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Patients' perceived factors that influence return to work after stroke

Nicole Duff

A research report submitted to the Faculty of Health Sciences, University of the Witwatersrand, in partial fulfilment of the requirements for the degree
of
Master of Science in Physiotherapy

Johannesburg, 2012

DECLARATION

I, Nicole Duff, declare that this research report is my own work. It is being submitted for the degree of Master of Physiotherapy at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination at this or any other University.

…….. [Signature of candidate]

…… day of ……., 2012

DEDICATION

To my parents who have supported me throughout this entire process, who always knew I could do this, who pushed me to always give my best and who kept me focused.

To my best friend and constant support, the Lord God Almighty, who gave me the knowledge to know this was the path I should take, the strength to begin, the dedication to persevere, the insight into what to write, and the passion for the knowledge in the area of this research.

ABSTRACT

Introduction:

Stroke continues to be a major public health problem for both the developed and developing world despite the various advances in health care. The economic burden of stroke is ever increasing and in light of this, return to work post-stroke is becoming an important area of research for therapists. Thus the main aims of the study were to establish the rate of return to work of patients following stroke and to establish the patients' perceived factors which influence their return to work after stroke.

Method

This was a quantitative cross sectional study. A sample of convenience of ninety seven participants were selected from a list of patients obtained from various rehabilitation units and government clinics within the Gauteng province. A self-designed questionnaire was used. A pilot study was conducted to determine the questionnaire's reliability and validity, and the validity, inter-rater and intra-rater reliability were all found to be satisfactory. The participants were contacted and interviewed at their homes or a location suitable for them using a self-designed questionnaire. The percentage of patients that returned to work was determined and reasons for returning or not returning to work were summarised using frequencies and percentages. A univariate and then multivariate analysis was performed to establish perceived factors which had an influence on return to work

Results

The study sample had more males than females with an overall mean age of 51years. They were mostly black and between 18 months and 24 months post-stroke. The most common co-morbidities were fatigue and hypertension. There was a 34% return to work rate, with 3% stopping work after a period of time, leaving 31% of the sample working at the time of interview. The most common reasons for returning to work were financial (77%), enjoyment of work (77%) and personal development (73%). For those who did not return to

work the two most common reasons were upper limb dysfunction (61%) and walking difficulties (53%). The main factors that decreased likelihood of return to work included depression and not paying life insurance or monthly car repayments.

Conclusion

The return to work rate following stroke in this study group is in line with other countries around the world, although it is still relatively low with less than a third of patients with stroke returning to work. Enjoyment of work was shown to be as important a motivating factor for return to work as finances, and physical fallout was the most demotivating factor. Depression was the most likely factor to decrease return to work.

Key words: rate of return to work after stroke, factors affecting return to work; stroke rehabilitation; stroke economic burden;

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CHAPTER 1

1. BACKGROUND AND NEED

1.1 Introduction

Stroke continues to be a major public health problem for both the developed and developing world despite the various advances in health care. Connor et al. (2004) showed that the prevalence of stroke survivors in rural South Africa was around 300/100 000 people compared to around 164/100 000 in the United Kingdom (Kwan, 2001). This is an enormous increase from a study done in urban South Africa in 1986 which showed that around 1/1000 patients suffered from stroke (Rosman, 1986). Stroke is one of the main causes of disability and is one of the most expensive diseases in modern society (Sim, 1999).

Previously, research has shown that prognosis post-stroke was poor with death rates and stroke recurrence high (Mennemeyer et al., 2006; Vestling et al., 2003). However, recent studies have shown a "shift in the natural history of stroke towards a less fatal and disabling disease" (Mennemeyer et al., 2006; Saeki and Hachisuka, 2004). Most of the patients with stroke are within the working age range and some are even younger than 45 and so still have a large portion of their working life to experience (Hofgren et al., 2007; Naess et al., 2004; Saeki and Hachisuka, 2004; Vestling et al., 2003; Saeki et al., 1995). The huge economic burden of stroke causes a negative impact on both individuals and society. The economic burden is double fold in terms of direct costs of medical care to the patients and the indirect costs of lost productivity (Vestling et al., 2003; Sim, 1999; Angeleri et al., 1993).

Countries which have economic incentives for return to work, but not disability grants, have significantly higher return to work rates (Carod-Artal et al., 2000; Angeleri et al., 1993), while those that provide disability grants, whether temporary or permanent, seem to enable disability rather than promote recovery (Vestling et al., 2005; Sim, 1999). The results of research done on rate of return to work are hugely varied, with rates ranging from 1% to 91% (Hofgren et al., 2007; Naess, 2004; Varona et al., 2004). These results on rate of return to work following stroke differ between countries as well as within countries but in different eras. The best explanation for this is the different operational definitions of work (Vestling et al., 2003) and stroke (Vestling et al., 2003), as well as the varying follow-up times (Vestling et al., 2003). Despite these shortcomings, one continuous thread we have throughout all the studies is that there is little information on return to work in developing countries and none from African countries.

Much research has been conducted on factors affecting return to work (Hofgren et al., 2007; Medin et al., 2006; Vestling et al., 2005; Naess et al., 2004; Saeki and Hachisuka, 2004; Varona et al., 2004) but none in an African setting. Factors which have been shown to increase return to work are: decreased age (Carod-Artal et al., 2000; Angeleri et al., 1993), higher education and qualifications (Angeleri et al., 1993), white collar employment (Vestling et al., 2005; Varona et al., 2004; Sim, 1999), independence in ambulation and activities of daily living (ADL's) (Medin et al., 2006; Saeki and Hachisuka, 2004; Saeki et al., 2000), urinary and bowel continence ((Wozniak et al., 1999), work flexibility and good work colleague's attitudes (Vestling et al., 2003; Williams and Westmorland, 2002; Angeleri et al., 1993), familial support (Varona et al., 2004; Williams and Westmorland, 2002; Wozniak et al., 1999), availability of transport (Wozniak et al., 1999) and patients' knowledge of their rights (Wozniak et al., 1999).

The following factors have been shown to decrease return to work: aphasia and neglect (Varona et al., 2004; Sim, 1999; Wozniak et al., 1999), cognitive and memory deficits (Hofgren et al., 2007; Williams and Westmorland, 2002; Wozniak et al., 1999), perceptual deficits such as agnosia and apraxia (Vestling et al., 2005; Varona et al., 2004), depression (Varona et al., 2004; Saeki et al., 2000; Wozniak et al., 1999), post-stroke seizures (Saeki and Hachisuka, 2004), severe fatigue (Hofgren et al., 2007; Medin et al., 2006) and low household income (Varona et al., 2004; Vestling et al., 2003; Wozniak et al., 1999). It was also shown that patients without emotional acceptance of disability had a 0% return to work (Angeleri et al., 1993).

Although not well researched, vocational rehabilitation has not been shown to have any effect on return to work (Vestling et al., 2003). Patients report that rehabilitation is often not age appropriate or age-adapted (Hofgren et al., 2007) and that it disempowers them and thus results in tremendous fear of returning to work (Hofgren et al., 2007; Vestling et al., 2003; Wozniak et al., 1999). Knowledge of patients' subjective aspects of work is useful in order to make the rehabilitation process more goal-directed and efficient (Vestling et al., 2003; Saeki et al., 1995).

.1.2 Problem Statement

Little is known regarding the rate of return to work of patients with stroke in a South-African setting or on vocational rehabilitation in general for patients with stroke and this inhibits best possible practices for South African therapists. Similarly the factors that influence return to work of patients with stroke have not been established in South Africa.

1.3 Research Question

What is the rate of return to work of patients with stroke and what are the patients' perceived factors which influence return to work after stroke?

1.4 Aim of the study

To determine the rate of return to work of patients with stroke and the patients' perceived factors which influence return to work after stroke.

1.4.1 Objectives of the study

1.4.1.1 To establish the rate of return to work of patients following stroke.

1.4.1.2 To establish the patients' perceived factors which influence the return to work after stroke.

1.5 Significance of study

When looking at research available on rate of return to work after stroke, the one observation that is glaringly obvious is the lack of information available in this area in developing countries and more specifically in South Africa. This is likely to be because of the high rate of unemployment in these countries. The unemployment rate in South Africa was 25% in the last quarter of 2011 (Statistics South Africa, 2012). Stroke is one of the most expensive diseases in modern day society and hence better return to work not only decreases economic burden on the country but also increases life satisfaction of patients with stroke.

Currently there is no information on the rate of return to work in South Africa or on vocational rehabilitation in South Africa for patients with stroke. There is also no information about factors that influence return to work after stroke. Perceived factors of return to work from patients in developed countries may not be the same as those from developing countries due to differences in labour laws and socioeconomic conditions. .In addition, therapists do not know if present rehabilitation strategies are effective as there is no information on how many patients are actually returning to work after stroke. The results of this study gives therapists an idea of what affects patients in terms of their ability to return to work instead of inferring from studies done in other countries. Knowledge about what work means to the patients and what motivates them to return to work, or what they feel is limiting them from returning to work is valuable information. Armed with this knowledge therapists are enabled to focus their vocational rehabilitation to better target these issues as well as advocate for patients to both the government and employers. This may enable patients to lead a better quality of life which is in line with the World Health Organisation's (WHO)

definition of the purpose of neurorehabilitation, which is “the integration of the patient into his/her family, work, and social environment” (Wozniak et al., 1999).

CHAPTER 2

2. LITERATURE REVIEW

2.1 Introduction

The aim of this review is to provide information on the various definitions of work and to set a definition for use in this study. The epidemiology of stroke will also be expounded on. The review will shed light on the economic burden of stroke, the rate of return to work after stroke and the factors that affect return to work post stroke. An understanding of the patients' perception of the factors that influence return to work will be given and linked to this will be return to work rehabilitation. Lastly a review of the instrumentation will be provided.

The following databases were used to search for literature: Pubmed; Pedro, Cinahl, Evidence Based Registry for Stroke Research (EBRSR), Stroke Engine and Google scholar. The search words that were used included: return to work after stroke, factors affecting return to work after stroke, stroke incidence, stroke epidemiology, stroke rehabilitation, stroke return to work rehabilitation, stroke economic burden and rate of return to work after stroke.

This literature review will be presented as follows:

2.2 Definition of return to work
2.3 Epidemiology of stroke
2.4 Economic burden of stroke
2.5 Rate of return to work after stroke
2.6 Factors that influence return to work after stroke
2.7 Patients' perception of factors affecting return to work
2.8 Return to work rehabilitation, organisational values and policies
2.9 Review of instrumentation
2.10 Conclusion

2.2 Definition of return to work

Various definitions of return to work have been used in studies on return to work, and this contributes to the lack of uniformity in research methodology, and therefore the large variations in return to work rates reported in studies. Some of these definitions include "one month or more duration of work in active employment after stroke" (Saeki et al., 1993). In the case of housewives and students, return to work was defined as "the ability to continue housework or studies as

before" (Saeki et al., 1993). Busch et al. (2009) used the definition of work as "return to paid work". Saeki et al. (2000) used "active employment at the former or at a new occupation (full-time or part-time competitive employment, or self-employment)". Return to work was defined by Andersen et al. (2011) "as working at least 10 hours per week"; while Vestling et al. (2005) defined return to work as "continuing occupation in the production of supplies and services for payment". Transitional work is defined as "any job or combination of tasks and functions that may be performed safely and with remuneration by an employee whose physical capacity to perform functional job demands has been compromised" (Olsheski et al., 2002).

For this study, Vestling et al. (2005)'s definition was used to define work. The reason for this is due to the fact that when looking at return to work in terms of economic provision, housewives and students have to be excluded as they are not generating income. Vestling et al. (2005)'s definition accurately describes that payment should be exchanged but places no limitations on hours, location or time frame of the work.

2.3 Epidemiology of stroke

According to the World Health Organisation, stroke is "a clinical syndrome characterised by rapidly developing clinical signs of focal (or global) disturbance of cerebral function, with symptoms lasting 24 hours or longer or leading to death, with no apparent cause other than of vascular origin" (World Health Organisation, 1989). The definition can be expanded to include a cerebral infarction, intracerebral haemorrhage and subarachnoid haemorrhage but not that of a transient ischaemic attack, subdural or extradural haemorrhage or any cerebral compromise due to infection or a malignancy or space occupying lesion (Kwan, 2001).

Using this definition, the annual incidence of first-ever-in-a-life-time stroke in the United Kingdom (UK) was recorded as 2/1000 people and this equates to around 130 000 people a year suffering a stroke (Kwan, 2001). In the Netherlands a much higher incidence rate was recorded showing a rate of 7.5/1000 per year which resulted in 118 500 people living in the Netherlands with stroke in the year 2000 (Van de Porti, 1997). Van de Porti (1997) predicted an increase in stroke incidence of about 27% which would result in over 150 000 people living with stroke in 2020.

"There are no accurate incidence or prevalence data available on stroke in South Africa as a whole" (Fritz, 1997). In South Africa the only study showing incidence of stroke was done in 1986 and it revealed a stroke incidence of 1.01/1000 individuals being admitted to hospital in a group 20

years and over. However once patients were over 65 years of age their incidence rose to 8.37/1000 (Rosman, 1986). There are limitations to this incidence report with factors such as lack of transport and treatment by traditional healers playing a role in reducing the number of hospital admissions. This incidence of stroke can therefore be regarded as the minimum incidence occurring in South Africa (Rosman, 1986). However, in 2004, the Southern Africa Stroke Prevention Initiative (SASPI), performed a study in the Agincourt Field Site and found a prevalence of stroke of 300/100 000 with a male to female ratio of 1:1.8 (Connor et al., 2004).

The incidence of stroke in both sexes increases exponentially with age (Roding et al., 2003 ; Leys et al., 2002; Rosman, 1986), so much so that those over 65 years have a 100 times greater risk of stroke than people aged 35 - 44 years (Leys et al., 2002). Of the 130 000 strokes occurring in a year, 75% occur in those over 65 years of age and 50 % in those over 75 years of age (Kwan, 2001). In most western countries the average age of stroke is 75 years (Leys et al., 2002). However, the incidence of stroke in those younger than 65 has increased sharply over the past few years with almost 5% of stroke incidence rates occurring in those younger than 45 years of age (Roding et al., 2003). The incidence of stroke among young patients is 6-20/100 000 in western countries (Leys et al., 2002).

Stroke is a serious condition that still results in fatalities and disability despite the advances that have been made in modern medicine. Case fatality is defined as the proportion of people who die within a specified period after an event (Kwan, 2001). Post-stroke the 30-day case fatality rate in the UK was 19% (Kwan, 2001) while that in South Africa was almost double at 33.6 % (Rosman, 1986). The 1-year case fatality rate in the UK was 31% while around the world it ranged between 15% and 57% (Kwan, 2001). The case fatality rate is double in patients aged 85 years and older compared to those younger than 65 years (Kwan, 2001). This is vital information as the working force is comprised of patients 65 years and younger and therefore most of the younger patients survive their strokes and can therefore still be part of the work force. The only question that needs an answer is, are they an economic burden or economically productive?

Stroke mortality rate is the number of deaths caused by stroke in a specified period (Kwan, 2001). The WHO showed the mortality rate of stroke to be 4.4.million in 1990 and this increased to 5.54 million by 1999 (Feigin et al., 2003). Not surprisingly, this is also significantly higher in those aged over 75 years (Kwan, 2001). In some parts of the world such as Japan, North America and Western Europe, stroke mortality rate has declined sharply during the last five decades (Feigin et al., 2003; Kwan, 2001). Overall, stroke mortality rate in the UK has reduced by about 40% in the

past 40 years (Kwan, 2001). The reasons for this decline are undetermined and range from a decreased incidence to a change in the natural history of the disease (Kwan, 2001). However, regardless of the cause, more and more people are surviving their strokes and therefore there is a need to improve their quality of life by minimising their disability post stroke.

