved and under-resourced settings. Additional competencies required for working in these settings will thus be explored (5.2). The essential role of supervision and support in facilitating competent practice within diverse contexts will be discussed (5.3). Furthermore, the pervasive impact that language and culture has on all areas of occupational therapy practice was identified by CSOTs and will be examined in depth (5.4). Finally the strengths and limitations of this study will be outlined (5.5).

### **5.1 UL rehabilitation**

What is known about UL injuries in South Africa will be described in this section along with the new insights that this research has contributed. An evaluation of how equipped CSOTs are for UL rehabilitation will be considered in the context of their practice contexts. This will be followed by insights gained into the UL rehabilitation curricula at South African universities and how these programmes relate to CSOTs preparedness. Finally, the broader context in which UL rehabilitation occurs will be considered. Whether a strategic plan to improve hand health in South Africa may further equip CSOTs to provide effective, appropriate and sustainable services will be explored.

### 5.1.1 Defining the problem

The overwhelming burden of communicable diseases and maternal and child morbidity and mortality, are acknowledged as key health priorities globally and in South Africa (Travis et al., 2004) but should not eclipse our vision of other significant health care problems. For example, injury death rates in South Africa are nearly twice the global average (Seedat, Van Niekerk, Jewkes, Suffla, & Ratele, 2009). In developing countries, absent or poor surgical care is known to contribute to death and disability. Furthermore, the increasing burden of orthopaedic injuries in developing countries causes significant disability and is largely a neglected problem (Beveridge & Howard, 2004).

Evidence to quantify the burden of hand injuries in South Africa has already been appraised in Chapter 1 as being scant. The incidence of injuries related to violence, road accidents and work-related strain or accidents would however suggest that the problem is significant and calls for further investigation in order to appropriately plan hand care services in South Africa. Furthermore, if more than half the work-related injuries to fingers alone (i.e. not considering the rest of the UL) can result in permanent disability (Jeebhay & Jacobs, 1999) then the impact of UL injuries on the South African manual labourer population is likely to be extensive.

Educated guesses at the extent of the problem (UL injuries and conditions) may suggest that it is substantial but tells us little about the *nature* of the problem. Injury statistics potentially imply that many of these injuries are traumatic and often related to interpersonal violence (Murray et al., 2012). A small retrospective study of a state hand unit suggests that injuries may be complex in nature, involving multiple tissue types (Pietrobon, 1996) and other studies have suggested they affect work ability (Jeebhay & Jacobs, 1999; Schultz et al., 2012). Although this may lend potential insights, it is insufficient to develop an understanding of the impact of hand injuries in South Africa. What is clear then, is the need to quantify and qualify the problem of hand injuries and conditions in South Africa. Results of this study have contributed some new insights.

In this study CSOTs reported seeing a median of 20 UL rehabilitation patients each month, although some are treating as many as 225 patients. These figures were self-reported and not based on verifiable statistics. It is also necessary, at this point, to mention that these figures included therapists' treatment of UL deficits as a result of cerebrovascular accident (CVA) and other upper motor neuron lesions. The need for functional rehabilitation post-CVA is clear as a study in rural South Africa revealed that two thirds of stroke survivors required assistance with at least one activity of daily living (Connor, Thorogood, Casserly, Dobson, & Warlow, 2004). Furthermore, stroke significantly affects the young-adult population in South Africa (Hoffmann, Desha, & Verrall, 2011) who need to return to work. It thus makes sense that 86.0% of CSOTs reported treating central nervous system UL disorders at least weekly. Other conditions treated frequently included arthritic hand conditions (37.0%), injuries to bones or joints (3.08%), thermal injuries (31.0%), tendon injuries (24.0%) and infections (23.0%). Over half of the participants (51.1%) reported treating complex UL trauma '*at least monthly*' supporting reports of the relatively frequent occurrence of these severe injuries that affect multiple tissue types (Pietrobon, 1996). Another South African study, reporting the assessment practices of 81 public and state therapists treating hand conditions, demonstrated that conditions seen by therapists included nerve injuries (90% of therapists), tendon injuries (88.8%) and fractures (42%). Arthritis, brachial plexus injuries and burns were also treated by at least 74% of therapists although the frequency with which these conditions were seen was not reported. Conditions seen frequently<sup>24</sup> were tendon injuries (58%), fractures (42%) and nerve injuries (29%) (De Klerk, 2014). Many of these conditions, and those treated frequently by CSOTs, are by their nature, caused by accidents or injury. A significant need for prevention and health promotion is therefore implied.

Both research questionnaires used in this study focused more intensively on the rehabilitative aspects of UL rehabilitation and gave little attention to investigating the prevention, promotion and curative elements of practice. Considered a limitation to this study, it may thus have under-captured participants' experiences in this regard. In taking on a population-based

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<sup>24</sup> '*Half of the time*' and '*a lot of the time*' categories combined

intervention approach, half the participants (50.6%) felt '*somewhat equipped*' to assess the needs of a population of patients at risk of, or suffering from UL pathology while the same percentage felt '*well-equipped*' to intervene at a population level. Prevention strategies need to target vulnerable road users (Beveridge & Howard, 2004), those at risk of work-related injuries (Schultz et al., 2012) and those at risk of acquiring burn injuries. The need for prevention of interpersonal violence is overwhelming but is also a complex problem driven by multiple determinants (Seedat et al., 2009). Without underestimating the contribution that CSOTs can make in this regard in the communities in which they work (e.g. poverty alleviation through income generation projects), it is evident that their practice needs to be situated within national policies and strategies in order to curb the impact of preventable injuries. A firm understanding of PHC philosophy and policy are required (Dookie & Singh, 2012) as well as an understanding of the impending National Health Insurance (Department of Health, 2011).

### **5.1.2 How equipped are they?**

The study results provide further evidence of the need for CSOTs to provide UL rehabilitation services. It has also become evident that most CSOTs (67.4%) are delivering this service without supervision from an experienced colleague. Some CSOTs (34.8%) did not have an appropriate work area in which to treat UL patients. Although two-thirds (66.3%) had access to CPD activities in UL rehabilitation, more than half of CSOTs (55.2%) did not have access to up-to-date evidence, and a majority (73.0%) did not have adequate equipment.

It is with this background that very surprisingly 64.4% of participants felt confident and 78.9% felt competent within UL rehabilitation. Approximately half the participants (49.4%) felt that they possessed sufficient knowledge and skill for UL rehabilitation practice. This likely represents a substantial over-estimation of competence, which is not uncommon for novice occupational therapists as well as those new to UL rehabilitation practice. In the United States, therapists new to hand therapy practice reported

acquiring their knowledge and skill earlier in their practice than therapists with more experience<sup>25</sup> (Dimick et al., 2009). According to the four stage model of skill development (Gordon Training International, 2014<sup>26</sup>), the first stage of learning a new skill is the *unconsciously incompetent* stage. In this stage individuals do not have insight into their incompetence. As demonstrated by experienced hand therapists (Dimick et al., 2009), awareness of what was *not known*, could only be generated in hindsight as an awareness of what *needs to be known* is developed. The *consciously incompetent* stage emerges as outcomes of action are evaluated, or feedback is received from others, causing the learner to realise their incompetence. If, in the case of many CSOTs, supervision (or other forms of clinical feedback) is not in place to provide this feedback, then the therapist must rely only on reflection to ensure progress in skill development or clinical decision-making (Wainwright, Shepard, Harman, & Stephens, 2010). In the absence of this, harm may be caused by a therapist who has not moved beyond the first level of skill acquisition but acts with increasing confidence.

*Conscious incompetence*, the second proposed stage of skill development, develops as an accurate appraisal of skill demonstrates a need for learning. Perhaps elements of this stage of learning were evident in some of the participants as they identified the need for supported learning<sup>27</sup>. Less relevant to a CSOT population are the stages of being *consciously competent* and *unconsciously competent*. In Dreyfus and Dreyfus' (1986) five phase process of skill acquisition, the novice (first) phase involved an ability to recognise various elements of a skill and the rules guiding its use but with little attention to the context in which it occurs. Many CSOTs may fall into the *advanced beginner* (second phase) category in which performance may only just be considered acceptable. It is important to note, however, that this second phase is only attained with extensive exposure to managing real clinical situations. Both of these stages are characterised by a procedural approach.

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<sup>25</sup> Five years of experience or more

<sup>26</sup> The origins on which this model is built is unclear (Bate, Hutchinson, Underhill, & Maskrey, 2012)

<sup>27</sup> To assist UL rehabilitation practice, 83.5% felt that support and supervision by a colleague with experience was needed, 74.7% felt that they needed an UL rehabilitation mentor, and 78% felt that they required in-service training at work.

The *competent* practitioner (phase three) is able to perceive an overwhelming amount of information from the environment (multiple aspects missed in the prior stages) and a purely procedural approach does not suffice. He/she develops the ability to integrate information, to prioritise, to plan and to problem solve, and is able to intentionally ignore various aspects of information for a time to concentrate on prioritised need. Although over three quarters of participants reported being '*competent*', with the limited experience that CSOTs are able to build their practice upon, it would be surprising for them to be able to operate at this level of skill.

The majority of participants (71.3%) astonishingly also felt that they had sufficiently developed their clinical reasoning within UL rehabilitation. This may similarly be linked to a lack of insight into their level of competence and ignorance about the vast differences between the reasoning ability of a novice and an expert practitioner. In a study that compared the clinical reasoning of expert and novice practitioners, Unsworth (2001) found a higher frequency of reasoning by expert practitioners. Novices used procedural reasoning more frequently than experts who integrated this form of reasoning with conditional and interactive reasoning more regularly<sup>28</sup>. Experts were more readily able to use an activity that met multiple patient goals, anticipated their patients' level of performance more accurately and were able to change the direction of a session where necessary without disrupting the flow of a session. It is highly likely that CSOTs significantly over-estimated their clinical reasoning ability and objective measurement of this competency would likely reveal substantial discrepancy.

### **5.1.3 Undergraduate curricula**

The time spent on UL assessment and treatment and developing splinting skills varied between 24 and 138 hours across universities. Although all universities taught assessment of performance components, only four taught standardised and non-standardised assessment methods, five included assessment of hand function, and just two covered patient-rated assessment. This question was open-ended and may have resulted in

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<sup>28</sup> The types of clinical reasoning, as defined by Mattingly & Fleming (1994), were used within this study.



educators omitting various assessments. However, the findings do make sense in the context of De Klerk 's (2014) investigation into the UL assessment practices of public and private therapists in South Africa which found that therapists used performance component assessment most frequently with tests of performance and patient-rated assessments being used infrequently.

Some unexpected findings around modalities taught were noted. Appropriate paper-based technology (APT), a modality used in low-resource settings, was not taught by three of the universities. It was surprising that not all universities taught students to make pressure garments, perform desensitisation, make ergonomic modifications, develop home programmes (essential for settings where patient follow-up opportunity is limited), facilitate appropriate patient education and use scar management techniques.

In terms of conditions covered in the curricula, it was surprising that not all universities covered UL infections, arthritis and complex trauma – conditions seen *'at least weekly'* by 23.5%, 38.9% and 20.5% of participants respectively.

In an attempt to develop an idea of what some universities were doing “right”, the relationship between universities and preparedness to treat various conditions and use various modalities was investigated. Graduates from university 6 were more likely to report feeling equipped to treat patients with cumulative trauma disorders, infections and Dupuytren's contracture. It should be noted that this university spent extensive time (90 hours) on assessment and treatment of the UL, although less time than university 7 (96 hours). Graduates from university 1, 4, 5, 6 and 7 were more likely to report being equipped to splint. Although some statistically significant relationships did emerge, they could not simply be explained by whether or not a condition or modality was covered in the curriculum, or by the number of hours spent on a particular skill.

Within UL rehabilitation competencies, 85.4% felt *'equipped'* to *'Implement intervention in accordance with evidence-based guidelines'*. Gray et al (2012)

found that intervention in line with best evidence was one of the areas that Australian and New Zealand new graduate occupational therapists felt least prepared to implement, although a percentage was not reported. CSOTs reported perceived competence in this area in the context of most frequently using the following evidence: *Knowledge from undergraduate education* (93.4%), *textbooks* (82.4%), *personal clinical experience* (79.1%), *searching the internet* (75.8%) and *advice from colleagues* (69.2%). Exploring the relationship between CSOT preparedness for EBP and their university revealed that graduates from universities 1,4,5 and 6 were more likely to report being prepared for this aspect of practice. At these universities the strategies used within the UL rehabilitation curriculum to encourage an evidence-based approach included research on hand therapy topics, students being encouraged to consult literature for all topics, inclusion of current best evidence in lectures, an emphasis on evidence-based practice (and interventions) and life-long learning, discussion of evidence-based practice related to students' clients in practice learning, and students being required to appraise literature.

More than half the participants (55.2%) felt that their undergraduate education did not sufficiently prepare them for UL rehabilitation practice. Yet, in spite of this, the majority felt both competent and confident. No significant association existed between this perception of competence and confidence, and the university from which the CSOT had graduated ( $p=0.230$  and  $p=0.352$  respectively). Literature has demonstrated an association between university and preparedness of doctors for specific competencies (Hill et al., 1998) but has also shown no specific association between education programmes and nurses' perceived preparedness (Hart & Macnee, 2007).

Although the university was not associated with competence and confidence, the results of a multivariate analysis demonstrated that *enjoying UL rehabilitation* and having had *an UL rehabilitation practice learning placement* were significantly related to both. A strong univariate association was also noted between *enjoying UL rehabilitation* and having *had a practice learning placement* in this area ( $p<0.001$ ) suggesting that practical exposure to UL rehabilitation at an undergraduate level may foster

an enjoyment of this area of practice which in turn contributes towards confidence and competence. It makes sense, therefore, that practical experience was considered most frequently (52.7%) to be the aspect of undergraduate education that contributed towards preparedness. Increased practical experience in UL rehabilitation was also perceived by CSOTs to be a key aspect that they felt would enrich curricula. However, the feasibility of this needs to be considered. The number one challenge to the curriculum reported by educators was limited practice learning opportunity. How to best utilise limited clinical opportunities to allow students to apply knowledge and develop reasoning and skill needs to be explored.

The second most frequent challenge to the curriculum was limited teaching time. This restricts the time that can be spent on the development of skill and reasoning. Although possessing *adequate skill* was significantly related to confidence, the process of skill acquisition and competence development described above demonstrates that this cannot be achieved within an undergraduate curriculum that is tasked with developing knowledge, skill and professional behaviors across multiple domains of practice. The need to distinguish between undergraduate proficiency and postgraduate education content (Buys, 2007), across universities, needs to be explored.

One further teaching consideration needs to be highlighted as it relates to UL rehabilitation practice in under resourced settings. A participant identified a need for specific knowledge of assessment and treatment when delayed patient presentation resulted in surgery no longer being an option. Other participants communicated their frustration when specialist surgery was not available (e.g. orthopaedic surgery) and this resulted in a loss of function for patients. What to do when surgery is not an option is something CSOTs had to consider and the researcher has also been forced to think about this when supporting a colleague working in the rural Eastern Cape. This reality needs to be explored within teaching. The problem also needs to be situated within the broader problem of access to health care.

#### **5.1.4 Could CSOTs be better positioned for UL rehabilitation?**

Is access to health care, or *hand-care* in the above-mentioned case, of surgical intervention being inaccessible, a CSOT concern? When considering whether CSOTs are equipped for UL rehabilitation, this study has appraised preparedness within the opportunities and barriers presented by the immediate clinical and community context. Should preparedness, however, also be considered within the broader context of *hand-care* in South Africa? Would CSOTs be better equipped to deliver appropriate, accessible and sustainable services if their practice was situated within a broader strategy for improving *hand-care* in South Africa?

More than two-thirds of CSOTs (64.8%) believed that UL rehabilitation was a specialised area of practice. Literature recognises that novice practitioners struggle to prioritise needs when presented with diverse or extensive problems, and to contextualise these needs (Dreyfus & Dreyfus, 1986). Would the presence of a comprehensive 'hand health' plan assist therapists in prioritising need and selecting appropriate health care approaches (i.e. prevention, promotion or rehabilitation) and interventions? National and provincial health policies and guidelines may meaningfully assist CSOTs in general prioritisation of services but may not provide sufficient specific information for services related to UL rehabilitation. Would understanding *hand health* priorities and plans to address these issues assist CSOTs in every day decision-making? Would it, for example, help a clinic-based CSOT to decide against motivating for UL treatment resources and instead refer complicated hand injuries to a district hospital while developing an injury prevention programme at a nearby factory where an ongoing need has been identified?

It has already been established that the nature and extent of hand injuries in South Africa is poorly understood. Dias (2006) issued a call to international hand societies to prioritise research around hand condition incidence and prevalence, treatment outcomes, and cost benefits of appropriate treatment. Findings are needed to demonstrate to health care providers the volume of cases, the impact of injury on the working population and the preventable burden of disability caused by inadequate

care. This is necessary to guide the development of comprehensive hand-care services that are appropriately situated within South Africa's PHC framework and National Health Insurance.

Dias, Chung, Garcia-Elias, Sabapathy, and Tang, (2006, p. 1078) propose that "provision of information, targeted education, relevant and well-supported research, and the improvement of infrastructure" is necessary for the improvement of hand care to be realised. These authors, from the United States, United Kingdom, Spain, India and China, leave occupational and physiotherapists out of what they consider to be the hand care team. We, however, know that if surgical management aims are not translated into functional gains, as is the purpose of UL rehabilitation (Dimick et al., 2009), then their recommendations are substantially weakened. Research agendas with strategic focus areas are necessary for both therapy (De Klerk, 2014) and surgical (Dias et al., 2006) groups to inform the development of hand care services in South Africa.

The vision and mission statement of the South African Society of Surgery to the Hand (SASSH, 2014) demonstrates little orientation towards the development of an integrated, comprehensive and strategic agenda for improving *hand care* in South Africa. Although the mission of the hand therapy society is situated around delivering quality hand rehabilitation, the majority of members of the society work within the private sector (SASHT, 2014). If these societies developed a strategy to improve services across the public and private sector, in line with PHC and NHI frameworks, they may be better positioned to guide the development of services delivered to the most needy populations by CSOTs (and other health professionals). These societies may also be able to more effectively support CS professionals' practice.

### **5.1.5 Summary**

Results from this study have contributed new information to the little that is known about UL conditions in South Africa. CSOTs are, at times, working with minimal resources and support. Despite this they consider themselves to be relatively equipped, competent and confident in UL rehabilitation. This

perception is likely to be a significant over-estimation of ability. Undergraduate UL curricula offered in South Africa vary widely. The role that practice learning plays in fostering an enjoyment of UL rehabilitation and preparing graduates for practice has been emphasised and was significantly linked to perceived competence and confidence. It is been proposed that situating CSOTs practice within a national agenda for improving hand care may facilitate the development of services that are effective, appropriate and sustainable.

## **5.2 Rural, under-served and under-resourced practice contexts**

When considering how equipped CSOTs are for practice, it is necessary to consider the barriers and facilitators presented by their clinical and community contexts. This section explores CSOTs experiences of working within rural, under-served and under-resourced settings. The role that universities play in preparing graduates for practice in these settings will briefly be explored. The impact of how equipped CSOTs would be if their services were situated within a broader human resource plan for rural and underserved areas will be considered.

### **5.2.1 Preparation for the realities of practice**

Approximately 45% of the CSOT participants in this study were located rurally<sup>29</sup> compared to 23.8% of doctors being placed in rural areas in 1999<sup>30</sup> (Reid, 2001). This percentage might be considered less than expected given that the central purpose of CS is to service rural and underserved areas (Reid, 2001). It is well-established that rural settings are largely under-served within a South African context (Reid, 2006) and are often under-resourced (Lee & Mackenzie, 2003; Roots, Brown, Bainbridge, & Li, 2014). Although more than half the participants may not have been serving rural or technically *underserved* areas, it is evident that a majority of CSOTs were working in under-resourced settings. In this study participants in urban

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<sup>29</sup> No formal definition for rural location was provided in the survey questionnaire so this percentage represents the perception of CSOTs rather than being based on objective criteria e.g. receiving a rural allowance.

<sup>30</sup> Rural location in this study was linked to eligibility for a rural allowance

locations were more likely to have access to adequate equipment to treat patients with UL conditions although this did not achieve statistical significance (OR 2.65; 95%CI 0.96 – 5.78, p=0.061). It was alarming, however, to find that irrespective of their location<sup>31</sup>, a significant proportion of participants did not have access to other basic resources (such as access to a telephone, fax or computer).

A lack of resources led to CSOTs feeling *challenged, frustrated and demotivated*. They felt that a period of *adjusting* was necessary to acclimatise to working with few resources. When the necessary resources or services were not available, CSOTs sometimes felt *inadequate* or sensed a *need for specific knowledge within assessment and treatment* in order to effectively intervene in the absence of resources. Furthermore, a lack of resources significantly restricted participants' use of various treatment modalities (for example splinting, assistive equipment and compressive therapy). Limited resources have also been reported by CS nurses (Thopola et al., 2013), dieticians (Parker et al., 2012), psychologists (Pillay & Harvey, 2006; Rohleder et al., 2006) and speech-language and hearing therapists (Wranz, 2011). Given these realities it is surprising that only two universities explicitly identified preparation for low-resource settings to be an important aspect within an UL rehabilitation curriculum. It cannot, however, be assumed that other universities have not integrated this as a focus area in their undergraduate curriculum as a whole. It is however evident that undergraduate curricula need to be orientated towards low-resource settings. In response to the context offering few resources, more than a third of participants reported feeling *resourceful*. Literature identifies resourcefulness as one of the competencies required for rural practice (Eldridge & Judkins, 2003; Lannin & Longland, 2003). It is a proactive skill that needs to be nurtured in students rather than only encouraged when all other options have been exhausted.

Along with developing resourcefulness in graduates, the literature also suggests that universities need to prepare therapists to protect themselves

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<sup>31</sup> 73% do not have adequate equipment to treat upper limb patients; 29.5% don't have access to a computer; 69.7% don't have access to the internet; 23.4% don't have access to a telephone or fax, and 34.8 % don't have an appropriate work area to treat upper limb patients.

against the risks of burnout (Gaede et al., 2006; Tryssenaar & Perkins, 1997). This recommendation resonates with the experiences of some CSOTs. A small, yet noteworthy proportion of CSOTs (15.6%) reported feeling as if they were *just surviving*, with one participant stating that she was, “just hoping to make it through the year”. A further 21.9% reported feeling *overwhelmed* which has been reported by other novice occupational therapists in other countries who faced limited resources in rural settings (Lee & Mackenzie, 2003).

Rural settings, or low-resource settings, do not only present challenges of limited resources, restricted support and the demand for a wide variety of skills as reported by CSOTs and others (Boshoff & Hartshorne, 2008; Reid, 2006; Wielandt & Taylor, 2010), they also present opportunities. CSOTs reported a sense of satisfaction or fulfillment and many enjoyed a sense of autonomy - benefits that have previously been described (Kolosa, 2003; Wielandt & Taylor, 2010). The following quote further acknowledges the rewards of rural practice, but also highlights the role that universities need to play to prepare students appropriately:

*“Working in a rural setting is a valuable experience that all OTs should have to do. Those that work in tertiary hospitals are unaware of the challenges these individuals face being so rural. More should be done at varsity to equip therapists with actual community work and more focus placed on empowering individuals in the community with regards to skills training, job placements, and just community life in general - how to have a sustainable life (education on agriculture, proper pre-natal education and training etc.)” (CSOT, 2013)*

This quote echoes the call made by Burch and Reid (2011) for an explicit and pervasive orientation of university curricula towards rural practice. Rural populations are least likely of all groups to have access to quality health services (Versteeg, Du Toit, & Coupar, 2013). South African health care remains far from its holistic PHC vision (Reid, 2006) and services remain orientated around a medical model approach (Gaede et al., 2006; Reid, 2006).



In their evaluation of South African health science faculties' orientation towards rural and underserved settings, Reid & Cakwe (2011) highlighted aspects that need to be addressed to better prepare graduates for practice in these areas. Firstly, proactively selecting students from rural and underserved areas needs to gain priority. This appears to be the single factor most strongly associated with rural practice (Grobler et al., 2009). Undergraduate clinical practice within a rural area may prepare professionals for prolonged rural practice (Grobler et al., 2009) but this exposure needs to occur early in an undergraduate programme, must constitute substantial clinical and community engagement, and needs to be adequately supervised (Reid & Cakwe, 2011). These authors acknowledge that 'assessment drives learning' and the competencies for rural practice (such as language and cultural competence, and resourcefulness) therefore need to be examined. These factors have been described as strategies to improve retention of health professionals to rural areas. If evidence suggests that these strategies may *retain* health professionals in rural and underserved areas, it is argued that implementation of these strategies would also contribute to better equipping CSOTs for practice in these areas. These factors would facilitate exit competencies that are more aligned to the realities of practice in these settings.

### **5.2.2 Could CSOTs be better positioned for rural practice?**

Lannin & Longland (2003) suggest that new graduates are not suited to rural practice. However, both locally and abroad, having novice practitioners serving in rural areas is an inevitable reality (Lee & Mackenzie, 2003; Stagnitti, 2008). With the desperate need to increase health personnel serving rural and underserved communities, CS has proven to be an ineffective recruitment strategy (Ross & Reid, 2009). Although participants in this study were not asked whether they wished to continue in their post after their 12 months of service, it is likely that they may not have wished to, given that CS is not an effective retention strategy (Ross & Reid, 2009; Wilson et al., 2009). Does this annual turnover and loss of skills in rural and underserved areas erode a foundation of skills and services that could position, or equip CS health professionals to better

deliver and develop services that are appropriate and sustainable within their brief stint of service? If CS as a successful recruitment strategy were situated within a greater human resource retention plan for rural areas, would this equip CS professionals for more effective practice?

The latter question may find its answer in the results of a study that used a Delphi technique to identify South African rural health priorities (Versteeg et al., 2013.) Key findings of this research echoed much of the essence of what Reid (2002) recommended 10 years prior to this investigation. Proposed interventions included the development of a national human resource plan that addresses the needs of rural contexts, the appointment of district and hospital managers based on appropriate experience and essential skills, equitable funding plans for hospitals as well as the need to recruit, retain and support senior health professionals in rural hospitals (Versteeg et al., 2013). With these strategies in place, it is argued that CSOTs would be better situated, and thus better equipped for practice that is aligned with national, provincial and community guidelines and priorities.

If the services of CSOTs in rural and underserved contexts were received and supervised by experienced therapists who had long-term partnerships with communities that they were serving, it is highly likely that the contribution of CSOTs would be maximised. To effectively harness the novice CSOT workforce, the development of rural practitioners needs to receive greater attention. Literature further suggests the need for greater opportunity to be facilitated for rural practitioners to assume positions of leadership within the profession and to contribute to a sound understanding of the skill set needed for rural practice and best practice in this setting. (Lannin & Longland, 2003). If CSOTs were supported and supervised by established rural practitioners, they would be better equipped to deliver services across the domains of occupational therapy practice, including rehabilitation of individuals with UL injuries and conditions.

## **5.3 Supervision and support**

Discussion thus far has established that CSOTs' practice needs to be situated within a broader strategy for effective service delivery and that CSOTs require guidance and support as they seek to fulfill their role competently, while navigating the transition from student to therapist. The role of support and supervision is thus essential.

### **5.3.1 The need for supervision and support**

It is well established that the progression from student to therapist is demanding as the intensity of support declines and workplace expectations and workload expand (Kasar & Muscari, 2000; Morley et al., 2007). The challenge of this shift is compounded by the significant life changes that new graduates are often going through, for example, moving to an unfamiliar area accompanied by large social changes (Morley, 2006). The absence of appropriate supervision and guidance may hinder the transition from student to therapist (Hummell & Koelmeyer, 1999) and may adversely affect the care that patients receive (Nemutandani et al., 2006).

In South Africa, the National DOH considers CS health professionals to be competent for practice based on their university qualification and therefore do not provide any specific mentorship or support and development programmes (Holland et al., 2013). Literature, however, makes it clear that rather than being a destination, competence is dynamic and developmental (Epstein & Hundert, 2002). Within the United Kingdom the support and supervision needs of novice health professionals has received specific attention within recent years (Morley et al., 2007). In Scotland, the National Health System launched a web-based development programme, *Flying Start* for all new nurses, midwives and allied health professionals (Deville-Almond, 2011). Graduates registered for the programme (within some service settings participation in the programme was compulsory) and confirmed with their manager who their appointed mentor would be. A meeting with the mentor soon after appointment of the graduate was required in order to develop a plan for working together. Protected time for the novice to access web-based learning resources was designated where

possible. Graduates were encouraged to locate other novice practitioners in their area or sign-up to the on-line discussion forum on the *Flying Start* website. The online programme consisted of 10 learning modules that practitioners were required to complete within their first year of practice. Modules included communication, clinical skills, reflective practice and professional development. Various learning activities were linked to each module and practitioners could select tasks that matched their learning needs. An evaluation of this programme found that although time presented a constraint for both mentors and novice practitioners, the programme developed clinical skill and confidence (Banks et al., 2011). Fitzpatrick (2006) described a programme with similar units of content used with novice practitioners to develop their competence to deliver UL rehabilitation. Therapists could work through the programme with the support of senior staff being available to them.