2.4 Economic burden of stroke

Stroke is a major cause of long-term disability and has potentially enormous emotional and socioeconomic impacts for patients, their families, and health services, with lifetime costs per patient estimated at between US$59 800 and US$230 000 (Feigin et al., 2003). The economic burden of stroke can be defined, not just in terms of the direct cost of providing care for the patient, but also in terms of the indirect cost of lost productivity (Saeki, 2000; Marini et al., 1999). As previously indicated, after one year post stroke almost 40% to 55% of survivors will be disabled (Kwan, 2001; Saeki, 2000). With improving medical technology and the rapid ageing of the population (Kwan, 2001) an increase in stroke incidence, prevalence and the overall burden of the disease are likely to increase (Van de Porti, 2007; Kwan, 2001; Saeki, 2000; Marini et al., 1999; Saeki et al., 1993). Currently stroke is the leading cause of long-term disability worldwide and therefore needs to be viewed as a serious public health concern (Kwan, 2001).

When assessing the economic burden of stroke, it is important to consider the current prevalence of stroke as opposed to its incidence (Kwan, 2001; Saeki et al., 1993). In Austria, stroke survivors are institutionalised three times more than their same age non-stroke counterparts (Kwan, 2001) while in the UK 25% of nursing home residents are stroke sufferers which places an estimated 51 000 patients with stroke in long-term care (Kwan, 2001). In 1995, 5.8% of the National Health Service budget was utilised by stroke sufferers in the United Kingdom and this equates to £2.3 billion (Kwan, 2001). However, other costs such as lost employment of the patient with stroke as well as their family members increases the economic burden of stroke (Mennemeyer et al., 2006; Marini et al., 1999). Family members giving up their jobs to care for patients with stroke in the United Kingdom is estimated at a further £31 million per year loss (Kwan, 2001).

Studies show that 40% more elderly patients who have had a stroke as opposed to those who have not, will require a family member to take care of them. This either reduces their family member's hours of employment or causes them to resign completely in order to care for the family member with stroke (Mennemeyer et al., 2006). In the United States (US) the average lifetime cost

per person having their first ever stroke in 1990 was US$103 576 (Saeki, 2000). This amount if multiplied by the incidence of 392 344 first time patients with stroke in 1990 results in a lifetime cost of US$40-46 billion occurring in 1990 alone, with 58% of this amount being due to loss of earnings (Saeki, 2000). Lost production due to stroke is a huge problem with a Swedish study revealing that 15-20% of patients with stroke are of a working age (Marini et al., 1999). The cost of medical care and rehabilitation adds to the costs incurred post stroke. As stated by Van de Porti (1997), physiotherapy was still being received by 26% of patients with stroke five years post stroke and 40% still received home care (Van de Porti, 1997). This results in a huge burden on the state, the family and on health resources. In the Netherlands the annual costs of stroke are estimated to exceed one billion Euros and about 60% of those costs are being spent on long-term care (Van de Porti, 1997). The earlier an individual is able to return to work the less the indirect costs are for that individual and this makes return to work a valuable and important goal (Saeki, 2000).

2.5 Rate of return to work after stroke

Many studies have been done on return to work in various countries such as the United States of America, the United Kingdom, Sweden, Denmark, Finland, Japan and Singapore. The rates of return to work are hugely varied, ranging from 1% to 91% in various countries over the last decade (Trygged et al., 2011; Hofgren et al., 2007; Naess, 2004; Varona et al., 2004; Vestling et al., 2003; et al., Wozniak and Kittner, 2002). The differences in return to work vary from continent to continent, region to region and even within the same country. In Sweden results range from 84% in 1977 to 10% in 1983 (Saeki, 2000) while Trygged et al. (2011) found a 69% return to work rate. In addition a recent study in 2009 by Gabriele et al., a 26.7% return to work rate in Germany was revealed. The US showed a maximum return to work percentage in 1990 of 49% and the UK in 1979 of 38% (Saeki, 2000). In more recent research Denmark demonstrated a 58% return to work (Andersen et al., 2011) and a 62% return to work (Hannerz et al., 2011). Hsieh et al. (1997) found a return to work rate of 53.7% but with only 27.4% having returned to work on a full time basis. Morris (2011)’s review of studies on return to work found the range of return to work to be between 14% to 73% with a median value of around 50%. Morris (2011)’s review showed that there is a dearth of literature on return to work from developing countries. Variations in return to work rates across studies is attributed to different definitions of work used in the various studies such as only including full time work, whether home executives and students are included, age group of patients included in the study, differences in the nature and intensity of the stroke rehabilitation program patients received, stroke duration, cultural factors such as availability of help from family members as well as disability compensation programs (Wozniak and Kittner, 2002; Saeki, 2000).

It is important to focus on young patients with stroke as they still have many economically viable years to live and be productive. Stroke in young adults can cause severe depression, decreased life expectancy and poor quality of life (Leys et al., 2002). These young adults may lose their jobs even if they are regarded as functionally able to work by health insurance companies (Leys et al., 2002) and this has socioeconomic consequences for themselves, their families and the country (Leys et al., 2002). The outcome for younger patients with stroke (being classified as between 15 and 45 years) is relatively unknown but is considered favourable (Kappelle et al., 1994). In a study by Leys et al. (2002), 87.5% of young patients with stroke reported themselves as functionally independent. However, it is important to note that being functionally independent does not reflect a lack of disability (Ahlsio et al., 1984). Patients who consider themselves independent may still use a walking aid, get disorientated, have speech impediments, suffer from fatigue, depression, memory and cognitive difficulties, and fine motor impairment and all of these influence quality of life (Ahlsio et al., 1984)

2.6 Factors that influence return to work after stroke

Return to work is an important outcome measure post stroke (Giaquinto and Ring, 2007; Hofgren et al., 2007; Mennemeyer et al., 2006; Schur et al., 2005; Saeki and Hachisuka, 2004) for patients and their families (Treger et al., 2007; Jonsson et al., 2005) as it signifies a complete return to their pre-morbid lives (Medin et al., 2006). Each job has various demands and specific requirements with varying degrees of both physical and cognitive requirements. For a patient to return to work, the severity of disability, the rate of recovery and the medical assessment of fitness to return to work is vital (Saeki, 2000; Kotila et al., 1984). The medical assessment will look at the specific requirements of the job and determine if the patient is able to fulfil these roles and therefore match the patient with their job. However, even in patients with comparable disabilities some return to work while others do not (Saeki, 2000; Kotila et al., 1984) and this suggests that no formula exists as to which patients will return to their pre-morbid level of activity. There is no specific factor which determines return to work that is known. Multiple factors influence return to work and these include socio-demographic, neurological, neuropsychological and functional factors (Saeki, 2000; Kotila et al., 1984). Each factor carries different levels of importance in each patient and therefore each patient is unique and an individual and should be treated as such (Saeki, 2000; Kotila et al., 1984). However, any form of neurological deficit may result in difficulty in return to work (Hofgren et al., 2007; Treger et al., 2007; Wozniak et al., 1999; Kotila et al., 1984).

It therefore follows that for successful return to work to occur, a multidimensional approach (Medin et al., 2006; Dowswell et al., 2000; Saeki, 2000; Saeki et al., 1993) and a multi-disciplinary team is needed (Giaquinto and Ring, 2007; Dowswell et al., 2000). This includes involvement of the stroke survivor as part of the multi-disciplinary team (Medin et al., 2006). This not only involves getting input from the patient and healthcare professionals but also requires workplace accommodation and modification of both the environment and working conditions, positive employer attitude as well as employer support (Giaquinto and Ring, 2007; Gobelet et al., 2007; Hofgren et al., 2007; Treger et al., 2007; Medin et al., 2006). Employers who have pre-conceived ideas about what patients are able to do post-stroke, are unwilling to change job descriptions or work environments, have a distinct lack of professionalism, are unwilling to alter the appearance of their company to the public, are concerned with excessive sick leave as well as a potential decrease in productivity will be unwilling to employ or maintain employment of people with disabilities (Giaquinto and Ring, 2007; Gobelet et al., 2007; Treger et al., 2007).

Work provides a basic human need to feel fulfilled, be part of society and to earn money and therefore it has an intricate involvement in quality of life, subjective well-being and life satisfaction (Treger et al., 2007; Medin et al., 2006; Jonsson et al., 2005; Jonsson et al., 2006; Vestling et al., 2003; Carod-Artal, 2000; Niemi et al., 1988). It demonstrates both human creativity and strength (Giaquinto and Ring, 2007). As a result, return to work is closely linked to better quality of life and life satisfaction (Gabriele and Renate, 2009; Giaquinto and Ring, 2007; Jonsson et al., 2005; Vestling et al., 2003; Carod-Artal, 2000; Kappelle et al., 1994). Those who do return to work have significantly higher psychosocial functioning, are less isolated and are in better financial situations (Treger et al., 2007) than those who do not return to work. In order to develop better rehabilitation strategies, it is important to know which factors have a significant effect on return to work (Vestling et al., 2003). The factors that have been shown to have an influence on return to work are discussed below:

2.6.1 Age

In general, the common belief is that the younger the patient's age the better the possibility of return to work (Gobelet et al., 2007; Treger et al., 2007; Leys et al., 2002; Shaw et al., 2002; Saeki, 2000; Wozniak et al., 1999; Angeleri et al., 1993; Ahlsio et al., 1984). This is because younger patients seem to have better neurological plasticity and therefore functional recovery (Treger et al., 2007; Saeki, 2000), better adjustment to their disabilities (Treger et al., 2007; Saeki 2000), higher motivation to return to work (Treger et al., 2007; Saeki, 2000), a greater willingness by their employers to accept them back (Treger et al., 2007; Saeki, 2000) as well as better overall

general health (Shaw et al., 2002). Most studies have however shown that age is in fact not a predictor of return to work especially in patients younger than 65 years of age (Hofgren et al., 2007; Treger et al., 2007; Naess et al., 2004; Varona et al., 2004; Carod-Artal, 2000; Saeki, 2000; Wozniak et al., 1999 Saeki et al., 1993). When age approaches 65 years, socio-economic factors play more of a role in return to work than age (Treger et al., 2007). A few studies have shown that increasing age is the single most important predictor of return to work (Shaw et al., 2002; Wyller et al., 1998). Kelly-Hayes et al. (2003) showed that older age accounted for an increased severity of disability but not a decrease in return to work. Once patients reach retirement age then age does become a significant predictor of return to work in that after the age of 65 years fewer patients return to work because they are past the retirement age and have both reduced willingness to return to work and employment options (Saeki, 2000; Saeki et al., 1993).

In summary, research seems to show that older age, especially when approaching retirement age, decreases return to work after stroke. It however does not seem to be a significant predictor of return to work in younger adults with stroke.

2.6.2 Gender

Studies have produced mixed reports on the effect of gender on return to work. Some have shown that women return to work more often than men (Saeki, 2000) while others state that gender has little influence with other factors such as type of occupation being more significant (Roding et al., 2003). This difference can be accounted for by the difference in the definition of work, with there being some contention around whether to include home executives as competitively employed persons (Saeki, 2000). However, in general women with stroke have been shown to have a significantly higher quality of life than men with stroke and this may result in an increased return to work (Wyller et al., 1998), however men generally have a higher earning potential and this may cause an increased return to work for men (Trygged et al., 2011). Current literature is not conclusive about the effect of gender on return to work after stroke.

2.6.3 Education and occupation

With regard to occupation, the type of industry, the size of the company or how long the patient had been in employment with the company prior to stroke for had no effect on return to work post-stroke (Saeki, 2000). It has however been noted that larger companies are more responsive to employment of persons with disabilities (Treger et al., 2007). Educational level showed a significant impact on return to work (Trygged et al., 2011; Gobelet et al., 2007; Naess et al., 2004; Carod-Artal, 2000; Saeki, 2000; Angeleri et al., 1993; Saeki et al., 1993). Patients with a high

school graduation and university entrance showed a higher rate of return to work (Trygged et al., 2011; Treger et al., 2007).

The patient's prior occupational status had a significant influence on return to work post stroke (Trygged et al., 2011; Treger et al., 2007; Medin et al., 2006; Saeki, 2000). White collar occupations such as professional, technical and managerial professions were associated with increased return to work. In fact all white collar professions except for the service industry had a more than 50% return to work, which was not the case for blue collar workers (Hofgren et al., 2007; Treger et al., 2007; Medin et al., 2006; Saeki and Hachisuka, 2004). This seems to be due to the high physical demand in blue collar professions as well as the fact that white collar professions seem to have higher pre-morbid job consistency and these workers are held in higher esteem with co-workers than blue collar workers (Naess et al., 2004; Carod-Artal, 2000). In general, higher income professions (Trygged et al., 2011; Naess et al., 2004; Carod-Artal, 2000; Saeki, 2000; Saeki et al., 1993) and patients in a higher income bracket (Treger et al., 2007) have a significantly higher correlation with return to work. Blue collar workers returned to work earlier than white collar workers when they did return to work (Saeki et al., 1995) and this is possibly due to the fact that those blue collar workers who could return to work had relatively minimal functional fallout and so could return to work earlier, as well as the fact that blue collar workers often are of a lower socioeconomic status and may therefore require the financial support of a job more urgently.

Treger et al. (2007) reported that 48% of workers went from full-time to part-time work, 66% reduced their hours and 58% had their job description modified for them after stroke. Research has found that employers who provide job flexibility and allow for job modifications allow for a higher rate of return to work than those who do not (Medin et al., 2006; Saeki and Hachisuka, 2004; Hsieh and Lee,1997). Self-employment, public sector employment and doing white collar work seemed to be linked to higher life satisfaction pre-morbidly which was shown to result in increased return to work (Trygged et al., 2011; Vestling et al., 2003; Angeleri et al., 1993). Employers who have had prior exposure to persons with disability are also more likely to employ those who have had a stroke (Treger et al., 2007). Positive attitudes of employers and of co-workers was an important factor in return to work (Medin et al., 2006) and once a patient has returned to work, the attitudes of employers and fellow employees strongly determines the patients continuation at work (Angeleri et al., 1993).

In conclusion it seems that employers' attitudes have a significant role to play in return to work. This also ties in with patients who have a higher educational level and held higher positions or white collar positions in their jobs as companies make more accommodations for these individuals.

2.6.4 Sickness benefits

There are a few studies which have commented on the influence of funding sources on return to work. When assessing return to work in comparison to period of time since stroke, two peaks are noticeable, one before six months and one at 18 months post stroke (Saeki 2000, Saeki et al., 1995). This coincides with social security benefits in the countries where the studies were performed. In Japan, by six months temporary disability grants fall away and then at 18 months patients' sickness benefits ran out (Saeki 2000, Saeki et al., 1995). Therefore if patients did not return to work straight after rehabilitation, at six months, they delayed return to work so that they could use up their social security benefits. Therefore, public funds could in fact delay return to work, although no significant effects have been recorded (Hofgren et al., 2007; Saeki, 2000; Saeki et al., 1995). Forty six percent of patients have been shown to move straight from vocational rehabilitation to temporary disability benefits and then within two years to have converted that into permanent disability benefits (Treger et al., 2007). The sickness and disability insurance offered by a country or company largely influences return to work (Gobelet et al., 2007; Henry et al., 2007; Shaw et al., 2002).

Mennemeyer et al. (2006) agrees with this by commenting that economic incentives to work and the level of disability related compensation are important mitigating factors in return to work. Current social grants in South Africa include a disability grant. This is granted to an individual first as a temporary grant for six to twelve months, after which the case is reviewed and based on medical documentation and therapists' reports, if the patient is unable to return to work, the patient is then put on a permanent disability grant. The amount of this grant is R1140 (http://www.services.gov.za) which are often not sufficient funds for an individual to survive on in a month.