These programmes represent examples of strategies to address the needs of new graduates or novice practitioners. They acknowledge that supervision and support needs of these therapists are extensive and multifaceted (Steenbergen & Mackenzie, 2004). Regardless of the programmes, literature identifies specific role-players in meeting support and supervision need. These will be explored in greater depth in the following sections.

### **5.3.2 The Supervisor**

Professional supervision is essential and central to how clinical practice is experienced by both undergraduate students and novice occupational therapists. Challenges related to supervision have been found to be the most significant contributor to negative undergraduate clinical experiences (Lew, Cara, & Richardson, 2007) and largely influence students' perceptions of clinical practice (Brown, William, & Lynch, 2013).

Most participants (89.6%) reported having a supervisor but many (65.9%) reported dissatisfaction with supervision. Dissatisfaction with supervision may be related to the extremely high expectations new graduates often have of this type of professional support (Morley et al., 2007). The chief cause for dissatisfaction by CSOTs in this study was that supervision was either

absent or perceived to be insufficient (1 hour per month was the median supervision time received by CSOTs) to meet the perceived needs of the CSOT. This is not unusual as shown in previous studies. For example, all nine new graduate occupational therapists involved in a study exploring rural professional support reported an absence of formal supervision with an occupational therapist (Steenbergen & Mackenzie, 2004). Similar findings were reported by Tryssenaar & Perkins (1997). The lack of confidence and heightened sense of responsibility experienced by novice therapists working specifically within UL rehabilitation (Fitzpatrick, 2006), was linked by participants in this study to a lack of supervision and support. An absence of adequate supervision was linked to participants feeling '*like I often doubt myself*', that they are in a process of *adjusting, anxious, frustrated, inadequate* and '*encouraged to think critically about my practice*'. Similar descriptors of experiences have been highlighted in the literature (Banks et al., 2011; Morley, 2006; Steenbergen & Mackenzie, 2004; Sweeney, Webley, & Treacher, 2001). Inadequate supervision was also significantly associated with a lack of identity as an occupational therapist ( $p=0.008$ ) emphasising the role supervision plays in professional identity formation of novice therapists (Tryssenaar & Perkins, 1997).

CSOTs further linked satisfaction with supervision to supervisor characteristics. Findings in other studies echo the link made by participants between satisfaction with supervision and supervisor characteristics. Desirable supervisor characteristics identified in previous studies include being from the same discipline (Steenbergen & Mackenzie, 2004; Toal-Sullivan, 2006), a positive role model (Mulholland, Derald, & Roy, 2006), skilled and experienced (Hummell & Koelmeyer, 1999; Nandgaonkar, 2014; Toal-Sullivan, 2006), facilitates open and honest relationships (Rodger, Fitzgerald, Davila, Millar, & Allison, 2011), and facilitates a sense of support coupled with freedom (Steenbergen & Mackenzie, 2004). CSOTs who reported satisfaction with supervision were also more likely to feel encouraged to reflect critically on their practice ( $p=0.012$ ). This role of supervision is supported by the findings of a previous study (Morley, 2006). The need for learning to occur through 'doing' (Fitzpatrick, 2006) with the support of supervision that is nurturing and non-judgmental (Kasar & Muscari, 2000) has been highlighted in the

literature and confirmed by participants in the current study. Although this may involve learning from mistakes, it is not the “trial and error” approach described by CSOTs, that may be inevitable when supervision and support is not available and patient care may be compromised (Morley et al., 2007).

Supervision in rural areas may be poor as reported in the study by Gaede (2006). Supervision in this study was *not* considered by the majority of participants in this study to be satisfactory. This was, however, the case for both rural and urban therapists with no significant relationship existing between location and presence of supervision ( $p=0.342$ ) or satisfaction with supervision ( $p=0.562$ ).

In a study in the United Kingdom, it was reported that occupational therapy supervision often takes the form of a formal “one-up/one-down first-line management” structure (Sweeney et al., 2001, p. 427). Sweeney and colleagues (2001) suggested that this traditional approach to supervision might not be the perfect prototype and could actually decrease supervisee morale and diminish relationships and the potential of this linear supervision partnership. It is traditionally accepted that it is the responsibility of the supervisor to facilitate the construction of competence within the supervisee and that the supervisee is responsible for contributing experiences, concerns and clinical challenges to the relationship. Sweeney et al (2001) suggests that this customary approach may be restrictive and fall short in its ability to address the need of the supervisee (for monitoring, personal and professional growth). This formal model may be propagated by limited training in supervision and expectations within the profession for supervision to take on a prescribed structure.

Sweeney and colleagues (2001) proposed three avenues of support and supervision for the novice practitioner: clinical supervisor, mentor and peers/co-workers. The clinical supervisor attends to clinical and work-related subjects; a mentor assists with emotional support and direction around professional development and personal growth; and peers and co-workers provide informal support. Role modeling would emanate from the clinical supervisor and mentor relationships. Rather than proposing a rigid

system, this model seeks to acknowledge that multiple supervision and support needs exist and should be addressed through multiple means.

### **5.3.3 The mentor**

Just under half the participants (41,7%) felt they needed a mentor to provide guidance, advice, feedback and role modeling although they were less likely to flag this need if they were satisfied with the supervision they were receiving (OR 0.11, 95%CI 0.03 – 0.34,  $p < 0.001$ ), or if their supervisor was an occupational therapist (OR 1.39, 95% CI 1.01 – 1.89,  $p = 0.040$ ). This may suggest overlap in the roles fulfilled by supervisors and mentors. Participants in Milner and Bossers' (2004) study perceived their mentor as a role model or counselor highlighting the contribution of mentors to professional development and the provision of emotional support. Furthermore it was felt that mentors should possess knowledge and experience and provide guidance and support. Tryssenaar and Perkins (1997) described the essential role that mentors play in the professional socialisation of new graduates with seeking a mentor being linked to the development of confidence in new graduates (Lloyd, King, & Ryan, 2007). Supporting the findings of the current study, the importance of a mentor within UL rehabilitation practice was emphasised in a study among occupational therapists and physiotherapists in India (Nandgaonkar, 2014).

In preparation for the first year of practice, Toal-Sullivan (2006) advised that occupational therapy students anticipated the support that is likely to be available in their first practice context. Should supervision and support resources appear limited, graduating therapists may prepare for this by seeking out mentorship. Tryssenaar and Perkins (1997) proposed that university educators should teach students how to select and approach suitable mentors. It is also recommended that academic and clinical therapists make themselves available to mentor new graduates.

### **5.3.4 The preceptor**

This role is a less familiar one within a South African context. A preceptor is a therapist with knowledge and experience. He/she is assigned to work parallel to a novice practitioner and uses coaching and role-modeling to support the development of confidence and competence within the new graduate (Morley, 2006). Use of this role necessitates that the novice has experienced work colleagues. Given that two thirds of participants in this study reported not having colleagues with experience to support UL rehabilitation practice, a preceptor may not always be a support option for CSOTs.

### **5.3.5 The role of the peer**

CSOTs highlighted that valued support was not limited to input from a supervisor. Morley et al (2007) reported similar findings. In a group of 45 new graduate occupational therapists in London, the authors found that very few participants reported accessing support from professional supervision sessions. CSOTs reported accessing *support* within the multi-disciplinary team. Peer support is essential (Toal-Sullivan, 2006) and may be drawn from within the work environment or accessed through support groups or online communities (Banks et al., 2011; Morley, 2006; Sweeney et al., 2001). Steenbergen and Mackenzie (2004) found that occupational therapists in rural areas benefited from support from colleagues across health science professions.

A more formal approach to utilising colleague support to transfer theory into practice has been described (Ladyshevsky, 2010). *Peer coaching* is a learning partnership in which novice practitioners embrace the vulnerability of being new to clinical practice. Through self-assessment, the coachee begins by identifying a development need (e.g. fabricating an anti-spasticity splint). Both the coach and coachee practice this skill on their own and then set aside time for the coachee to perform this with the peer coach observing. During or after this session, the coach offers non-evaluative feedback to the coachee through a process of questioning. “Why” questions are avoided as they easily alter the status dynamic between peers.



Experiential learning that emerges through this process is consolidated and the target skill practiced. Continued self-assessment allows the coaching pair to determine when the need has been met and to move on to other identified needs. Although not without its challenges, this model may facilitate the meeting of various learning and support needs within novice clinical practice. CSOTs may not always have a supervisor but the vast majority worked with at least one occupational therapy or physiotherapy colleague. Peer support thus presents a readily accessible form of support for CSOTs.

### **5.3.6 Summary**

Various support and supervision role-players have been described and examples of programmes that utilise, or integrate these roles, have been explored. If CSOTs are to be equipped to deliver quality services within the public health system, a comprehensive *web* of supervision and support is essential. Individual strands of this web may look different for each therapist practicing within a given context, and sources of support may vary. The employer has a responsibility to provide this support (Reid, 2001) but the CSOT should also be empowered to be able to seek out individual strands of support that will support competent practice, sustainable service development and personal and professional growth. Appropriate supervision and support will act as a facilitator of competent UL rehabilitation practice and quality service delivery.

## **5.4 The impact of language and culture on practice**

The absence or presence of supervision and support pervasively impacts on CSOTs' practice. Results of this study unexpectedly identified the widespread impact that communication difficulties have on practice as well as the impact of culture on intervention. Culture and language are closely linked and, as the following quote suggests, have a significant impact on practice.

*“As an occupational therapist working for the first time, I have not found many difficulties regarding patients (culture). I however needed to adapt (to) the culture in order to be accepted. For example: having to wear skirts or shorts covering my knees when going into the community for clinic visits. A woman’s knees are considered sacred in the siSwati culture and therefore I had to adapt to that in order to be respected as a health professional. Cultural competence impacts your treatment in a huge way, patients often want to see you learn their language and understand their situations.” (CSOT, 2013)*

Where cultural competence is not valued and services are not provided in an appropriate language the quality of care may be adversely affected (Anderson, Scrimshaw, Fullilove, Fielding, & Normand, 2003). The impact that language and culture had on CSOTs’ practice will be explored in the following sub-section along with the evidence that seeks to guide both curriculum development and practice in the pursuit of culturally competent and linguistically appropriate practice.

#### **5.4.1 Language**

Communication difficulties appeared to be a pervasive feature of CSOTs’ experience. They were significantly associated with therapists’ feelings of being *challenged* ( $p=0.014$ ) and *frustrated* ( $p=0.012$ ), and cited as a reason for being *unsure, anxious, poorly recognised, feeling like a physio* and part of a sense of *adjusting*. Other health professionals have reported similar feelings. Nurses and doctors working in acute medical settings reported high levels of stress (97% and 78% respectively) related to working across language barriers (Bernard et al., 2006). Evidence demonstrates that language barriers not only present a challenge to health professionals but also adversely affect the quality of care that patients receive (Flores, 2005; Timmins, 2002).

The 73.9% of CSOTs who reported having communication difficulties when engaging with patients was significantly larger than the 20% rate reported by Parker et al (2012) in their study of CS dieticians, but similar to the rate

reported in another study with this professional group where 74% of CS practitioners reported communication difficulties (Visser et al., 2006). Similarly 75% of the first group of CS psychologists reported communication difficulties (Pillay & Harvey, 2006) as did more than 50% of the 17 speech-language and hearing therapy CS participants in the study by Wranz (2011).

Language has been described as the “cornerstone” of communication (Mccarthy, Cassidy, Graham, & Tuohy, 2013, p. 335). Communication difficulties in this study were largely linked to language barriers. In describing the nature of the language barrier, three times as many participants (n=30) chose to explain the barrier as patients not being able to speak their language than those who reported being unable to speak the language of their patients (n=10). This may suggest an expectation of therapists that patients should be able to converse with them in the first language of the therapist. Alternatively, this may imply a lack of awareness of the National Language Policy Framework of South Africa that requires that health services are delivered in the language (one of the 11 official languages or locally spoken languages) of the patient or community (Department of Arts & Culture, 2003). This said, it needs to be acknowledged that with citizens of varying descent and many immigrant populations, there are well over 25 languages spoken within South Africa’s borders exacerbating the challenges for appropriate verbal and written communication (Department of Arts & Culture, 2003).

The relationship between communication difficulties with urban/rural location revealed no significant association ( $p=0.142$ ). When tested against province it was noted that therapists placed in the Eastern Cape<sup>32</sup>, KwaZulu Natal<sup>33</sup>, and Mpumalanga<sup>34</sup> were more likely to report communication problems ( $P=0.024$ ). An appraisal of national and provincial statistics (STATSSA, 2014) revealed that provincial land area, population size and density, and language proportions could not simply explain this association although any interpretation would have been made with caution given that

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<sup>32</sup> Eastern Cape population is 83.42 % isiXhosa speaking

<sup>33</sup> KwaZulu Natal population is 80.9% isiZulu speaking

<sup>34</sup> Mpumalanga population is 30.8% Siswati, 26.4% isiZulu, 12.1% isiNdebele and 10.8% Sepedi speaking

the calculation was underpowered by a small sample size. Despite communication difficulties not being characteristic of rural practice only, developing language proficiency is necessary to prepare graduates for rural practice. Currently only four of the eight medical schools in South Africa provide language and communication courses (Levin, 2011). A participant in this study indicated that she had been taught other languages and learnt about other cultures at university, but her patients were not from this culture and did not speak the language that she had learnt. This suggests that greater attention needs to be given to selecting graduates for placements based on their language proficiency in the CS allocation process.

Some participants reported that language barriers resulted in meaning or therapeutic qualities being lost within interpersonal interactions with patients. This finding echoes qualitative descriptive findings of a study of Irish nurses who felt that they had “limiting conversations” (p. 336) with their patients and their attempts to overcome barriers were insufficient to facilitate comprehensive patient assessment (McCarthy et al., 2013). Previous Minister of Arts Culture, Science and Technology, Dr Ngubane, in introducing the National Language Policy Framework stated that “A person’s language is in many ways a ‘second skin’: a natural possession of every normal human being, with which we use to express our hopes, ideals, articulate our thoughts and values, explore our experience and customs, and construct our society and the laws that govern it. It is through language that we function as human beings in an ever-changing world” (Department of Arts & Culture, 2003, p.3). This description suggests that meaning is expressed through language. If meaning is central to a definition of occupation (World Federation of Occupational Therapists, 2014), and therefore part of the foundation of occupational therapy practice, an inability to access meaning through language may significantly diminish the potency of the contribution a therapist can make to the experience of patients and communities.

Participants further emphasised that the purpose of occupational therapy is explained through language and that an explanation of the profession sometimes got ‘lost in translation’. Translation was challenged by

occupational therapy not having only one key focus area for intervention to which patients may be able to relate. Audiologists, for example may be referred to as the professionals who help with “the ears” or “hearing” and dieticians’ may relate to “food”. This difficulty was perceived to contribute to occupational therapy being poorly recognised within communities. A thorough search of the literature revealed that little has been published on the impact of language barriers on occupational therapy practice specifically. One article, however, acknowledged that communication across barriers involves more than learning to speak a couple of words of the patients’ language or translating instructions into the patient’s language. Language, embedded in culture, allows the therapist an understanding of how cultural factors impact on health, health service seeking and treatment compliance, and is also central to enabling collaborative treatment planning (Meadows, 1991). This relationship between language and culture was highlighted by some CSOTs in this study who felt that cultural competence was supported when no language barrier existed. Links were often made between language proficiency and cultural competence and it is evident that quality care requires an understanding of patients’ culture (McCarthy et al., 2013).

CSOTs who reported not having communication difficulties either reported patient and therapist language-concordance, or described communication supports. Of particular note was the key role played by formal and informal translators. Literature has addressed the role of interpreters. The experience of Irish nurses using translators within an increasingly diverse society (McCarthy, Cassidy, Graham, & Tuohy, 2004) identified that the use of family or friends as informal translators was common, although it was perceived that these translators sometimes appeared to filter or withhold information. Formal interpreters seemed to be more objective in their intermediary role. Difficulties associated with interpreters included a lack of consistency (use of multiple interpreters with one patient), limited understanding of health care terminology by interpreters, and that health care workers required training to use interpreters effectively. In a study of six physiotherapists’ views of using interpreter, family members were the first method to facilitate communication with patients (Lee, Lansbury, & Sullivan, 2005). If this was not an option, non-verbal communication was

used or multi-lingual colleagues approached for assistance. Seeking formal interpreters was uncommon for this small group of therapists who only used this service when there were no other options. Negative physiotherapist perceptions about using formal translators were informed by time constraints, distrust and the cost of such services. In a study of the use of interpreters by primary care nurses, practitioners were often comfortable with asking family members to translate. Insufficient training of nurses and interpreters could negatively affected the quality of care (McCarthy et al., 2004). Similarly, in a systematic review of the use of interpreters in medical care, Flores (2005) found that bilingual health professionals or trained interpreters facilitated better communication with fewer interpreter errors, and that patient satisfaction also increased.

Strategies to address language discordance vary. The National Language Policy framework (2003) of South Africa identifies the need for learning other official languages although it does not specifically relate this to state service providers. Building human capacity through multiple means including the training of interpreters and use of Human Language Technology (HLT) applications has been outlined within the policy. Improving access to trained interpreters is crucial, as well as training health professionals to use interpreter services. Provision of trained physical interpreters for all languages may not be possible and remote telephonic interpreting (for example, a hands-free conference telephone positioned between patient and health care worker accessing services from a call center type service) has been suggested although further research into this possibility is required. Patients may feel less certain about confidentiality when an interpreter is not visible and non-verbal communication may be missed with this technique (Jones & Paramjit, 1998) although these effects may be limited by internet-based video and voice calling. Portable translation devices could be helpful within some health care settings (Bernard et al., 2006)

Development of appropriate interpersonal relationships requires more than the use of an interpreter (McCarthy et al., 2013) or translation devices and therefore merely managing language discordance between patients and health care workers is insufficient. Improving the language proficiency of

health professionals is important. In a small South African study conducted in the Western Cape, a 10-week course (total of 20 hours) in basic isiXhosa speaking and listening skills, and cultural competence, was effective in improving patient satisfaction with healthcare. Patients rated health care workers who did not speak isiXhosa before and after the course. Improvements were noted in concern for patients ( $p < 0.01$ ), understanding of the patient's problem ( $p < 0.01$ ), respect shown by the professional ( $p < 0.02$ ), listening to the patient ( $p = 0.02$ ), patient understanding of the health professionals ( $p < 0.01$ ), and clarity of the instructions ( $p < 0.01$ ) (Levin, 2011).

### **5.4.2 Culture**

The research questionnaire captured CSOTs' perceptions of their cultural competence and the perceived impact of this on their practice. The open-ended structure of the question made it difficult to interpret whether or not participants felt culturally competent. However, from the responses that were clear ( $n = 49$ ), the majority reported feeling a measure of cultural competence (91.8%). However, an objective measure of competence was not used and it should be noted that a tendency to over-estimate cultural competence has been reported in other contexts (Hawala-Druy & Hill, 2012).

The most frequently shared reflection was the perceived centrality of CS in developing culturally competent practice. CS could be considered as a *cultural immersion* experience suggested as a model to improve cultural competency by involving participants in direct contact with a community that is socio-culturally different to theirs (Tomlinson-Clarke & Clarke, 2010). This technique is dependent on participants being submerged in a context for long enough to recover from potential culture shock (p. 172) and begin the process of adjustment and adaptation alluded to by participants in this study (Tomlinson-Clarke & Clarke, 2010).

Another strong theme that emerged from CSOTs responses was the recognition of challenges and errors in the process of pursuing cultural

competence. Within a cultural immersion experience, the importance of debriefing has been emphasised to facilitate reflection, processing and personal development (Tomlinson-Clarke & Clarke, 2010). This type of facilitation was not referred to by CSOTs in the current study, and given their reports on their supervision, it is likely that they did not receive this input. This input may have been particularly helpful for the five CSOTs who reported struggling with traditional treatment and negative patient outcomes.

Some participants questioned the appropriateness of occupational therapy theory and interventions for clients from different cultural backgrounds. One participant stated:

*“Older men in the Xhosa culture sit at home with the woman of the household doing everything, literally. They reach an age when all engagement stops, i.e. no gardening, mending of fences or rondavels, etc. Now, in this situation, how do I introduce culturally appropriate activities for assessment and treatment of men of this age with mental health disorders and also knowing their predisposition to occupational injustice.”*

Although this CSOT had arguably not yet come to an understanding of the meaning of, “sit(ing) at home” and the role fulfillment that is linked to this, she had identified dissonance between her theoretical orientation and the meaning of activity for her client. In a review of the cultural competence literature within occupational therapy, Awaad (2003) cited the work of Kinebanian and Stomph (1992) and Finlay, (1997) who confirmed that purposeful and meaningful activity forms a foundation of occupational therapy assessment and treatment. This is, however, subject to the cultural understanding of activities. Similarly an orientation towards goal-achievement, independence and balance is also central to practice but may not be equally valued by clients – as was evidenced by the CSOTs experience. This western-centric orientation was not reported by all participants as one CSOT stated:

*“I think it [cultural difference] didn't really affect competence as we grew up in this society where we understand the vast differences in cultures and at the end of the day therapy is a universal language as*



*all patients had (the) same needs and using the holistic approach helped me plan appropriate sessions”.*

Although not identified by CSOTs, the core occupational therapy value of personal autonomy is also not equally valued across cultures and this potential value discrepancy needs to be acknowledged and negotiated in therapy (Awaad, 2003).

CS may not have served as a learning tool in cultural competence for all participants, as a minority appeared to have a restricted understanding of the impact that culture has on treatment as evidenced by the following quote:

*“At university we were educated on something called cultural sensitivity. Many of our clients have traditional beliefs or are uneducated about development of a baby, injuries, illness and conditions. However I always ensure that the client understands the injury, illness or condition. With regards to traditional beliefs I always ensure that I educate the client/parents, but do not force them to change their beliefs”.*

One CSOT who stated *“My culture doesn’t influence my treatment of a patient who is from a different culture to me because I respect them and treat them as individuals”* may have felt that her culture did not influence her treatment. Whether this is accurate or not, she appeared to miss the impact that her patient’s cultural identity had on her ability to identify needs and implement appropriate treatment (Awaad, 2003).

As with any competency, cultural competence is developmental (Epstein & Hundert, 2002) and ongoing (Campinha-Bacote, 2002; Hawala-Drury & Hill, 2012). CS clearly provides an essential opportunity for learning but teaching needs to precede and follow this. Participants reflected on various personal experiences beyond their formal education that contributed to their competence but undergraduate courses need to facilitate the development of cultural competency. If assessment drives learning (Reid & Cakwe, 2011) then assessing competence in this area is also essential. According to occupational therapy literature, this involves the assimilation of the concept of culture, awareness of one’s own culture and an ability to

use knowledge and skill to interact appropriately with patients and communities (Awaad, 2003). It also needs to be built on an understanding that extensive variation and diversity exist within any given culture (Campinha-Bacote, 2002).

Hawala-Druy and Hill (2012) proposed the use of interdisciplinary health science courses to develop “cultural awareness, competency and proficiency” (p. 772). They found that the multicultural and multigenerational diversity that existed within the university setting provided an appropriate context for developing cultural competency. They used a transformative learning framework and utilised culturally appropriate teaching methods demonstrating a statistically significant increase in participants’ pre- and post-intervention scores. As a pre-cursor to independent clinical practice, practice learning may provide an appropriate opportunity for students to develop cultural competence. A quasi-experimental study that used various structured tasks within the practice learning setting noted significant improvements in the intervention group (Chen et al., 2012). The tasks included a structured orientation to the practice setting to promote awareness and insight into cultural diversity, a presentation by participants on culturally appropriate services and reflective journaling. Evidence thus suggests that an introduction to cultural competence and the development of basic competence in this area before graduation can be achieved through various undergraduate strategies.

Twelve CSOTs in this study emphasised the ongoing nature of cultural competence. This view is supported by Campinha-Bacote’s (2002) model of cultural competence that identifies the need for health practitioners to consistently view themselves as “becoming culturally competent” (p. 181). Key inter-playing concepts in this model are *cultural awareness* (in-depth insight into one’s own culture), *cultural knowledge* (the assimilation of accurate knowledge of other cultures), *cultural skill* (ability to perceive important cultural information and conduct a culturally appropriate physical assessment), *cultural encounters* (interpersonal engagement with culturally diverse patients) and *cultural desire* (a drive / want to become culturally competent). Integration of these knowledge, skill, affect and

behavioral components, over time, is proposed to facilitate cultural competence. This model may serve as a useful guide within curriculum development to facilitate and assess cultural competency within students. Similarly, it may be used in supervision in clinical practice as cultural competence is nurtured.

### **5.4.3 Summary**

Literature supports CSOTs' view that cultural competence contributes towards the effectiveness, appropriateness and quality of care (Awaad, 2003; Campinha-Bacote, 2002; Levin, 2011). Although a CSOT reported that cultural competence was of benefit to rural practice, the language and cultural diversity throughout South Africa (STATSSA, 2014) demands that language and cultural competence are essential components of all undergraduate health professional programmes.

## **5.5 Strengths and limitations of the study**

This study is the first of its kind in several areas. Firstly, it is the first to document the general experience of CSOTs 11 years after the implementation of CS for rehabilitation professionals in South Africa. Secondly, it is the first to report the perceived preparedness of novice occupational therapists for treating patients with UL injuries and conditions. Thirdly, it is the first study to report the nature and extent of undergraduate UL curricula. Given the 100% response rate for the *Educator Survey*, these results reflect all undergraduate occupational therapy curricula in South Africa.

Non-response error was reduced by using the official National Department of Health list of occupational therapists registered for CS practice for 2013, (OECD, 2014). Evidence-based methods to increase the response rate were the inclusion of stamped-return envelopes in the posted questionnaires, personalised emails, offering an incentive for participation, and multiple reminders for non-responders (Edwards et al., 2010). A rigorous piloting test process was followed to optimise the content and face validity as well as

the utility of the questionnaires. The accuracy of data entry and coding was checked by a second person and the research supervisor verified the reasoning used to categorise data from open-ended responses.

Extensive use of open-ended questions in the questionnaire and opportunities for participants to add comments on their close-ended question selections enabled greater insights and depth to the understanding of CS participants' experience.

The self-report nature of the questionnaire was appropriate for determining participants' perceptions of their practice context, confidence and competence. The instrument, however, did not provide an objective measure of their competence. It was also not able to assess the quality of the services that CSOTs were delivering. During development of the CSOT survey, back-translation of the questionnaire was not performed due to budget restrictions. Meaning may have thus been lost in the translation process.

Although several strategies were used to increase the response rate, more than half of the population did not participate. Although the names of all CS therapists for 2013 were obtained, their contact details were limited (hospital names and some cellphone numbers) and their accuracy could not be verified. It is therefore not known whether all posted and text message invitations to participate reached the participants. It is likely that many received the invitation but chose not to participate which may have introduced non-response bias (Berg, 2010). The length of the survey may also have deterred some. Because the focus of the study was preparedness for UL rehabilitation practice, it is possible that those who felt less prepared for this area of practice chose not to participate. Regular item non-response (i.e. Missing data) occurred and could not be regulated by software settings by the researcher due to limited support being available for effectively using the online Canadian-based survey tool (*Fluidsurveys*) used for data collection. Item non-response may have occurred when participants found the question too lengthy or considered it irrelevant to them. Although hard copy questionnaires were offered to participants, only 16% (n=16) participants preferred this method of survey completion. Participants with

limited internet access or connectivity may have been hindered from submitting completed questionnaires.

A response rate of 42.9% was achieved for the study which is higher than the 26.8% response rate achieved in the study of CS doctors (Reid (2001) but lower than that obtained with Limpopo doctors (70% response rate) (Nemutandani et al., 2006). The high response rate in the latter study was likely achieved by conducting the survey telephonically. Other studies of CS doctors (Ross & Reid (2009) and dieticians (Parker et al., 2012; Visser et al., 2006) have similarly achieved higher response rates. In the study by Visser et al (2006), researchers had access to participants' telephone numbers and called potential participants to remind them of the study which may have been more successful in encouraging participation. This information was not available for all participants in this study.

In the absence of literature reporting the number of CSOTs who were likely to perceive themselves as being prepared for practice, it was estimated that 10% of participants would feel prepared for practice. For the study to be powered sufficiently, 88 CSOTs had to participate (representing a 37% response rate). Although this number of responses was achieved, the results demonstrated a significantly higher percentage of participants who felt both competent (78.9% reported varying measures of competence) and confident (64.4% reported varying measures of confidence) within UL rehabilitation practice. As a result, the study was underpowered due to the small sample size. Based on the above considerations, generalising the findings of this study to the entire 2013 CSOT population, and other CSOT groups, needs to be performed with caution.

## **5.6 Summary**

CSOTs reported unexpectedly high levels of competence and confidence within UL rehabilitation practice. This despite the challenges presented by limited supervision and the realities of rural, underserved and under-resourced practice contexts. Literature suggests that CSOTs are likely to have significantly over-estimated their ability. The need for increased supervision and support, and for CSOTs practice to be situated within broader approaches to improving access to health care and *hand care* have been identified. The strengths and limitations of the study were described to allow the reader to effectively evaluate the results and the contribution that they make to the existing body of knowledge.

## **Chapter 6: Conclusion and recommendations**

This chapter revisits the research aim and objectives, summarising the results that address these. The implications of the findings have on practice will inform various recommendations made around practice, education and further research.

### **6.1 Conclusion**

Of the 240 OTs who completed CS in 2013, 103 participated in the study representing a 42.9% response rate. The greatest percentage of responses was received from CSOTs working in the Gauteng province (26.2%). A small majority was placed in urban areas (55.3%) and 32% of participants worked in primary settings. Therapists delivered services at a median of three sites and worked with a median of three other occupational therapists. The median number of patients seen by CSOTs was 83 per month. Most common reasons for referrals included requests for wheelchair related services, addressing the developmental needs of children, treating adults with neurological disorders (for example CVA) and for disability grant assessments.

Communication difficulties characterised CSOTs' experience of practice. This was largely attributed to patient – therapist language discordance and insufficient availability of resources to overcome the language barriers that negatively impacted on quality of care. This difficulty was linked to feeling *challenged* and *frustrated*, a descriptor reported by a majority of participants in the study.

Another typical feature that characterised experience was a sense of dissatisfaction with the limited supervision and support that was received. This dissatisfaction was due, in part, to characteristics of the supervisor as well as the extent and content of supervision. CSOTs selected descriptors that they felt captured their experience: A majority of participants felt that occupational therapy was poorly recognised but derived a strong sense of

satisfaction from interaction with their patients and reported feeling proud to be an occupational therapist.

CSOTs reported treating a median of 20 upper limb patients per month although this varied considerably (Range: 0 – 225). UL conditions commonly seen included the following: upper motor neuron lesions affecting the UL, conditions affecting bones and joints, arthritis, burns, tendon injuries, infections and complex trauma. Conditions that therapists felt *well equipped* to treat included upper motor neuron lesions affecting the UL, amputations, burns, and arthritis.

Home programmes were used most frequently by CSOTs. Other modalities used weekly included manual therapy, activity (as a means or as an end), training in ADLs, exercise, strengthening, education and assistive equipment. These modalities also constituted those that CSOTs felt well-equipped to use. In addition, participants felt well prepared to use standardised and non-standardised assessment methods, and to perform scar management techniques.

The majority of participants felt *well*, or *somewhat equipped* for all competency areas of UL rehabilitation (i.e. knowledge, assessment, treatment, clinical reasoning, interpersonal relationships, population-based services, service management and professional practice). More than two thirds of participants appraised themselves as being both competent and confident within UL rehabilitation.

CSOTs' practice was largely hindered by a lack of resources and limited access to mentorship and supervision. Some participants used this as an opportunity to develop a sense of resourcefulness. Facilitators of UL rehabilitation practice included access to CPD activities. Participants felt that further CPD courses, access to protocols, regular supervision from an experienced therapist and improved undergraduate practical exposure to UL rehabilitation would support practice in this area.

Practical undergraduate experience with UL rehabilitation patients and lectures were identified by participants as aspects in their curriculum that



prepared them most for UL practice. Curricula varied considerably in content and teaching hours, with a median of 30 hours being spent on UL assessment and treatment knowledge, and 22 hours dedicated to developing splinting skill. Although the university was significantly associated with perceived preparedness for some aspects of treatment, it was not related to participants' overall sense of competence and confidence. When multiple factors that might reasonably be considered to support competence and confidence were simultaneously considered, the only factors significantly related to both competence and confidence were *having had an UL rehabilitation practice learning placement at university* and *enjoying UL rehabilitation*. Additionally, perceiving oneself to have adequate skill (e.g. splinting) was associated with confidence.

These results and other factors explored in chapters four and five form the basis for the recommendations that have been generated.

## **6.2 Recommendations**

Recommendations for practice, education and research are presented in this section.

### **6.2.1 Practice**

Supervision and support

- Literature strongly states that it is not advisable to send novice practitioners out into rural, under-resourced and highly complex work environments without support and supervision. Given that this is an unavoidable reality, this needs to receive serious consideration by the employer, universities and professional organisations. This is of particular urgency in rural areas. Opportunities need to facilitate both professional development and personal support. Accessible CPD opportunities, supervision and mentorship programmes need to be explored.

- Although supervision was often in place, it was perceived to be unsatisfactory. Findings and literature agree that the training of occupational therapists in the skills of supervision needs to be prioritised by the DOH and professional organisations. This is necessary to support CSOTs but also to ensure that service delivery is aligned with DOH guidelines and that the resource of CSOT services is being appropriately harnessed. It is recommended that professional development opportunities be provided for occupational therapy supervisors to develop their supervisory skills.

### Context specific support

- The development of rural occupational therapy services needs further attention. Opportunities for increasing leadership in this field are required. Rural representation on professional organization executive committees (for example OTASA) may assist in increasing awareness of rural needs and agendas and could act as a precursor to leadership development. Leadership development courses for rural therapists may further advance this aim. Strategies to recruit experienced clinicians to rural areas are needed. Financial incentives should be considered. Universities and professional organisations also need to consider how post-graduate education and CPD opportunities can be made accessible to rural practitioners.
- Opportunity for the development of OTs' language proficiency and cultural competency need to be provided both at an undergraduate level as well as after qualification. In addition, given the changing local and global context, it stands to reason that there will always be a measure of non-language concordance between health practitioner and patients. Therefore the training of interpreters and development of an effective and sustainable interpreter service needs to be explored. The training of health professionals in the use of interpreter services also requires attention. The feasibility of a centralised, call centre-style interpretation service that provides interpretation into multiple languages and uses on-line video conferencing may be a method to consider.

## UL rehabilitation

- It is recommended that the improvement of *hand-care* in South Africa become a joint focus of hand therapy and hand surgery bodies. A comprehensive plan, situated within PHC and NHI frameworks, needs to be developed by professional bodies to guide the growth and development of both private and public hand health services.
- Increased support and professional development opportunities within UL rehabilitation need to be provided for novice or generalist practitioners. The South African Society of Hand Therapists may be best positioned to fulfill this role.

## 6.2.2 Education

### UL rehabilitation

- Educators and clinicians in South Africa need to agree on which UL rehabilitation competencies are considered essential as undergraduate exit competencies and those that form part of postgraduate education. This may be achieved through an expert panel discussion of upper limb rehabilitation clinicians and educators.
- Using the results of this study, a guideline for what should be included in an undergraduate UL rehabilitation curriculum and how this should be presented, should be developed and published within a peer-reviewed journal.
- Results suggest that opportunities to treat UL patients within practice learning need to be developed. Within curriculum limitations this needs to focus on the best possible utilisation of clinical opportunities. This may involve developing stronger links with clinicians and academics to explore possible developments and maximizing the contribution that students make in the clinical setting through appropriate supervision.

### Context specific preparation

- More attention needs to be paid to service contexts and university preparation needs to be tailored accordingly. Of particular importance, curricula need to be orientated towards rural, underserved and under-resourced settings. Education needs to foster adaptation, self-directed and ongoing learning as well as resourcefulness.
- In order to support the development of rural practice competencies, occupational therapy students need to be recruited by universities from rural areas. Rural electives need to be encouraged to further prepare graduates for practice and this may be achieved through a partnership with RuReSA.

- Health Science students need to become aware of the fact that when employed by the state, they will be required to render services in any of the 11 official languages, or the official languages of their region. This understanding should motivate invested participation in language courses provided by faculties. All faculties need to provide language and communication courses as well as opportunity to develop cultural competency. If limited resources could be cleverly harnessed, elective language courses that prepared students for the contexts to which they would likely return (rather than just the local languages of the region in which the university is situated) would be advantageous. Integration of language skills across undergraduate courses needs to be facilitated.
- It is recommended that fourth year occupational therapists be provided with an opportunity to explore what they can expect in CS and how they can best prepare themselves for this. An annual workshop, which the researcher would be interested in developing, may be facilitated universities or a professional organization.

### **6.2.3 Research**

- A comprehensive understanding of the burden of upper limb injuries needs to be developed in South Africa through developing integrated research agendas of surgical and rehabilitation bodies. This is essential for the development of appropriate services.
- Further research is required to develop an understanding of best practice in rural areas. This relates to all aspects of occupational therapy practice, including the practice of upper limb rehabilitation.
- An objective evaluation of the nature and quality of services that are being developed by CSOTs is required to determine whether these are appropriate, effective and sustainable, and in-line with identified national, provincial and local health priorities. This may be achieved through postgraduate research projects.

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## **Appendices**

## Appendix 1: Literature Review Outline

During the research proposal development stage of the project, a detailed record of literature searches was not kept. On developing an understanding of the need to maintain a record of the approach used, the record below from November 2013 – August 2014. Ad hoc searches were performed for the write-up of the project until mid-November 2014 but these searches were not recorded.

### **Title: The Extent to which CS occupational therapists are equipped to treat hand injuries and conditions**

Introduction: Context/Problem/Rationale, Aims & Objectives

Questions that guided review:

- What is CS and why is it used?
- What is the experience, in general, of CS Health Professionals?
- What is the experience, in general, of CS Occupational Therapists?
- What epidemiology related to Hand Injuries and conditions in RSA is known? What is unknown?
- 'CS' in RSA context implies novice. What are the implications of being a novice health professional?
- What are the implications of being a novice OT in general? And in RSA?
- What does it take to be *equipped* to treat hand injuries /conditions in general? In an RSA context?
- Undergraduate preparation is part of being *equipped*. What (content) needs to be covered in undergraduate preparation?
- What educational strategies and approaches are recommended to optimize preparation?
- What is the best way to investigate this subject? Quantitative/ qualitative? Data collection method?

Type of Information Extracted from each article:

- Study quality
- Population, sample
- Methodology: instrumentation
- Results

Literature Review Structure plan:

- CS:
  - Context (much of this may be in intro)
  - Past Studies & Government Response (Lit rev)
  - Occupational Therapists (Lit rev)
  - Effective Communication: with patients & colleagues
- Novice Therapists (enablers / needs etc)

- The experience of the novice therapist
- Supervision
- Support: Interpersonal, resources etc
- Continuous professional Development
- Confidence
- The development of prof competence and confidence.
- Cultural competence
- The Competencies demanded of CSOT treating UL conditions:
  - Understanding of Health systems / primary health care
  - UL competencies
- Undergraduate preparation
  - What is needed to train therapists for the SA context
  - What is needed for CSOTs
  - UL Rehab
  - Teaching Content
  - Teaching Methods / strategies

**Topic: CS**

Search for unpublished studies: Emailed each of 8 Universities in RSA offering undergrad and postgrad programs. Enquired whether any research involving CSOTs had been conducted at their University:

Results:

- UWC: PhD Student L. Hess-April currently completing research on CS therapist’s experience of Occupational Injustice.
- UCT: H Flieringa completed her Masters thesis on how practice learning prepared CSOTs for practice.

Date of Search	Database	Search Terms	Filters / Limits	Tot Results	Relevant results
18/11/13	Cinahl	CS, South Africa	None set	11	<ul style="list-style-type: none"> <li>• Parker, W., Steyn, N., McHiza, Z., Wentzel-Viljoen, E., Dannhauser, A., Mbhenyane, X., &amp; ... Moeng, L. (2012). Challenges for efficient health service delivery: experiences of dietitians completing their compulsory CS year in South Africa. <i>Public Health Nutrition</i>, 15(8), 1411-1418. doi:10.1017/S1368980011003314</li> <li>• Holland, K., Middleton, L., &amp; Uys, L. (2013). Professional Confidence: Conceptions Held by Novice Occupational Therapists in South Africa Professional Confidence: Conceptions Held by Novice Occupational Therapists in South Africa. <i>Occupational Therapy International</i>, 20(3), 105-113. doi:10.1002/oti.1340 relevant to <i>Professional Competence</i></li> <li>• Ramklass, S. (2009). Physiotherapists in under-resourced South African communities reflect on practice. <i>Health &amp; Social Care In The Community</i>, 17(5), 522-529. doi:10.1111/j.1365-2524.2009.00869.x</li> </ul> Paterson, M., Green, M., & Maunder, E. (2007). Running before we walk: how can we maximise the benefits from CS dietitians in KwaZulu-Natal, South Africa?. <i>Health Policy</i> , 82(3), 288-301.
18/11/13	<ul style="list-style-type: none"> <li>• Medline</li> <li>• Academic Source Premier</li> <li>• Health Source: Nursing / Academic edition</li> </ul>	CS, South Africa	None set	37	<ul style="list-style-type: none"> <li>• 4 x Duplication of Cinahl Relevant articles</li> </ul> In addition: <ul style="list-style-type: none"> <li>• Swarts, B. (2013). A community (dis)service: Reflections of a CS clinical psychologist. <i>South African Journal Of Psychology</i>, 43(1), 105-115. doi:10.1177/0081246312474420</li> <li>• Erasmus, N. (2012). Slaves of the state - medical internship and CS in South Africa. <i>South African Medical Journal = Suid-Afrikaanse Tydskrif Vir Geneeskunde</i>, 102(8), 655-658.</li> <li>• van Wyk, S., &amp; Naidoo, A. V. (2006). Broadening Mental Health Services to Disadvantaged Communities in South Africa: Reflections on Establishing a Community Based Internship. <i>Journal Of Psychology In Africa</i>, 16(2), 273-281. (full text</li> </ul>

					<p>not available – no author details)</p> <ul style="list-style-type: none"> <li>Kolosa, M. (2003). CS in rural South Africa. <i>South African Medical Journal = Suid-Afrikaanse Tydskrif Vir Geneeskunde</i>, 93(8), 556.</li> <li>Reid, S. (2001). Compulsory CS for doctors in South Africa--an evaluation of the first year. <i>South African Medical Journal = Suid-Afrikaanse Tydskrif Vir Geneeskunde</i>, 91(4), 329-336.</li> <li>Tomlinson-Clarke, S. M., &amp; Clarke, D. (2010). Culturally Focused Community-Centered Service Learning: An International Cultural Immersion Experience. <i>Journal Of Multicultural Counseling &amp; Development</i>, 38(3), 166-175. Relevant to <i>Cultural Competence</i>.</li> <li>Bender, G., &amp; Jordaan, R. (2007). Student perceptions and attitudes about CS-Learning in the teacher training curriculum. <i>South African Journal Of Education</i>, 27(4), 631-654.relevant to CS learning</li> </ul>
18/11/13	<ul style="list-style-type: none"> <li>African Wide Information</li> </ul>	'CS', 'South Africa'	2000-2013	7	<ul style="list-style-type: none"> <li>Thopola, M., Kgole, J., &amp; Mamogobo, P. (2013). Experiences of newly qualified nurses at University of Limpopo, Turfloop Campus executing CSs in Limpopo Province, South Africa. <i>African Journal For Physical, Health Education, Recreation And Dance</i>, 19(2013), 169-181.</li> <li>Dup</li> <li>Zaborowski, A., &amp; Strachan, K. I. (2000). CS in South Africa. <i>H S T Update</i>, (57), 1-11. Full text not available</li> <li>Bateman, C. C. (2003). Still getting CS right: izindaba. <i>South African Medical Journal</i>, 93(1), 16.</li> <li>Reid, S. S., &amp; Strachan, K. K. (2000). An overview of the first two years of CS; What the Department of Health says .... policy in progress. <i>H S T Update</i>, 11(57), 6-8. – full text not available</li> </ul>
18/11/13	<ul style="list-style-type: none"> <li>Pubmed</li> </ul>	CS', 'South Africa'	2000- 2013 Humans (ie. Not 'other animals')	754	Search refined to below:
	<ul style="list-style-type: none"> <li>Pubmed</li> </ul>	CS Health Professional		128	<ul style="list-style-type: none"> <li>4 x duplication</li> <li>Reid, S.J. &amp; Cakwe, M. 2011. The contribution of South African curricula to prepare health professionals for working in rural or under-served areas in South Africa: A peer review evaluation. <i>South African Medical Journal</i>, 101 (1): 34 – 38. (Other Articles found while locating full text of the above:</li> <li>Reid, S.J., Couper, I.D. &amp; Volmink, J. 2011. Educational factors that influence the urban-rural distribution of health professionals in South Africa: A case-control study. <i>South African Medical Journal</i>, 101 (1): 29 – 33.</li> <li>Burch, V. &amp; Reid, S.J. Fit for purpose? The appropriate education of health professionals in South Africa, <i>South African Medical Journal</i>, 101 (1):25-26. (Editorial.)</li> <li>Khan, N.B., Knight, S. &amp; Esterhuizen, T. 2009. Perceptions of and attitudes to the compulsory CS programme for therapists in KwaZulu-Natal. <i>South African Journal of Communication Disorders</i>, 56:17-22. Full text not available – emailed author to request <a href="mailto:Nasim.BanuKhan@kznhealth.gov.za">Nasim.BanuKhan@kznhealth.gov.za</a></li> <li>Bhayat, A., Yengopal, V., Rudolph, M.J. &amp; Govender, U. 2008. Attitudes of South African dental therapy students toward compulsory CS. <i>Journal of dental education</i>, 72 (10), 1135 – 41. (Similar article of oral hygienists found but excluded as different professional group, 1<sup>st</sup> year of dental comserv found but excluded)</li> <li>Nemutandani, M.S., Maluleke, F.R.S. &amp; Rudolph, M.J. 2006. CS doctors in Limpopo province. <i>South African Medical Journal</i>, 96 (3): 180 – 182.</li> </ul>
	<ul style="list-style-type: none"> <li>Pubmed</li> </ul>	CS Health Professional, South Africa	1998 - 2014	154	
19/11/13Repeated 23/7/14*	Science Direct	CS, South Africa	2000-2014, Journals, Lancet, Social Science & Medicine, World Development, International Journal of Educational Development, Public Health	91 and * 67	<ul style="list-style-type: none"> <li>Duplicates</li> <li>Baleta, A. (2009). Rural hospital beats the odds in South Africa. <i>The Lancet</i>, 374(9692), 771-772. doi:10.1016/S0140-6736(09)61577-4</li> </ul>
22/7/14	Cinahl Medline Academic Source Premier Health Source: Nursing / Academic edition	Language barrier in health care practice	* Public Health excluded (not available), Health policy and Progress in planning added	2	<ul style="list-style-type: none"> <li>Gadon, M., Balch, G.I. &amp; Jacobs, E. 2007. Caring for patients with limited English proficiency:the perspectives of small group practitioners. <i>Journal of general internal medicine</i>, 22 (2): 341 – 346. – difficulty accessing full text.</li> <li>Linked articles:</li> <li>Mccarthy, J., Cassidy, I., Graham, M. M., &amp; Tuohy, D. (2013). of language and interpretation. 22(6), 335-339.</li> <li>Bernard, A., Whitaker, M., Ray, M., Rockich, A., Barton-Baxter, M., Barnes, S. L., ... Kearney, P. (2006). Impact of language barrier on acute care medical professionals is dependent upon role. <i>Journal of professional nursing : official journal of the American Association of Colleges of Nursing</i>, 22(6), 355-8. doi:10.1016/j.profnurs.2006.09.00</li> </ul>
22/7/14	As above	Language barrier, health care		15	<ul style="list-style-type: none"> <li></li> </ul>
23/7/14	Pubmed	Hand therapy,		1470	(Including related Links):



		university education Refined to: "Hand therapy" and Education		39	<ul style="list-style-type: none"> <li>Clark, G. (2002). The Case for Hand therapy. <i>TCM</i>, 78, 75–78.</li> <li>Nandgaonk, P. H. (2014). The Experience of Being a Hand Therapist in India, 2(9), 513–518.</li> <li>Dorf, E., Blue, C., Otr, L., Smith, B. P., &amp; Koman, L. A. (n.d.). Therapy After Injury to the Hand Abstract, 464–473</li> <li>Stagnitti, K. (2008). Occupational therapy practice in rural and remote South Australia. <i>The Australian journal of rural health</i>, 16(5), 253–4. doi:10.1111/j.1440-1584.2008.01002.x</li> <li>Boshoff, K., &amp; Hartshorne, S. (2008). Profile of occupational therapy practice in rural and remote South Australia. <i>The Australian journal of rural health</i>, 16(5), 255–61. doi:10.1111/j.1440-1584.2008.00988.x</li> <li>Thistlethwaite, J. E., Davies, D., Ekeocha, S., Kidd, J. M., MacDougall, C., Matthews, P., ... Clay, D. (2012). The effectiveness of case-based learning in health professional education. A BEME systematic review: BEME Guide No. 23. <i>Medical teacher</i>, 34(6), e421–44. doi:10.3109/0142159X.2012.680939</li> <li>Buckley, S., Coleman, J., Davison, I., Khan, K. S., Zamora, J., Malick, S., ... Sayers, J. (2009). The educational effects of portfolios on undergraduate student learning: a Best Evidence Medical Education (BEME) systematic review. BEME Guide No. 11. <i>Medical teacher</i>, 31(4), 282–98. doi:10.1080/01421590902889897</li> <li>Steinert, Y., Mann, K., Centeno, A., Dolmans, D., Spencer, J., Gelula, M., &amp; PrIDEaux, D. (2006). A systematic review of faculty development initiatives designed to improve teaching effectiveness in medical education: BEME Guide No. 8. <i>Medical teacher</i>, 28(6), 497–526. doi:10.1080/01421590600902976</li> <li>Buys, T. (2007). Professional competencies in occupational therapy work practice: What are they and how should these be developed? <i>Work (Reading, Mass.)</i>, 29(1), 3–4. Retrieved from <a href="http://www.ncbi.nlm.nih.gov/pubmed/17627069">http://www.ncbi.nlm.nih.gov/pubmed/17627069</a></li> <li>Brosky, J. a., &amp; Scott, R. (2007). Professional competence in physical therapy. <i>Journal of allied health</i>, 36(2), 113–8. Retrieved from <a href="http://www.ncbi.nlm.nih.gov/pubmed/17633969">http://www.ncbi.nlm.nih.gov/pubmed/17633969</a></li> <li>Casteleijn, D. (2007). Occupational work therapy practice in South Africa. <i>Work (Reading, Mass.)</i>, 29(1), 1–2. Retrieved from <a href="http://www.ncbi.nlm.nih.gov/pubmed/17627068">http://www.ncbi.nlm.nih.gov/pubmed/17627068</a></li> <li>Parry, C. B. W. (1997). Some aspects of the history of rehabilitation of the hand. <i>Journal of Hand Therapy</i>, 10(3), 199–205. doi:10.1016/S0894-1130(97)80022-1</li> <li>Frampton, V. (1998). Hand therapy education: A global perspective. <i>Journal of Hand Therapy</i>, 11(4), 239–243. doi:10.1016/S0894-1130(98)80018-5</li> </ul>
23/7/2014	Sciedirect	"Hand Therapy" AND Education	Journal, 1995 – 2014; Topic: Hand therapy, hand therapist; hand rehabilitation, OT, PT, hand injury	161	<p>Duplicates</p> <ul style="list-style-type: none"> <li>Dias, J. J., Chung, K. C., Garcia-Elias, M., Sabapathy, S. R., &amp; Tang, J. B. (2006). Recommendations for the improvement of hand injury care across the world. <i>Injury</i>, 37(11), 1078–82. doi:10.1016/j.injury.2006.07.022</li> <li>MacDermid, J. C. (2004). An introduction to evidence-based practice for hand therapists. <i>Journal of hand therapy : official journal of the American Society of Hand Therapists</i>, 17(2), 105–17. doi:10.1197/j.jht.2004.02.001</li> <li>Dimick, M. P., Caro, C. M., Kasch, M. C., Muenzen, P. M., Fullenwider, L., Taylor, P. a., ... Walsh, J. M. (2009). 2008 Practice Analysis Study of Hand Therapy. <i>Journal of hand therapy : official journal of the American Society of Hand Therapists</i>, 22(4), 361–75; quiz 376. doi:10.1016/j.jht.2009.06.001</li> </ul>
24/7/2014	Google Scholar	"CS" for health professionals in South Africa		22900 first 200 reviewd	<p>Duplicates</p> <ul style="list-style-type: none"> <li>Lehmann, U., Dieleman, M., &amp; Martineau, T. (2008). Staffing remote rural areas in middle- and low-income countries: a literature review of attraction and retention. <i>BMC health services research</i>, 8, 19. doi:10.1186/1472-6963-8-19</li> <li>Kumar, P., &amp; Afri-, S. (2007). Providing the Providers — Remediating Africa's Shortage of Health Care Workers.</li> <li>Dolea, C., Stormont, L., &amp; Braichet, J.-M. (2010). Evaluated strategies to increase attraction and retention of health workers in remote and rural areas. <i>Bulletin of the World Health Organization</i>, 88(5), 379–85. doi:10.2471/BLT.09.070607</li> <li>Wilson, N. W., Couper, I. D., De Vries, E., Reid, S., Fish, T., &amp; Marais, B. J. (2009). A critical review of interventions to redress the inequitable distribution of healthcare professionals to rural and remote areas. <i>Rural and remote health</i>, 9(2), 1060. Retrieved from <a href="http://www.ncbi.nlm.nih.gov/pubmed/19530891">http://www.ncbi.nlm.nih.gov/pubmed/19530891</a></li> <li>Frehywot, S., Mullan, F., Payne, P. W., &amp; Ross, H. (2010). Compulsory service programmes for recruiting health workers in remote and rural areas: do they work? <i>Bulletin of the World Health Organization</i>, 88(5), 364–70. doi:10.2471/BLT.09.071605</li> <li>Grobler, L., Bj, M., Sa, M., Pn, M., Reuter, H., &amp; Volmink, J. (2009). Interventions for increasing the proportion of health professionals practising in rural and other underserved areas ( Review ), (1).</li> <li>Pillay, a. L., &amp; Harvey, B. M. (2006). The Experiences of the First South African CS Clinical Psychologists. <i>South African Journal of Psychology</i>, 36(2), 259–280. doi:10.1177/008124630603600204</li> </ul>
		Above results refined to "CS for health professions" AND South Africa		60	<p>Duplicates</p> <ul style="list-style-type: none"> <li>Beyers, B. (2013). No Title, (October).</li> <li>Rohleder, P., Miller, M., &amp; Smith, R. (2006). Doing time : Clinical psychologists ' experience of CS in a prison placement, 36(4), 795–812.</li> <li>Plessis, J., Steenkamp, I., &amp; Troskie, I. (2003). Experiences and attitudes of dietitians during the first compulsory CS year ( 2003 ).</li> </ul>

					<ul style="list-style-type: none"> <li>Reid, S. J. (2006). Rural health and transformation in South Africa. <i>South African medical journal = Suid-Afrikaanse tydskrif vir geneeskunde</i>, 96(8), 676–7. Retrieved from <a href="http://www.ncbi.nlm.nih.gov/pubmed/21721301">http://www.ncbi.nlm.nih.gov/pubmed/21721301</a></li> <li>Wranz, E. S. (2011). Compulsory CS for Speech-language and Hearing Therapy Professionals : Readiness , Reality and Readjustment by, (March).</li> </ul>
24/7/2014		Needs of novice occupational therapists		17400 first 200 reviewed	<ul style="list-style-type: none"> <li>Unsworth, C. a. (2001). The Clinical Reasoning of Novice and Expert Occupational Therapists. <i>Scandinavian Journal of Occupational Therapy</i>, 8(4), 163–173. doi:10.1080/110381201317166522</li> <li>Tryssenaar, J. (1999). The Lived Experience of Becoming an Occupational . Therapist, 62(March).</li> <li>Are, T., Fewer, P., &amp; Working, O. T. (2003). Critical shortage of occupational therapists in rural Australia : Changing our long-held beliefs provides a solution, (November 2002), 184–187.</li> </ul>
25/7/2014		Needs of “novice health professional”		5192 first 200 reviewed	<p>Duplicates.</p> <ul style="list-style-type: none"> <li>Relevant associated articles (links) included:</li> <li>Talberg, H., Hes, M., &amp; Scott, D. (2014). Do physiotherapy students perceive that they are adequately prepared to enter clinical practice? An empirical study, 6(1), 17–22. doi:10.7196/AJHPE.219</li> <li>Frantz, J., &amp; Rooijen, A. J. Van. (2013). Article A model for community physiotherapy from the perspective of newly graduated physiotherapists as a guide to curriculum revision, 5(1), 19–25. doi:10.7196/AJHPE.203</li> <li>Swarts, B. (2013). A community (dis)service: Reflections of a CS clinical psychologist. <i>South African Journal of Psychology</i>, 43(1), 105–115. doi:10.1177/0081246312474420</li> <li>Levin, M. E. (2011). Effects on quality of care and health care worker satisfaction of language training for health care workers in South Africa, 3(1), 11–14.</li> <li>Deville-almond, J. (2011). Off to a flying start in practice, 21(10), 10–11.</li> <li>Price, B. (2014). Writing a journal article: guidance for novice authors. <i>Nursing Standard (Royal College of Nursing (Great Britain) : 1987)</i>, 28(35), 40–7. doi:10.7748/ns2014.04.28.35.40.e8582</li> <li>Seright, T. J. (2011). Clinical decision-making of rural novice nurses. <i>Rural and Remote Health</i>, 11(3), 1726. Retrieved from <a href="http://www.ncbi.nlm.nih.gov/pubmed/21787110">http://www.ncbi.nlm.nih.gov/pubmed/21787110</a></li> <li>Gaede, B., Mahlobo,S., Shabalala,K., Moloi, M. &amp; Van Deventer, C. (2006). Limitations to practicing holistically in the public sector in a rural sub-district in South Africa. <i>Rural and Remote Health</i>, 6:607. Retrieved from</li> <li>Mills, J. E., Francis, K., &amp; Bonner, A. (2007). The accidental mentor : Australian rural nurses developing supportive relationships in the workplace, 1–11.</li> <li>Roots, R. K., Brown, H., Bainbridge, L., &amp; Li, L. C. (2014). Rural rehabilitation practice : perspectives of occupational therapists and physical therapists in British Columbia , Canada, 1–16.</li> <li>Banks, P., Roxburgh, M., Kane, H., Lauder, W., Jones, M., Kydd, A., &amp; Atkinson, J. (2011). Flying Start NHS™: easing the transition from student to registered health professional. <i>Journal of Clinical Nursing</i>, 20(23-24), 3567–76. doi:10.1111/j.1365-2702.2011.03796.x</li> <li>Caspersen, J., &amp; Raaen, F. D. (2014). Novice teachers and how they cope. <i>Teachers and Teaching</i>, 20(2), 189–211. doi:10.1080/13540602.2013.848570</li> <li>Black, L. L., Jensen, G. M., Mostrom, E., Ritzline, P. D., Hayward, L., Black, L. L., ... Blackmer, B. (2010). Research Report The First Year of Practice : An Investigation of the Professional Promising Novice Physical Therapists. doi:10.2522/ptj.20100078</li> <li>Ladyshevsky, R. K. (n.d.). POTENTIAL PATTERN I Building Competency in the Novice Allied Health Professional through Peer Coaching, 77–83.</li> </ul>
1/8/14		“Hand Surgery in South Africa”		122	Pietrobon, C. (1996). Hand Therapy Trends in a Changing South Africa. <i>Journal of Hand Therapy</i> , 9(4), 299–302. doi:10.1016/S0894-1130(96)80033-0