2.6.5 Stroke risk factors, location and subtypes

Factors such as severity of stroke or stroke subtype are associated with prognosis in terms of independence in activities of daily living and ambulation but not with return to work (Treger et al., 2007; Leys et al., 2002; Saeki, 2000). An old study by Wozniak et al., (1999) showed that stroke severity and subtype influence both independence in ADL's and return to work. In addition, the location of stroke was shown to have no effect on return to work (Treger et al., 2007; Leys et al.,

2002). However patients with stroke caused by cardioembolism and atherothrombosis have been found to have a poorer prognosis in terms of return to work (Varona et al., 2004). Cerebellar strokes have been shown to have significantly better functional outcomes than cerebral strokes, although studies have not translated this into return to work (Treger et al., 2007). Patients with subarachnoid and intracerebral haemorrhages have also been shown to have better functional outcome than those with infarcts, but again have not been conclusively linked to a higher rate of return to work (Treger et al., 2007).

Wozniak et al. (1999) however showed that a supratentorial versus a brain stem stroke, an anterior versus a posterior circulation stroke, and a large versus a small cortical, lacunar and infratentorial stroke all show higher rates of return to work. However, these factors did not have as great an effect on return to work as functional ability, social support or job characteristics (Wozniak et al., 1999). A cortical stroke's anatomical location has also been found to have no influence on return to work (Saeki and Hachisuka, 2004).

Alcohol drinking prior to stroke was a negative predictor of return to work (Treger et al., 2007; Leys et al., 2002; Saeki, 2000; Black-Schaffer and Osberg, 1990). Other risk factors such as hypertension and smoking were linked to poor prognosis functionally but not to return to work (Treger et al., 2007; Saeki, 2000). Patients with stroke caused by cardiovascular problems had a decreased return to work as well as those who suffered from atherosclerosis of large vessels in the carotid area (Treger et al., 2007). Patients suffering a myocardial infarct which caused the stroke showed no worse return to work than those whose stroke was caused by other factors (Leys et al., 2002).

Diabetes mellitus sufferers had a poorer prognosis in terms of functional ability (Naess et al., 2004; Leys et al., 2002), while those patients who had had a myocardial infarct prior to having had the stroke showed poorer functional recovery (Prencipe et al., 1998). Those patients with hypercholesterolemia also showed a poorer prognosis in terms of functional abilities (Leys et al., 2002; Prencipe et al., 1998). Stroke associated with migraine and oral contraceptive use has a poorer functional ability prognosis (Varona et al., 2004; Leys et al., 2002). A significant link can be established between a patient's functional abilities and independence in ADL's and return to work (Giaquinto and Ring, 2007; Gobelet et al., 2007; Hofgren et al., 2007; Treger et al., 2007; Naess et al., 2004; Varona et al., 2004).

Patients who have recurrent strokes have a significantly lower rate of return to work than those who only have a single event (Treger et al., 2007). However, Saeki (2000) and Leys et al. (2002) disagree saying a previous stroke has no or little effect on return to work. It has been established that patients with multiple infarcts, whether it is on one or many occasions, have a significantly lower quality of life (Lofgren et al., 1999). Epilepsy sufferers as a result of the stroke showed no decrease in return to work as a result of the epilepsy (Leys et al., 2002).

In conclusion, location of stroke and stroke subtype have no significant effect on return to work. Alcohol consumption prior to stroke, epilepsy prior to stroke, and stroke caused by cardiovascular complications were the only three risk factors that were conclusively linked to a decreased return to work post stroke.

2.6.6 Side and severity of hemiplegia

The first observation is that the presence of hemiplegia is in itself a negative factor predicting return to work (Treger et al., 2007; Saeki et al., 1993). Studies show that patients with left hemiplegia have a higher rate of return to work than those with right hemiplegia (Hofgren et al., 2007; Treger et al., 2007; Saeki, 2000; Wozniak et al., 1999; Saeki et al., 1993). This is probably due to the presence of aphasia in those with right hemiplegia. Once this confounding variable is taken into account, severity of hemiplegia is a significant negative predictor of return to work but the side of hemiplegia is not (Treger et al., 2007; Wozniak et al.,2002; Saeki, 2000; Wozniak et al., 1999; Hsieh and Lee,1997; Saeki et al., 1993). Severity of hemiplegia results in decreased use of affected limbs which is a particularly significant negative predictor of return to work in blue collar workers (Treger et al., 2007; Saeki, 2000) presumably due to the highly physical component of their work.

2.6.7 Ambulation and functional abilities

Both independence in ambulation and in activities of daily living are significant determinants of return to work (Trygged et al., 2011; Gabriele and Renate, 2009; Giaquinto and Ring, 2007; Gobelet et al., 2007; Hofgren et al., 2007; Treger et al., 2007; Naess et al., 2004; Varona et al., 2004) as well as quality of life (Saeki and Hachisuka, 2004; Carod-Artal, 2000; Lofgren et al., 1999; Wozniak et al., 1999). The two most important ADL aspects linked to positive functional outcome include a patient's ability to eat and maintain personal hygiene, which is directly linked to their arm function (Wyller et al., 1998; Angeleri et al., 1993). Independence in ambulation and in ADL's has been shown to be of more significance with regards to return to work than age and cognitive abilities (Vestling et al., 2003). A patient's hand function and manual dexterity of their

hand has a significant effect on functional outcome and prognosis as it relates to their ADL abilities (Angeleri et al., 1993; Ahlsio et al., 1984).

Black-Schaffer and Osberg, (1990) established that ADL scores on admission and discharge have an influence on return to work. It was also established that ADL abilities on admission are a better predictor of work than ADL ability on discharge (Varona et al., 2004; Saeki et al., 1993; Ahlsio et al., 1984). However, this is all dependent on the physical requirements of an individual's job. If the physical demands are low, then these factors are less important in predicting return to work (Treger et al., 2007; Saeki, 2000). The only consistent impairment factor found to predict return to work is severity of injury (Shaw et al., 2002). Although Shaw et al. (2002) examined all injuries halting work including head injuries, spinal cord injuries and orthopaedic pathologies after accidents and not specifically in patients with stroke, this can be extrapolated to stroke in terms of loss of functional ability. So the severity of functional loss may have an impact on return to work.

Ambulation and ADL independence are not only important because they affect the patients' motivation but modifications will also have to be made to the work environment, which might influence the willingness of employers to accept patients back at work (Saeki, 2000). Linked to the importance of ambulation was the finding that being able to walk 300m without showing significant signs of fatigue is a positive predictor of return to walk (Saeki, 2000). The patients' ability to negotiate stairs was also a powerful predictor of functional outcome (Angeleri et al., 1993). Studies have also shown that patients with normal muscle strength are five times more likely to return to work than those with severe muscle weakness (Saeki and Hachisuka, 2004; Saeki, 2000; Saeki et al., 1995; Saeki et al., 1993).

Fatigue was shown to be a significant impairment experienced by patients with stroke and one which impacted heavily on return to work (Giaquinto and Ring, 2007; Van de Porti, 2007; Medin et al., 2006; Naess et al., 2004). Fatigue resulted in an inability to cope with the daily demands of life, to engage in daily life and a general indifference about life (Roding et al., 2003).

Pain is a very common symptom experienced post stroke (Widar et al., 2002). There are many different types of pain experienced with central post-stroke pain (CPSP) occurring in 2 - 8% of patients (Widar et al., 2002). This is due to a lesion of the spinothalamic pathway in the brain (Widar et al., 2002). Nociceptive pain also occurs most often in the affected shoulder and occurs in up to 84% of patients (Widar et al., 2002). Headaches are also very common post-stroke and are often tension headaches caused by muscle weakness (Roding et al., 2003; Widar et al., 2002).

This pain can be experienced during as much as 50% of the day and can have a serious impact on a person's ability to return to work (Gobelet et al., 2007; Widar et al., 2002). Up to 16% of patients with stroke had frequent episodes of headache and 10% had post-stroke seizures (Giaquinto and Ring, 2007; Varona et al., 2004) which are both linked to poor function and therefore decreased return to work. Jonsson et al. (2006) found pain prevalence after four months post-stroke to be around 32% which decreased to around 21% after 16 months. However, the pain was at a severe level of seven out of 10 on the Visual Analogue Scale. The pain became persistent in 47%, disturbed sleep in 58%, and required rest for relief in 40% of patients. Therefore the conclusion was drawn that the longer the pain lasts the more severe and disabling it becomes.

Other important factors which have been shown to have a significant effect on reduced return to work are bowel and bladder control, which can create awkwardness in a work environment as well as logistical nightmares for the patient (Angeleri et al., 1993). The presence of vertigo can cause severe disability in itself limiting patients' ability to leave the house, balance or negotiate obstacles and change position (Alaszewski et al., 2007; Ahlsio et al., 1984).

2.6.8 Intelligence, memory and communication

Any form of deficit in memory, orientation, attention, concentration, initiation, language and cognitive functioning were significant inhibitors of return to work (Giaquinto and Ring, 2007; Hofgren et al., 2007; Treger et al., 2007; Medin et al., 2006; Naess et al., 2004; Zinn et al., 2004). Other cognitive factors associated with good return to work are good attentional abilities and visuomotor speed (Hofgren et al., 2007) as well as mental speed and flexibility (Treger et al., 2007). Being able to maintain good concentration on a task for 15 seconds or more increased the likelihood of returning to work (Saeki, 2000). An individual must be able to receive, remember, sort and process information quickly and simultaneously and to make adequate decisions. Moreover, all this must take place in circumstances where productivity and thus efficiency is vital (Hofgren et al., 2007). Any type of impairment on a neuropsychological assessment is a severe negative predictor of return to work (Treger et al., 2007). However, other studies have shown that cognitive functioning at time of admission to hospital is more of a predictor of return to work than cognitive status at discharge (Ozdemir et al., 2001).

Aphasia is also an important predictor of return to work with receptive aphasia having more of an effect than expressive aphasia in reducing return to work after stroke (Giaquinto and Ring, 2007; Treger et al., 2007; Saeki, 2000). In addition, aphasia can cause social problems due to difficulty with interacting in social circumstances which results in decreased return to work (Naess et al.,

2004) and can also have a significant effect on quality of life (Lofgren et al., 1999). Communication and interaction with co-workers are of great importance in a situation where adequate language ability, perceptual and affective functioning are also needed (Hofgren et al., 2007). It is vital for co-workers to be able to talk and communicate with each other and where this is impaired an incoherent work environment may result. Following on from the inability to communicate, patients with visual and hearing loss (Giaquinto and Ring, 2007), or with abnormal sensation in their limbs (Treger et al., 2007) have a reduced return to work rate.

Agnosia and apraxia, which are perceptual disorders, were significant negative predictors of return to work (Treger et al., 2007; Saeki and Hachisuka, 2004; Saeki, 2000; Wozniak et al., 1999; Saeki et al., 1995; Saeki et al., 1993). Patients without apraxia are four times more likely to return to work than those with apraxia (Saeki, 2000). The presence of neglect has not been shown to have an effect on functional recovery or return to work (Giaquinto and Ring, 2007; Hofgren et al., 2007).

2.6.9 Length of stay in hospital

The length of stay in hospital was inversely proportional to the rate of return to work (Treger et al., 2007; Saeki, 2000; Black-Schaffer and Osberg, 1990). This is possibly because more severely impaired patients tend to stay longer in hospital and therefore it is not the hospital stay itself that causes the low rate of return to work but rather the severity of the impairments. Early admission to a rehabilitation unit has been shown to have a strong correlation to return to work (Treger et al., 2007; Roding et al., 2003). Recent research on factors influencing return to work showed no significant link between length of rehabilitation stay and return to work (Hartke et al., 2011). Patients with stroke in municipalities with brain-injury rehabilitation units did no better than those municipalities without specialised units (Hartke et al., 2011). Boter et al. (2004) compared standard in-patient care with an intervention involving one home visit and three phone calls by a nurse. The study showed no difference in terms of quality of life between the two. This study did not report on return to work among the study sample. However, all these studies were conducted in developed countries, and so the length of stay differs from country to country according to different policies, and therefore may differ in our local setting.

2.6.10 Medical rehabilitation

There are few studies that have reported a direct relationship between rehabilitation and successful return to work and those that have explained a relationship have not commented on details such as types and intensity of services (Saeki, 2000). Studies have shown that there is a high percentage of unmet demands by patients in rehabilitation (Treger et al., 2007; Medin et al.,

2006; Roding et al., 2003; Wiles et al., 2002; Carod-Artal, 2000) and this in turn can result in decreased return to work (Treger et al., 2007; Van de Porti, 2007; Roding et al., 2003; Wiles et al., 2002; Angeleri et al., 1993).

Three specific intervention strategies have shown the most promise in promoting return to work. Firstly, early intervention is crucial in order to promote and facilitate return to work. Secondly, setting up realistic return to work goals and then providing the necessary assistance to disabled individuals by maintaining communication with them. Thirdly, setting up both cash and health benefits to encourage return to work have been shown to aid return to work (Vestling et al., 2003; Sim, 1999).

The goal of rehabilitation is to make the individual as independent as possible (Wolfenden and Grace, 2009; Vestling et al., 2003; Angeleri et al., 1993). To fully achieve this, rehabilitation therapists should observe and address all community barriers (Lock et al., 2005; Kersten et al., 2003). Other factors within the rehabilitation setting that have been shown to be vital for recovery of the stroke patient are a stimulating environment, including the patient and giving them the opportunity to choose and initiate therapy activities as well as to problem solve (Van de Porti, 2007; Lock et al., 2005; Vestling et al., 2003). It is also important to, provide sufficient information at appropriate times, allow the patient to take responsibility but not force it on them, provide counselling and listen to the patient's needs (Van de Porti, 2007; Lock et al., 2005; Vestling et al., 2003). The therapy provided should be age-adaptable, ensure interaction of stroke patients of the same age and provide sufficient therapy time and contact with therapists (Van de Porti, 2007; Lock et al., 2005; Vestling et al., 2003). During rehabilitation, a functional routine needs to be set up in order to maintain a person's habits for if and when they return to work so that they remember how to utilise time effectively and maintain a routine (Kielhofner, 1999). In addition assistive devices or compensatory strategies for transport must be sought (Henry et al., 2007).

Rehabilitation follows mostly a biomedical approach focusing only on getting people back home and not considering their social context (Medin et al., 2006; Angeleri et al., 1993). The WHO states that the aim of neurorehabilitation is to integrate the patient into their family, work and social environment (Angeleri et al., 1993). When this does not parallel therapists' goals, patients are left disappointed and often do not achieve full potential and have a decreased return to work (Wolfenden and Grace, 2009; Medin et al., 2006; Lock et al., 2005; Angeleri et al., 1993). It has also been shown that the more information patients have regarding return to work, equipment and

facilities the better the functional recovery and the greater the rate of return to work (Roding et al., 2003; Wiles et al., 2002; Angeleri et al., 1993).

Therapy which did not resonate with a patient's core beliefs or value systems resulted in lower motivation during therapy which in turn resulted in decreased physical improvements and thus decreased return to work (Maclean and Pound, 2000). Conflict in terms of difference in opinion of personal beliefs, treatment ideas, prognosis, and goals between patients and therapists can cause decreased motivation resulting in poor functional outcome (Maclean and Pound, 2000). Therapists who exhibit a constantly positive and encouraging attitude towards the patient, a willingness to empower patients to become actively involved in the management of their rehabilitation programmes and the ability to instil instrumental rationality (the ability to select appropriate means to achieve a given end) in the patient have been shown to have much better therapeutic results with their patients (Maclean and Pound, 2000). Therapists should however avoid too much of a bond or friendship being formed between them and the patient as this could in turn lead to decreased motivation as the patient does not want to leave the therapy environment, and decreased ability to cope outside of the therapy environment which in turn can lead to depression as well as decreased return to work (Wiles et al., 2002; Maclean and Pound, 2000). Patients who are led to believe that return to work is a possibility have a significantly higher return to work than those who are never informed of this possibility (Gobelet et al., 2007).