## Appendix 2: Survey 1 Question rationale & Classification

#	Question Subject	Classification of Item	Rationale for inclusion
Section A: General CS Experience			
1	Age	Demographic	To develop a profile of participants' age
2	University	Demographic	To develop a profile of the universities from which participants graduated
3	Graduation year	Demographic	To develop a profile of participants' year of graduation
4	Gender	Demographic	To develop a profile of participants' gender
5	Province allocated	Demographic	To develop a profile of province allocation of participants
6	Level of Care	Demographic	To develop a profile of participants' allocation to levels of care
7	Location (rural/urban)	Demographic	To develop a profile of participants' location
8	Service Setting	Demographic	To develop a profile of participants service settings
9	No. Of service sites	Demographic	Morley (2009) highlighted the significant challenge that working at multiple practice sites can pose with negotiating access and the initiation and maintenance of relationships at each service site.
10	No. patients seen monthly	Demographic	Assist development of understanding of CSOT workload.
11	Common reasons for referral	Open ended	Gain understanding of <i>nature</i> of workload.
12	No. OTs in team/department	Numerical	Morley (2009) reported that working alone significantly impacts upon new graduate's transition to practice.
13	No. of other rehab personnel in team / work area	Numerical with open-ended component	Morley (2009, p.508) stated that, 'Novices learn from experienced practitioners in a 'community of practice' made up of practitioners with shared goals and interests' and that new graduates' informal access to other therapists support was the most important aspect in their development.
14	Supervisor – yes/no and supervisor's profession	Yes / No with opportunity to qualify response	Morley (2006) highlighted that supervision is crucial to assist the transition into practice and notes that the same need as been recognised in Canada, Australia and within the United Kingdom. It also preferable to be supervised by someone from your own profession (Steenbergen & Mackenzie, 2004; Toal-Sullivan, 2006).
15	Hours and content of supervision	Numerical item with open-ended component	Item included to ascertain extent and nature of supervision.
16	Satisfaction with supervision	Yes/No with unstructured component	The needs of new graduates change with time (Lee & Mackenzie, 2003) and are affected by contextual factors (Morley, 2009). A tailored approach that is perceived by CSOTs to meet their needs is essential.
17	Challenges around communication	Yes/No with unstructured component	Ramklass (2009) reported that CS physiotherapists had difficulty developing relationships with patients due to language barriers.
18	Able to observe other OTs' practice	Yes/No response	In Morley's (2009) research all newly qualified occupational therapists highly valued opportunity to observe the practice of others.
19	CS experience descriptors (related to practice in general)	Descriptor list (Multiple response item) with opportunity to add /explanation	<p>The list was provided to assist participants to describe their experience and opportunity was given for explanation. The list was compiled based on the feelings and experiences reported by graduates in studies conducted by :</p> <ul style="list-style-type: none"> <li>• Fortune, Ryan, &amp; Adamson, 2013</li> <li>• Hodgetts et al., 2007</li> <li>• Hummell &amp; Koelmeyer, 1999</li> <li>• Lee &amp; Mackenzie, 2003</li> <li>• Morley, 2006</li> <li>• Morley, 2009</li> <li>• Robertson &amp; Griffiths, 2009</li> <li>• Toal-sullivan, 2006</li> <li>• Wilding, Curtin, &amp; Whiteford, 2012</li> </ul> <p>Participants' were given the opportunity to add any other descriptors not included in the list. The question provided insight into the frequency of experiences and reasons for selections. The question aimed to</p>

			understand what feelings are commonplace as a consideration when preparing undergraduates or supporting new graduates in practice.
20	Cultural competence	Open-ended question	Ramklass (2009) reported that CS physiotherapists had difficulty developing relationships with patients from different cultural backgrounds to their own and who spoke a language different to their own. Cultural competence is needed to address the difficulty reported by Ramklass (2009). The scope of this project does not allow for a comprehensive assessment of this skill thus CSOTs OT's perceived level of cultural competence has been targeted in an open-ended question.
<b>Section B: UL rehabilitation experience</b>			
21	Practice learning experience at university in UL rehab	Yes / no	Practice learning experience may significantly contribute to new graduate's sense of preparedness for practice (Lloyd et al., 2007).
22	Aspect in curriculum that best prepared students for UL rehabilitation	Unstructured, open-ended item	Item included to identify teaching / learning experiences that they considered valuable in preparing them for practice.
23	Aspects that should have been included in UL rehabilitation curriculum	Unstructured, open-ended item	Item included to identify learning opportunities / experiences that CSOTs perceived would have been helpful.
24	No. Of UL rehabilitation patients treated monthly	Demographic Item	Item to establish how often hand rehabilitation is required of CS OTs.
25	Frequency of conditions seen	5 Point Frequency Scale with opportunity to comment	In 2001 The Hand Certification Commission of the United States completed a practice analysis of hand therapy. Kasch, Greenberg, & Muenzen (2003) reported the competency areas described and adopted by the commission from this analysis. Muenzen et al (2002), from the same analysis reported on the scope/domains of practice, commonly treated UL diagnoses and treatment techniques and tools. These descriptions of practice were used to develop questions in this study's questionnaire that related specifically to the assessment and treatment of the UL but was adapted somewhat for the South African context (informed by pilot study). Competency areas described by Kasch et al., 2003 were validated through a survey completed by 586 Certified Hand Therapists (South African participants being part of the validation process).
26	Equipped to treat conditions	Linear Numeric Scale with opportunity to comment	
27	Frequency of modality use	5 Point Frequency Scale with opportunity to comment	
28	Equipped to use modalities	Linear Numeric Scale with opportunity to comment	
29	Equipped within UL rehabilitation competency areas	5 Point Linear Numeric Scale with opportunity to comment	
30	UL rehabilitation descriptors	Descriptor list (Multiple response item)with opportunity to add and for explanation	List compiled by the researcher based on the article by Fitzpatrick (2006) to assist CSOTs in describing their feelings around UL rehabilitation with opportunity given for explanation and to add additional descriptors.
31	Perceived competence within UL rehabilitation	6 Point Linear Numeric Scale	Feelings of <i>competence and confidence</i> impact on the extent to which CSOTs feel prepared to treat patients with hand injuries and needs to be quantified.
32	Confidence in UL rehabilitation	6 Point Linear Numeric Scale	
33	Explanation of current confidence	Unstructured open-ended	
34	Presence of resources, professional support and development & practice perceptions	Multiple Choice, single response	A lack of supervision and support, and a lack of basic facilities and resources were identified as a significant constraint to delivery of quality services (Paterson et al., 2007). Parker et al (2012, p.1413) reported that 38% of their study sample did not have allocated space in which to complete their work. 31% of clinicians had access to email facility but more than half of these participants reported that this facility was faulty much of the time. 25% of clinicians did not have adequate resources to perform their jobs and 14% reported a lack of supervision and guidance.
35	Hinders/Helps to UL rehabilitation practice	Unstructured Open ended	Allowed participants to add factors that they considered to hinder or help their UL rehabilitation

			practice.
36	Aspects considered to assist UL rehabilitation practice	Multiple Choice, multiple response with opportunity to add	Suggestions compiled by researcher
37	Evidence used to support UL rehabilitation practice	Multiple Choice, multiple response with opportunity to add	Suggestions compiled by researcher
38	Other factors felt to impact UL rehabilitation preparedness	Unstructured, open-ended	Allowed participants to share any other aspects that they deemed important when considering the research question.

### **Appendix 3: Survey 1 (CSOT)**

This version of the questionnaire was the printable copy generated by *Fluidsurveys*®. *Hardcopy or emailed questionnaires completed by some participants were formatted more efficiently and allowed adequate space for comments. All questionnaires had attached information sheets and informed consent.*

#### CS Occupational Therapy & UL Rehabilitation

This is a survey designed to determine the extent to which CS Occupational Therapists (referred to as CSOTs) are equipped to treat patients who have (or are at risk of developing) UL / hand injuries or conditions. Even if you are not currently treating patients from this group, your response is valuable. This study has been approved by the University of Cape Town Human Research Ethics Committee (551/2013). Your name will be dissociated from your questionnaire during analysis and your responses will thus remain anonymous. This survey should take approximately 30 minutes for you to complete. Please complete the questions based on your experience in general within your service year thus far rather than relating your responses to isolated patients or incidents. Thank you for your time and willingness to share your experience!  
–Kirsty van Stormbroek (OT)

If you have not yet received an Information Sheet about the study, please read the information below:

Dear Community Service Occupational Therapist.

Community Service can be both daunting and a great adventure. Your 2013 year of service is increasing the number of professionals providing vital health services to the South African people and in many cases improving communities' access to rehabilitation services. It is a year, however, that is seldom without its challenges. I am an Occupational Therapist currently working and completing my Masters in Occupational Therapy at the University of Cape Town. My personal community service experience gave me a passion for Community Service Occupational Therapists (CSOTs). My subsequent experience within hand rehabilitation at a large state hospital has not only given me a commitment to optimizing hand rehabilitation services but has prompted me to question the extent to which Community Service Occupational Therapists are equipped to treat patients with hand injuries and conditions. It is with this background that I started this Masters Research project and would like to request your participation in a survey. Even if you have not yet treated a patient with an injury or condition affecting their upper limb, or never plan to, your opinions and experiences are valued. This study has been approved by the University of Cape Town Human Research Ethics Committee (551/2013). Completing the questionnaire will take approximately 30 minutes. Questionnaires have been sent to all 2013 registered CSOTs in South Africa and may be completed and submitted electronically by following the internet link below or completing the emailed attachment / mailed hardcopy and returning these. Participation of the entire 2013 CSOT group will enable the research to capture the experiences of graduates from all 8 Universities who are practicing across all provinces within various service settings. Your name will not be reported and your university will be assigned a pseudonym when results are reported. Results applicable to each university will be sent to them on request. Your participation is voluntary and you are free to withdraw from the research process at any point before submitting your completed questionnaire. Your questionnaire will be allocated a number and your name removed from it before analysis begins in order to protect confidentiality. This means that it will no longer be possible to withdraw your individual questionnaire from the pool of responses. (Your name is requested in the survey only to ensure that multiple responses from the same participant is avoided and so that you can be entered into the hand rehabilitation textbook draw). A list linking questionnaire numbers to participants' names will be kept by the researcher on her password-protected computer. On completion of the research, this list will be destroyed. Should you have chosen to submit an emailed survey or mailed hardcopy, your responses will be manually entered into an online survey tool. Your completed survey (email or hard-copy) will be kept securely (on researcher's password protected computer) until the research project is completed and then these documents will be destroyed. Various online-based systems will be used to store and analyse data. Systems committed to the security of information have been chosen to ensure the safety of the information that you share as far as possible. The questions in the survey are not generally of a sensitive nature. If they, however, cause you any distress or highlight a need you may have for support, supervision, counseling etc., please do not hesitate to convey this so that I can assist you in obtaining the assistance you would like. The names of all participants who complete questionnaires will be entered into a lucky draw. The winner will receive a hand rehabilitation textbook kindly sponsored by Elsevier. Participating in this study will allow you to share your unique experience that may improve the experience of CSOTs in the future as well as improve services offered to the South African population. A summary of the results of the study will be emailed to you on completion of the project. Completed questionnaires and consent forms need to be returned by 30 November 2013. Should you choose to post the survey, please make use of the enclosed envelope with postage attached. (Please also allow time for your response to reach us by 30 November 2013). Thank you for your time and for sharing your community service experience. I wish you everything of the best for the rest of the year. Please feel free to ask any questions you may have about the research by contacting me by email: [kirsty.vanstormbroek@uct.ac.za](mailto:kirsty.vanstormbroek@uct.ac.za) or telephone: 060977705 or the research supervisor, Dr Helen Buchanan (email: [Helen.buchanan@uct.ac.za](mailto:Helen.buchanan@uct.ac.za), tel: 021 406 6383). Should you have any concerns regarding your rights or welfare as a research participant, please contact the University of Cape Town, Faculty of Health Sciences, Human Research Ethics Committee (HREC) (Prof Marc Blockman, email: [Marc.Blockman@uct.ac.za](mailto:Marc.Blockman@uct.ac.za) or tel: 021 406 6338).

**Informed Consent**

Before you get started, please read the information sheet attached to the email that you received (or the information above) and answer the following questions:

- Do you understand the implications of your involvement?  Yes  No
- Have you read the information sheet?  Yes  No
- Have you been given the opportunity to ask questions and discuss the study?  Yes  No
- Have you received satisfactory answers to all of your questions?  Yes  No
- Have you received enough information about the study?  Yes  No
- Do you understand that you are free to withdraw from this study at any time prior to submitting your questionnaire, without having to give reasons for withdrawing and without any penalty?  Yes  No
- Do you agree to take part in this study?  Yes  No

Your Name and Surname:

Date:

**Section A: General Information**

***Please provide your Name and Surname***

Your name is requested in the survey only to ensure that multiple responses from the same participant is avoided and so that you can be entered into the hand rehabilitation textbook draw. Your questionnaire will be allocated a number and your name removed from it before analysis begins in order to protect confidentiality.

***How old are?***

***From which University did you graduate?***

- Free State
- Cape Town
- Pretoria
- Stellenbosch
- Limpopo
- Western Cape
- KwaZulu Natal
- Witwatersrand

***In what year did you complete your undergraduate Occupational Therapy Programme?***

***Please indicate your gender***

- Male
- Female
- I do not wish to disclose this information

***In which province are you working as a CSOT?***

- Eastern Cape
- Gauteng
- Free State
- KwaZulu Natal
- Limpopo
- Mpumalanga
- Northwest
- Northern Cape
- Western Cape

**At what level/s of care do you provide services (more than one option may be selected)?**

- Primary
- Secondary / District
- Tertiary
- Other \_\_\_\_\_

**In what type of area have you been placed?**

- Rural / Deep Rural
- Urban / Peri-urban

**Do you deliver a facility-based or community-based service? Check both if appropriate**

- Facility-based Service
- Community-based Service

**At how many different sites do you deliver services? (eg. clinics, community centres etc)**

**Approximately how many patients do you see per month in total?**

**For what reasons / intervention are patients commonly referred to you? Eg. Wheelchair prescription, disability grant screening.**

**How many occupational therapists are there in your team/department?**

**How many other rehabilitation personnel are there in your team/work area? Please indicate to which discipline they belong.**

**Do you have a supervisor? If yes, please indicate to which profession he/she belongs (OT/PT/Nursing)**

- Yes \_\_\_\_\_
- No

**How many hours of supervision (informal and formal combined) do you receive per month and what is covered in this time?**

**Are you satisfied with the supervision that you receive? Please explain your answer.**

Please explain

Yes

No

**Is communication with your patients a challenge? Please explain your answer**

Please explain

Yes

No

**Are you able to observe other occupational therapists practicing? You may use the space provided to explain your answer if you so choose.**

Please explain

Yes

No

**Please select any or all of the words that you would use to describe how you feel or how you have felt about your CS experience thus far. Please explain the reason for your choice in the comment box provided if you wish to. I feel...**



- A need for specific knowledge in assessment and treatment. \_\_\_\_\_
- A sense of satisfaction from interacting with clients \_\_\_\_\_
- A strong identity as an occupational therapist \_\_\_\_\_
- Accountable \_\_\_\_\_
- Affirmed in decision making \_\_\_\_\_
- Alone \_\_\_\_\_
- Anxious \_\_\_\_\_
- Apprehensive \_\_\_\_\_
- Autonomous \_\_\_\_\_
- Challenged \_\_\_\_\_
- Encouraged to reflect critically on my practice \_\_\_\_\_
- Enthusiastic \_\_\_\_\_
- Frustrated \_\_\_\_\_
- Ill-equipped to manage stress \_\_\_\_\_
- Inadequate \_\_\_\_\_
- Isolated \_\_\_\_\_
- Like a physio \_\_\_\_\_
- Like a student \_\_\_\_\_
- Like I am consolidating my skills \_\_\_\_\_
- Like I am adjusting \_\_\_\_\_
- Like I am just surviving \_\_\_\_\_
- Like I am thriving \_\_\_\_\_
- Like I lack recognition \_\_\_\_\_
- Like I need a mentor \_\_\_\_\_
- Like I often doubt myself \_\_\_\_\_
- Like my expectations have been met \_\_\_\_\_
- Like my workload is realistic \_\_\_\_\_
- Like Occupational Therapy is poorly recognised \_\_\_\_\_
- Motivated \_\_\_\_\_
- Okay with not knowing everything \_\_\_\_\_
- Overwhelmed \_\_\_\_\_
- Poorly understood as an Occupational Therapist \_\_\_\_\_
- Pressure to perform \_\_\_\_\_
- Professionally confident \_\_\_\_\_
- Proud to be an Occupational Therapist \_\_\_\_\_
- Resentful \_\_\_\_\_
- Resourceful \_\_\_\_\_
- Satisfied in my job \_\_\_\_\_
- Self confident \_\_\_\_\_
- Stressed \_\_\_\_\_
- Supported \_\_\_\_\_
- Uncertain \_\_\_\_\_
- Uncertain about my role \_\_\_\_\_
- Unconfident \_\_\_\_\_
- Undervalued \_\_\_\_\_
- Unsettled \_\_\_\_\_
- Unsupported \_\_\_\_\_
- Unsure whether I am doing the right thing \_\_\_\_\_
- Other: \_\_\_\_\_

***How culturally competent do you feel and how do you think that this impacts on your practice?***

Cultural competence has been defined as ‘is the ability of an individual to understand and respect values, attitudes, beliefs, and mores that differ across cultures, and to consider and respond appropriately to these differences in planning, implementing, and evaluating health education and promotion programs and interventions’ (Joint Committee on Health Education and Promotion Terminology, 2000)

**Section B: UL Rehabilitation**

Please note: UL Injuries and Conditions is a term used in this survey to refer to any condition affecting the function of the upper quarter (including the hand) including upper motor neuron lesions (eg. cerebral palsy, CVA), lower motor neuron lesions and injuries to other systems.

**Did you have a practice learning placement as a student at a site where you were required to treat patients with UL injuries and conditions?**

Yes \_\_\_\_\_

No \_\_\_\_\_

**What aspect of your undergraduate curriculum (eg. lecture, practical experience, tutorial, elective) prepared you most for treating patients with UL injuries and conditions?**

**What do you think could have been included in your undergraduate curriculum to better prepare you to treat patients with UL injuries and conditions?**

**Approximately how many patients with UL injuries or conditions do you treat each month?**

**Listed below are various UL diagnoses. Please indicate by selecting from the dropdown list how often you treat patients with / at risk of each condition using the scale provided. If known please state the commonly seen primary cause of the injury (eg. Stab, accident-on-duty).**

		Primary Cause
Amputations	<input type="radio"/> Daily <input type="radio"/> Weekly <input type="radio"/> Monthly <input type="radio"/> Every 2nd month or less <input type="radio"/> Never	<input type="text"/>
Central nervous system disorders as they relate to the upper quarter eg. cerebral palsy, CVA	<input type="radio"/> Daily <input type="radio"/> Weekly <input type="radio"/> Monthly <input type="radio"/> Every 2nd month or less <input type="radio"/> Never	<input type="text"/>
Congenital differences/anomalies	<input type="radio"/> Daily <input type="radio"/> Weekly <input type="radio"/> Monthly <input type="radio"/> Every 2nd month or less <input type="radio"/> Never	<input type="text"/>
Cumulative trauma disorders/repetitive stress injuries eg. De Quervain's tenosynovitis, epicondylitis	<input type="radio"/> Daily <input type="radio"/> Weekly <input type="radio"/> Monthly <input type="radio"/> Every 2nd month or less <input type="radio"/> Never	<input type="text"/>
Dupuytren's contracture	<input type="radio"/> Daily <input type="radio"/> Weekly <input type="radio"/> Monthly <input type="radio"/> Every 2nd month or less <input type="radio"/> Never	<input type="text"/>
Flexor/extensor tendon injuries	<input type="radio"/> Daily <input type="radio"/> Weekly <input type="radio"/> Monthly <input type="radio"/> Every 2nd month or less <input type="radio"/> Never	<input type="text"/>
Fractures/dislocations/joint instabilities	<input type="radio"/> Daily <input type="radio"/> Weekly <input type="radio"/> Monthly <input type="radio"/> Every 2nd month or less <input type="radio"/> Never	<input type="text"/>
Infections (eg. human bite injury, cellulitis, paronychia)	<input type="radio"/> Daily <input type="radio"/> Weekly <input type="radio"/> Monthly <input type="radio"/> Every 2nd month or less <input type="radio"/> Never	<input type="text"/>
Inflammatory and degenerative arthritis (eg. Osteoarthritis, Rheumatoid Arthritis, Scleroderma, Fibromyalgia)	<input type="radio"/> Daily <input type="radio"/> Weekly <input type="radio"/> Monthly <input type="radio"/> Every 2nd month or less <input type="radio"/> Never	<input type="text"/>
Complex trauma affecting multiple tissue types (eg. gunshot wounds, Panga injury, crush injury)	<input type="radio"/> Daily <input type="radio"/> Weekly <input type="radio"/> Monthly <input type="radio"/> Every 2nd month or less <input type="radio"/> Never	<input type="text"/>
Nail bed injuries	<input type="radio"/> Daily <input type="radio"/> Weekly <input type="radio"/> Monthly <input type="radio"/> Every 2nd month or less <input type="radio"/> Never	<input type="text"/>
Pain-related syndromes (eg. complex regional pain syndrome)	<input type="radio"/> Daily <input type="radio"/> Weekly <input type="radio"/> Monthly <input type="radio"/> Every 2nd month or less <input type="radio"/> Never	<input type="text"/>
Peripheral nerve compression and disease (eg. Carpal tunnel syndrome, thoracic outlet syndrome,	<input type="radio"/> Daily <input type="radio"/> Weekly	<input type="text"/>

diabetic neuropathy)	<input type="radio"/> Monthly	
	<input type="radio"/> Every 2nd month or less	
	<input type="radio"/> Never	
Peripheral nerve injuries (peripheral nerves and brachial plexus injuries)	<input type="radio"/> Daily	<input type="text"/>
	<input type="radio"/> Weekly	
	<input type="radio"/> Monthly	
	<input type="radio"/> Every 2nd month or less	
	<input type="radio"/> Never	
Post-mastectomy/post-radiation lymphedema	<input type="radio"/> Daily	<input type="text"/>
	<input type="radio"/> Weekly	
	<input type="radio"/> Monthly	
	<input type="radio"/> Every 2nd month or less	
	<input type="radio"/> Never	
Psychogenic disorders involving the upper quarter (eg. Conversion disorder, clenched fist syndrome)	<input type="radio"/> Daily	<input type="text"/>
	<input type="radio"/> Weekly	
	<input type="radio"/> Monthly	
	<input type="radio"/> Every 2nd month or less	
	<input type="radio"/> Never	
Soft tissue injuries (eg. acute ligament injuries)	<input type="radio"/> Daily	<input type="text"/>
	<input type="radio"/> Weekly	
	<input type="radio"/> Monthly	
	<input type="radio"/> Every 2nd month or less	
	<input type="radio"/> Never	
Thermal Injuries including burns, electrical injuries	<input type="radio"/> Daily	<input type="text"/>
	<input type="radio"/> Weekly	
	<input type="radio"/> Monthly	
	<input type="radio"/> Every 2nd month or less	
	<input type="radio"/> Never	
Tumors and Cysts (eg. ganglions)	<input type="radio"/> Daily	<input type="text"/>
	<input type="radio"/> Weekly	
	<input type="radio"/> Monthly	
	<input type="radio"/> Every 2nd month or less	
	<input type="radio"/> Never	
Vascular disorders (eg. aneurysm)	<input type="radio"/> Daily	<input type="text"/>
	<input type="radio"/> Weekly	
	<input type="radio"/> Monthly	
	<input type="radio"/> Every 2nd month or less	
	<input type="radio"/> Never	
Other:	<input type="radio"/> Daily	<input type="text"/>
	<input type="radio"/> Weekly	
	<input type="radio"/> Monthly	
	<input type="radio"/> Every 2nd month or less	
	<input type="radio"/> Never	

**Listed below are various UL diagnoses. Please indicate by selecting from the dropdown list how equipped and prepared you feel to treat these patients effectively by using the scale provided. If you wish to explain your answer, please do so in the comment column:**

		Comment
Amputations	<input type="radio"/> extremely prepared/equipped	
	<input type="radio"/> well prepared/equipped	<input type="text"/>
	<input type="radio"/> somewhat prepared/equipped	
	<input type="radio"/> poorly prepared/equipped	
	<input type="radio"/> extremely unprepared/ill-equipped	
Central nervous system disorders as they relate to the upper quarter eg. cerebral palsy, CVA	<input type="radio"/> extremely prepared/equipped	
	<input type="radio"/> well prepared/equipped	<input type="text"/>
	<input type="radio"/> somewhat prepared/equipped	
	<input type="radio"/> poorly prepared/equipped	
	<input type="radio"/> extremely unprepared/ill-equipped	
Congenital differences/anomalies	<input type="radio"/> extremely prepared/equipped	
	<input type="radio"/> well prepared/equipped	<input type="text"/>
	<input type="radio"/> somewhat prepared/equipped	
	<input type="radio"/> poorly prepared/equipped	
	<input type="radio"/> extremely unprepared/ill-equipped	
Cumulative trauma disorders/repetitive stress	<input type="radio"/> extremely prepared/equipped	

injuries eg. De Quervain's tenosynovitis, epicondylitis	<input type="radio"/>	well prepared/equipped	<input type="text"/>
	<input type="radio"/>	somewhat prepared/equipped	
	<input type="radio"/>	poorly prepared/equipped	
	<input type="radio"/>	extremely unprepared/ill-equipped	
Dupuytren's contracture	<input type="radio"/>	extremely prepared/equipped	
	<input type="radio"/>	well prepared/equipped	<input type="text"/>
	<input type="radio"/>	somewhat prepared/equipped	
	<input type="radio"/>	poorly prepared/equipped	
	<input type="radio"/>	extremely unprepared/ill-equipped	
Flexor/extensor tendon injuries	<input type="radio"/>	extremely prepared/equipped	
	<input type="radio"/>	well prepared/equipped	<input type="text"/>
	<input type="radio"/>	somewhat prepared/equipped	
	<input type="radio"/>	poorly prepared/equipped	
	<input type="radio"/>	extremely unprepared/ill-equipped	
Fractures/dislocations/joint instabilities	<input type="radio"/>	extremely prepared/equipped	
	<input type="radio"/>	well prepared/equipped	<input type="text"/>
	<input type="radio"/>	somewhat prepared/equipped	
	<input type="radio"/>	poorly prepared/equipped	
	<input type="radio"/>	extremely unprepared/ill-equipped	
Infections (eg. human bite injury, cellulitis, paronychia)	<input type="radio"/>	extremely prepared/equipped	
	<input type="radio"/>	well prepared/equipped	<input type="text"/>
	<input type="radio"/>	somewhat prepared/equipped	
	<input type="radio"/>	poorly prepared/equipped	
	<input type="radio"/>	extremely unprepared/ill-equipped	
Inflammatory and degenerative arthritis (eg. Osteoarthritis, Rheumatoid Arthritis, Scleroderma, Fibromyalgia)	<input type="radio"/>	extremely prepared/equipped	
	<input type="radio"/>	well prepared/equipped	<input type="text"/>
	<input type="radio"/>	somewhat prepared/equipped	
	<input type="radio"/>	poorly prepared/equipped	
	<input type="radio"/>	extremely unprepared/ill-equipped	
Complex trauma affecting multiple tissue types (eg. gunshot wounds, Panga injury, crush injury)	<input type="radio"/>	extremely prepared/equipped	
	<input type="radio"/>	well prepared/equipped	<input type="text"/>
	<input type="radio"/>	somewhat prepared/equipped	
	<input type="radio"/>	poorly prepared/equipped	
	<input type="radio"/>	extremely unprepared/ill-equipped	
Nail bed injuries	<input type="radio"/>	extremely prepared/equipped	
	<input type="radio"/>	well prepared/equipped	<input type="text"/>
	<input type="radio"/>	somewhat prepared/equipped	
	<input type="radio"/>	poorly prepared/equipped	
	<input type="radio"/>	extremely unprepared/ill-equipped	
Pain-related syndromes (eg. complex regional pain syndrome)	<input type="radio"/>	extremely prepared/equipped	
	<input type="radio"/>	well prepared/equipped	<input type="text"/>
	<input type="radio"/>	somewhat prepared/equipped	
	<input type="radio"/>	poorly prepared/equipped	
	<input type="radio"/>	extremely unprepared/ill-equipped	
Peripheral nerve compression and disease (eg. Carpal tunnel syndrome, thoracic outlet syndrome, diabetic neuropathy)	<input type="radio"/>	extremely prepared/equipped	
	<input type="radio"/>	well prepared/equipped	<input type="text"/>
	<input type="radio"/>	somewhat prepared/equipped	
	<input type="radio"/>	poorly prepared/equipped	
	<input type="radio"/>	extremely unprepared/ill-equipped	
Peripheral nerve injuries (peripheral nerves and brachial plexus injuries)	<input type="radio"/>	extremely prepared/equipped	
	<input type="radio"/>	well prepared/equipped	<input type="text"/>
	<input type="radio"/>	somewhat prepared/equipped	
	<input type="radio"/>	poorly prepared/equipped	
	<input type="radio"/>	extremely unprepared/ill-equipped	
Post-mastectomy/post-radiation lymphedema	<input type="radio"/>	extremely prepared/equipped	
	<input type="radio"/>	well prepared/equipped	<input type="text"/>
	<input type="radio"/>	somewhat prepared/equipped	
	<input type="radio"/>	poorly prepared/equipped	
	<input type="radio"/>	extremely unprepared/ill-equipped	
Psychogenic disorders involving the upper quarter (eg. Conversion disorder, clenched fist syndrome)	<input type="radio"/>	extremely prepared/equipped	
	<input type="radio"/>	well prepared/equipped	<input type="text"/>
	<input type="radio"/>	somewhat prepared/equipped	
	<input type="radio"/>	poorly prepared/equipped	
	<input type="radio"/>	extremely unprepared/ill-equipped	
Soft tissue injuries (eg. acute ligament injuries)	<input type="radio"/>	extremely prepared/equipped	

	<input type="radio"/>	well prepared/equipped	<input type="text"/>
	<input type="radio"/>	somewhat prepared/equipped	
	<input type="radio"/>	poorly prepared/equipped	
	<input type="radio"/>	extremely unprepared/ill-equipped	
Thermal Injuries including burns, electrical injuries	<input type="radio"/>	extremely prepared/equipped	
	<input type="radio"/>	well prepared/equipped	<input type="text"/>
	<input type="radio"/>	somewhat prepared/equipped	
	<input type="radio"/>	poorly prepared/equipped	
	<input type="radio"/>	extremely unprepared/ill-equipped	
Tumors and Cysts (eg. ganglions)	<input type="radio"/>	extremely prepared/equipped	
	<input type="radio"/>	well prepared/equipped	<input type="text"/>
	<input type="radio"/>	somewhat prepared/equipped	
	<input type="radio"/>	poorly prepared/equipped	
	<input type="radio"/>	extremely unprepared/ill-equipped	
Vascular disorders (eg. aneurysm)	<input type="radio"/>	extremely prepared/equipped	
	<input type="radio"/>	well prepared/equipped	<input type="text"/>
	<input type="radio"/>	somewhat prepared/equipped	
	<input type="radio"/>	poorly prepared/equipped	
	<input type="radio"/>	extremely unprepared/ill-equipped	
Other:	<input type="radio"/>	extremely prepared/equipped	
	<input type="radio"/>	well prepared/equipped	<input type="text"/>
	<input type="radio"/>	somewhat prepared/equipped	
	<input type="radio"/>	poorly prepared/equipped	
	<input type="radio"/>	extremely unprepared/ill-equipped	

**Listed below are various interventions / modalities commonly used to treat patients with, or at risk of, UL pathology. Please indicate by selecting from the dropdown list how often you make use of each modality making use of the scale**

		Comment
Activity as a 'means' and / or 'an end'	<input type="radio"/> Daily	<input type="text"/>
	<input type="radio"/> Weekly	
	<input type="radio"/> Monthly	
	<input type="radio"/> Every 2nd month or less	
	<input type="radio"/> Never	
Adaptive / assistive devices	<input type="radio"/> Daily	<input type="text"/>
	<input type="radio"/> Weekly	
	<input type="radio"/> Monthly	
	<input type="radio"/> Every 2nd month or less	
	<input type="radio"/> Never	
Appropriate paper-based technology (APT)	<input type="radio"/> Daily	<input type="text"/>
	<input type="radio"/> Weekly	
	<input type="radio"/> Monthly	
	<input type="radio"/> Every 2nd month or less	
	<input type="radio"/> Never	
Training in activities of daily living (ADLs)	<input type="radio"/> Daily	<input type="text"/>
	<input type="radio"/> Weekly	
	<input type="radio"/> Monthly	
	<input type="radio"/> Every 2nd month or less	
	<input type="radio"/> Never	
Behaviour Management eg. CBT	<input type="radio"/> Daily	<input type="text"/>
	<input type="radio"/> Weekly	
	<input type="radio"/> Monthly	
	<input type="radio"/> Every 2nd month or less	
	<input type="radio"/> Never	
Compressive therapy eg. pressure garments	<input type="radio"/> Daily	<input type="text"/>
	<input type="radio"/> Weekly	
	<input type="radio"/> Monthly	
	<input type="radio"/> Every 2nd month or less	
	<input type="radio"/> Never	
Desensitization	<input type="radio"/> Daily	<input type="text"/>
	<input type="radio"/> Weekly	
	<input type="radio"/> Monthly	
	<input type="radio"/> Every 2nd month or less	
	<input type="radio"/> Never	
Electrical Modalities (eg. Ultrasound)	<input type="radio"/> Daily	<input type="text"/>
	<input type="radio"/> Weekly	

	<input type="radio"/>	Monthly	
	<input type="radio"/>	Every 2nd month or less	
	<input type="radio"/>	Never	
Ergonomic Modifications	<input type="radio"/>	Daily	<input type="text"/>
	<input type="radio"/>	Weekly	
	<input type="radio"/>	Monthly	
	<input type="radio"/>	Every 2nd month or less	
	<input type="radio"/>	Never	
Exercise	<input type="radio"/>	Daily	<input type="text"/>
	<input type="radio"/>	Weekly	
	<input type="radio"/>	Monthly	
	<input type="radio"/>	Every 2nd month or less	
	<input type="radio"/>	Never	
Home programmes	<input type="radio"/>	Daily	<input type="text"/>
	<input type="radio"/>	Weekly	
	<input type="radio"/>	Monthly	
	<input type="radio"/>	Every 2nd month or less	
	<input type="radio"/>	Never	
Manual Therapy eg. NDT, manual oedema mobilization	<input type="radio"/>	Daily	<input type="text"/>
	<input type="radio"/>	Weekly	
	<input type="radio"/>	Monthly	
	<input type="radio"/>	Every 2nd month or less	
	<input type="radio"/>	Never	
Mirror Therapy (as part of a graded-motor imagery program)	<input type="radio"/>	Daily	<input type="text"/>
	<input type="radio"/>	Weekly	
	<input type="radio"/>	Monthly	
	<input type="radio"/>	Every 2nd month or less	
	<input type="radio"/>	Never	
Patient, family, workplace education	<input type="radio"/>	Daily	<input type="text"/>
	<input type="radio"/>	Weekly	
	<input type="radio"/>	Monthly	
	<input type="radio"/>	Every 2nd month or less	
	<input type="radio"/>	Never	
Prosthetic training	<input type="radio"/>	Daily	<input type="text"/>
	<input type="radio"/>	Weekly	
	<input type="radio"/>	Monthly	
	<input type="radio"/>	Every 2nd month or less	
	<input type="radio"/>	Never	
Scar management techniques	<input type="radio"/>	Daily	<input type="text"/>
	<input type="radio"/>	Weekly	
	<input type="radio"/>	Monthly	
	<input type="radio"/>	Every 2nd month or less	
	<input type="radio"/>	Never	
Sensory re-education	<input type="radio"/>	Daily	<input type="text"/>
	<input type="radio"/>	Weekly	
	<input type="radio"/>	Monthly	
	<input type="radio"/>	Every 2nd month or less	
	<input type="radio"/>	Never	
Splinting	<input type="radio"/>	Daily	<input type="text"/>
	<input type="radio"/>	Weekly	
	<input type="radio"/>	Monthly	
	<input type="radio"/>	Every 2nd month or less	
	<input type="radio"/>	Never	
Standardized and non-standardized assessment tools	<input type="radio"/>	Daily	<input type="text"/>
	<input type="radio"/>	Weekly	
	<input type="radio"/>	Monthly	
	<input type="radio"/>	Every 2nd month or less	
	<input type="radio"/>	Never	
Strengthening	<input type="radio"/>	Daily	<input type="text"/>
	<input type="radio"/>	Weekly	
	<input type="radio"/>	Monthly	
	<input type="radio"/>	Every 2nd month or less	
	<input type="radio"/>	Never	
Thermal modalities eg. icing, heat	<input type="radio"/>	Daily	<input type="text"/>
	<input type="radio"/>	Weekly	
	<input type="radio"/>	Monthly	

Work hardening / retraining	<input type="radio"/> Every 2nd month or less <input type="radio"/> Never <input type="radio"/> Daily <input type="radio"/> Weekly <input type="radio"/> Monthly <input type="radio"/> Every 2nd month or less <input type="radio"/> Never <input type="radio"/> Daily <input type="radio"/> Weekly <input type="radio"/> Monthly <input type="radio"/> Every 2nd month or less <input type="radio"/> Never <input type="radio"/> Daily <input type="radio"/> Weekly <input type="radio"/> Monthly <input type="radio"/> Every 2nd month or less <input type="radio"/> Never	<input type="text"/>
Wound Care / dressing	<input type="radio"/> Every 2nd month or less <input type="radio"/> Never <input type="radio"/> Daily <input type="radio"/> Weekly <input type="radio"/> Monthly <input type="radio"/> Every 2nd month or less <input type="radio"/> Never <input type="radio"/> Daily <input type="radio"/> Weekly <input type="radio"/> Monthly <input type="radio"/> Every 2nd month or less <input type="radio"/> Never	<input type="text"/>
Other:	<input type="radio"/> Every 2nd month or less <input type="radio"/> Never <input type="radio"/> Daily <input type="radio"/> Weekly <input type="radio"/> Monthly <input type="radio"/> Every 2nd month or less <input type="radio"/> Never	<input type="text"/>

**Listed below are various interventions / modalities commonly used in treating patients with, or at risk of, UL pathology. Please indicate by selecting from the drop-down list how equipped and prepared you feel to effectively implement these modalities in treating patients with UL pathology by using the scale provided. If you wish to explain your answer, please do so in the comment column:**

		Comment
Activity as a 'means' / as an 'end'	<input type="radio"/> Extremely prepared/equipped <input type="radio"/> Well prepared/equipped <input type="radio"/> Somewhat prepared /equipped <input type="radio"/> Poorly prepared / equipped <input type="radio"/> Extremely unprepared / ill-equipped	<input type="text"/>
Adaptive / assistive devices	<input type="radio"/> Extremely prepared/equipped <input type="radio"/> Well prepared/equipped <input type="radio"/> Somewhat prepared /equipped <input type="radio"/> Poorly prepared / equipped <input type="radio"/> Extremely unprepared / ill-equipped	<input type="text"/>
Appropriate Paper-based technology (APT)	<input type="radio"/> Extremely prepared/equipped <input type="radio"/> Well prepared/equipped <input type="radio"/> Somewhat prepared /equipped <input type="radio"/> Poorly prepared / equipped <input type="radio"/> Extremely unprepared / ill-equipped	<input type="text"/>
Training in activities of daily living (ADLs)	<input type="radio"/> Extremely prepared/equipped <input type="radio"/> Well prepared/equipped <input type="radio"/> Somewhat prepared /equipped <input type="radio"/> Poorly prepared / equipped <input type="radio"/> Extremely unprepared / ill-equipped	<input type="text"/>
Behaviour Management	<input type="radio"/> Extremely prepared/equipped <input type="radio"/> Well prepared/equipped <input type="radio"/> Somewhat prepared /equipped <input type="radio"/> Poorly prepared / equipped <input type="radio"/> Extremely unprepared / ill-equipped	<input type="text"/>
Compressive therapy	<input type="radio"/> Extremely prepared/equipped <input type="radio"/> Well prepared/equipped <input type="radio"/> Somewhat prepared /equipped <input type="radio"/> Poorly prepared / equipped <input type="radio"/> Extremely unprepared / ill-equipped	<input type="text"/>
Desensitization	<input type="radio"/> Extremely prepared/equipped <input type="radio"/> Well prepared/equipped <input type="radio"/> Somewhat prepared /equipped <input type="radio"/> Poorly prepared / equipped <input type="radio"/> Extremely unprepared / ill-equipped	<input type="text"/>
Electrical Modalities eg. Ultrasound	<input type="radio"/> Extremely prepared/equipped	<input type="text"/>



	<input type="radio"/>	Well prepared/equipped	
	<input type="radio"/>	Somewhat prepared /equipped	
	<input type="radio"/>	Poorly prepared / equipped	
	<input type="radio"/>	Extremely unprepared / ill-equipped	
Ergonomic Modifications	<input type="radio"/>	Extremely prepared/equipped	<input type="text"/>
	<input type="radio"/>	Well prepared/equipped	
	<input type="radio"/>	Somewhat prepared /equipped	
	<input type="radio"/>	Poorly prepared / equipped	
	<input type="radio"/>	Extremely unprepared / ill-equipped	
Exercise	<input type="radio"/>	Extremely prepared/equipped	<input type="text"/>
	<input type="radio"/>	Well prepared/equipped	
	<input type="radio"/>	Somewhat prepared /equipped	
	<input type="radio"/>	Poorly prepared / equipped	
	<input type="radio"/>	Extremely unprepared / ill-equipped	
Home programmes	<input type="radio"/>	Extremely prepared/equipped	<input type="text"/>
	<input type="radio"/>	Well prepared/equipped	
	<input type="radio"/>	Somewhat prepared /equipped	
	<input type="radio"/>	Poorly prepared / equipped	
	<input type="radio"/>	Extremely unprepared / ill-equipped	
Manual Therapy eg. NDT, manual oedema mobilization	<input type="radio"/>	Extremely prepared/equipped	<input type="text"/>
	<input type="radio"/>	Well prepared/equipped	
	<input type="radio"/>	Somewhat prepared /equipped	
	<input type="radio"/>	Poorly prepared / equipped	
	<input type="radio"/>	Extremely unprepared / ill-equipped	
Mirror Therapy (as part of a graded-motor imagery program)	<input type="radio"/>	Extremely prepared/equipped	<input type="text"/>
	<input type="radio"/>	Well prepared/equipped	
	<input type="radio"/>	Somewhat prepared /equipped	
	<input type="radio"/>	Poorly prepared / equipped	
	<input type="radio"/>	Extremely unprepared / ill-equipped	
Patient, family, workplace education	<input type="radio"/>	Extremely prepared/equipped	<input type="text"/>
	<input type="radio"/>	Well prepared/equipped	
	<input type="radio"/>	Somewhat prepared /equipped	
	<input type="radio"/>	Poorly prepared / equipped	
	<input type="radio"/>	Extremely unprepared / ill-equipped	
Prosthetic training	<input type="radio"/>	Extremely prepared/equipped	<input type="text"/>
	<input type="radio"/>	Well prepared/equipped	
	<input type="radio"/>	Somewhat prepared /equipped	
	<input type="radio"/>	Poorly prepared / equipped	
	<input type="radio"/>	Extremely unprepared / ill-equipped	
Scar management techniques	<input type="radio"/>	Extremely prepared/equipped	<input type="text"/>
	<input type="radio"/>	Well prepared/equipped	
	<input type="radio"/>	Somewhat prepared /equipped	
	<input type="radio"/>	Poorly prepared / equipped	
	<input type="radio"/>	Extremely unprepared / ill-equipped	
Sensory re-education	<input type="radio"/>	Extremely prepared/equipped	<input type="text"/>
	<input type="radio"/>	Well prepared/equipped	
	<input type="radio"/>	Somewhat prepared /equipped	
	<input type="radio"/>	Poorly prepared / equipped	
	<input type="radio"/>	Extremely unprepared / ill-equipped	
Splinting	<input type="radio"/>	Extremely prepared/equipped	<input type="text"/>
	<input type="radio"/>	Well prepared/equipped	
	<input type="radio"/>	Somewhat prepared /equipped	
	<input type="radio"/>	Poorly prepared / equipped	
	<input type="radio"/>	Extremely unprepared / ill-equipped	
Standardized and non-standardized assessment tools	<input type="radio"/>	Extremely prepared/equipped	<input type="text"/>
	<input type="radio"/>	Well prepared/equipped	

Strengthening	<input type="radio"/> Somewhat prepared /equipped <input type="radio"/> Poorly prepared / equipped <input type="radio"/> Extremely unprepared / ill-equipped <input type="radio"/> Extremely prepared/equipped <input type="radio"/> Well prepared/equipped <input type="radio"/> Somewhat prepared /equipped <input type="radio"/> Poorly prepared / equipped <input type="radio"/> Extremely unprepared / ill-equipped	<input style="width: 100px; height: 20px;" type="text"/>
Thermal modalities	<input type="radio"/> Extremely prepared/equipped <input type="radio"/> Well prepared/equipped <input type="radio"/> Somewhat prepared /equipped <input type="radio"/> Poorly prepared / equipped <input type="radio"/> Extremely unprepared / ill-equipped	<input style="width: 100px; height: 20px;" type="text"/>
Work hardening / retraining	<input type="radio"/> Extremely prepared/equipped <input type="radio"/> Well prepared/equipped <input type="radio"/> Somewhat prepared /equipped <input type="radio"/> Poorly prepared / equipped <input type="radio"/> Extremely unprepared / ill-equipped	<input style="width: 100px; height: 20px;" type="text"/>
Wound Care / dressing / topical agents	<input type="radio"/> Extremely prepared/equipped <input type="radio"/> Well prepared/equipped <input type="radio"/> Somewhat prepared /equipped <input type="radio"/> Poorly prepared / equipped <input type="radio"/> Extremely unprepared / ill-equipped	<input style="width: 100px; height: 20px;" type="text"/>
Other:	<input type="radio"/> Extremely prepared/equipped <input type="radio"/> Well prepared/equipped <input type="radio"/> Somewhat prepared /equipped <input type="radio"/> Poorly prepared / equipped <input type="radio"/> Extremely unprepared / ill-equipped	<input style="width: 100px; height: 20px;" type="text"/>

Various domains (scientific knowledge, assessment, treatment, clinical judgment /reasoning, interpersonal skills & relationships, population-based services, management of services & professional practice) and competency areas within UL rehabilitation are listed below. Please indicate how equipped/prepared you feel to complete the tasks listed within each domain (if you were required to treat a patient with an UL injury/condition). If you wish to explain your answer, please do so in the comment column:

		Comment
Demonstrate knowledge of anatomy, physiology and histology of UL	<input type="radio"/> Extremely prepared/equipped <input type="radio"/> Well prepared/equipped <input type="radio"/> Somewhat prepared /equipped <input type="radio"/> Poorly prepared / equipped <input type="radio"/> Extremely unprepared / ill-equipped	<input style="width: 100px; height: 20px;" type="text"/>
Demonstrate knowledge of biomechanics	<input type="radio"/> Extremely prepared/equipped <input type="radio"/> Well prepared/equipped <input type="radio"/> Somewhat prepared /equipped <input type="radio"/> Poorly prepared / equipped <input type="radio"/> Extremely unprepared / ill-equipped	<input style="width: 100px; height: 20px;" type="text"/>
Demonstrate knowledge of pathology, epidemiology, medical and surgical interventions affecting the UL	<input type="radio"/> Extremely prepared/equipped <input type="radio"/> Well prepared/equipped <input type="radio"/> Somewhat prepared /equipped <input type="radio"/> Poorly prepared / equipped <input type="radio"/> Extremely unprepared / ill-equipped	<input style="width: 100px; height: 20px;" type="text"/>
Demonstrate knowledge of psychosocial and behavioural science	<input type="radio"/> Extremely prepared/equipped <input type="radio"/> Well prepared/equipped <input type="radio"/> Somewhat prepared /equipped <input type="radio"/> Poorly prepared / equipped <input type="radio"/> Extremely unprepared / ill-equipped	<input style="width: 100px; height: 20px;" type="text"/>
Demonstrate knowledge of rehabilitation and adaptation	<input type="radio"/> Extremely prepared/equipped <input type="radio"/> Well prepared/equipped <input type="radio"/> Somewhat prepared /equipped <input type="radio"/> Poorly prepared / equipped <input type="radio"/> Extremely unprepared / ill-equipped	<input style="width: 100px; height: 20px;" type="text"/>

Demonstrate knowledge of research-based clinical interventions / Evidence based practice	<input type="radio"/> Extremely prepared/equipped <input type="radio"/> Well prepared/equipped <input type="radio"/> Somewhat prepared /equipped <input type="radio"/> Poorly prepared / equipped <input type="radio"/> Extremely unprepared / ill-equipped	<input type="text"/>
Obtain and review medical, psychosocial and work history	<input type="radio"/> Extremely prepared/equipped <input type="radio"/> Well prepared/equipped <input type="radio"/> Somewhat prepared /equipped <input type="radio"/> Poorly prepared / equipped <input type="radio"/> Extremely unprepared / ill-equipped	<input type="text"/>
Obtain appropriate collateral information	<input type="radio"/> Extremely prepared/equipped <input type="radio"/> Well prepared/equipped <input type="radio"/> Somewhat prepared /equipped <input type="radio"/> Poorly prepared / equipped <input type="radio"/> Extremely unprepared / ill-equipped	<input type="text"/>
Select appropriate assessment tools	<input type="radio"/> Extremely prepared/equipped <input type="radio"/> Well prepared/equipped <input type="radio"/> Somewhat prepared /equipped <input type="radio"/> Poorly prepared / equipped <input type="radio"/> Extremely unprepared / ill-equipped	<input type="text"/>
Demonstrate technical skill related to assessment	<input type="radio"/> Extremely prepared/equipped <input type="radio"/> Well prepared/equipped <input type="radio"/> Somewhat prepared /equipped <input type="radio"/> Poorly prepared / equipped <input type="radio"/> Extremely unprepared / ill-equipped	<input type="text"/>
Assess and record the skeletal, muscular, vascular, skin and connective tissue status of the UL	<input type="radio"/> Extremely prepared/equipped <input type="radio"/> Well prepared/equipped <input type="radio"/> Somewhat prepared /equipped <input type="radio"/> Poorly prepared / equipped <input type="radio"/> Extremely unprepared / ill-equipped	<input type="text"/>
Assess and record dexterity and hand function	<input type="radio"/> Extremely prepared/equipped <input type="radio"/> Well prepared/equipped <input type="radio"/> Somewhat prepared /equipped <input type="radio"/> Poorly prepared / equipped <input type="radio"/> Extremely unprepared / ill-equipped	<input type="text"/>
Determine the patient's level of, and satisfaction with, their occupational performance	<input type="radio"/> Extremely prepared/equipped <input type="radio"/> Well prepared/equipped <input type="radio"/> Somewhat prepared /equipped <input type="radio"/> Poorly prepared / equipped <input type="radio"/> Extremely unprepared / ill-equipped	<input type="text"/>
Assess relevant contextual/environmental factors	<input type="radio"/> Extremely prepared/equipped <input type="radio"/> Well prepared/equipped <input type="radio"/> Somewhat prepared /equipped <input type="radio"/> Poorly prepared / equipped <input type="radio"/> Extremely unprepared / ill-equipped	<input type="text"/>
Assess relevant ergonomic factors	<input type="radio"/> Extremely prepared/equipped <input type="radio"/> Well prepared/equipped <input type="radio"/> Somewhat prepared /equipped <input type="radio"/> Poorly prepared / equipped <input type="radio"/> Extremely unprepared / ill-equipped	<input type="text"/>
Assess relevant psychosocial factors	<input type="radio"/> Extremely prepared/equipped <input type="radio"/> Well prepared/equipped <input type="radio"/> Somewhat prepared /equipped <input type="radio"/> Poorly prepared / equipped <input type="radio"/> Extremely unprepared / ill-equipped	<input type="text"/>
Demonstrate ability to assess needs of patient related to experiencing trauma	<input type="radio"/> Extremely prepared/equipped <input type="radio"/> Well prepared/equipped <input type="radio"/> Somewhat prepared /equipped <input type="radio"/> Poorly prepared / equipped <input type="radio"/> Extremely unprepared / ill-equipped	<input type="text"/>
Review and interpret assessment findings to plan treatment	<input type="radio"/> Extremely prepared/equipped <input type="radio"/> Well prepared/equipped <input type="radio"/> Somewhat prepared /equipped <input type="radio"/> Poorly prepared / equipped <input type="radio"/> Extremely unprepared / ill-equipped	<input type="text"/>

Develop functional prognosis based on assessment findings to direct treatment	<input type="radio"/> Extremely prepared/equipped <input type="radio"/> Well prepared/equipped <input type="radio"/> Somewhat prepared /equipped <input type="radio"/> Poorly prepared / equipped <input type="radio"/> Extremely unprepared / ill-equipped	<input type="text"/>
Formulate long, medium & short-term intervention goals in collaboration with client	<input type="radio"/> Extremely prepared/equipped <input type="radio"/> Well prepared/equipped <input type="radio"/> Somewhat prepared /equipped <input type="radio"/> Poorly prepared / equipped <input type="radio"/> Extremely unprepared / ill-equipped	<input type="text"/>
Select and implement treatment modalities and techniques to address performance component impairments: such as oedema, vascularity, pain, scar, range of motion, flexibility, wounds, strength, dexterity, sensation, function, endurance, posture/movement	<input type="radio"/> Extremely prepared/equipped <input type="radio"/> Well prepared/equipped <input type="radio"/> Somewhat prepared /equipped <input type="radio"/> Poorly prepared / equipped <input type="radio"/> Extremely unprepared / ill-equipped	<input type="text"/>
Select and implement modalities & techniques to address occupational performance limitations	<input type="radio"/> Extremely prepared/equipped <input type="radio"/> Well prepared/equipped <input type="radio"/> Somewhat prepared /equipped <input type="radio"/> Poorly prepared / equipped <input type="radio"/> Extremely unprepared / ill-equipped	<input type="text"/>
Select and implement modalities & techniques to address contextual/environmental barriers	<input type="radio"/> Extremely prepared/equipped <input type="radio"/> Well prepared/equipped <input type="radio"/> Somewhat prepared /equipped <input type="radio"/> Poorly prepared / equipped <input type="radio"/> Extremely unprepared / ill-equipped	<input type="text"/>
Select and implement modalities and techniques to address psychosocial limiting aspects	<input type="radio"/> Extremely prepared/equipped <input type="radio"/> Well prepared/equipped <input type="radio"/> Somewhat prepared /equipped <input type="radio"/> Poorly prepared / equipped <input type="radio"/> Extremely unprepared / ill-equipped	<input type="text"/>
Demonstrate ability to appropriately manage needs of patients who have undergone trauma (eg. Basic counseling, referral)	<input type="radio"/> Extremely prepared/equipped <input type="radio"/> Well prepared/equipped <input type="radio"/> Somewhat prepared /equipped <input type="radio"/> Poorly prepared / equipped <input type="radio"/> Extremely unprepared / ill-equipped	<input type="text"/>
Assess readiness and assess needs for return-to-work	<input type="radio"/> Extremely prepared/equipped <input type="radio"/> Well prepared/equipped <input type="radio"/> Somewhat prepared /equipped <input type="radio"/> Poorly prepared / equipped <input type="radio"/> Extremely unprepared / ill-equipped	<input type="text"/>
Implement intervention in accordance with evidence-based guidelines	<input type="radio"/> Extremely prepared/equipped <input type="radio"/> Well prepared/equipped <input type="radio"/> Somewhat prepared /equipped <input type="radio"/> Poorly prepared / equipped <input type="radio"/> Extremely unprepared / ill-equipped	<input type="text"/>
Demonstrate technical skill in treatment	<input type="radio"/> Extremely prepared/equipped <input type="radio"/> Well prepared/equipped <input type="radio"/> Somewhat prepared /equipped <input type="radio"/> Poorly prepared / equipped <input type="radio"/> Extremely unprepared / ill-equipped	<input type="text"/>
Monitor and revise treatment program	<input type="radio"/> Extremely prepared/equipped <input type="radio"/> Well prepared/equipped <input type="radio"/> Somewhat prepared /equipped <input type="radio"/> Poorly prepared / equipped <input type="radio"/> Extremely unprepared / ill-equipped	<input type="text"/>
Implement group-based intervention	<input type="radio"/> Extremely prepared/equipped <input type="radio"/> Well prepared/equipped <input type="radio"/> Somewhat prepared /equipped <input type="radio"/> Poorly prepared / equipped <input type="radio"/> Extremely unprepared / ill-equipped	<input type="text"/>
Accurately document all aspects of intervention	<input type="radio"/> Extremely prepared/equipped <input type="radio"/> Well prepared/equipped <input type="radio"/> Somewhat prepared /equipped <input type="radio"/> Poorly prepared / equipped <input type="radio"/> Extremely unprepared / ill-equipped	<input type="text"/>