A study by Huang et al. (2009) showed that there is a dose-dependent effect of rehabilitation on functional improvement of stroke patients for the first six months post-stroke and that early delivery of rehabilitation has lasting effects on the functional recovery of stroke patients up to one year. The earlier and more intense the rehabilitation is in the first 6-months post-stroke the higher the likelihood of return to work due to improved functional recovery (Van de Porti, 2007; Lock et al., 2005; Sim, 1999).

Vocational rehabilitation recognises what the employee's disability is, how it will impact on their work, assists employees with recognising what their new disability constitutes and what their possibilities are. It also involves working with families, helping to mediate between employee and employer to see what reasonable accommodations can be made and provides information about social support and public and private welfare (Wolfenden and Grace, 2009; Sweetland et al., 2007; Sirvastava et al., 2005; Isaksson et al., 2004; Friesen et al., 2001). In addition vocational rehabilitation continues to take place within the work environment (Olsheski et al., 2002) and educates patients about their rights (Lock et al., 2005). There is however no conclusive link that

has been established between the provision of vocational rehabilitation and increased return to work (Vestling et al., 2003).

Specialised stroke units improve the functional state of patients (Diez-Tejedor and Fuentes, 2001). Improved functional state has been shown to increase return to work in earlier sections and so stroke care units may have a relational influence on increasing return to work (de Villiers et al., 2009).

2.6.11 Emotional state

Emotional acceptance of disability is a significant predictor of return to work and has more return to work prediction value than ambulation, ADL and cognitive abilities (Treger et al., 2007; Medin et al., 2006; Saeki, 2000; Angeleri et al., 1993). Familial and social support has been shown to have a positive link to return to work, although not a definitive one (Hartke et al., 2011; Hofgren et al., 2007; Medin et al., 2006; Saeki and Hachisuka, 2004; Roding et al., 2003). Patients who do not return to social and leisure activities have a significantly lower rate of return to work (Dowswell et al., 2000; Lofgren et al., 1999) as well as quality of life (Astrom et al., 1992). This can be attributed to loss of social roles as well as a fear of being criticised (Angeleri et al., 1993).

Depression is prevalent post stroke and patients with higher levels of depression have decreased return to work post stroke (Dafer et al., 2008; Giaquinto and Ring, 2007; Gobelet et al., 2007; Treger et al., 2007; Van de Porti, 2007; Medin et al., 2006; Naess et al., 2004; Varona et al., 2004). Depression can be caused by numerous factors such as the remaining biological effects of the stroke, neurological fallout, financial anxiety and uncertainty of the future (Kappelle et al., 1994).

Depression rates have been shown to be between 20% and 50% within the first year post-stroke with the highest peak being within the first 6 months (Dafer et al., 2008). Depression impedes rehabilitation progress following stroke and it is associated with impaired functional outcome, cognitive decline, increased mortality and increased risk of stroke occurrence (Dafer et al., 2008). The treatment of depression has been shown to improve return to work and social integration (Angeleri et al., 1993).

Other emotional problems such as anxiety, irritation, lability, euphoria, indifference and mood problems (Giaquinto and Ring, 2007; Treger et al., 2007; Saeki and Hachisuka, 2004; Roding et al., 2003) as well as behavioural problems such decreased tolerance, impulsiveness and loss of inhibition (Leys et al., 2002) have been shown to decrease return to work. In addition these

emotional and behavioural problems can influence social integration resulting in decreased social activities which in turn also decreases return to work (Dowswell et al., 2000; Clark and Smith, 1998; Angeleri et al., 1993).

Patients' social support at home is positively linked to return to work (Medin et al., 2006; Wozniak et al., 1999; Angeleri et al., 1993) and an increased quality of life (Astrom et al., 1992). Those patients who were able to receive physical assistance either from a family member or from a carer showed better functional recovery than those without (Angeleri et al., 1993). However, a stressful family life, where patients are criticised by their families showed increased depression and decreased return to work (Dowswell et al., 2000; Angeleri et al., 1993). A successful compromise seems to be found in societies where institutions are available to provide support for patients with stroke and can complement the love, value and esteem provided by families. This seems to increase patients' willingness to accept help and this in turn increases their return to work rate (Angeleri et al., 1993). It has also been shown that unmarried patients have a poorer functional recovery, which in turn is linked to decreased return to work as they tend to have less emotional support and motivation at home (Treger et al., 2007; Naess et al., 2004).

The patients' personality and their view of life has an effect on return to work. If they are by nature optimistic or hopeful they have a significantly higher return to work rate than those who are pessimistic or cynical (Gobelet et al., 2007; Hofgren et al., 2007; Medin et al., 2006; Lofgren et al., 1999; Angeleri et al., 1993). The motivation of the patient is the most important, yet the most difficult aspect of the therapeutic professions (Maclean and Pound, 2000). Many studies have shown that motivation plays an important role in physical outcome post rehabilitation as those who are more motivated tend to show an increased work ethic during rehabilitation as well as more interest in their improvement (Maclean and Pound, 2000). Motivation is often seen as part of the patient's personality and those who lack motivation seem to become more dependent (Maclean and Pound, 2000).

Genetics plays a role in outcome post-stroke especially as it guides a person's personality and therefore motivation (Angeleri et al., 1993). In addition, patients with a low self-esteem are unlikely to return to work (Giaquinto and Ring, 2007; Gobelet et al., 2007; Medin et al., 2006) due to a decreased belief in their abilities and hence decreased motivation. Those disinterested in work either prior to the stroke or as a result of the stroke are unlikely to return to work (Giaquinto and Ring, 2007). Often linked to a patient's motivation are their religious beliefs as these can be an

important support structure for some and therefore have been shown to play a role in return to work (Angeleri et al., 1993).

2.6.12 Socioeconomic factors

Patients' socioeconomic situations are often underestimated and under researched but are a definite factor in return to work (Giaquinto and Ring, 2007; Carod-Artal, 2000; Saeki et al., 1993). Patients of low socio-economic status prior to stroke tend to have a lower return to work as they often prefer using government benefits or disability pensions (Kerr et al., 2011; Trygged et al., 2011; Gobelet et al., 2007; Treger et al., 2007; Medin et al., 2006). This is presumably because most people of a lower socio-economic status work in blue collar professions and therefore have more physical work tasks and therefore prefer not to or are unable to return to the heavy labour demands. Well-educated individuals tend to be of a higher socio-economic status (Trygged et al., 2011) and they probably have higher expectations and may be in a better position to voice their demands both for cutting-edge health care in connection with the stroke and for subsequent rehabilitation (Trygged et al., 2011). In addition those of a higher socio-economic status may also be able to pay for more intensive rehabilitation.

Transport remains a big issue for patients with stroke returning to work. Lack of suitable public transport demands that patients have their own suitable transport which is expensive. If patients' finances do not allow for this, they are left stranded with no way of getting to work (Treger et al.,2007; Angeleri et al., 1993).

Societal issues such as political factors, economic structuring of the country and infrastructure all have strong influences on return to work (Shaw et al., 2002). These factors shape peoples' views towards people with disabilities, company policies, physical structures, general stereotypes and money directed towards people with disabilities. The beliefs of a country's members including their social, moral and cultural values also have a large impact on return to work as people learn how to behave by watching and following society and therefore develop their behavioural expectations in this manner (Shaw et al., 2002; Sim, 1999). The country's socioeconomic policies ultimately influence peoples' attitudes and views towards those with disabilities (Shaw et al., 2002). Specific barriers inhibiting people with stroke from returning to work are architectural barriers; lack of appropriate transportation; the general unemployment rate of an area or country and stereotypes in an organisation (Treger et al., 2007; Matt and Butterfield, 2006; Saeki, 2000; Tate, 1992).

2.7 Patients' perception of factors affecting return to work

The subtopic that was discussed above "Factors Affecting Return To Work" is a large, well-researched and extensive area, with many correlations being drawn between various factors in order to draw conclusions about what makes people go back to work or not. However, patients' opinions of why they go back to work or do not go back to work, is also important. In this section the small amount of research done on patients' experiences of rehabilitation and return to work post stroke will be discussed. Twenty seven percent of patients with stroke expressed unmet demands in the domain of return to work (Van de Porti, 2007). There is a need to understand what drives individuals and what works for them in terms of rehabilitation as individuals' perceptions of reality may offer a better explanation for their return to work decisions (Shaw et al., 2002). The main theme that emerges from studies that have been done is frustration (Treger et al., 2007; Lock et al., 2005; Roding et al., 2003; Angeleri et al., 1993).

A qualitative study done by Roding et al. (2003) came up with categories of factors that were perceived by patients to be influencing their ability to return to work. The first category was "The Paralysed Everyday". The fatigue patients experienced was devastating and they often found it uncontrollable and overwhelming. It stopped patients from working full-time, if at all, and reduced time spent both with their family and socially. Women (especially) felt bitterness as they were still expected to continue with their "expected roles" despite their disabilities (Roding et al., 2003 Ahlgren and Hammarstrom, 2000). Men on the other hand felt pressure as generally they were the bread winners and felt a financial obligation to go back to work (Roding et al., 2003). If they had disability insurance or a pension, the pressure was significantly reduced (Roding et al., 2003).

The second category was the feeling of being "Outside and Invisible". Patients felt that they were unable to participate in rehabilitation. Some felt the rehabilitation was neither age-appropriate nor work targeted which made them feel unready and insecure about returning to work. Lack of goal setting was a major complaint of rehabilitation leaving the patients feeling directionless (Roding et al., 2003). The amount of physiotherapy received was directly linked to the confidence patients felt and therefore in turn the likelihood that they would return to work (Wiles et al., 2002).

Many patients mentioned that they did not return to work due to their motor impairments (Van de Porti, 2007). Complaints of being fatigued and depressed were given as reasons for failing to return to work (Van de Porti, 2007; Ash and Goldstein, 1995).

Patients often reported low self-esteem post-stroke and it contributed towards poor return to work (Alaszewski et al., 2007). When patients were exposed to good human resources from their employers or from employment agencies it made the process of employment much easier and they commented that it facilitated easier return to work (Alaszewski et al., 2007). Fear of social stigma was a significant concern in return to work (Alaszewski et al., 2007). Many patients felt that work was important for social status and that without it, they would get very bored (Alaszewski et al., 2007). When an individual had had a very stressful career prior to their stroke and they viewed that as a causative factor in their stroke, then they were unlikely to return to work, especially not to the same job (Alaszewski et al., 2007). However, return to work was often seen as a good goal and as a sign of return to normality and was therefore often highly valued (Alaszewski et al., 2007). Patients mentioned speech impediments, fatigue and cognitive impediments as reasons for not returning to work, especially in a stressful work environment (Alaszewski et al., 2007). The perceived supportiveness and acceptance of the work environment also played an important role in return to work (Alaszewski et al., 2007).

2.8 Return to work rehabilitation, organisational values and policies

Vocational rehabilitation is a complex and vital part of rehabilitation (Sirvastava et al., 2005). The most complete definition of vocational rehabilitation is medical, psychological, social and occupational aspects where a vocational assessment, work retraining, work guidance, work orientation and counselling are performed and includes an inter-disciplinary team of doctors, physiotherapists, occupational therapists, psychologists, insurance case managers, work counsellors, work trainers, employers, occupational health nurses and any other social security officers (Blomquist, 2007; Gobelet et al., 2007; Matt and Butterfield, 2006; Davis, 2005; Olsheski et al., 2002; Kielhofner, 1999). Rehabilitation cannot be considered complete or comprehensive until all possible aspects of vocational rehabilitation have been performed (Gobelet et al., 2007; Sirvastava et al., 2005; Olsheski et al., 2002; Sim, 1999; Tate, 1992). Research also shows that the vocational aspect of rehabilitation should be introduced as soon as possible and is appropriate when a patient is receiving intensive acute rehabilitation (Gobelet et al., 2007; Sim, 1999). Vocational rehabilitation therapists mediate between employers and employees and they ensure jobs are not lost erroneously (Gobelet et al., 2007; Olsheski et al., 2002; Blanck and Pransky, 1999).

Specific vocational rehabilitation given to patients has a very positive effect on return to work as it not only equips the individual with the skills to return to work, but it motivates them and plants the

seed that work could be a reality for them (Treger et al., 2007). Vocational therapists can help shed light on what the employee's disability is and how it will impact on their work. They can also work with the employee to make them understand what their new disability constitutes, help the employee to see what their possibilities and options are, help to mediate between employee and employer to see what accommodations need to be made, to see what is reasonable for the employer and they can provide information about social support and public and private welfare (Wolfenden and Grace, 2009; Sirvastava et al., 2005; Isaksson et al., 2004; Friesen et al., 2001; Sim, 1999; Kielhofner, 1999; Tate, 1992; Mudrick, 1991). However, there are studies that suggest that traditional vocational rehabilitation is ineffective as all rehabilitation takes place externally from the work environment and so environmental factors are largely unaddressed (Olsheski et al., 2002). The focus is entirely on the individual and their capabilities while ignoring the possible employment difficulties and assistance that can be provided. It has been suggested that a more proactive and systematic approach be developed where rehabilitation continues to take place within the work environment (Olsheski et al., 2002). Vocational rehabilitation services offer the ability for the employee to enter into training opportunities for work, to return immediately to their existing job, to identify suitable alternative employment, plan withdrawal from work at a beneficial time in terms of benefits to be received and to access appropriate occupational and educational opportunities (Sweetland et al., 2007).

Despite the high cost of rehabilitation, it is clear that a great discrepancy exists between the interest dedicated to rehabilitative techniques and the true purpose of neurorehabilitation. This includes the integration of the patient into their family, work, and social environment, as recommended by the WHO (Angeleri et al., 1993). Therapy should focus on exercises to improve physical abilities, cognitive behavioural therapy, anxiety reducing techniques, stress management techniques and education to allow people to know what resources they have available to them and how they can advocate for their rights (Henry et al., 2007).

The most common form of rehabilitation in post-acute stroke is that of organised inpatient multidisciplinary rehabilitation (Roding et al., 2003). This form of rehabilitation has been shown to have substantial benefits (Roding et al., 2003). Within this setting various factors can both enhance and detract from the effectiveness of the therapy. When patients are involved in setting clear and revisable goals, this has been shown to positively increase their mood and motivation levels (Maclean and Pound, 2000). This is because it allows the patient to feel included, valued and that their ideas are accepted and valid (Maclean and Pound, 2000; Angeleri et al., 1993). Therapists who accept patients' idiosyncrasies and avoid clashing with the patients' value systems

tend to be seen as warm, competent and approachable, and this creates a better trust relationship with a patient which enhances therapies (Maclean and Pound, 2000). Nursing staff often get forgotten as part of the rehabilitation team, however, involvement of the nursing staff in therapy has been shown to reduce mixed messages about what is expected of the patient as well as to remind them of their goals and assist in continuous work towards those goals outside of structured therapy sessions (Blomquist, 2007; Matt and Butterfield, 2006; Davis, 2005; Maclean and Pound, 2000).

It is not possible to "borrow" return to work practices from other countries, due to the unique economic, social and political elements in each country (Sim, 1999). Disability benefits which promote return to work in one country can actually inhibit such practices in another (Sim, 1999). Transitional grants should be considered post stroke, but the number one goal should always be return to work as opposed to disability grants (Gobelet et al., 2007; Henry et al., 2007; Sim, 1999). The availability of vocational rehabilitation services in specific countries also influences the rate of return to work (Treger et al., 2007; Sim, 1999; Angeleri et al., 1993).

Therapy is not the only thing that influences return to work. Corporate culture can create attitudinal, behavioural, and physical barriers for workers and job applicants with disabilities (Schur et al., 2005).

2.8.1 Workplace accommodation

Many jobs are varied and so individuals with disabilities should be carefully considered and placed in suitable jobs where modifications and aids can be made as necessary (Wolfenden and Grace, 2009; Henry et al., 2007; Pagan, 2007; Saeki, 2000; Sim, 1999). Accommodating a disabled person is not only costly but provides many logistical challenges but should always be attempted (Wolfenden and Grace, 2009; Pagan, 2007; Medin et al., 2006; Friesen et al., 2001; Saeki, 2000). Employers face concerns such as having costs when they have to temporarily replace the employee and then risk a drop in efficiency when they re-employ the old employee if they are not competent for the job anymore (Wolfenden and Grace, 2009). Employers' premiums may also increase in terms of workman's compensation as well as employees' insurance when a disabled individual is employed by a company (Wolfenden and Grace, 2009). The workplace and often transport systems need to be changed to facilitate return to work but it is up to an employer to determine whether or not the changes that need to be made are considered reasonable (Mudrick, 1991). Other employees may also feel resentment if they feel that a person with a disability is receiving special treatment (Schur et al., 2005). Most workplace accommodation requires the co-

operation of fellow employees in terms of job restructuring and schedule shift and so co-worker morale is vital for a person with a disability to be reintegrated (Schur et al., 2005; Blanck and Pransky, 1999). In the same tone support from co-workers and encouragement improves relations and performance (Schur et al., 2005). Thirty one percent of organisations stated that the lack of supervisor knowledge regarding accommodations hindered persons with disabilities' employment, and 16% said that cost was the main hindrance (Schur et al., 2005).

Schur et al. (2005)'s study advocated for companies to select their top management according to their demonstration of strong and on-going commitment to persons with disability employment. They believed that this would set an inclusive tone for the company and would help change and reinforce other employees' behaviour (Schur et al., 2005; Sirvastava et al., 2005; Saeki, 2000). In addition, training programs for non-disabled employees to combat stereotypes and increase knowledge about disability as well as how to better interact with disabled co-workers has been shown to be beneficial (Schur et al., 2005). By implementing a rewards system for employees and managers who put disabled friendly programs into place such as mentoring programs, training and resources, disabled employment becomes a positive experience. Top management must also remain in contact with persons from disability unions for knowledge on job accommodation as well as to broaden their recruitment strategies to find disabled employees looking for work as well as to set up sponsoring programs and internships (Schur et al., 2005). Top management are also responsible for making sure the achievements of disabled employees are recognised as well as creating open chains of communication for both disabled and non-disabled employees. Personal attention to all employees and flexibility of job descriptions creates a relaxed and open work environment which allows personal development and autonomy (Pagan, 2007). Recreational and team building activities allow for social interaction between employees and encourages acceptance of individuals with disabilities (Schur et al., 2005). Employer-based disability management programs grew out of the realization that the solution to occupational disability problems lies in the employment setting and that employers themselves could reduce disability related costs and get employees back on the job by actively participating in the rehabilitation and return to work processes (Olsheski et al., 2002). A safe and secure work environment is critical to not only making a person feel comfortable when back at work but for job performance (Wolfenden and Grace, 2009). Much emphasis is placed on return to work but therapy often ends there with little attention being given to job retention and job performance (Wolfenden and Grace, 2009).

A viable but little researched area for disabled persons is that of non-standard jobs which includes part-time work, temporary employment as well as independent contracting (Pagan, 2007; Treger

et al., 2007; Isaksson et al., 2004). About 21% of patients were unable to return to their previous work and had to make adjustments to either their environment, work description, or be reassigned (Schur et al., 2002). Although most constitutions prohibit dismissal during a period of illness, in smaller businesses, illegal layoffs may occur or companies may be unable to reasonably compensate for the individual and therefore will be forced to retrench (Schur et al., 2002). Employers need to be educated and advised in these cases as to what the law does and does not allow (Schur et al., 2002). Non-standard jobs have many benefits such as giving employers and employees flexibility, allowing employees time to find balance in their lives with leisure activities and family and deal with complications such as fatigue and pain, sharpen their work skills again, build their confidence, endurance and social skills (Pagan, 2007; Schur et al., 2002; Sim, 1999). It can be used as a vocational therapy tool and allow for transition time to get back into full time work, and it may reduce anxiety and increase motivation (Pagan, 2007; Schur et al., 2002; Sim, 1999). Non-standard jobs also have drawbacks of their own, they tend to pay less and have less benefits and subsidies, higher instability, turnover and fewer promotion and training options (Pagan, 2007; Schur et al., 2002). Some European countries have incentives for employees to transit into work as opposed to returning full time or not at all (Sim, 1999).

Several new technologies such as information technologies, telecommuting and non-standard work arrangements are promising for increasing return to work potential (Schur et al., 2005). Part-time work helps decrease the amount of time that persons with disabilities spend inactive and this is a promising start for increased quality of life and life satisfaction (Pagan, 2007). This may even allow people to start work earlier than if they were waiting to be ready for a full-time position (Pagan, 2007).

Return to work programs for employees with musculoskeletal disorders have a number of aims which are namely to prevent and limit disability, provide early health care intervention and to develop management strategies for cost-effective return to work (Williams et al., 1998). Although some of these may differ for stroke patients, many general principles can be applied. The primary goal of managing disability is safe and early return to work (Williams et al., 1998). Within this, the role of health care providers is well recognised in encouraging return to work as they can determine where it is appropriate for the individual to return to work and what accommodations need to be made making effective communication between companies and health care providers essential (Gobelet et al., 2007; Medin et al., 2006; Sirvastava et al., 2005; Williams and Westmorland, 2002; Mudrick, 1991). Open communication between all parties results in more successful return to work as it enhances the employees' motivation to return to work,

demonstrates employers' empathy and concern for the employee, allows the employee to be an active decision maker and also allows all to work towards a unified goal (Wolfenden and Grace, 2009; Gobelet et al., 2007; Medin et al., 2006; Olsheski et al., 2002; Williams and Westmorland, 2002; Friesen et al., 2001; Angeleri et al., 1993).

2.8.2 Corporate culture

There are three levels of culture within organisations. The first fundamental level consists of the guiding values and norms of an organisation. These norms are generally unspoken and unconscious and are often taken for granted (Schur et al., 2005). These norms and values identify appropriate behaviours within the organisation and they provide the moral justification for the current practices and policies of the organisation (Pagan, 2007; Schur et al., 2005). The second level is that of the "espoused values" of the organisation and these include explicitly stated strategies, goals and philosophies that guide organisational policies (Schur et al., 2005). The third and final level reflects the culture of the corporation and includes the physical and social environment (Schur et al., 2005).

For successful return to work, all three levels need to be examined at a corporate level as they all influence each other. For example, the voiced policies of level two could state that people with disabilities will have equal opportunities for employment; however, the unstated first level could reflect discrimination for the disabled and this results in an inaccessible physical environment and unwelcoming colleagues (Medin et al., 2006; Schur et al., 2005). The most common barriers to return to work include factors such as negative attitudes among supervisors and co-workers regarding job accommodations, ergonomic problems, ineffective policies and procedures regarding disability issues, lack of a formal return-to-work program, poor labour relations, and a corporate culture that does not value return to work (Olsheski et al., 2002).

2.8.3 Organisational Values and Policies

The organisational values of the company can disadvantage disabled individuals especially if the policies are inflexible (Pagan, 2007; Medin et al., 2006; Sirvastava et al., 2005; Olsheski et al., 2002; Blanck and Pransky, 1999; Tate, 1992). If the organisation has a more bureaucratic system, it is often based on an equity value system, which pits the fairness of treatment for all employees against the personalised consideration of individuals' needs (Schur et al., 2005). Twenty percent of employers stated that the greatest barrier to people with disabilities being employed is discrimination, prejudice or employer reluctance to hire them (Schur et al., 2005). Those companies that value racial, cultural, ethnic and gender diversity have been shown to create a

more hospitable environment for disabled workers. Policies which emphasise that every individual has their own unique set of skills to bring to the company as well as those that are prepared to take the time to break down a job into components and essential tasks can then provide employment for disabled persons based on their skills and those essential tasks they can perform (Schur et al., 2005; Saeki, 2000; Tate, 1992). The biggest problem is not the unsuitability of jobs but rather finding an organisation that is willing to break the mould and allow individuals with disabilities a chance to prove their capabilities (Schur et al., 2005). Work satisfaction and commitment to work are linked to the extent to which a worker is accepted, respected, and liked by co-workers and supervisors (Schur et al., 2005).

Workers who receive feedback from their workplace that they are valued, and workers who feel supported and rewarded for their efforts have a stronger incentive for working (Kielhofner, 1999). The most effective techniques used to change supervisor and colleague attitudes were in 81% of cases showing top-management commitment, in 62% of cases staff training and in 59% of cases setting up a mentoring system (Schur et al., 2005; Williams and Westmorland, 2002). Ignorance, embarrassment and minimal understanding on the part of management or colleagues can lead to the stroke survivor being alienated or ignored (Wolfenden and Grace, 2009). This may make the employee feel even more vulnerable or it may force them into resignation or early retirement (Wolfenden and Grace, 2009). In general supervisors and co-workers need to be supportive of workers with disabilities and the corporate culture that is created needs be one of respect and diversity (Wolfenden and Grace, 2009; Pagan, 2007; Medin et al., 2006; Schur et al., 2005; Saeki, 2000).

The negativity about people with disabilities that can be created in the workforce can be due to several factors. Firstly, stereotypes of people with disabilities (Wolfenden and Grace, 2009). This can either be that they are needy and helpless, less intelligent, bitter or that they are saints (Wolfenden and Grace, 2009). Secondly, it could be due to discomfort about being around people with disabilities. Many people are intolerant towards people with stroke and this intolerance can result in embarrassment and frustration for the employee (Wolfenden and Grace, 2009). Thirdly, disabilities creating communication difficulties can place strain on relations and these people tend to be ignored as it takes too much time or effort to communicate with them (Wolfenden and Grace, 2009). Fourthly, like in non-disabled people's personalities, the personality of the disabled person can affect their acceptance by co-workers with aggression, egocentricity and limited tolerance being undesirable characteristics (Wolfenden and Grace, 2009).

Lastly, prior contact with people with disabilities helps counteract negative perceptions and can increase acceptance of people with disabilities (Schur et al., 2005). These negative perceptions can affect various aspects of the disabled employees' work including their performance expectations and evaluations by others. They may also be given less responsibility, be placed in a job with limited interaction with other employees and may be limited in terms of their potential for promotions (Medin et al., 2006; Schur et al., 2005). In reaction to this, disabled employees may react in ways that shape the work environment to their benefit. These include communicating information about their disability to reduce anxiety and discomfort among their co-workers; requesting help, emphasising their similarities to their co-workers, becoming a super worker so that their actions are beyond reproach or they may also try and change the current organisational policies of their employers (Schur et al., 2005). Studies estimate that disabled employees earn 10% - 25% less than a non-disabled person in the same position (Schur et al., 2002). This is a prime example of the values a company holds as to whether they feel a disabled person deserves as much as a non-disabled individual. It has been acknowledged that the most significant barriers to employment arise from the environment and not the person (Wolfenden and Grace, 2009).

Return to work rehabilitation needs to be a process between all parties including the employer, employee, family and therapists. Vocational rehabilitation is an important area of rehabilitation which prepares patients for work and also mediates between employees and employers. In addition vocational therapists can arrange necessary workplace accommodations including non-traditional employment arrangements. Employers' organisational values as well as the company's culture can strongly influence return to work. Companies need to address these internal issues to make employment for persons with disabilities more accessible.

2.9 Review of instrumentation

a) The modified Rankin scale

The modified Rankin scale (mRs) was used to quantify an individual's level of disability, and was elected for this reason as it focuses on disability as opposed to other tools which focus on function. It is the only available tool which measures an individual's level of disability. The mRS is a clinician-reported measure for global disability. It is scored on a scale of zero through to five, zero being the lowest level of disability, and five being the most severe level of disability. The clinician selects a description reflecting the individual's level of disability and scores the individual according to the numerical value attached to that description. It is widely applied for evaluating stroke patient outcomes (Banks and Marotta, 2007) and is a valuable instrument for assessing the

impact of new stroke treatments (Banks and Marotta, 2007). In addition, it has been shown to be an excellent tool to assess overall disability (Bonita and Beaglehole, 1988). Previously, for a person to be considered to have a favourable outcome based on the mRS they needed to score either zero, one or two (Lai and Duncan, 2011). The current thinking however is that for one to be considered to have a favourable outcome, a transition needs to be seen in the mRS score from a higher score to a lower score, even if by one digit (Lai and Duncan, 2011). The transition from a higher to a lower score is linked to a higher level of functioning and an improvement in ADLs than just a single mRS score. This was however not possible in this study because it involved a single once-off interview. The test-retest reliability of the tool was found to be excellent (Wilson et al., 2005) as was the intra-rater reliability (Wolfe et al., 1991) and inter-rate reliability (van Swieten et al., 1988; Wolfe et al., 1991; Wilson et al., 2002; Shinohara et al., 2006). The concurrent validity of the tool was found to be excellent (Shinohara et al., 2006; Kwon et al., 2004***;*** Weimar et al., 2002); as was the construct validity (de Haan et al., 1993; de Haan et al., 1995).

b) Structured questionnaire

The use of a structured interviewer administered questionnaire was chosen over open interviews in this study for a number of reasons. Firstly, open interviews are more qualitative in nature and it was the desire of the researcher to go the quantitative route, a sentiment that was corroborated by the statisticians. In addition, open interviews are difficult to replicate and have a low inter- and intra-rater reliability (Harris and Brown, 2010). Structured questionnaires are also seen as more objective and have more generalisable results which is suitable for large sample sizes (Harris and Brown, 2010). Interviewer administered questionnaires were chosen because they make it possible to record more than the verbal responses of the interviewee, which are often superficial. “When human beings communicate directly with each other much more information is communicated between them. The nature of words used, facial expressions and body language all communicate what the other party means” (Network and Centre for Agricultural Marketing Training in Eastern and Southern Africa, 1997). This is especially important in patients with stroke due to possible cognitive fallout or receptive and expressive aphasia that may have occurred, and therefore more information that may not be verbalised can be conveyed. In addition, certain aspects such as the patients speech and walking abilities had to be observed by the therapist and this was not possible telephonically.

2.10 Conclusion

Factors that promote return to work include the patient's education level as well as whether the individual is a blue or white collar worker. This is also closely linked to the company's attitudes and employment policies, which are in turn affected by government policies. A patient's socioeconomic status also plays a role in that it is intricately linked to an individual's job, the position they hold in a company and their access to adequate transport. If a patient consumed alcohol, suffered from epilepsy or if their stroke was caused by a cardiovascular complication the patient had a significantly reduced chance of returning to work rate. Countries where social grants were provided showed reduced return to work due to the provision of the grant.

Physically, any patient who has hemiparesis regardless of the side affected, reduced ability to perform functional abilities, pain or fatigue has a lesser chance of going back to work. In addition any cognitive, perceptual or sensory fallout and the presence of aphasia resulted in reduced return to work. Neither the occurrence nor the amount of rehabilitation influenced return to work but what occurs in therapy such as the therapist patient relationship, an empowering process of the patient as well as therapy meeting patients' core values influenced return to work. A patient's emotional acceptance of their condition as well as their personality, whether it be optimistic or pessimistic, the presence of depression, the level of family support and religious beliefs all influence return to work.