Use theory, clinical science knowledge, and experience to collect and interpret pertinent clinical data; identifying and prioritizing clinical problems and providing optimal patient care.	<input type="radio"/> Extremely prepared/equipped <input type="radio"/> Well prepared/equipped <input type="radio"/> Somewhat prepared /equipped <input type="radio"/> Poorly prepared / equipped <input type="radio"/> Extremely unprepared / ill-equipped	<input type="text"/>
Exhibit effective & appropriate interpersonal and communication skills	<input type="radio"/> Extremely prepared/equipped <input type="radio"/> Well prepared/equipped <input type="radio"/> Somewhat prepared /equipped <input type="radio"/> Poorly prepared / equipped <input type="radio"/> Extremely unprepared / ill-equipped	<input type="text"/>
Exhibit sensitivity to a diverse patient population	<input type="radio"/> Extremely prepared/equipped <input type="radio"/> Well prepared/equipped <input type="radio"/> Somewhat prepared /equipped <input type="radio"/> Poorly prepared / equipped <input type="radio"/> Extremely unprepared / ill-equipped	<input type="text"/>
Collaborate with patients, families, and professionals to attain desired outcomes	<input type="radio"/> Extremely prepared/equipped <input type="radio"/> Well prepared/equipped <input type="radio"/> Somewhat prepared /equipped <input type="radio"/> Poorly prepared / equipped <input type="radio"/> Extremely unprepared / ill-equipped	<input type="text"/>
Assess needs of identified population suffering from UL pathology or at risk of suffering from UL pathology eg. factory workers	<input type="radio"/> Extremely prepared/equipped <input type="radio"/> Well prepared/equipped <input type="radio"/> Somewhat prepared /equipped <input type="radio"/> Poorly prepared / equipped <input type="radio"/> Extremely unprepared / ill-equipped	<input type="text"/>
Make intervention recommendations based on available resources	<input type="radio"/> Extremely prepared/equipped <input type="radio"/> Well prepared/equipped <input type="radio"/> Somewhat prepared /equipped <input type="radio"/> Poorly prepared / equipped <input type="radio"/> Extremely unprepared / ill-equipped	<input type="text"/>
Intervene (eg. education, prevention, ergonomic modifications)	<input type="radio"/> Extremely prepared/equipped <input type="radio"/> Well prepared/equipped <input type="radio"/> Somewhat prepared /equipped <input type="radio"/> Poorly prepared / equipped <input type="radio"/> Extremely unprepared / ill-equipped	<input type="text"/>
Monitor and adjust interventions	<input type="radio"/> Extremely prepared/equipped <input type="radio"/> Well prepared/equipped <input type="radio"/> Somewhat prepared /equipped <input type="radio"/> Poorly prepared / equipped <input type="radio"/> Extremely unprepared / ill-equipped	<input type="text"/>
Complete planning functions for service in line with national/provincial/regional guidelines	<input type="radio"/> Extremely prepared/equipped <input type="radio"/> Well prepared/equipped <input type="radio"/> Somewhat prepared /equipped <input type="radio"/> Poorly prepared / equipped <input type="radio"/> Extremely unprepared / ill-equipped	<input type="text"/>
Complete stock taking and acquisition of new equipment	<input type="radio"/> Extremely prepared/equipped <input type="radio"/> Well prepared/equipped <input type="radio"/> Somewhat prepared /equipped <input type="radio"/> Poorly prepared / equipped <input type="radio"/> Extremely unprepared / ill-equipped	<input type="text"/>
Ensure compliance with national /provincial / regional priorities, policies and procedures	<input type="radio"/> Extremely prepared/equipped <input type="radio"/> Well prepared/equipped <input type="radio"/> Somewhat prepared /equipped <input type="radio"/> Poorly prepared / equipped <input type="radio"/> Extremely unprepared / ill-equipped	<input type="text"/>
Obtain and use materials and supplies judiciously	<input type="radio"/> Extremely prepared/equipped <input type="radio"/> Well prepared/equipped <input type="radio"/> Somewhat prepared /equipped <input type="radio"/> Poorly prepared / equipped <input type="radio"/> Extremely unprepared / ill-equipped	<input type="text"/>
Acquire and maintain work space	<input type="radio"/> Extremely prepared/equipped <input type="radio"/> Well prepared/equipped <input type="radio"/> Somewhat prepared /equipped <input type="radio"/> Poorly prepared / equipped <input type="radio"/> Extremely unprepared / ill-equipped	<input type="text"/>

Identify, access, and use existing resources within or outside of health care systems to benefit patients, families, and patient populations (eg. Non-governmental organization services, donations from companies eg. off-cut neoprene materials)	<input type="radio"/> Extremely prepared/equipped <input type="radio"/> Well prepared/equipped <input type="radio"/> Somewhat prepared /equipped <input type="radio"/> Poorly prepared / equipped <input type="radio"/> Extremely unprepared / ill-equipped	<input style="width: 100px; height: 20px;" type="text"/>
Maintain ethical and legal standards	<input type="radio"/> Extremely prepared/equipped <input type="radio"/> Well prepared/equipped <input type="radio"/> Somewhat prepared /equipped <input type="radio"/> Poorly prepared / equipped <input type="radio"/> Extremely unprepared / ill-equipped	<input style="width: 100px; height: 20px;" type="text"/>
Interpret and apply clinical research (evidence-based practice)	<input type="radio"/> Extremely prepared/equipped <input type="radio"/> Well prepared/equipped <input type="radio"/> Somewhat prepared /equipped <input type="radio"/> Poorly prepared / equipped <input type="radio"/> Extremely unprepared / ill-equipped	<input style="width: 100px; height: 20px;" type="text"/>
Commitment to continuous professional development	<input type="radio"/> Extremely prepared/equipped <input type="radio"/> Well prepared/equipped <input type="radio"/> Somewhat prepared /equipped <input type="radio"/> Poorly prepared / equipped <input type="radio"/> Extremely unprepared / ill-equipped	<input style="width: 100px; height: 20px;" type="text"/>
Seek mentorship & support	<input type="radio"/> Extremely prepared/equipped <input type="radio"/> Well prepared/equipped <input type="radio"/> Somewhat prepared /equipped <input type="radio"/> Poorly prepared / equipped <input type="radio"/> Extremely unprepared / ill-equipped	<input style="width: 100px; height: 20px;" type="text"/>
Participate in activities and professional associations that advance professional practice and public welfare.	<input type="radio"/> Extremely prepared/equipped <input type="radio"/> Well prepared/equipped <input type="radio"/> Somewhat prepared /equipped <input type="radio"/> Poorly prepared / equipped <input type="radio"/> Extremely unprepared / ill-equipped	<input style="width: 100px; height: 20px;" type="text"/>
Other:	<input type="radio"/> Extremely prepared/equipped <input type="radio"/> Well prepared/equipped <input type="radio"/> Somewhat prepared /equipped <input type="radio"/> Poorly prepared / equipped <input type="radio"/> Extremely unprepared / ill-equipped	<input style="width: 100px; height: 20px;" type="text"/>

**Please select any of the descriptors that describe your experience of treating patients with UL injuries or conditions. Please explain your choice and add any other feelings you may have / have had.**

- Enthusiastic \_\_\_\_\_
- Overwhelmed \_\_\_\_\_
- A heightened sense of responsibility \_\_\_\_\_
- That I am not confident \_\_\_\_\_
- That I need to learn by doing \_\_\_\_\_
- That UL rehabilitation is a specialised area \_\_\_\_\_
- Fearful of harming my patient \_\_\_\_\_
- Other: \_\_\_\_\_

**Please indicate how competent you feel to treat patients/groups with UL injuries / conditions:**

- Extremely Competent
- Very Competent
- Competent
- Incompetent
- Very Incompetent
- Extremely Incompetent

**Please indicate how confident you feel to treat patients/groups with UL injuries / conditions:**

- Extremely Confident
- Very Confident
- Confident
- Unconfident
- Very unconfident
- Extremely Unconfident

**What has contributed to your current level of competence?**

**Please indicate whether each of the following statements are true or false. If you wish to explain your answer, please do so in the comment column provided.**

		Comment
I have sufficient knowledge about UL rehabilitation	<input type="radio"/> True <input type="radio"/> False	<input type="text"/>
My practical skills (eg. splinting) are adequate	<input type="radio"/> True <input type="radio"/> False	<input type="text"/>
My clinical reasoning within UL rehabilitation is sufficiently developed	<input type="radio"/> True <input type="radio"/> False	<input type="text"/>
I am able to adequately and confidently communicate with the referring doctor regarding my patient	<input type="radio"/> True <input type="radio"/> False	<input type="text"/>
I have sufficient support at work	<input type="radio"/> True <input type="radio"/> False	<input type="text"/>
I have sufficient supervision from colleagues with experience	<input type="radio"/> True <input type="radio"/> False	<input type="text"/>
I have a mentor to guide my professional development	<input type="radio"/> True <input type="radio"/> False	<input type="text"/>
I have adequate equipment to treat patients with UL injuries	<input type="radio"/> True <input type="radio"/> False	<input type="text"/>
I have convenient access to a computer at work	<input type="radio"/> True <input type="radio"/> False	<input type="text"/>
I have convenient access to the internet at work	<input type="radio"/> True <input type="radio"/> False	<input type="text"/>
I have convenient access to a telephone / fax at work	<input type="radio"/> True <input type="radio"/> False	<input type="text"/>
I have an appropriate work area in which to treat patients with UL pathology	<input type="radio"/> True <input type="radio"/> False	<input type="text"/>
I am able to communicate effectively in the language of my patients / groups	<input type="radio"/> True <input type="radio"/> False	<input type="text"/>
I am able to relate to the beliefs/values/traditions of my patients	<input type="radio"/> True <input type="radio"/> False	<input type="text"/>
I do not fear that I will injure the patient	<input type="radio"/> True <input type="radio"/> False	<input type="text"/>
I am not overwhelmed by the magnitude of the problems	<input type="radio"/> True <input type="radio"/> False	<input type="text"/>
I enjoy treating patients / groups with UL pathology	<input type="radio"/> True <input type="radio"/> False	<input type="text"/>
I have access to professional development opportunities within the field of UL rehabilitation	<input type="radio"/> True <input type="radio"/> False	<input type="text"/>
I have access to up-to-date research / literature / evidence	<input type="radio"/> True <input type="radio"/> False	<input type="text"/>
I received sufficient undergraduate preparation to treat patients with UL conditions / injury	<input type="radio"/> True <input type="radio"/> False	<input type="text"/>
I am a member of associations that could assist my practice (eg. The South African Society of Hand Therapists, The Occupational Therapy Association of South Africa, Rural Rehabilitation in South Africa)	<input type="radio"/> True <input type="radio"/> False	<input type="text"/>

**Is there anything else that currently hinders or helps you in delivering a UL rehabilitation service?**

Hinders

Helps

**Which of the following do you think would assist you in providing an effective UL rehabilitation service? Choose all that apply**

- CPD courses to improve knowledge, skill and clinical reasoning within UL rehabilitation \_\_\_\_\_
- Up-to-date UL textbooks \_\_\_\_\_
- Access to clinical guidelines & various treatment protocols \_\_\_\_\_
- Online resources eg electronic databases \_\_\_\_\_
- Online support forums \_\_\_\_\_
- Online courses \_\_\_\_\_
- UL Rehabilitation mentor \_\_\_\_\_
- Regular supervision and /support by experienced OT colleague \_\_\_\_\_
- In-service training at work \_\_\_\_\_
- Adapted undergraduate UL rehabilitation theoretical curriculum \_\_\_\_\_
- Improved undergraduate practical exposure to UL rehabilitation eg. Assessing and treating 'live' patients \_\_\_\_\_
- UL Rehabilitation Smartphone or iPad / Tablet application \_\_\_\_\_
- Other (please specify): \_\_\_\_\_

**What evidence do you use to support and develop your UL rehabilitation practice? (Choose as many as apply)**

- I use my own knowledge from undergraduate education \_\_\_\_\_
- I use advice from my colleagues \_\_\_\_\_
- I call colleagues at other practice sites \_\_\_\_\_
- I use research literature hard copy \_\_\_\_\_
- I search the internet \_\_\_\_\_
- I attend continuing education activities \_\_\_\_\_
- I use textbooks \_\_\_\_\_
- I use my own clinical experience and judgement \_\_\_\_\_
- I make use of open/free online databases/clinical guidelines \_\_\_\_\_
- I have access to a medical library and make use of its resources \_\_\_\_\_
- I participate in a journal club \_\_\_\_\_
- Other (please specify): \_\_\_\_\_

**Would you like to make any other comments on other factors that you feel impact on how prepared or equipped you are to deliver a upper rehabilitation service:**

**If completing this survey has caused you distress or has identified a need that you may have for support, supervision, counseling or other services, please do not hesitate to contact me in order for me to help you obtain the assistance that you require wherever possible (Kirsty van Stormbroek Email: [kirsty.vanstormbroek@uct.ac.za](mailto:kirsty.vanstormbroek@uct.ac.za) Cel: 0760977705). Alternatively, should you wish me to contact you, please leave your full name and contact details in the space provided below:**

Name

Email Address

Mobile Number

Alternative telephone number



#### Appendix 4: Survey 2 Question rationale & Classification

	Question Subject	Classification of Item	Rationale for inclusion
1	University	Demographic	-
2	Role within UL curriculum	Descriptive item	-
3	Length of time involved in curriculum (years)	Numerical	-
4	Perceived most important aspect of curriculum	Descriptive item	Illicit expert opinion.
5	UL assessments taught	Open- ended	Performance tests and outcomes measures were found to be used infrequently by South African therapists in a study conducted by De Klerk (2014).
6	Modalities taught	Yes/No response with opportunity to comment	Based on practice analysis completed by American Hand Therapy Certification Commission (Kasch et al., 2003). Identical tables were included in the CSOT survey to enable association with reported preparedness by CSOTs and whether modalities and conditions were covered in the curriculum.
7	Conditions covered	Yes/No response	
8	Teaching strategies used	5 Point Frequency Scale with opportunity to comment	Teaching strategies extracted from article by Brown, Brown, & Roever (2006) on paediatric curriculum within undergraduate education in South Africa.
9	Learning resources used	Open-ended	To determine commonly used teaching and learning resources and mediums.
10	Time spent on splinting	Numerical	To determine if increased time spent on skill development is related to an increase in CSOTs perceived preparedness.
11	Splints students fabricate	Open-ended	To determine splints commonly taught at an undergraduate level.
12	% Students who have UL practice learning placement	Numerical	Practice learning experience may significantly contribute to new graduate's sense of preparedness for practice (Lloyd et al., 2007).
13	# Of teaching hours spent on UL Ax and Rx	Numerical	To determine if increased time spent on assessment and treatment is related to an increase in CSOTs perceived preparedness.
14	Strategies used to encourage EBP	Open-ended	Searching for evidence and critical appraisal of research, integration of clinician experience and patients' values are considered important aspects of EBP in UL rehabilitation practice (MacDermid, 2004).
15	Challenges faced in UL curriculum	Descriptive	To assist in developing understanding of constraints in teaching UL rehabilitation to students.
16	Perception: whether graduates prepared for UL practice	Descriptive	Nayar et al (2013) highlight that preparedness for practice needs to be appraised from multiple perspectives including that of the educator.

## Appendix 5: Survey 2 (Educator)

### *UL Rehabilitation Curricula at South African Universities*

*Thank you for taking the time to complete this questionnaire which aims to elicit the nature and extent of the UL rehabilitation curriculum covered at your university. If a number of staff members are involved in your curriculum, would you kindly consult these colleagues when completing the questionnaire. Should your UL rehabilitation curriculum have changed recently, please base your responses on the curriculum presented to the graduates of 2012 as CSOTs completing their service in 2013 will be taking part in this study. Thank you again for your time and your valued contribution.*

**At which university do you work?**

- Free State
- Limpopo
- Cape Town
- Western Cape
- Pretoria
- KwaZulu Natal
- Stellenbosch
- Witwatersrand

**What is your role within the UL rehabilitation undergraduate curriculum?**

**How long have you been involved in teaching the UL rehabilitation curriculum?**

**Within a full undergraduate curriculum that may allow limited time for extensive coverage of various clinical areas, what do you think are the most important aspects of UL rehabilitation that students need to learn at an undergraduate level?**

**Which assessments of performance components, hand function and occupational performance are taught at your university as they relate to UL rehabilitation? (Please note that you can 'cut' and 'paste' text from WORD files. This allows you to insert information that you may have available in other documents).**

**Which of the following modalities /interventions are taught to your undergraduate students? Please add any modalities that have not been mentioned and add any comments you may have in the textboxes provided.**

- Activity as a 'means' / as an 'end' \_\_\_\_\_
- Adaptive / assistive devices \_\_\_\_\_
- Appropriate Paper-based technology (APT) \_\_\_\_\_
- Training in activities of daily living (ADLs) \_\_\_\_\_
- Behaviour Management \_\_\_\_\_
- Compressive therapy \_\_\_\_\_
- Desensitization \_\_\_\_\_
- Electrical Modalities eg. Ultrasound \_\_\_\_\_
- Ergonomic Modifications \_\_\_\_\_
- Exercise \_\_\_\_\_
- Home programmes \_\_\_\_\_
- Manual Therapy eg. NDT \_\_\_\_\_
- Mirror Therapy (as part of a graded-motor imagery program) \_\_\_\_\_
- Patient, family, workplace education \_\_\_\_\_
- Prosthetic training \_\_\_\_\_
- Scar management techniques \_\_\_\_\_
- Sensory re-education \_\_\_\_\_
- Splinting \_\_\_\_\_
- Standardized and non-standardized assessment tools \_\_\_\_\_

- Strengthening \_\_\_\_\_
- Thermal modalities \_\_\_\_\_
- Work hardening / retraining \_\_\_\_\_
- Wound Care / dressing / topical agents \_\_\_\_\_
- Other: \_\_\_\_\_

**Which conditions / diagnoses related to hand rehabilitation are covered within your curriculum?  
Please add any that are not listed below.**

- Amputations
- Central nervous system disorders as they relate to the upper quarter eg. cerebral palsy, CVA
- Congenital differences/anomalies
- Cumulative trauma disorders/repetitive stress injuries eg. De Quervain's tenosynovitis, epicondylitis
- Dupuytren's contracture
- Flexor/extensor tendon injuries
- Fractures/dislocations/joint instabilities
- Infections (eg. human bite injury, cellulitis, paronychia)
- Inflammatory and degenerative arthritis (eg. Osteoarthritis, Rheumatoid Arthritis, Scleroderma, Fibromyalgia)
- Complex trauma affecting multiple tissue types (eg. gunshot wounds, Panga injury, crush injury)
- Nail bed injuries
- Pain-related syndromes (eg. complex regional pain syndrome)
- Peripheral nerve compression and disease (eg. Carpal tunnel syndrome, thoracic outlet syndrome, diabetic neuropathy)
- Peripheral nerve injuries (peripheral nerves and brachial plexus injuries)
- Post-mastectomy/post-radiation lymphedema
- Psychogenic disorders involving the upper quarter (eg. Conversion disorder, clenched fist syndrome)
- Soft tissue injuries (eg. acute ligament injuries)
- Thermal Injuries including burns, electrical injuries
- Tumors and Cysts (eg. ganglions)
- Vascular disorders (eg. aneurysm)
- Other: \_\_\_\_\_

**Which teaching strategies does your institution make use of in the UL rehabilitation curriculum?  
Please indicate the estimated frequency of the applicable method by making use of the scale  
provided. Feel free to make any additional comments in the textboxes provided.**

		Comment
Case histories	<input type="radio"/> Never <input type="radio"/> Seldom <input type="radio"/> Sometimes <input type="radio"/> Often <input type="radio"/> Always	<input style="width: 100px; height: 20px;" type="text"/>
Clinical storytelling	<input type="radio"/> Never <input type="radio"/> Seldom <input type="radio"/> Sometimes <input type="radio"/> Often <input type="radio"/> Always	<input style="width: 100px; height: 20px;" type="text"/>
Didactic teaching	<input type="radio"/> Never <input type="radio"/> Seldom <input type="radio"/> Sometimes <input type="radio"/> Often <input type="radio"/> Always	<input style="width: 100px; height: 20px;" type="text"/>
Experiential learning	<input type="radio"/> Never <input type="radio"/> Seldom <input type="radio"/> Sometimes <input type="radio"/> Often <input type="radio"/> Always	<input style="width: 100px; height: 20px;" type="text"/>
Group work	<input type="radio"/> Never	<input style="width: 100px; height: 20px;" type="text"/>

	<input type="radio"/> Seldom	
	<input type="radio"/> Sometimes	
	<input type="radio"/> Often	
	<input type="radio"/> Always	
Guest lectures/presenters	<input type="radio"/> Never	<input type="text"/>
	<input type="radio"/> Seldom	
	<input type="radio"/> Sometimes	
	<input type="radio"/> Often	
	<input type="radio"/> Always	
Practical demonstrations/laboratories	<input type="radio"/> Never	<input type="text"/>
	<input type="radio"/> Seldom	
	<input type="radio"/> Sometimes	
	<input type="radio"/> Often	
	<input type="radio"/> Always	
Problem-based learning methods	<input type="radio"/> Never	<input type="text"/>
	<input type="radio"/> Seldom	
	<input type="radio"/> Sometimes	
	<input type="radio"/> Often	
	<input type="radio"/> Always	
Reflective diaries, journals and exercises	<input type="radio"/> Never	<input type="text"/>
	<input type="radio"/> Seldom	
	<input type="radio"/> Sometimes	
	<input type="radio"/> Often	
	<input type="radio"/> Always	
Resource-based learning	<input type="radio"/> Never	<input type="text"/>
	<input type="radio"/> Seldom	
	<input type="radio"/> Sometimes	
	<input type="radio"/> Often	
	<input type="radio"/> Always	
Role-playing	<input type="radio"/> Never	<input type="text"/>
	<input type="radio"/> Seldom	
	<input type="radio"/> Sometimes	
	<input type="radio"/> Often	
	<input type="radio"/> Always	
Self-study	<input type="radio"/> Never	<input type="text"/>
	<input type="radio"/> Seldom	
	<input type="radio"/> Sometimes	
	<input type="radio"/> Often	
	<input type="radio"/> Always	
Simulated patients	<input type="radio"/> Never	<input type="text"/>
	<input type="radio"/> Seldom	
	<input type="radio"/> Sometimes	
	<input type="radio"/> Often	
	<input type="radio"/> Always	
Traditional lecture	<input type="radio"/> Never	<input type="text"/>
	<input type="radio"/> Seldom	
	<input type="radio"/> Sometimes	
	<input type="radio"/> Often	
	<input type="radio"/> Always	
Tutorials	<input type="radio"/> Never	<input type="text"/>
	<input type="radio"/> Seldom	
	<input type="radio"/> Sometimes	
	<input type="radio"/> Often	
	<input type="radio"/> Always	
Practice Learning	<input type="radio"/> Never	<input type="text"/>
	<input type="radio"/> Seldom	
	<input type="radio"/> Sometimes	

- Other:  Often  
 Always  
 Never   
 Seldom  
 Sometimes  
 Often  
 Always

**Which specific learning resources do you make use of in the UL rehabilitation curriculum? Eg. The Journal of Hand Therapy, a specific textbook, anatomy models, OER, YouTube.**

**How many hours do the students spend doing splinting practicals?**

**What type of splints do the students make themselves?**

**What percentage of students has practice learning placements in which they are required to treat patients with UL difficulties (due to peripheral or central injury eg. stroke).**

**How many teaching hours are spent on UL assessment and treatment?**

**Which strategies are used to encourage students to adopt evidence-based strategies within hand rehabilitation?**

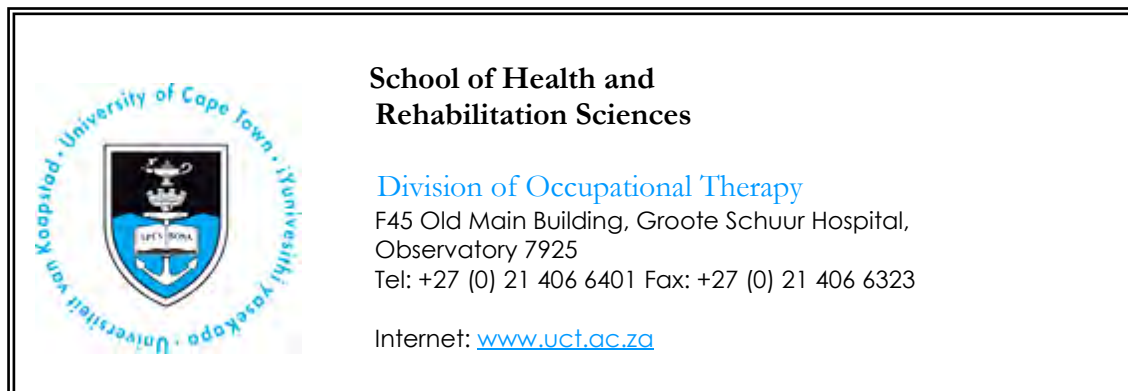
**What particular challenges does your university face in presenting a hand rehabilitation curriculum?**

**Do you think that the Occupational therapy students that graduate from your university are prepared to effectively treat patients with hand injuries and conditions during their CS year? Please provide an explanation for your answer.**

**If you wish to add any further comment, please do so below:**

**Thank you for your time and valued input! Please do not hesitate to contact me should you have any questions about the research project or if you wish to attach any further information related to the survey questions. (Kirsty van Stormbroek: [kirsty.vanstormbroek@uct.ac.za](mailto:kirsty.vanstormbroek@uct.ac.za) / tel. 0760977705).**

## Appendix 6: Letter and questions to expert therapists



30 September 2013

Dear Hand Therapist

Thank you for taking the time to evaluate this questionnaire for my research project that aims to *determine the extent to which CS Occupational Therapist are equipped to treat patients with hand injuries and conditions.*

The purpose of asking *expert clinicians* to evaluate the questionnaire is to *check that the content of questions does in fact relate to hand rehabilitation in South Africa, the domains of practice within hand rehabilitation and the competencies required to practice.* The domains of practice and competency areas within the questionnaire were adapted from the findings of a practice analysis of hand therapy conducted by The Hand Therapy Certification Commission Inc. (USA) published in 2001 and 2002 (articles have been attached should you wish to refer to these).

The questionnaire commences with general practice and demographic questions that you are welcome to comment on. The Hand Rehabilitation section, however, starts at Question 22 on page 4. Would you kindly review this section and provide comment by answering the questions in the table on page 2. (Please note that the formatting will be optimized when the questionnaire is uploaded to an online survey system).

Should you require any further information on the project or more context around my reasoning for inclusion of various items, please let me know. Would you kindly return your comments to me by *Monday, 14 October 2013.*

Thank you again for generously giving of your time and expertise.

Kind Regards  
Kirsty van Stormbroek

Clinical Educator and Masters Student  
The University of Cape Town  
Tel: 076 0977705

Do the questions adequately cover...	Yes / No Comments/Omissions &
1. All <b>diagnoses</b> related to UL rehabilitation that CSOTs may be required to treat?	
2. All <b>interventions/modalities</b> that CSOTs may be required to use?	
3. All <b>knowledge</b> areas CSOTs will need to possess?	
4. All aspects of <b>assessment, treatment and clinical reasoning / judgement</b> necessary to perform hand rehabilitation?	
5. All <b>interpersonal skills</b> required for hand rehabilitation?	
6. All skills required for <b>population-based hand rehabilitation services</b> ?	
7. All <b>organizational and management</b> skills required for a hand rehabilitation service?	
8. All aspects related to perceived <b>competence</b> and <b>confidence</b> in hand rehabilitation?	
9. <i>What else might you include in the questionnaire to assess the extent to which CSOTs are equipped to treat patient with UL conditions/injuries?</i>	
10. <i>What might you change about the structure and format of the questionnaire?</i>	
11. <i>Please describe any other changes / recommendations?</i>	

## Appendix 7: Comments made on Survey 1 by expert clinicians

Answers and comments provided by the 5 expert clinicians who reviewed Survey 1 are contained, per question, in the tables below. Expert 5's comments are listed in the final table accompanied by the researchers' response.