Fatigue was a major contributor from patients' perspective on why they couldn't return to work. Patients voiced the need to have an understanding of and be included in the process of rehabilitation and goal setting. They require information about their condition, possible prognosis, the rehabilitation process and when this is not provided patients feel it is a very negative factor in terms of allowing them to return to work. Finally stereotypes and stigma attached to stroke were a major contributing factor in stopping people from returning to work.

CHAPTER 3

3. METHODOLOGY

3.1 Study Design

This was a quantitative cross sectional study. A quantitative study was chosen, as it was recommended for statistical analysis. A cross sectional study was sufficient to provide the required data.

3.2 Subjects

3.2.1 Source of subjects

Patients for the study were recruited from physiotherapy practices in Johannesburg that treat patients with neurological problems. These practices were namely: Life New Kensington hospital, Rehab Matters, Rosebank Neuro-Medical Ward and Netcare Rehabilitation hospital. All of these practices were private institutions treating both in and out neurologically impaired patients. In addition, Headway which is an non-profit private organisation for people with acquired brain injury was contacted and available patients were also interviewed. Government clinics in Johannesburg were contacted and the patients attending their weekly stroke classes were recruited into the study.

3.2.2 Sampling and Sample Size

A sample size of convenience of at least 97 patients would estimate the proportion of patients that return to work to within an accuracy of 0.1 (10%) with 95% confidence. The sample size was calculated statistically based on the sample required to provide a significant proportion. The expected proportion of patients returning to work was assumed to be 50% which was the return to work percentage estimated by Saeki (2000).

3.2.2.1 Inclusion and Exclusion Criteria

i) Inclusion Criteria

Patients were included into the study if they:

- had a confirmed diagnosis of stroke by a doctor either clinically or using magnetic resonance imaging

- were between six months and two years post-stroke. Research shows that maximum improvement post-stroke is seen within the first six months and maximally up to two years (Saeki et al., 1993).
- were employed prior to the stroke.
- lived within the Johannesburg area.
- were aged between18 and 64 years.

ii) Exclusion Criteria

Patients were excluded from the study if they:

- were discharged to a nursing home.
- had stopped work due to another illness/ condition.

3.3 Ethical Considerations

Ethical clearance was applied for and obtained from the Committee for Research on Human Subjects of the University of the Witwatersrand (clearance number: M080953; Appendix K). At the time ethical clearance was applied for the title was “Rate of Return to Work of Patients With Stroke”. However, after postgraduate meetings the title was changed to “Perceived Factors Influencing Return to Work After Stroke.” Permission was obtained from the Life New Kensington hospital, Rehab Matters, Rosebank Neuro-Medical Ward; Netcare Rehabilitation hospital; Headway; and all government clinics within the Johannesburg region (Appendix D – Appendix H).

An information document (Appendix I) was presented to the patient prior to administering the questionnaire. The researcher or research assistant went through the information document and patients were then required to complete an informed consent form prior to taking part in the study (Appendix J). Wherever possible, interviews were done on a one-on-one basis. If the patient struggled with speech or understanding of the questions, then a family member or caregiver was called in to assist. Data collected was kept safe and confidential and was used only for the purposes of this research.

3.4. Measuring Instruments

The following instruments were used for the data collection process.

3.4.1 The Questionnaire (Appendix A)

A questionnaire (Appendix A) was developed to establish the reasons for returning or not return to work. Content validity, inter- and intra-rater reliability were established for this questionnaire. The questionnaire comprised the following sections:

Section A

This section gathered information on the patients' demographic details which included the age, gender, date of stroke, side of stroke, level of education, previous and current occupation, presence of a caregiver, participation in family activities, presence of pain, walking abilties, ADL abilities, marital status, co-morbidities and rehabilitation received. In addition certain observations and inferences were made by the researcher on administration of the questionnaire, regarding speech abilities, the patients understanding, and walking abiltiies.

Section B

This section established if the patient had returned to work, if they had returned to their previous employment or another form of work and details about their current employment.

Section C

This section established the reasons why patients who had returned to work chose to do so or were able to do so.

Section D

This section established the reasons why patients with stroke who had initially returned to work then later stopped working.

Section E

This section established the reasons why patients with stroke had not returned to work

3.4.2 The Modified Rankin Scale (Appendix B)

The modified Rankin scale was used to establish the degree of disability and is interpreted as follows:

0	No symptoms at all
1	No significant disability despite symptoms; able to carry out all usual duties and activities
2	Slight disability; unable to carry out all previous activities, but able to look after own affairs without assistance
3	Moderate disability requiring some help, but able to walk without assistance
4	Moderate severe disability; unable to walk without assistance and unable to attend to own bodily needs without assistance
5	Severe disability; bedridden, incontinent, and requiring constant nursing care and Attention

3.5 Procedure

3.5.1 Content Validity of the Questionnaire

The questionnaire was developed using information from literature. The content of the questionnaire was then validated by eight therapists who had experience in the fields of adult neurological rehabilitation and vocational rehabilitation. Each therapist present had more than five years of experience working in the field of stroke and each had an MSc Physiotherapy specialising in adult neurology.This group of therapists was largely happy with the questionnaire. A few questions they thought would be useful were suggested and included by consensus.

3.5.2 Pilot Study

The pilot study was done to help establish the intra-rater and inter-rater reliability of the questionnaire. It was also used to check the patients' understanding of the questions in the questionnaire, the time it took to administer the questionnaire and to detect any possible flaws in the data collection process.

Methodology of the pilot study

Rehab Matters was contacted to get permission to carry out the pilot study. Names and numbers of all patients who had suffered a stroke over the previous two years were received from Rehab Matters. Patients were chosen from the list and contacted telephonically to inform them about the

study. Patients who met the inclusion criteria were asked if they were prepared to be a part of the pilot study which required them to be interviewed twice. If they agreed, a suitable time and date was then set with them. The research assistants were trained in the questionnaire, the purpose of the study and how the interviews were to be conducted. The researcher and the research assistant visited the patients at their houses. The questionnaire was administered by the researcher. Both the researcher and research assistant marked answers on the questionnaire at the same time, but only the researcher asked the questions. Upon conclusion of the initial interview, a time and date for the repeat interview was set up. Both the researcher and research assistant were present for both the interviews. After the interviews the researcher and research assistant compared results. On all occasions it was requested that a caregiver be present unless this was not possible, or if the patient felt it was unnecessary.

Results and implications of the pilot study

a) Intra-rater reliability:

Intra-rater reliability for the primary researcher

	Section A	**Section B**	**Section C**	**Section D**	**Section E**	**Total**
Score	85.9%	98.5%	75%	N/A	53.3%	78.2%

When comparing all answers noted by the primary researcher at the two separate interviews the answers were exactly the same 78.2% of the time.

Intra-rater reliability for the research assistant

	Section A	**Section B**	**Section C**	**Section D**	**Section E**	**Total**
Score	85.1%	95.5%	82.6%	N/A	53.3%	79.1%

When comparing all answers noted by the research assistant at the two separate interviews the answers were exactly the same 79.1% of the time.

For section E it was evident that there was no discrepancy in the understanding of the answers between the researcher and research assistant, the actual answers given by the patients differed between the first and second interviews. Section D was only answered if patients returned to work post-stroke but then chose to stop working. This wasn't applicable to this cohort of patents and hence no answers were recorded.

On sections A and B patients' answers were consistent, however, in sections C (reason for return to work) and E (reason for not returning to work) when patients' perceptions were questioned their answers, or the researcher's perception of their answers varied considerably. On the first interview for sections C and E, patients were asked to state reasons off the top of their heads as to why they did or did not go back to work and the assistant and researcher then ticked the boxes that best fitted the reasons given. However patients often could not think of reasons and this led to few reasons and many prompts being given by the researcher and the assistant. This meant that much interpretation was needed and bias could have come into play with the prompts given.

It was as a result decided that the list of reasons would be read out by the researcher in their entirety and then ask the patients to name which ones applied to them. This however was flawed because of patients' poor memory recall and other cognitive factors which came into play. This was evident in the difference in answers given in sections C and E which showed poor intra-rater reliability. It was thus decided that the best way to ask the questions for sections C, D and E was to read out the possible list of reasons one at a time and then ask the patients to respond positively or negatively for each reason as to whether that applied to them or not. At the end of the list, patients were then questioned as to whether any reason had not been mentioned which they wished to add. They were also asked to choose one reason they thought was the number one determining factor for their work status.

From the pilot study it was decided that in the main study, patients would be interviewed on their own, unless they had severe receptive fallout and the researcher was unable to obtain all information from them alone, or if the patient could not remember specific information and then the carer would be asked for that information at the end of the interview.

b) Inter-rater reliability:

	Section A	**Section B**	**Section C**	**Section D**	**Section E**	**Total**
Score	96.8%	100%	93.9%	N/A	95.8%	96.62%

The inter-rater agreement showed high scores which demonstrates that the patients' answers to the questions were clear and easily interpreted with little room for variability.

Inter-rater and intra-rater reliability percentage acceptability levels have been debated in literature. McMillan and Schumacher, (2001) considers a percentage between 50 and 90% acceptable, while Marques and McCall, (2005) comment that a percentage of 80% is considered acceptable. In addition Mathias et al., (1997), in a study with stroke patients and Huxley et al., (2000) while studying other health care patients considered an inter-rater and intra-rater reliability of >80% to be excellent. Therefore, the inter-rater reliability results showed excellent agreement and reliability, while the intra-rater reliability scores were not excellent, but acceptable.

Section D was only answered if patients returned to work post-stroke but then chose to stop working. This wasn't applicable to this cohort of patents and hence no answers were recorded.

c) General changes to the questionnaire

Section A

- **Question five**: One patient had a midline stroke where one side was not as affected as another. This is rare but possible and therefore an option of a midline stroke was included.
- **Question seven:** This question was removed as the date the assessment took place on was irrelevant
- **Question eight:** This question had tick boxes added after consultation with the statistician for more accurate analysis
- **Question nine:** This question was removed as it was decided that patients would be interviewed without a carer. This is because there was concern after the pilot study that patients may not answer all questions honestly with a carer or family member present.
- **Question 11:** Tick box for seizures was removed as epilepsy covers this condition. However, under epilepsy, diabetes and hypertension tick boxes were added for if these conditions were controlled or not.
- **Question 14:** Tick box options were added for data capturing purposes.
- **Question 15:** A distinction needed to be made between the categories of amount of time during the day the caregiver is present and how many days a week. Therefore it was split into two questions asking if the caregiver was around day and night, day only, night only or half day and then a separate question was created to determine if the carer was present only during the week or on weekdays only. This is important to know as the amount of time, specific time of the day and day of the week the carer is present may have an important influence on return to work and it was important for us to establish the level of correlation.
- **Question 23** was changed from stating "Are you the primary breadwinner?" to "Were you the primary breadwinner?" If the patient was the primary breadwinner, they then go on to

answer if they still are a primary breadwinner as the distinction must be made between the financial pressure and position they once held compared to now.

- **Question 25:** Tick box options were added as well as an “Other” option.
- **Question 28** seemed to be irrelevant, as if the person has a dependent, their age doesn’t really matter and therefore it was removed.
- **Question 29:** An option of acute hospital rehabilitation was added. The option of “Both” was removed due to this addition. As a result, the length and intensity of acute rehabilitation received added valuable information and therefore the option of “acute” was included under questions 32 and 33.
- **Question 32 and 33:** Although patients answered the questions with ease, it was very difficult to score and therefore tick boxes were added for these questions to make it easier for data capturing purposes.
- **Question 35 and 36:** A distinction needed to be made between the type of occupation and whether the patient was self-employed or employed by others. Therefore a separate question was created so that even if the patient was self-employed we could still determine the type of work they were doing within their own business.
- **Question 37:** Instead of leaving this question open ended, for ease of data capturing the question was adapted into having only two options; that of full paid sick leave and partly paid sick leave.
- **Question 58:** Distance options were given as patients struggled to come up with distances on their own when answering this question.
- Further literature review revealed that pain played a significant role in patients’ return to work. Therefore three questions on pain were added to this section to determine if there was a relationship between pain and return to work in South Africa. A body chart was included for the section on the location of pain so as to make analysis easier and more standardised.

No changes were made to Sections B, C and E

Section D

There was no option on the possible role of incontinence in stopping return to work and so this was added.

The questionnaire took between 20 and 45 minutes to administer but on average they took about 30 minutes. Two of the patients commented that the questions were easy to answer and that the whole process was a lot simpler than they thought it would be.

Conclusion of the pilot study

The time taken to administer the questionnaire was found to be satisfactory by the patients, the research assistant and the researcher. Necessary changes were made to the questionnaire as explained above and it was decided that the list of reasons in sections C and E would be read out as a check list for patients to then answer yes or no to each item. It was also decided that patients would be interviewed without carers initially unless it was decided by the researcher that one was evidently necessary to assist the patient.

3.5.3 Main Study

Permission to conduct the study was obtained from the authorities at the various physiotherapy practices and government clinics by either faxing or hand delivering the request letter. The letter explained the study objectives and the expected benefits to them and their patients (Appendix C). Questions were answered by the researcher telephonically or in person when the practices had any queries. Upon receiving approval from the various places, a list of suitable patients was provided to the researcher from the research facility. Patients were contacted telephonically to give an explanation of the study and to obtain informed consent. Thereafter an appointment was made for the researcher to see the patients either at their residence or place of work (whichever they preferred). Depending on the area that was selected by the patient, the researcher or one of the research assistants were selected to conduct the interview. All research assistants were qualified physiotherapists, bar one who was a psychologist, but who had worked extensively with neurologically impaired patients.

The researcher or research assistant introduced themselves to the patient and went through the information sheet with the patient and asked them to sign the consent form if they still wanted to participate in the study. The questionnaire was then administered by the researcher or research assistant allowing adequate time for patients to think and answer. Any further questions regarding the study were answered by the researcher or research assistant. Thereafter all data was captured by the researcher onto the spread sheet which had been set up in conjunction with the statistician.

3.6. Data Analysis

STATA 12 was used to analyse data. The percentage of patients that returned to work was determined. Reasons for returning to work, not returning to work, returning to work and then stopping work were summarised using frequencies and percentages. A univariate and multivariate analysis was performed to establish patients' perceived factors which influenced return to work post stroke. All data with a p-value of 0.15 or less were included in the multivariate analysis. Significance was set at 0.05.

CHAPTER 4

4. RESULTS

4.1 Introduction

The objectives of this study were to establish the rate of return to work of patients following stroke and to establish the perceived factors which influence the return to work of patients with stroke.

The results will be presented as follows: the demographics of the study sample; the return to work percentages; perceived factors which patients with stroke described as their main influencing factors for returning to work and the factors which influenced return to work.

4.2 Demographics of the study sample

4.2.1 General Demographics

A total 97 patients were recruited and participated in the study. No patients who met the inclusion criteria were excluded. Forty three (44%) were females and 54 (56%) were males. The mean age of the patients was 51 years with a standard deviation of 10.5. The youngest patient was 27 years and the oldest patient was 64 years of age. There were more patients with right sided hemiplegia 52 (54%) than left sided hemiplegia 42 (43%). Three (3%) of the patients had central hemiplegia.

General demographic details of the patients in this study sample are shown below in Table 4.1.

Table 4.1: General demographic details of the patients in the study sample (n = 97)

Demographic Detail		**n (%)**
Race distribution	Black	54 (56)
	White	29(30)
	Indian	8 (8)
	Coloured	6 (6)
Hand dominance	Right	92 (95)
	Left	5(5)
Time since stroke (months)	6-9	13 (13)
	>9-12	12 (12)
	>12-18	18 (19)
	>18-24	54 (56)
Orientation to person, place and time.	Not fully orientated	3 (3)
	Fully orientated	94 (97)
Marital status	Married	57 (59)
	Single	18 (19)
	Divorced	8 (8)
	Widow/Widower	12 (12)
	Live-in partner	2 (2)
Participation in family activities: such as family outings	Yes	82 (85)
	No	15 (15)
Active member of the family: included in decision making and conversations	Yes	75 (77)
	No	22 (23)
Emotional support from family members	Always	82 (85)
	Seldom	11 (11)
	Never	4 (4)
Education level	University degree	14 (14)
	University diploma	16 (16)
	Grade 12	25 (26)
	Up to Grade 11	22 (23)
	Up to grade 7	19 (20)
	None	1 (1)

More than half of the study sample (56%) were between 18 months and 24 months post-stroke and 59% were married. Almost half of the study sample (44%) had an education level below Grade 12.

Table 4.2 below shows the co-morbidities which the patients in this study sample presented with. NB: One patient could choose more than one co-morbidity.

Table 4.2: Co-morbidities which the patients in this study sample had (n = 97)

Co-Morbidity	**n (%)**
Hypertension	61 (63)
Diabetes	16 (16)
Epilepsy	10 (10)
Cardiovascular problems	17 (18)
Headaches	34 (35)
Fatigue	54 (56)
Depression	34 (35)
Arthritis	13 (13)
Smoker	32 (33)
Chronic Obstructive Pulmonary Disease	6 (6)

About 63% of the study sample had hypertension, and 56% had fatigue. Sixteen percent of individuals with hypertension, 22% of those with diabetes and 42% of those with epilepsy reported that it was uncontrolled.

The caregiver (CG) availability information for the study sample is given in Table 4.3 below.

Table 4.3: Caregiver (CG) information (n = 43)

Caregiver availability	**n (%)**
CG present day and night	30 (71)
CG present day only	9 (21)
CG present night only	3 (8)
CG present weekdays and weekends	37 (88)
CG present weekdays only	5 (12)
CG Remunerated	11 (26)
CG family member	30 (71)
Family member gave up work to be CG	5 (12)

Most of the patients' caregivers (88%) were present weekdays and weekends. Twelve percent of the family members gave up work to be the caregiver.

4.2.2 Patients' financial obligations

Information about patients who were breadwinners before the stroke is shown in Figure 4.1below.

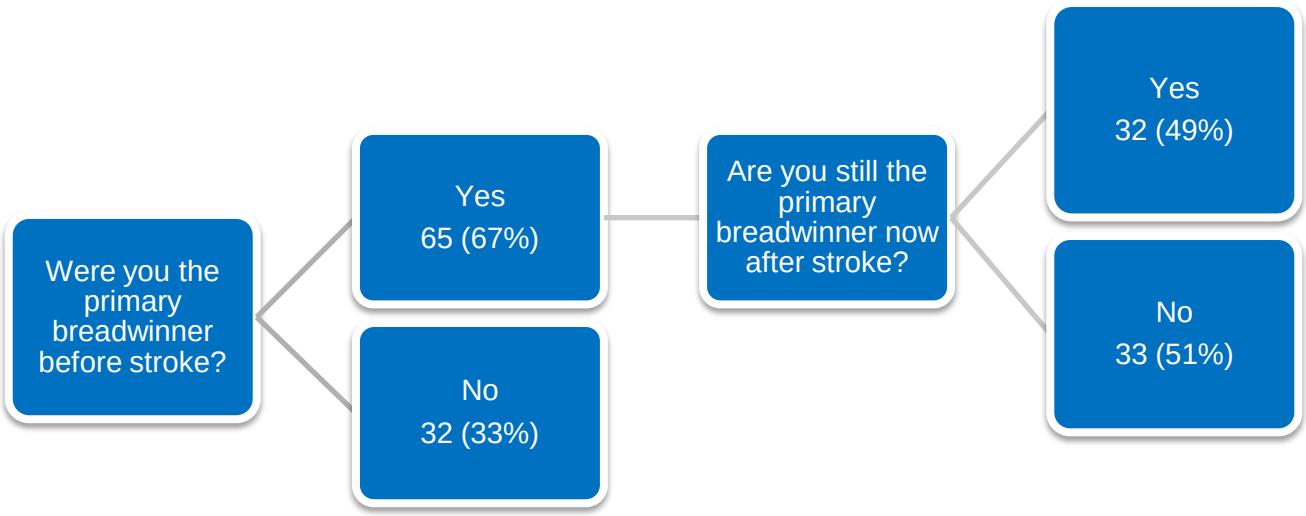

Figure 4.1: Primary Breadwinner Statistics (n = 97)

From the study sample 67% of the patients were breadwinners before the stroke and 49% of them remained breadwinners after stroke.

The mean number of dependents for patients in this study was two people with a standard deviation of 2.3. The minimum number of dependents was zero and the maximum number was16.

The patients' financial obligations are presented in Figure 4.2 and Figure 4.3 below

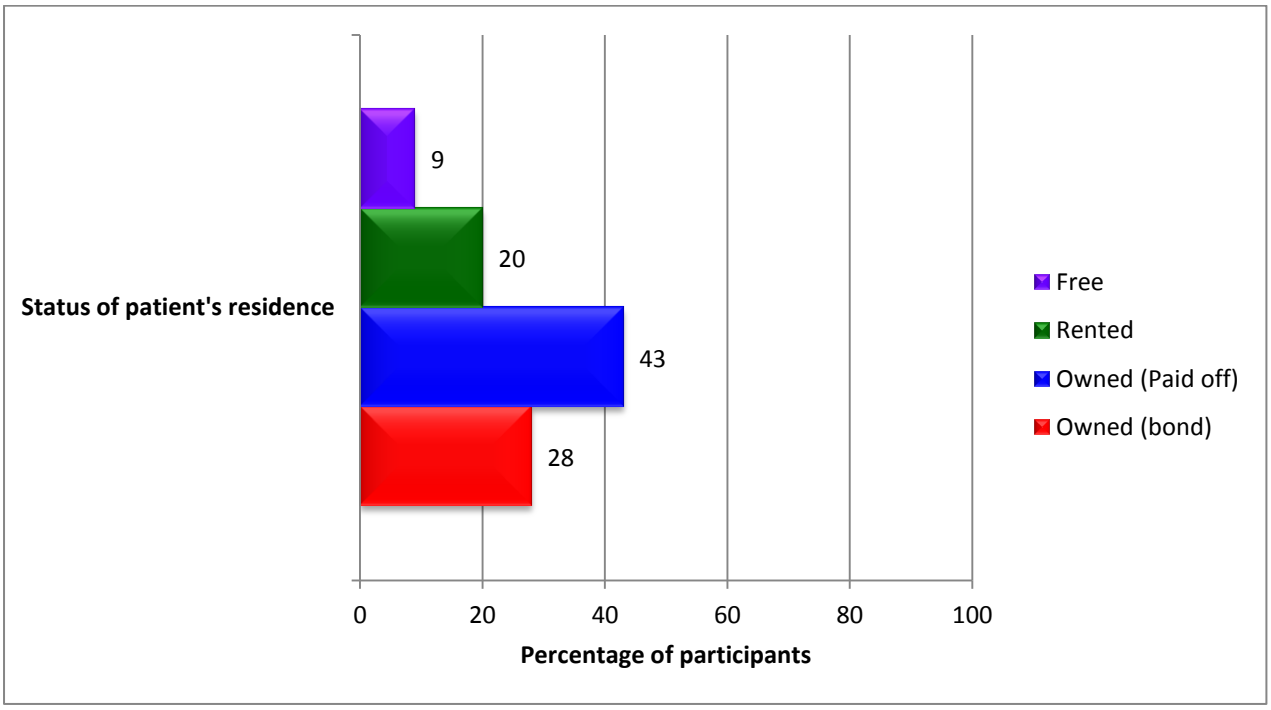

Figure 4.2: Residential costs obligations (n = 97)

About 43% of the patients owned the houses they were living in and had paid it off in full.

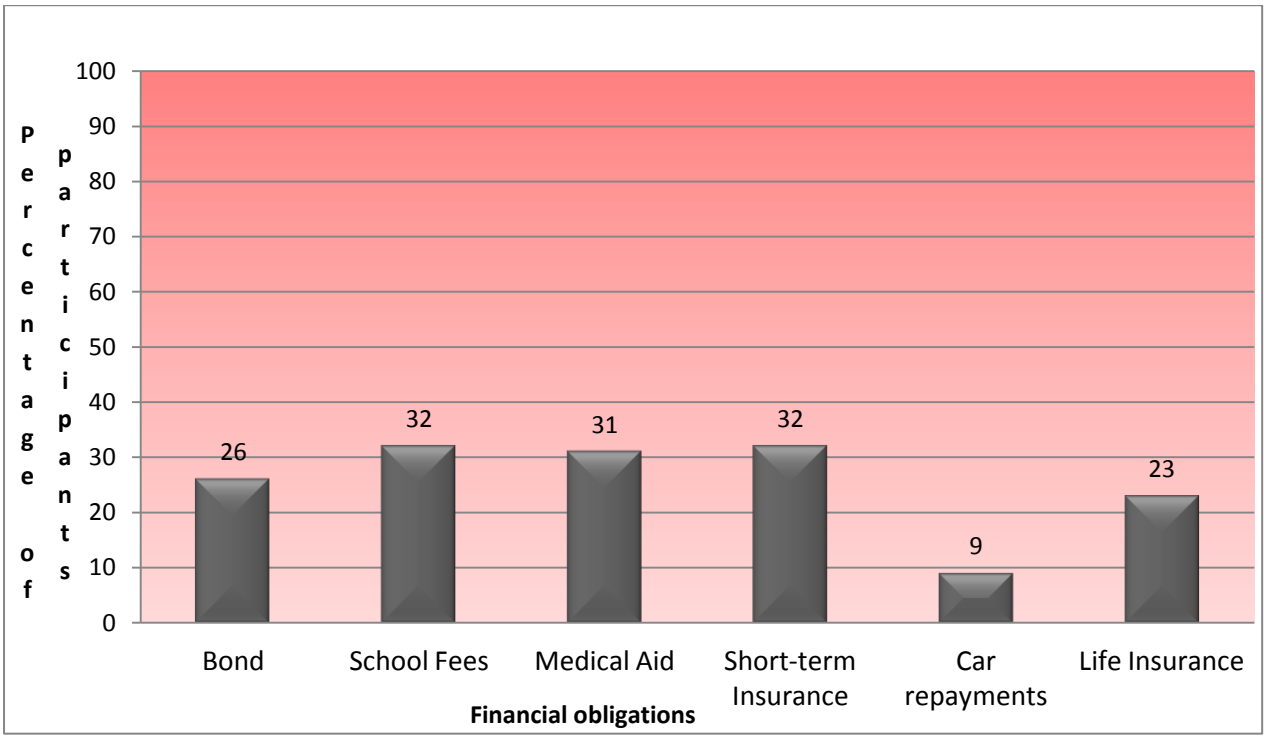

Figure 4.3: Major monthly financial obligations (n = 97)

The most common major monthly financial obligations were school fees (32%) and short term insurance (32%).

4.2.3 Rehabilitation services received by the patients in this study

Table 4.4 below shows the type of rehabilitation received by the study sample.
NB: One patient could select more than one type of service received.

Table 4.4: Rehabilitation received (n = 97)

Variable	**n (%)**
Received rehabilitation	95 (98)
Received acute hospital rehabilitation	57 (59)
Received rehabilitation at a specialised unit	35 (36)
Received out-patient rehabilitation	85 (88)
Received physiotherapy	94 (99)
Received occupational therapy	65 (68)
Received speech therapy	51 (54)
Received counselling	20 (21)
Received dietetics advice	9 (9)
Received neuropsychology	8 (8)
Received vocational rehabilitation	1 (1)

Almost all patients (98%) received some form of rehabilitation with out-patient rehabilitation being the most common (88%). Only one patient received vocational rehabilitation.

The length of time spent receiving rehabilitation at the various facilities is shown in Figure 4.4 below.

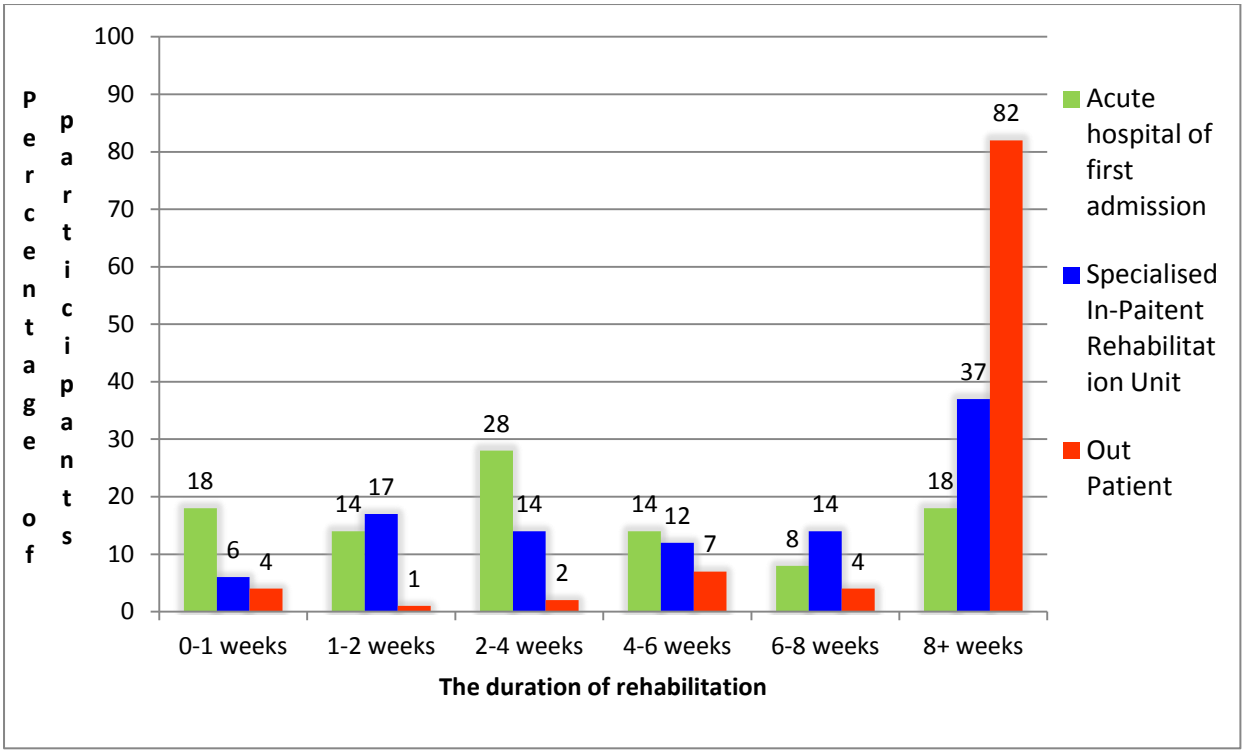

Figure 4.4: The duration of rehabilitation at various facilities (n = 97)

Most patients received over eight weeks of rehabilitation at an out-patient department (82%).

Figure 4.5 below shows the intensity of therapy received at the different rehabilitation facilities.