### Question 1: Does the question adequately cover all diagnoses related to UL rehabilitation that CSOTs may be required to treat?

Expert Therapist Answer		Action by Researcher
1	Yes	No change made by researcher
2	Yes, may just need to make more reference to post surgical cases.	*'Post surgical' cases may be applied to almost all of the diagnoses listed and is assumed as being a part of the general management of the condition. A separate/general category for this was therefore not created
3	Yes, I feel that you have covered the diagnoses	-
4	I think so yes.	-

### Question 2: Does the question adequately cover all interventions / modalities that CSOTs may be required to use?

Expert Therapist Answer		Action by Researcher
1	Yes	-
2	Yes	-
3	See my comments on the questionnaire regarding electrical modalities, prosthetics and manual oedema mobilisation	Changes made as per comments
4	Yes, is APT on there?	APT added

### Question 3: Do the questions adequately cover all knowledge areas CSOTs will need to possess?

Expert Therapist Answer		Action by Researcher
1	Yes	-
2	Yes	-
3	Yes	-
4	Yes	-

### Question 4: Does the question cover all aspects of assessment, treatment and clinical reasoning / judgment necessary to perform hand rehabilitation?



Expert Therapist Answer		Action by Researcher
1	Yes	-
2	Yes, possibly clarify that clinicians need to be comfortable and familiar with standardised tools such as goniometer, dynamometer, semmes etc	Decision taken not to list specific assessment tools as competency in use of the tools is assumed when competency in standardized assessment is being considered. Attempting to keep the survey as short as possible did not allow all tools to be mentioned and by mentioning only examples, participants might only base their responses on these and not on standardized assessment in general.
3	Yes, although I feel this section may be somewhat overwhelming to read and answer.	No action
4	Yes	-

**Question 5: Does the question cover all interpersonal skills required for hand rehabilitation?**

Expert Therapist Answer		Action by Researcher
1	Yes	-
2	Yes	-
3	Yes	-
4	Yes	-

**Question 6: Does the question cover all skills required for population-based hand rehabilitation services?**

Expert Therapist Answer		Action by Researcher
1	Yes	-
2	Yes	-
3	Yes	-
4	Yes	-

**Question 7: Does the question cover all organizational and management skills required for hand rehabilitation services?**

Expert Therapist Answer		Action by Researcher
1	Yes	-
2	Yes, perhaps more mention of adequate documentation skills	Clear omission in initial survey draft therefore 'Accurately document all aspects of intervention' included under Intervention competencies.
3	Yes	-
4	Yes	-

**Question 8: Does the question cover all aspects related to competence and confidence within hand rehabilitation ?**

Expert Therapist Answer		Action by Researcher
1	Yes	-
2	Yes	-
3	Yes	-
4	Yes	-

**Question 9:** What else might you include in the questionnaire to assess the extent to which CSOTs are equipped to treat patient with UL conditions/injuries?

Expert Therapist Answer		Action by Researcher
1	Very comprehensive	-
2	Does something like "I am able to adequately or confidently communicate with the referring physician regarding my patient" warrant a place or is it irrelevant?	Despite this competency area not being found in literature, the student and supervisor strongly agreed with relevance of the suggestion and therefore included within a true/false question.
3	Comments made on questionnaire	Appropriate changes made by researcher
4	Not sure if you want to go into that – but should you maybe ask something about what is available in their practice setting - that makes a difference as to whether they are equipped to treat a patient with an UL condition? They might feel confident and equipped to use mirror therapy – but don't have a mirror box...	Decision taken to allow this to fall under question "Do you have sufficient equipment to treat patients with UL injuries and conditions" to prevent survey from becoming increasingly lengthy.

**Question 10:** What might you change about the structure and format of the questionnaire?

Expert Therapist Answer		Action by Researcher
1	Perhaps "ALL" is a very strong word as its almost impossible to include ALL diagnoses or All treatment modalities or cover All the knowledge you should have etc???	-
2	Adequate	-
3	Nothing	-
4	I wrote some comments on your questionnaire – maybe the electronic format will ease out the crinkles... You must just look very carefully that the final product is easy to complete – that where possible, people can just tick a box. It is a very long survey and people <u>do not read</u> . I'm worried for you with regards to the length of the survey...	Survey formatted.

**Question 11:** Please describe any other changes / recommendations?

Expert Therapist Answer	Action by Researcher
1 Good Luck.	-
2 <ul style="list-style-type: none"> <li>• I would just try to be consistent in saying “hand and UL” conditions, otherwise students may be biased to just think of “hand” injuries.</li> <li>• Can add CTS (to list of diagnoses) as this is quite common</li> <li>• You have mentioned flexor/extensor injury, but not the “post surgical option”, may be something to consider...</li> <li>• Ultrasound (suggested to be included as example under ‘Electrical modalities’)</li> <li>• Survey Item: ‘Demonstrate technical skill related to assessment’ Suggested Addition: Demonstrate ability to interpret assessment data appropriately i.e. correctly diagnose...I think in SA we are allowed to Diagnose, whereas in the USA we are not.)</li> <li>• Within item ‘Demonstrate ability to appropriately manage needs of patients who have undergone trauma’ it is suggested that a description/example be included - (i.e. counsel/refer?)</li> <li>• Under population-based services: ‘Monitor interventions’ Addition recommended: ‘and adapt’</li> <li>• Could “my training was not adequate?” be another experience?</li> </ul>	<ul style="list-style-type: none"> <li>• Feedback incorporated and ‘UL injuries’ used as the term throughout.</li> <li>• CTS already included</li> <li>• *as above</li>   <li>• Ultrasound included as example</li> <li>• Establishing a medical diagnosis is not the priority within OT intervention. However, interpreting assessment to guide treatment essential therefore item changed to separate 2 items under treatment:               <ul style="list-style-type: none"> <li>○ ‘Review and interpret assessment findings to plan treatment’</li> <li>○ ‘Develop functional prognosis based on assessment findings to direct treatment’</li> </ul> </li> <li>• Example included within item</li> <li>• Item changed to ‘Monitor and Adapt interventions’</li> <li>• Feeling descriptors contained in question extracted from literature. The specific descriptor suggested was not found in literature.</li> </ul>
3 See comments on the questionnaire: <ul style="list-style-type: none"> <li>• Cultural competence should be explained better (in more detail). Do you want to know how competent the therapist feels when treating patients who are from another cultural group than her/his own?</li> </ul>	- Comments on questionnaire appraised and appropriate changes made  Definition provided
4 Will it be translated into Afrikaans (or other languages)? I was just looking at some of the terminology (or even just the text)... Can think of a few of our graduates who will not know what it means and will therefore choose not to complete...	Survey translated into Afrikaans.

### Expert 5:

Comment made	Action by researcher
It is very long, and I wondered if you though people would respond if it's that long?	Risk which researcher was willing to take
Is there enough space for people to write their comments in the most right hand columns of the tables?	Online and hard copy questionnaire formatted to allow sufficient space for comments
In Q's 30 and 31, you may need to clarify what is meant by "exercise", and in what way it's different from "strengthening".	Researcher and supervisor felt that this was not necessary
Also in Q's 30 and 31, perhaps compression therapy should be called "oedema management" and subtitled to include compression garments, compression bandage (such as coban), elevation, and "other" which should be defined by the respondent.	Comment overrided
In the question about diagnoses seen, lymphoedema/post mastectomy lymphoedema should not be seen by a hand therapist, unless they are specially trained in the techniques. No compression garments, bandages or treatment that students are taught at an undergrad level is appropriate for these patients. However, I would be very interested to know how many of these patients are being seen on these placements. I have specialised in the treatment of lymphoedema (as well as hands) and so this information would be very interesting to me.	In agreement, however aspects still part of UL rehabilitaiton competencies therefore need to be included. CSOTs insight into their competence additionally tested through this question.
While I think the results of this questionnaire will be very interesting, it almost seems that the information you're requesting would be aimed at qualified therapists going into hands/ working in hands, but who have not done any post-graduate work. At CS level I'm not sure what skills or knowledge new therapists really have, so it will be very interesting, but probably (and in many ways "hopefully") very predictable.	Researcher recognises that no distinction is drawn in the questionnaire between undergraduate and postgraduate exit competencies. As above, all aspects still part of UL rehabilitation competencies therefore need to be included. CSOTs insight into their competence additionally tested through this question.

**Appendix 8: OT IV students' comments on Survey 1**

<b>Comment</b>	<b>Action by researcher</b>
Size of textboxes to provide comment insufficient	Online version of survey provided unlimited space for comment; hardcopy survey adjusted to allow sufficient space in textboxes for comment
Unclear which comment box relates to which checklist item	Checklist options to be contained in separate rows to allow comments to be made alongside the correct item.
The questionnaire took between 20-40 minutes to complete	The approximate time for survey completion in the information sheet was changed from 20 minutes to 30 minutes.
Two of the five respondents indicated that they did not know what <i>Dupuytren's Contracture</i> was.	No change was made in response to this feedback.

## Appendix 9: Previous CSOTs comments on Survey 1

Comment	Action by researcher
The questionnaire took approximately 30 minutes to complete	Approximate time stated in information sheet amended.
'At what level/s of care do you provide services' – questioned if terms such as central, regional should be provided as options.	No change made as Primary, Secondary/District and Tertiary understood across provinces. 'Other' option provided with comment textbox should the participant wish to use other descriptors.
In what type of area have you been placed? (Urban, Peri-urban, Rural, Deep Rural) – concern that some placements are difficult to clarify.	Definitions that would provide adequate clarification for all 4 descriptors could not be found. Therefore Urban and Peri-urban combined as one option and Rural and Deep-Rural combined as another option.
How many patients do you see per month and for what reason / intervention are patients commonly referred to you? – does this refer to hand patients all patients-in-general?	Question changed to: 'Approximately how many patients do you see per month <i>in total</i> ?'
'How many occupational therapists are there in your team?' - unclear what is meant by 'team'. Therapists recommended adding 'department' to clarify.	Question changed to: 'How many occupational therapists are there in your team / department?'
'How many other rehabilitation personnel are there in your team? Please indicate to which discipline they belong' – unclear what is meant by 'team'. Therapists recommended adding 'work area' to clarify.	Question changed to: 'How many rehabilitation personnel are in your team / work area?'
Insufficient space to provide comment	Sufficient space allowance for comments included in formatting.
'Cultural competence has been described as 'an awareness of, sensitivity to, and knowledge of the meaning of culture' (Dillard <i>et al</i> , 1992:722 in Janse van Rensburg, van der Merwe and Nel, 2012). How culturally competent do you feel and how do you think that this impacts on your practice?' – definition raised multiple queries. Therapists recommended providing an alternative definition.	Definition changed to: 'Cultural competence is the ability of an individual to understand and respect values, attitudes, beliefs, and mores that differ across cultures, and to consider and respond appropriately to these differences in planning, implementing, and evaluating health education and promotion programs and interventions' (Joint Committee on Health Education and Promotion Terminology, 2000).
'What part of your undergrad curriculum prepared you most for treating patients with hand injuries and conditions?' Therapists recommended clarifying what is meant by 'part'.	Question changed to: 'What aspect of your undergraduate curriculum (eg. Lecture, practical experience, tutorial, elective) prepared you most for treating patients with UL injuries and conditions'.
'Psychogenic disorders involving the upper quarter (eg. clenched fist syndrome)': therapists recommended including 'conversion disorder' as an example.	Example added as recommended.
'Electrical Modalities' are not learnt at an undergraduate level. Therapists recommended providing an example.	Ultrasound added as an example.
Therapists queried whether 'Cognitive therapy' and 'Mirror therapy' should be included within the intervention question.	'Mirror Therapy as part of a graded motor imagery program)' included within list of interventions and 'CBT' added as an example 'Behavior Management'.
'Which of the following do you think would assist you in providing an effective hand rehabilitation service?'. Therapist suggested adding 'practical experience' (at an undergraduate level) as an option.	Question relates to assistance at a postgraduate/practicing level. Comment therefore not included within question. Therapist's comment covered within question:?.
'Alternatively, should you wish me to contact you, please leave your full name and contact details in the space provided below'. Therapists recommended moving this statement to above the researcher's contact details.	Recommendation implemented.

### Appendix 10: Comments made on Survey 2 pilot questionnaire

Three OT educators / upper limb rehabilitation clinicians were requested to review Survey 2 and critique whether they thought that questions would elicit the nature and extent of the UL rehabilitation curricula. Comments made and actions taken by the researcher are tabulated below:

	Comment	Action taken by researcher
OT Educator 1	<ul style="list-style-type: none"> <li>You need to ask yourself is how are you going to code the information you are receiving as your questions is open ended. How are your answers going to relate to statistics.</li> <li>You need to leave space for answers if the question is open ended and use tables if you have a list of things that needs to be ticked as you are going to get tick's/crosses all over the place as in question 6 and 7.</li> <li>Be careful of a scale with 5 options as people tend to choose the middle one as an easy way out as in question 8.</li> <li>Be careful of making assumptions in your questions, e.g. 4. Within a crowded pressured undergraduate curriculum.....</li> <li>In general, look at spacing and make use of tables.</li> </ul>	<ul style="list-style-type: none"> <li>Postcoding used</li> <li>Spacing adequate on electronic / <i>Fluidsurveys</i> copy</li> <li>Scaling determined by question type</li> <li>Question modified</li> <li>Formatting attended to in <i>Fluidsurveys</i></li> </ul>
OT Educator 2	<p>Modalities Question: Add ? Extensive anatomy of the upper extremity</p> <ul style="list-style-type: none"> <li>? Joint mobilisation as a means to enhance AROM ( I am not sure if this is meant to be covered in the Manual Therapy question...)</li> <li>Conditions Question: Add</li> <li>? Wounds,</li> <li>? Burns</li> </ul>	<ul style="list-style-type: none"> <li>Item included under knowledge competencies (not a modality)</li> <li>Included under <i>manual therapy</i></li> <li>Included under <i>soft tissue injury</i></li> <li>Included under <i>thermal injuries</i></li> </ul>
OT Educator 3	<ul style="list-style-type: none"> <li>General Comment: Please see my comments in the attached document. To answer your question in the email, yes I think your survey will elicit the information you are seeking appropriately. In my opinion, your survey has been put together well. The questions are clear, not ambiguous and they ask the 'right' questions for the information you want. At face value - the survey looks good.</li> <li>Question 4 (most important aspects of UL rehabilitation curriculum) Would you consider adding: 'the core concepts'? Also I suggest that most important aspects and core concepts be italics, not UL rehabilitation</li> <li>Teaching strategies question: If you introduce reading learning material here, should you maybe also include text books, journal articles, etc. or do you want to leave all 'reading' activities to question 9.</li> <li>Learning resources question: Are you referring to print media here i.e. text books 7 journal articles or also to learning resources such as anatomy models or e-learning materials, i.e. OER or You Tube</li> </ul>	<ul style="list-style-type: none"> <li>NA</li> <li>Considered – left as <i>most important aspects</i></li> <li>Left to question 9 / learning resources question</li> <li>Other resources included in question 9 as suggested</li> </ul>

## Appendix 11: Human Research Ethics Council Approval Letter

UNIVERSITY OF CAPE TOWN



Faculty of Health Sciences  
Human Research Ethics Committee  
Room E52-24 Groote Schuur Hospital Old Main Building  
Observatory 7925  
Telephone [021] 406 6338 • Facsimile [021] 406 6411  
e-mail: [shuretta.thomas@uct.ac.za](mailto:shuretta.thomas@uct.ac.za)  
Website: [www.health.uct.ac.za/research/humanethics/forms](http://www.health.uct.ac.za/research/humanethics/forms)

09 September 2013

**HREC REF: 551/2013**

**Dr H Buchanan**  
Occupational Therapy  
F45, OMB

Dear Dr Buchanan

**PROJECT TITLE: THE EXTENT TO WHICH COMMUNITY SERVICE OCCUPATIONAL THERAPIST ARE EQUIPPED TO TREAT PATIENTS WITH HAND INJURIES AND CONDITIONS**

Thank you for submitting your study to the Faculty of Health Sciences Human Research Ethics Committee for review.

It is a pleasure to inform you that the HREC has **formally approved** the above-mentioned study.

**Approval is granted for one year till the 30<sup>th</sup> September 2014**

Please submit a progress form, using the standardised Annual Report Form if the study continues beyond the approval period. Please submit a Standard Closure form if the study is completed within the approval period.

(Forms can be found on our website: [www.health.uct.ac.za/research/humanethics/forms](http://www.health.uct.ac.za/research/humanethics/forms))

Please note that the ongoing ethical conduct of the study remains the responsibility of the principal investigator.

**Please quote the HREC. REF in all your correspondence.**

Yours sincerely

Signed by candidate

**PROFESSOR M BLOCKMAN**  
**CHAIRPERSON, FHS HUMAN ETHICS**

Federal Wide Assurance Number: FWA00001637.

Institutional Review Board (IRB) number: IRB00001938

This serves to confirm that the University of Cape Town Human Research Ethics Committee complies to the Ethics Standards for Clinical Research with a new drug in patients, based on the Medical Research Council (MRC-SA), Food and Drug Administration (FDA-USA), International Convention on Harmonisation Good Clinical Practice (ICH GCP) and Declaration of Helsinki guidelines.

The Human Research Ethics Committee granting this approval is in compliance with the ICH Harmonised Tripartite Guidelines E6: Note for Guidance on Good Clinical Practice (CPMP/ICH/135/95) and FDA Code Federal Regulation Part 50, 56 and 312.



## Appendix 12: Research Assistant Confidentiality agreement<sup>35</sup>

I, *Ruth Van Stormbroek*, agree to assist the primary investigator with this study by

- *checking data entry*
- *checking data coding*

I agree to maintain full confidentiality when performing these tasks.

Specifically, I agree to:

1. Keep all research information shared with me confidential by not discussing or sharing the information in any form or format with anyone other than the primary investigator;
2. Hold in strictest confidence the identification of any individual that may be revealed during the course of performing the research tasks;
3. Not make copies of any raw data in any form or format

The research assistant will work alongside the principal investigator for tasks listed above and all data shall remain in the possession of the principal investigator on her personal password protected computers.

Printed name of research assistant: Ruth Van Stormbroek

Address: 3 Boekenhout Estate, Pascali Street, Sonstraal Heights, 7550

Telephone number: 082 575 3342

Signature of research assistant:  Date: January 2014

Printed name of primary investigator: Kirsty van Stormbroek

Signature of primary investigator:  Date: January 2014

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<sup>35</sup> Research Assistant Confidentiality Agreement, Augsburg College  
(<http://inside.augsburg.edu/irb/files/2012/09/Research-Assistant-Confidentiality-Agreement.docx>.  
Accessed November 2014, 14) used as guide in development of agreement.

## Appendix 13: Information Sheet

	<p><b>School of Health and Rehabilitation Sciences</b> <b>Faculty of Health Sciences</b> Divisions of Communications Sciences and Disorders, Nursing and Midwifery, Occupational Therapy, Physiotherapy F45 Old Main Building, Groote Schuur Hospital, Observatory 7925 Tel: +27 (0) 21 406 6401 Fax: +27 (0) 21 406 6323 Internet: <a href="http://www.uct.ac.za">www.uct.ac.za</a></p>
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Dear CS Occupational Therapist

CS can be both daunting and a great adventure. Your 2013 year of service is increasing the number of professionals providing vital health services to the South African people and in many cases improving communities' access to rehabilitation services. It is a year, however, that is seldom without its challenges.

I am an Occupational Therapist currently working and completing my Masters in Occupational Therapy at the University of Cape Town. My personal CS experience gave me a passion for CS Occupational Therapists (CSOTs). My subsequent experience within hand rehabilitation at a large state hospital has not only given me a commitment to optimizing hand rehabilitation services but has prompted me to question **the extent to which CS Occupational Therapists are equipped to treat patients with hand injuries and conditions**. It is with this background that I started this Masters Research project and would like to request *your* participation in a survey. Even if you have not yet treated a patient with an injury or condition affecting their UL, or never plan to, your opinions and experiences are valued.

This study has been approved by the University of Cape Town Human Research Ethics Committee (551/2013). Completing the questionnaire will take approximately 30 minutes. Questionnaires have been sent to all 2013 registered CSOTs in South Africa and may be completed and submitted electronically by following the internet link below or completing the emailed attachment / mailed hardcopy and returning these. Participation of the entire 2013 CSOT group will enable the research to capture the experiences of graduates from all 8 Universities who are practicing across all provinces within various service settings. Your name will not be reported and your university will be assigned a pseudonym when results are reported. Results applicable to each university will be sent to them on request.

Your participation is voluntary and you are free to withdraw from the research process at any point *before* submitting your completed questionnaire. Your questionnaire will be allocated a number and your name removed from it before analysis begins in order to protect confidentiality. This means that it will no longer be possible to withdraw your individual questionnaire from the pool of responses. (Your name is requested in the survey only to ensure that multiple responses from the

same participant is avoided and so that you can be entered into the hand rehabilitation textbook draw). A list linking questionnaire numbers to participants' names will be kept by the researcher on her password-protected computer. On completion of the research, this list will be destroyed.

Should you have chosen to submit an emailed survey or mailed hardcopy, your responses will be manually entered into an online survey tool. Your completed survey (email or hard-copy) will be kept securely (on researcher's password protected computer) until the research project is completed and then these documents will be destroyed. Various online-based systems will be used to store and analyse data. Systems committed to the security of information have been chosen to ensure the safety of the information that you share *as far as possible*.

The questions in the survey are not generally of a sensitive nature. If they, however, cause you any distress or highlight a need you may have for support, supervision, counseling etc., please do not hesitate to convey this so that I can assist you in obtaining the assistance you would like.

The names of all participants who complete questionnaires will be entered into a lucky draw. The winner will receive a hand rehabilitation textbook kindly sponsored by *Elsevier*. Participating in this study will allow you to share your unique experience, which may improve the experience of CSOTs in the future as well as improve services offered to the South African population. A summary of the results of the study will be emailed to you on completion of the project.

Completed questionnaires (Online or email) and consent forms need to be returned by **30 November 2013**. To complete the survey online, ***or for an Afrikaans version of the survey*** go to: <http://fluidsurveys.com/surveys/kirsty-gh2/csot-and-upper-limb-rehabilitation/> . If you would prefer an emailed electronic copy of the survey and information sheet (in English or Afrikaans), please email me on [kirsty.vanstormbroek@uct.ac.za](mailto:kirsty.vanstormbroek@uct.ac.za) and I will forward these to you. Should you choose to POST the enclosed hardcopy survey, please make use of the enclosed envelope with postage attached. (Please also allow time for your response to reach us by 10 DECEMBER 2013).

Thank you for your time and for sharing your CS experience. I wish you everything of the best for the rest of the year.

Please feel free to ask any questions you may have about the research by contacting me by email: [kirsty.vanstormbroek@uct.ac.za](mailto:kirsty.vanstormbroek@uct.ac.za) or telephone: 060977705 or the research supervisor, Dr Helen Buchanan (email: [Helen.buchanan@uct.ac.za](mailto:Helen.buchanan@uct.ac.za), tel: 021 406 6383). Should you have any concerns regarding your rights or welfare as a research participant, please contact the University of Cape Town, Faculty of Health Sciences, Human Research Ethics Committee (HREC) (Prof Marc Blockman, email: [Marc.Blockman@uct.ac.za](mailto:Marc.Blockman@uct.ac.za) or tel: 021 406 6338).

Kind Regards

Kirsty van Stormbroek

## Appendix 14: Descriptors of general CS experience

Descriptors	No. Of responses (missing responses)	No (Valid %) Indicated	Total (%)
A need for specific knowledge in assessment and treatment.	96 (7)	42 (43.8)	96 (100)
A sense of satisfaction from interacting with clients	96 (7)	72 (75.0)	96 (100)
A strong identity as an occupational therapist	96 (7)	40 (41.7)	96 (100)
Accountable	96 (7)	40 (41.7)	96 (100)
Affirmed in decision making	96 (7)	36 (37.5)	96 (100)
Alone	96 (7)	27 (28.1)	96 (100)
Anxious	96 (7)	24 (25.0)	96 (100)
Apprehensive	96 (7)	12 (12.5)	96 (100)
Autonomous	96 (7)	29 (30.2)	96 (100)
Challenged	96 (7)	52 (54.2)	96 (100)
Encouraged to reflect critically on my practice	96 (7)	40 (41.7)	96 (100)
Enthusiastic	96 (7)	45 (46.9)	96 (100)
Frustrated	96 (7)	56 (58.3)	96 (100)
Ill-equipped to manage stress	96 (7)	2 (2.1)	96 (100)
Inadequate	96 (7)	20 (20.8)	96 (100)
Isolated	96 (7)	10 (10.4)	96 (100)
Like a physio	96 (7)	43 (44.8)	96 (100)
Like a student	96 (7)	6 (6.3)	96 (100)
Like I am consolidating my skills	96 (7)	30 (31.3)	96 (100)
Like I am adjusting	96 (7)	28 (29.2)	96 (100)
Like I am just surviving	96 (7)	15 (15.6)	96 (100)
Like I am thriving	96 (7)	15 (15.6)	96 (100)
Like I lack recognition	96 (7)	23 (24.0)	96 (100)
Like I need a mentor	96 (7)	40 (41.7)	96 (100)
Like I often doubt myself	96 (7)	28 (29.2)	96 (100)
Like my expectations have been met	96 (7)	10 (10.4)	96 (100)
Like my workload is realistic	96 (7)	27 (28.1)	96 (100)
Like Occupational Therapy is poorly recognised	96 (7)	61 (63.5)	96 (100)
Motivated	96 (7)	34 (35.4)	96 (100)
Okay with not knowing everything	96 (7)	41 (42.7)	96 (100)
Overwhelmed	96 (7)	21 (21.9)	96 (100)
Poorly understood as an Occupational Therapist	96 (7)	21 (21.9)	96 (100)
Pressure to perform	96 (7)	13 (13.5)	96 (100)
Professionally confident	96 (7)	24 (25)	96 (100)
Proud to be an Occupational Therapist	96 (7)	64 (66.7)	96 (100)
Resentful	96 (7)	4 (4.2)	96 (100)
Resourceful	96 (7)	33 (34.4)	96 (100)
Satisfied in my job	96 (7)	35 (36.5)	96 (100)
Self confident	96 (7)	21 (21.9)	96 (100)
Stressed	96 (7)	10 (10.4)	96 (100)
Supported	96 (7)	20 (20.8)	96 (100)
Uncertain	96 (7)	14 (14.6)	96 (100)
Uncertain about my role	96 (7)	10 (10.4)	96 (100)
Unconfident	96 (7)	7 (7.3)	96 (100)
Undervalued	96 (7)	20 (20.8)	96 (100)
Unsettled	96 (7)	3 (3.1)	96 (100)
Unsupported	96 (7)	23 (24.0)	96 (100)
Unsure whether I am doing the right thing	96 (7)	37(38.5)	96 (100)

## Appendix 15: Treatment frequencies for various UL diagnoses

Diagnosis	Daily No (%)	Weekly No (%)	Monthly No (%)	≤ every 2nd month No (%)	Never No (%)	Mis- s- ing No.	Total No (%)
Amputations	2 (2.3)	10 (11.5)	23 (26.4)	27 (31.0)	25 (28.7)	16	87 (100)
Central nervous system disorders as they relate to the upper quarter eg. CP, CVA	43 (47.3)	35 (38.5)	5 (5.5)	5 (5.5)	3 (3.3)	12	91 (100)
Congenital differences/anomalies	4 (4.6)	13 (14.9)	19 (21.8)	31 (35.6)	20 (23)	16	87 (100)
Cumulative trauma disorders/RSI eg. De Quervain's tenosynovitis, epicondylitis	2 (2.3)	12 (13.6)	22 (25)	16 (18.2)	36 (40.9)	15	88 (100)
Dupuytren's contracture	0 (0.0)	0 (0.0)	7 (8.2)	19 (22.4)	59 (69.4)	18	85 (100)
Flexor/extensor tendon injuries	4 (4.5)	18 (20.5)	29 (33.0)	25 (28.4)	12 (13.6)	15	88 (100)
Fractures/dislocations/joint instabilities	6 (6.8)	29 (33.0)	29 (33.0)	10 (11.4)	14 (15.9)	15	88 (100)
Infections (eg. human bite injury, cellulitis, paronychia)	5 (5.7)	16 (18.2)	20 (22.7)	21 (23.9)	26 (29.5)	15	88 (100)
Inflammatory and degenerative arthritis (eg. OA, RA, Scleroderma, Fibromyalgia)	6 (6.9)	28 (32.2)	29 (33.3)	17 (19.5)	7 (8.0)	16	87 (100)
Complex trauma affecting multiple tissue types (eg. gunshot wounds, Panga injury, crush injury)	6 (6.8)	12 (13.6)	27 (30.7)	27 (30.7)	16 (18.2)	15	88 (100)
Nail bed injuries	0 (0.0)	0 (0.0)	3 (3.5)	9 (10.5)	74 (86.0)	17	86 (100)
Pain-related syndromes (eg. complex regional pain syndrome)	0 (0.0)	3 (3.4)	17 (19.5)	22 (25.3)	45 (51.7)	16	87 (100)
Peripheral nerve compression and disease (eg. CTS, thoracic outlet syndrome, diabetic neuropathy)	0 (0.0)	11 (12.5)	26 (29.5)	28 (31.8)	23 (26.1)	15	88 (100)
Peripheral nerve injuries (peripheral nerves and brachial plexus injuries)	3 (3.3)	13 (14.4)	24 (26.7)	30 (33.3)	20 (22.2)	13	90 (100)
Post-mastectomy/post-radiation lymphedema	0 (0.0)	0 (0.0)	3(3.5)	12 (14.0)	71 (82.6)	17	86 (100)
Psychogenic disorders involving the upper quarter	0 (0.0)	1 (1.1)	3 (3.4)	12 (13.6)	72 (81.8)	15	88 (100)
Soft tissue injuries (eg. acute ligament injuries)	4 (4.7)	5 (5.9)	15 (17.6)	27 (31.8)	34 (40.0)	18	85 (100)
Thermal Injuries including burns, electrical injuries	10 (11.1)	18 (20.0)	25 (27.8)	24 (26.7)	13 (14.4)	13	90 (100)
Tumors and Cysts (eg. ganglions)	2 (2.3)	2 (2.3)	2 (2.3)	23 (26.4)	58 (66.7)	16	87 (100)
Vascular disorders (eg. aneurysm)	1 (1.1)	4 (4.5)	10 (11.4)	13 (14.8)	60 (68.2)	15	88 (100)

## Appendix 16: UL treatment modalities frequency

Treatment Modality	Daily No (%)	Weekly No (%)	Monthly No (%)	≤ every 2nd month No (%)	Never No (%)	Mis sing No	Total No (%)
Activity as a 'means' and / or 'an end'	51 (57.3)	20 (22.5)	15 (16.9)	1 (1.1)	2 (2.2)	14	89 (100)
Adaptive / assistive devices	17 (19.3)	35 (39.8)	15 (17.0)	15 (17.0)	6 (6.8)	15	88 (100)
Appropriate paper-based technology	2 (2.3)	5 (5.7)	8 (9.2)	19 (21.8)	53 (60.9)	16	87 (100)
Training in activities of daily living	43 (48.3)	27 (30.3)	12 (13.5)	5 (5.6)	2 (2.2)	14	89 (100)
Behaviour Management eg. CBT	10 (11.4)	13 (14.8)	18 (20.5)	17 (19.3)	30 (34.1)	15	88 (100)
Compressive therapy eg. PGs	1 (1.1)	13 (14.6)	22 (24.7)	19 (21.3)	34 (38.2)	14	89 (100)
Desensitization	1 (1.1)	19 (21.6)	27 (30.7)	30 (34.1)	11 (12.5)	15	88 (100)
Electrical Modalities (eg. Ultrasound)	1 (1.1)	0 (0.0)	0 (0.0)	1 (1.1)	86 (97.7)	15	88 (100)
Ergonomic Modifications	5 (5.7)	15 (17.0)	27 (30.7)	20 (22.7)	21 (23.9)	15	88 (100)
Exercise	45 (51.7)	25 (28.7)	11 (12.6)	4 (4.6)	2 (2.3)	16	87 (100)
Home programmes	54 (61.4)	20 (22.7)	5 (5.7)	6 (6.8)	3 (3.4)	15	88 (100)
Manual Therapy eg. NDT, MEM	45 (51.1)	27 (30.7)	6 (6.8)	4 (4.5)	6 (6.8)	15	88 (100)
Mirror Therapy (as part of GMI prog.)	2 (2.3)	13 (14.8)	9 (10.2)	16 (18.2)	48 (54.5)	15	88 (100)
Patient, family, workplace education	51 (57.3)	13 (14.6)	18 (20.2)	5 (5.6)	2 (2.2)	14	89 (100)
Prosthetic training	1 (1.1)	2 (2.3)	4 (4.5)	8 (9.1)	73 (83.0)	15	88 (100)
Scar management techniques	16 (18.0)	33 (37.1)	20 (22.5)	10 (11.2)	10 (11.2)	14	89 (100)
Sensory re-education	5 (5.7)	19 (21.6)	21 (23.9)	22 (25.0)	21 (23.9)	15	88 (100)
Splinting	11 (12.5)	30 (34.1)	22 (25.0)	8 (9.1)	17 (19.3)	15	88 (100)
Std. & non-std assessment tools	25 (28.1)	23 (25.8)	23 (25.8)	10 (11.2)	8 (9.0)	14	89 (100)
Strengthening	35 (39.8)	32 (36.4)	10 (11.4)	6 (6.8)	5 (5.7)	15	88 (100)
Thermal modalities eg. icing, heat	12 (13.8)	16 (18.4)	15 (17.2)	12 (13.8)	32 (36.8)	16	87 (100)
Work hardening / retraining	2 (2.3)	5 (5.7)	22 (25.0)	15 (17.0)	44 (50.0)	15	88 (100)
Wound Care / dressing	9 (10.5)	20 (23.3)	19 (22.1)	14 (16.3)	24 (27.9)	17	86 (100)

## Appendix 17: Perceived preparedness to treat UL diagnoses

<b>Diagnosis</b>	<b>Extremely prepared/ Equipped No (%)</b>	<b>Well prepared / equipped No (%)</b>	<b>Somewh at prepared / Equippe d No (%)</b>	<b>Poorly prepared / equipped No (%)</b>	<b>Extremel y unprepar ed/ ill-equipped No (%)</b>	<b>Mis sing No</b>	<b>Total No (%)</b>
Amputations	4 (4.5)	36 (40.4)	34 (38.2)	14 (15.7)	1 (1.1)	14	89 (100)
Central nervous system disorders as they relate to the upper quarter eg. CP, CVA	14 (15.4)	55 (60.4)	17 (18.7)	5 (5.5)	0 (0.0)	12	91 (100)
Congenital differences/anomalies	0 (0.0)	13 (14.6)	42 (47.2)	31 (34.8)	3 (3.4)	14	89 (100)
Cumulative trauma disorders/RSI eg. De Quervain's tenosynovitis, epicondylitis	2 (2.2)	16 (18.0)	27 (30.3)	32 (36.0)	12 (13.5)	14	89 (100)
Dupuytren's contracture	1 (1.1)	11 (12.4)	24 (27.0)	39 (43.8)	14 (15.7)	14	89 (100)
Flexor/extensor tendon injuries	7 (7.8)	24 (26.7)	38 (42.2)	16 (17.8)	5 (5.6)	13	90 (100)
Fractures/dislocations/joint instabilities	5 (5.6)	24 (27.0)	38 (42.7)	17 (19.1)	5 (5.6)	14	89 (100)
Infections (eg. human bite injury, cellulitis, paronychia)	6 (5.8)	20 (22.7)	24 (27.3)	25 (28.4)	13 (14.8)	15	88 (100)
Inflammatory and degenerative arthritis (eg. OA, RA, Scleroderma, Fibromyalgia)	11 (12.2)	38 (42.2)	33 (36.7)	8 (8.9)	0 (0.0)	13	90 (100)
Complex trauma affecting multiple tissue types (eg. gunshot wounds, Panga injury, crush injury)	2 (2.2)	17 (18.9)	42 (46.7)	25 (27.8)	4 (4.4)	13	90 (100)
Nail bed injuries	1 (1.1)	2 (3.4)	10 (11.2)	48 (53.9)	28 (31.5)	14	89 (100)
Pain-related syndromes (eg. complex regional pain syndrome)	0 (0.0)	11 (12.5)	32 (36.4)	27 (30.7)	18 (20.5)	15	88 (100)
Peripheral nerve compression and disease (eg. CTS, thoracic outlet syndrome, diabetic neuropathy)	3 (3.4)	21 (23.6)	43 (48.3)	15 (16.9)	7 (7.9)	14	89 (100)
Peripheral nerve injuries (peripheral nerves and brachial plexus injuries)	3 (3.3)	25 (27.8)	39 (43.3)	19 (21.1)	4 (4.4)	13	90 (100)
Post-mastectomy/post-radiation lymphedema	0 (0.0)	1 (1.1)	20 (22.5)	30 (33.7)	38 (42.7)	14	89 (100)
Psychogenic disorders involving the upper quarter (eg. Conversion disorder, clenched fist syndrome)	0 (0.0)	1 (1.1)	15 (17.0)	24 (27.3)	48 (54.5)	15	88 (100)
Soft tissue injuries (eg. acute ligament injuries)	0 (0.0)	13 (14.8)	38 (43.2)	24 (27.3)	13 (14.8)	15	88 (100)
Thermal Injuries including burns, electrical injuries	11 (12.1)	51 (56.0)	22 (24.2)	6 (6.6)	1 (1.1)	12	91 (100)
Tumors and Cysts (eg. ganglions)	0 (0.0)	7 (7.9)	26 (29.2)	30 (33.7)	26 (29.2)	14	89 (100)
Vascular disorders (eg. aneurysm)	0 (0.0)	6 (6.7)	25 (28.1)	31 (34.8)	27 (30.3)	14	89 (100)

## Appendix 18: University & preparedness for treating conditions

Association between university & perception of being equipped to treat conditions	Pearson's Chi-squared	P-value
Amputations	7.82	0.349
CNS	7.79	0.380
Congenital differences/anomalies	11.82	0.106
<i>Cumulative trauma disorders/RSI</i>	15.50	0.030
<i>Dupuytren's contracture</i>	16.31	0.022
Flexor/extensor tendon injuries	9.47	0.221
Fractures/dislocations/joint instabilities	3.50	0.835
<i>Infections</i>	23.77	0.001
Arthritis	8.04	0.329
Complex trauma	8.62	0.281
Nail bed injuries	6.61	0.471
Pain-related syndromes	10.61	0.156
Peripheral nerve compression and disease	6.99	0.430
Peripheral nerve injuries	11.61	0.114
Lymphedema	4.52	0.718
Psychogenic disorders	6.72	0.459
Soft tissue injuries	6.42	0.492
Thermal Injuries	8.81	0.267
Tumors and Cysts	4.00	0.780
Vascular disorders	5.10	0.648



## Appendix 19: Perceived preparedness for UL treatment modalities

Treatment Modality	<i>Extremely prepared / Equipped No (%)</i>	<i>Well prepared / equipped No (%)</i>	<i>Somewhat prepared / Equipped No (%)</i>	<i>Poorly prepared / equipped No (%)</i>	<i>Extremely unprepared/ ill-equipped No (%)</i>	<i>Missing No</i>	<i>Total No (%)</i>
Activity as a 'means' and / or 'an end'	36 (40.4)	43 (48.3)	7 (7.9)	3 (3.4)	0 (0.0)	14	89 (100)
Adaptive / assistive devices	21 (23.9)	48 (54.5)	13 (14.8)	4 (4.5)	2 (2.3)	15	88 (100)
Appropriate paper-based technology	11 (12.5)	17 (19.3)	22 (25.0)	16 (18.2)	22 (25.0)	15	88 (100)
Training in activities of daily living	28 (31.8)	46 (52.3)	13 (14.8)	1 (1.1)	0 (0.0)	15	88 (100)
Behaviour Management eg. CBT	2 (2.3)	26 (29.5)	28 (31.8)	26 (29.5)	6 (6.8)	15	88 (100)
Compressive therapy eg. PGs	4 (4.5)	23 (26.1)	37 (42.0)	13 (14.8)	11 (12.5)	15	88 (100)
Desensitization	7 (8.0)	34 (38.6)	35 (39.8)	10 (11.4)	2 (2.3)	15	88 (100)
Electrical Modalities (eg. Ultrasound)	0 (0.0)	1 (1.1)	3 (3.4)	19 (21.8)	64 (73.6)	16	87 (100)
Ergonomic Modifications	7 (8.0)	38 (43.2)	35 (39.8)	6 (6.8)	2 (2.3)	15	88 (100)
Exercise	13 (14.8)	46 (52.3)	26 (29.5)	2 (2.3)	1 (1.1)	15	88 (100)
Home programmes	20 (22.5)	46 (51.7)	22 (24.7)	1 (1.1)	0 (0.0)	14	89 (100)
Manual Therapy eg. NDT, MEM	14 (15.9)	40 (45.5)	27 (30.7)	6 (6.8)	1 (1.1)	15	88 (100)
Mirror Therapy (as part of a GMI prog.)	3 (3.4)	17 (19.3)	20 (22.7)	23 (26.1)	25 (28.4)	15	88 (100)
Patient, family, workplace education	18 (20.5)	48 (54.5)	21 (23.9)	1 (1.1)	0 (0.0)	15	88 (100)
Prosthetic training	2 (2.3)	2 (2.3)	21 (23.9)	34 (38.6)	29 (33.0)	15	88 (100)
Scar management techniques	14 (15.7)	43 (48.3)	25 (28.1)	5 (5.6)	2 (2.2)	14	89 (100)
Sensory re-education	6 (7.0)	25 (29.1)	43 (50.0)	10 (11.6)	2 (2.3)	17	86 (100)
Splinting	13 (14.8)	33 (37.5)	26 (29.5)	10 (11.4)	6 (6.8)	15	88 (100)
Std. & non-std. assessment tools	8 (9.0)	46 (51.7)	22 (24.7)	12 (13.5)	1 (1.1)	14	89 (100)
Strengthening	12 (13.8)	40 (46.0)	29 (33.3)	6 (6.9)	0 (0.0)	16	87 (100)
Thermal modalities eg. icing, heat	6 (6.8)	23 (26.1)	27 (30.7)	19 (21.6)	13 (14.8)	15	88 (100)
Work hardening / retraining	1 (1.1)	17 (19.3)	44 (50.0)	21 (23.9)	5 (5.7)	15	88 (100)
Wound Care / dressing	1 (1.1)	17 (19.3)	44 (50.0)	21 (23.9)	5 (5.7)	15	88 (100)

## Appendix 20. University & preparedness for modality use

Association between University and equippedness for using modalities	Chi-squared value	P-value
Activity as a 'means' and / or 'an end'	13.95	0.052
<i>Adaptive / assistive devices</i>	18.26	0.011
<i>Appropriate paper-based technology (APT)</i>	38.14	0.000
Training in activities of daily living (ADLs)	8.88	0.261
Behaviour Management eg. CBT	4.62	0.706
Compressive therapy eg. pressure garments	5.21	0.635
Desensitization	4.96	0.665
Electrical Modalities (eg. Ultrasound)	9.89	0.195
Ergonomic Modifications	8.00	0.332
Exercise	7.84	0.347
Home programmes	8.99	0.253
Manual Therapy eg. NDT, MEM	7.93	0.339
Mirror Therapy (as part of GMI program)	4.82	0.682
Patient, family, workplace education	10.12	0.182
Prosthetic training	8.81	0.267
Scar management techniques	9.23	0.237
Sensory re-education	11.56	0.116
<i>Splinting</i>	15.25	0.033
Standardized & non-standardized assessment tools	5.41	0.610
Strengthening	10.41	0.167
Thermal modalities eg. icing, heat	12.02	0.100
Work hardening / retraining	10.38	0.168
Wound Care / dressing	7.50	0.378

## Appendix 21: Preparedness for UL rehabilitation competencies

Competency Area	Extremely prepared/ Equipped No (%)	Well prepared/ equipped No (%)	Somewhat prepared/ Equipped No (%)	Poorly prepared/ equipped No (%)	Extremely unprepared/ ill-equipped No (%)	Missing No	Total No (%)
<b>Knowledge</b>							
Demonstrate knowledge of anatomy, physiology and histology of UL	5 (5.6)	37 (41.6)	41 (46.1)	6 (6.7)	0 (0.0)	14	89 (100)
Demonstrate knowledge of biomechanics	3 (3.4)	33 (37.5)	41 (46.6)	9 (10.2)	2 (2.3)	15	88 (100)
Demonstrate knowledge of pathology, epidemiology, medical and surgical interventions affecting the UL	4 (4.5)	20 (22.5)	48 (53.9)	16 (18.0)	1 (1.1)	14	89 (100)
Demonstrate knowledge of psychosocial and behavioural science	4 (4.5)	33 (37.1)	33 (37.1)	18 (20.2)	1 (1.1)	14	89 (100)
Demonstrate knowledge of rehabilitation and adaptation	10 (11.2)	54 (60.7)	22 (24.7)	3 (3.4)	0 (0.0)	14	89 (100)
Demonstrate knowledge of research-based clinical interventions / Evidence based practice	3 (3.4)	21 (23.9)	40 (45.5)	21 (23.9)	3 (3.4)	15	88 (100)
<b>Assessment</b>							
Obtain and review medical, psychosocial and work history	22 (24.7)	52 (58.4)	14 (15.7)	1 (1.1)	0 (0.0)	14	89 (100)
Obtain appropriate collateral information	22 (25.0)	52 (59.1)	12 (13.6)	2 (2.3)	0 (0.0)	15	88 (100)
Select appropriate assessment tools	11 (12.5)	53 (60.2)	22 (25.0)	1 (1.1)	1 (1.1)	15	88 (100)
Demonstrate technical skill related to assessment	5 (5.6)	52 (58.4)	27 (30.3)	4 (4.5)	1 (1.1)	14	89 (100)
Assess and record the skeletal, muscular, vascular, skin and connective tissue status of UL	9 (10.2)	34 (38.6)	34 (38.6)	10 (11.4)	1 (1.1)	15	88 (100)
Assess and record dexterity and hand function	9 (10.1)	52 (58.4)	22 (24.7)	6 (6.7)	0 (0.0)	14	89 (100)
Determine the patient's level of, and satisfaction with, their occupational performance	11 (12.5)	51 (58.0)	24 (27.3)	2 (2.3)	0 (0.0)	15	88 (100)
Assess relevant contextual/environmental factors	13 (14.9)	58 (66.7)	16 (18.4)	0 (0.0)	0 (0.0)	16	87 (100)
Assess relevant ergonomic factors	6 (6.7)	48 (53.9)	32 (36.0)	3 (3.4)	0 (0.0)	14	89 (100)
Assess relevant psychosocial factors	11 (12.5)	49 (55.7)	27 (30.7)	1 (1.1)	0 (0.0)	15	88 (100)
Demonstrate ability to assess needs of patient related to experiencing trauma	7 (8.0)	32 (36.4)	44 (50.0)	5 (5.7)	0 (0.0)	15	88 (100)
<b>Treatment</b>							
Review and interpret assessment findings to plan treatment	11 (12.4)	51 (57.3)	22 (24.7)	5 (5.6)	0 (0.0)	14	89 (100)
Develop functional prognosis based on assessment findings to direct treatment	7 (7.9)	30 (33.7)	41 (46.1)	10 (11.2)	1 (1.1)	14	89 (100)
Formulate long, medium & short-term intervention goals in collaboration with client	8 (9.1)	41 (46.6)	30 (34.1)	9 (10.2)	0 (0.0)	15	88 (100)
Select & implement treatment modalities and techniques to address Perf. comp impairments: such as oedema, vascularity, pain, scar, ROM, flexibility, wounds, MS, dexterity, sensation, function, endurance, posture/movement	8 (9.2)	44 (50.6)	29 (33.3)	6 (6.9)	0 (0.0)	16	87 (100)
Select and implement modalities & techniques to address occ. performance limitations	8 (9.2)	43 (49.4)	33 (37.9)	3 (3.4)	0 (0.0)	16	87 (100)
Select and implement modalities & techniques to address contextual/environmental barriers	5 (5.6)	41 (46.1)	37 (41.6)	5 (5.6)	1 (1.1)	14	89 (100)
Select & implement modalities and techniques to address psychosocial limiting aspects	3 (3.3)	29 (32.2)	43 (47.8)	15 (16.7)	0 (0.0)	13	90 (100)
Demonstrate ability to appropriately manage needs of patients who have undergone trauma (eg. Basic counseling, referral)	7 (7.9)	41 (46.1)	32 (36.0)	9 (10.1)	0 (0.0)	14	89 (100)
Assess readiness and assess needs for return-to-work	7 (8.0)	33 (37.5)	35 (39.8)	11 (12.5)	2 (2.3)	15	88 (100)
Implement intervention in accordance with evidence-based guidelines	4 (4.5)	26 (29.2)	46 (51.7)	12 (13.5)	1 (1.1)	14	89 (100)
Demonstrate technical skill in treatment	5 (5.6)	32 (36.0)	43 (48.3)	8 (9.0)	1 (1.1)	14	89 (100)

Monitor and revise treatment program	9 (10.1)	44 (49.4)	34 (38.2)	2 (2.2)	0 (0.0)	14	89 (100)
Implement group-based intervention	6 (6.7)	36 (40.4)	33 (37.1)	13 (14.6)	1 (1.1)	14	89 (100)
Accurately document all aspects of intervention	10 (11.4)	47 (53.4)	27 (30.7)	4 (4.5)	0 (0.0)	15	88 (100)
<b>Clinical Judgment / Clinical Reasoning</b>							
Use theory, clinical science knowledge, and experience to collect and interpret pertinent clinical data; identifying and prioritizing clinical problems and providing optimal patient care.	8 (9.5)	35 (41.7)	35 (41.7)	5 (6.0)	1 (1.2)	19	84 (100)
<b>Interpersonal Skills and Relationships</b>							
Exhibit effective & appropriate interpersonal and communication skills	26 (29.9)	54 (62.1)	7 (8.0)	0 (0.0)	0 (0.0)	16	87 (100)
Exhibit sensitivity to a diverse patient population	20 (22.7)	59 (67.0)	8 (9.1)	1 (1.1)	0 (0.0)	15	88 (100)
Collaborate with patients, families, and professionals to attain desired outcomes	16 (18.2)	61 (69.3)	10 (11.4)	1	0	15	88 (100)
<b>Population-based services</b>							
Assess needs of identified population suffering from UL pathology or at risk of suffering from UL pathology eg. factory workers	4 (4.5)	23 (25.8)	45 (50.6)	15 (16.9)	2 (2.2)	14	89 (100)
Make intervention recommendations based on available resources	10 (11.4)	42 (47.7)	32 (36.4)	4 (4.5)	0 (0.0)	15	88 (100)
Intervene (eg. education, prevention, ergonomic modifications)	11 (12.4)	45 (50.6)	33 (37.1)	0 (0.0)	0 (0.0)	14	89 (100)
Monitor and adjust interventions	7 (8.0)	45 (51.1)	34 (38.6)	2 (2.3)	0 (0.0)	15	88 (100)
<b>Organize and manage services</b>							
Complete planning functions for service in line with national/provincial/regional guidelines	2 (2.3)	19 (21.6)	46 (52.3)	19 (21.6)	2 (2.3)	15	88 (100)
Complete stock taking and acquisition of new equipment	12 (13.6)	28 (31.8)	27 (30.7)	18 (20.5)	3 (3.4)	15	88 (100)
Ensure compliance with national /provincial / regional priorities, policies and procedures	3 (3.4)	27 (30.3)	39 (43.8)	18 (20.2)	2 (2.2)	14	89 (100)
Obtain and use materials and supplies judiciously	10 (11.2)	47 (52.8)	23 (25.8)	8 (9.0)	1 (1.1)	14	89 (100)
Acquire and maintain work space	15 (17.0)	51 (58.0)	15 (17.0)	6 (6.8)	1 (1.1)	15	88 (100)
Identify, access, and use existing resources within or outside of health care systems to benefit patients, families, and patient populations (eg. NGO services, donations from companies eg. off-cut neoprene materials)	9 (10.2)	38 (43.2)	31 (35.2)	7 (8.0)	3 (3.4)	15	88 (100)
<b>Professional Practice</b>							
Maintain ethical and legal standards	18 (20.5)	49 (55.7)	19 (21.6)	1 (1.1)	1 (1.1)	15	88 (100)
Interpret and apply clinical research (EBP)	4 (4.5)	28 (31.5)	48 (53.9)	9 (10.1)	0 (0.0)	14	89 (100)
Commitment to CPD	25 (28.1)	52 (58.4)	9 (10.1)	2 (2.2)	1 (1.1)	14	89 (100)
Seek mentorship & support	13 (14.8)	42 (47.7)	27 (30.7)	5 (5.7)	1 (1.1)	15	88 (100)
Participate in activities and professional associations that advance professional practice and public welfare.	10 (11.4)	45 (51.1)	26 (29.5)	5 (5.7)	2 (2.3)	15	88 (100)

## Appendix 22: Relationship between university & perception of being equipped for UL rehabilitation competency areas

Scientific Knowledge	Pearson's Chi	P-value
Demonstrate knowledge of anatomy, physiology and histology of upper limb	4.21	0.756
Demonstrate knowledge of biomechanics	7.05	0.424
Demonstrate knowledge of pathology, epidemiology, medical and surgical interventions affecting the upper limb	6.35	0.500
Demonstrate knowledge of psychosocial and behavioural science	7.72	0.358
Demonstrate knowledge of rehabilitation and adaptation	6.31	0.504
<i>Demonstrate knowledge of research-based clinical interventions / Evidence based practice</i>	14.09	0.050
<b>Assessment</b>		
Obtain and review medical, psychosocial and work history	8.99	0.253
Obtain appropriate collateral information	5.33	0.620
Select appropriate assessment tools	5.33	0.620
Demonstrate technical skill related to assessment	7.28	0.400
Assess and record the skeletal, muscular, vascular, skin and connective tissue status of the upper limb	9.43	0.223
Assess and record dexterity and hand function	8.13	0.321
Determine the patient's level of, and satisfaction with, their occupational performance	6.23	0.513
Assess relevant contextual/environmental factors	Not computed as variable is a constant	
Assess relevant ergonomic factors	5.95	0.546
Assess relevant psychosocial factors	10.12	0.182
Demonstrate ability to assess needs of patient related to experiencing trauma	4.48	0.723
<b>Treatment</b>		
Review and interpret assessment findings to plan treatment	7.78	0.400
Develop functional prognosis based on assessment findings to direct treatment	12.15	0.096
<i>Formulate long, medium &amp; short-term intervention goals in collaboration with client</i>	24.50	0.001
Select and implement treatment modalities and techniques to address performance component impairments: such as oedema, vascularity, pain, scar, range of motion, flexibility, wounds, strength, dexterity, sensation, function, endurance, posture/movement	7.79	0.352
Select and implement modalities & techniques to address occupational performance limitations	5.24	0.631
Select and implement modalities & techniques to address contextual/environmental barriers	6.37	0.498
Select and implement modalities and techniques to address psychosocial limiting aspects	7.93	0.339
Demonstrate ability to appropriately manage needs of patients who have undergone trauma (eg. Basic counseling, referral)	3.43	0.843
Assess readiness and assess needs for return-to-work	11.42	0.121
Implement intervention in accordance with evidence-based guidelines	9.86	0.197
<i>Demonstrate technical skill in treatment</i>	13.15	0.069
Monitor and revise treatment program	8.07	0.326
Implement group-based intervention	9.92	0.193
Accurately document all aspects of intervention	11.43	0.121
<b>Clinical Judgment / Clinical Reasoning</b>		
Use theory, clinical science knowledge, and experience to collect and interpret pertinent clinical data; identifying and prioritizing clinical problems and providing optimal patient care.	8.60	0.283
<b>Interpersonal Skills and Relationships</b>		
Exhibit effective & appropriate interpersonal and communication skills	11.70	0.111
Exhibit sensitivity to a diverse patient population	Not computed as constant	
Collaborate with patients, families, and professionals to attain desired outcomes	10.12	0.182
<b>Population-based services</b>		
Assess needs of identified population suffering from upper limb pathology or at risk of suffering from upper limb pathology eg. factory workers	8.57	0.285
Make intervention recommendations based on available resources	5.01	0.659
Intervene (eg. education, prevention, ergonomic modifications)	Not computed as constant	
Monitor and adjust interventions	8.58	0.284
<b>Organize and manage services</b>		
Complete planning functions for service in line with national/provincial/regional guidelines	6.56	0.476
Complete stock taking and acquisition of new equipment	6.28	0.507
Ensure compliance with national /provincial / regional priorities, policies and procedures	10.40	0.167
Obtain and use materials and supplies judiciously	5.77	0.567
Acquire and maintain work space	5.81	0.562
Identify, access, and use existing resources within or outside of health care systems to benefit patients, families, and patient populations (eg. Non-governmental organization services, donations from companies eg. off-cut neoprene materials)	5.18	0.638
<b>Professional Practice</b>		
Maintain ethical and legal standards	5.60	0.587
Interpret and apply clinical research (evidence-based practice)	3.38	0.848
Commitment to continuous professional development	6.50	0.483
Seek mentorship & support	8.05	0.328
Participate in activities and professional associations that advance professional practice and public welfare.	5.77	0.576