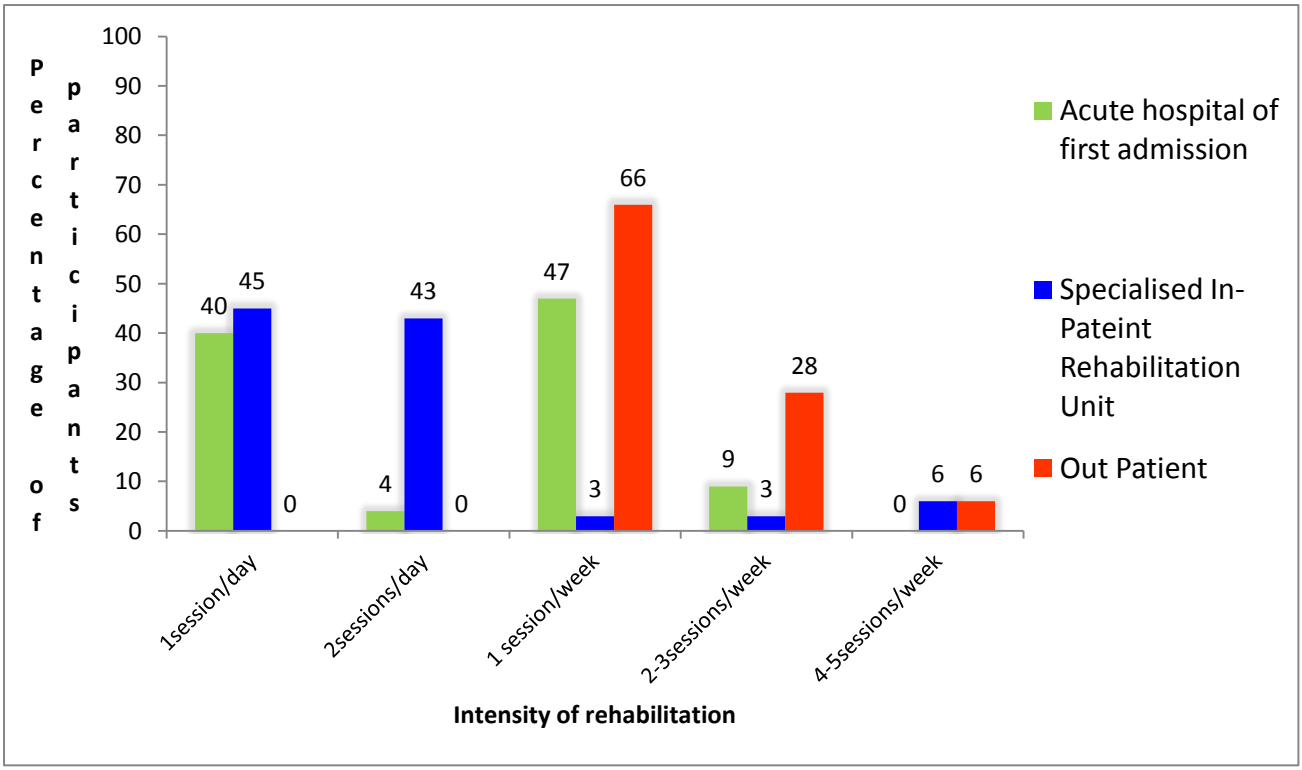

Figure 4.5: Intensity of rehabilitation at the rehabilitation units (n = 97)

About 66% of the patients who received out-patient rehabilitation received one session a week. In acute hospitals almost half the patients (47%) received therapy once a week. In rehabilitation units most patients (45%) received a session every day and an almost equal number (43%), two sessions a day.

4.2.4 Sick leave, Job types, and Grants

Fifty two patients (54%) received sick leave. Of those who received sick leave almost all of them (94%) received paid sick leave and 67% received paid leave for the full period they were not able to go to work. Both pre-and post-stroke more patients were employed by others with 81% employed by others prior to stroke and 67% employed by others post-stroke.

Table 4.5 below shows the job types of the study sample both prior to stroke and post-stroke.

Table 4.5: Job type pre- and post-stroke

Job Type	**Prior to stroke (n =97) n (%)**	**Post stroke (n= 30) n (%)**
Desk Job	32 (33)	13 (43)
Physical Labourer (Majority of work includes manual labour)	45 (46)	7 (23)
Service Industry	7 (7)	2 (7)
Manager	13 (13)	8 (27)

Prior to stroke the most common job type was that of a physical labourer (46%) while post-stroke it was a desk job (43%).

Figure 4.6 below shows results of grants received by the patients post stroke.

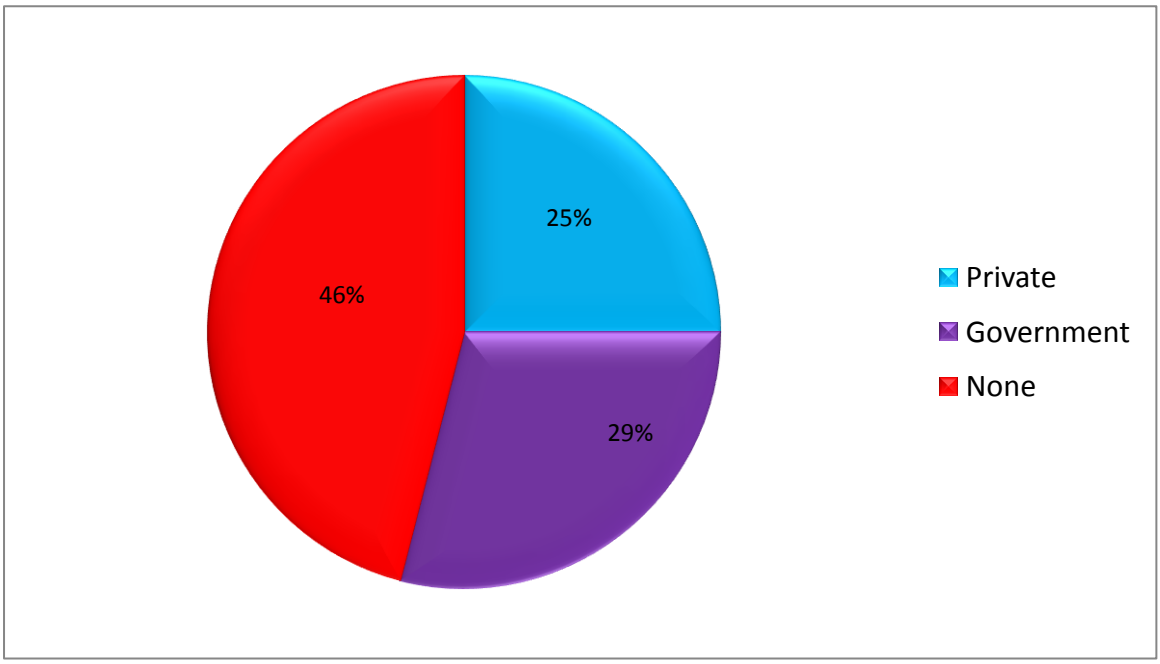

Figure 4.6: Disability grants received by patients after stroke (n = 97)

Almost half of the patients (46%) did not receive disability funding.

4.2.5 Speech, Cognitive, Physical abilities and Pain

Table 4.6 below shows the speech abilities, communication and understanding of the patients post-stroke

Table 4.6: Speech, communication and understanding distribution of the patients (n = 97)

Item		**n (%)**
Speech classification	Fluent	63 (65)
	Dysphasic	22 (23)
	Aphasic	6 (6)
	Dysarthric	6 (6)
Communication classification	Easily	63 (65)
	With difficulty	32 (33)
	Unable	2 (2)
Understanding classification	Good	85 (88)
	Fair	12 (12)
	Poor	0 (0)

The majority of the patients (88%) had good understanding. The main speech complaint was that of dysphasia (23%).

Table 4.7 Summarises the patients' cognitive ability and ability to cope with activities of daily living (ADLs). NB: One patient could select more than one item.

Table 4.7: Cognitive ability and ADLs post-stroke (n = 97)

Cognitive/ADL Item	**n (%)**
Reading ability unchanged	48 (51)
Memory unchanged	44 (45)
Concentration unchanged	47 (48)
Wash independently	71 (73)
Dress independently	72 (74)
Eat independently	95 (98)
Prepare food independently	57 (59)
Comfortable to eat publicly	86 (89)
Grooming independently	94 (97)
Toilet Independently	92 (95)
Bladder continent	91 (94)
Bowel continent	96 (99)

More than 90% of the patients had bowel and bladder continence, were independent in eating, grooming and toilet use.

Figure 4.7 shows the assistance required by the participants to walk outdoors and indoors post-stroke.

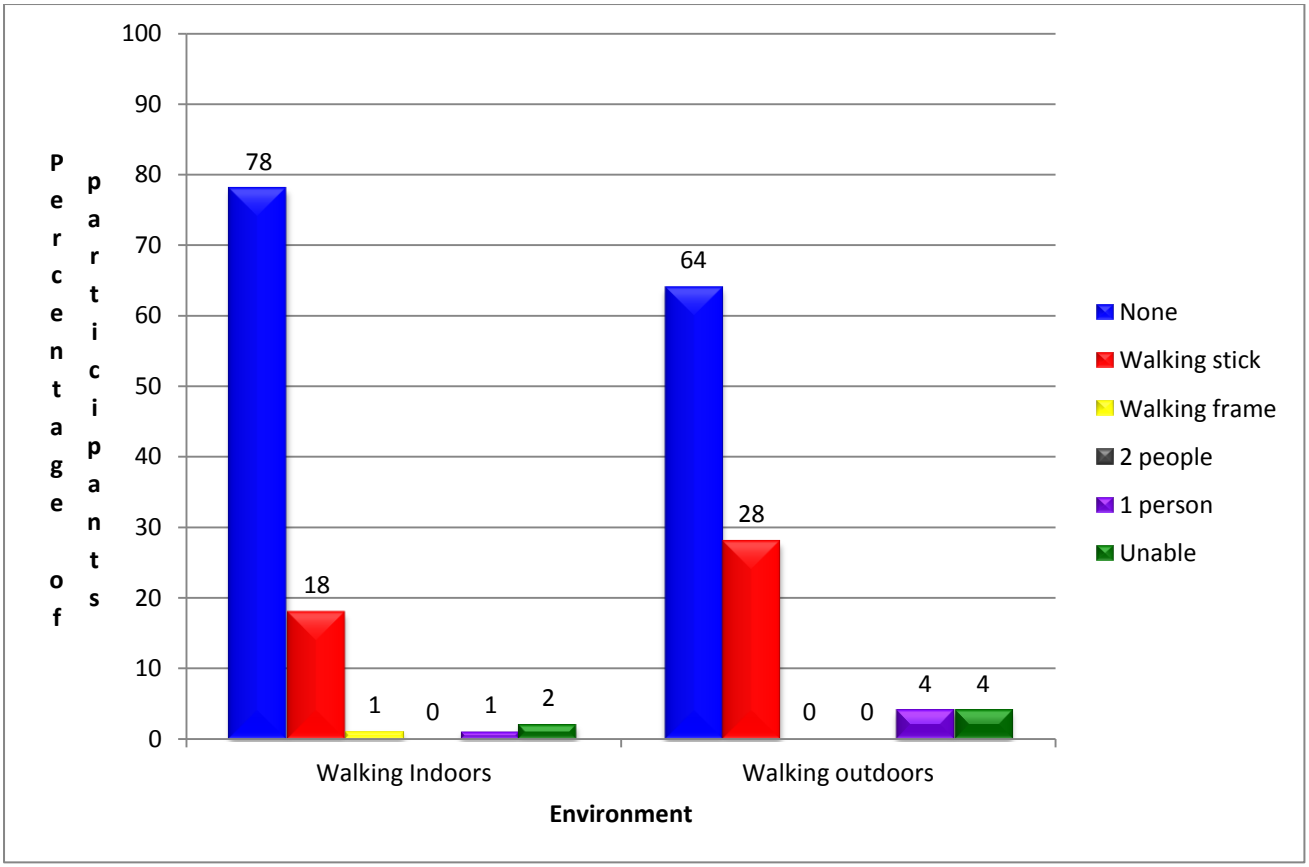

Figure 4.7: Assistance required to walk indoors and outdoors (n = 97)

Most patients (78%) required no assistance to walk indoors.

Table 4.8 below shows the results of the patients' walking speed, walking distance and assistance required to climb stairs.

Table 4.8: Walking speed, walking distance and assistance required for stairs (n = 97)

Item		**n (%)**
Walking speed	Fast	17 (18)
	Intermediate	42 (44)
	slow	36 (38)
Walking distance	0 – 10m	7 (7)
	10 – 50m	9 (9)
	50 – 100m	3 (3)
	100 – 500m	15 (15)
	>500m	63 (65)
Assistance required to ascend stairs	None	29 (30)
	1 Rail	59 (61)
	1 Rail & 1 Person	5 (5)
	Unable	4 (4)
Assistance required to descend stairs	None	28 (29)
	1 Rail	59 (61)
	1 Rail & 1 Person	6 (6)
	Unable	4 (4)

About 44% of the patients felt that they walked at an intermediate pace while 65% felt comfortable walking more than 500m.

For those patients who had pain the mean Visual Analogue Scale score for the patients' pain was 5.6 with a standard deviation of 2.4. The minimum VAS score chosen was one and the maximum was 10

Results of the presence of pain and parts of the body affected by pain are shown in Figure 4.8 below.

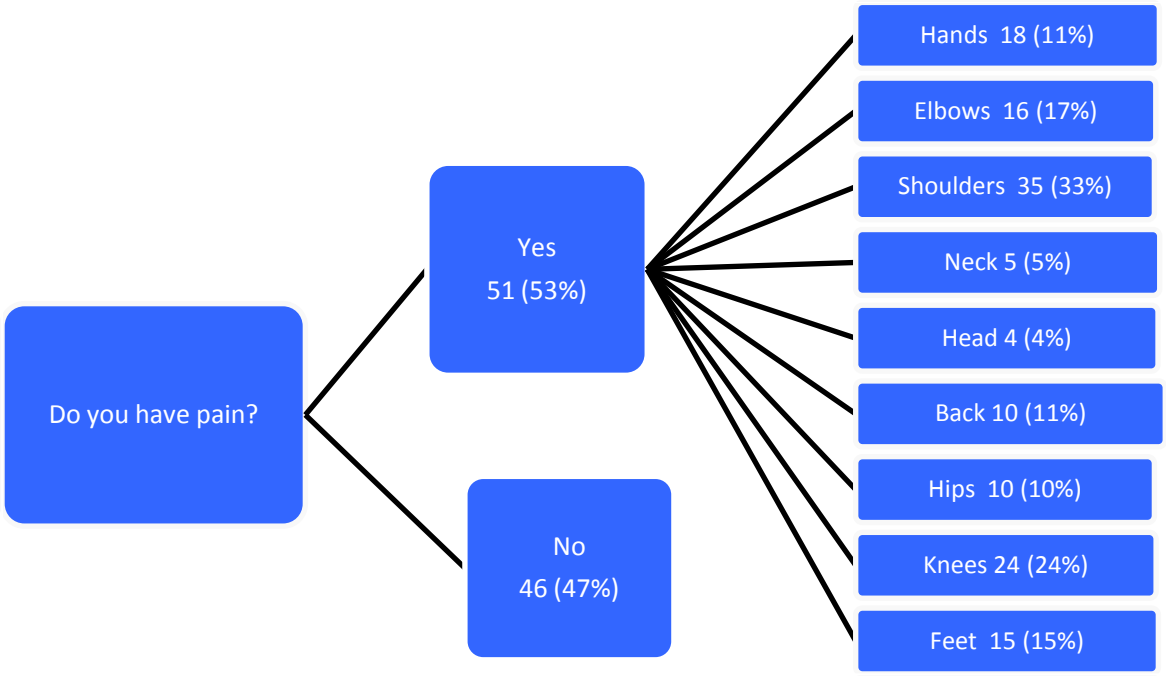

Figure 4.8: The presence of pain and pain locations (n = 97)

Fifty three percent of the patients had pain and 33% of them had pain in the shoulders followed by 24% with pain in the knees.

The Modified Rankin Scale results which indicate a global measure of disability are in shown in Figure 4.9 below.

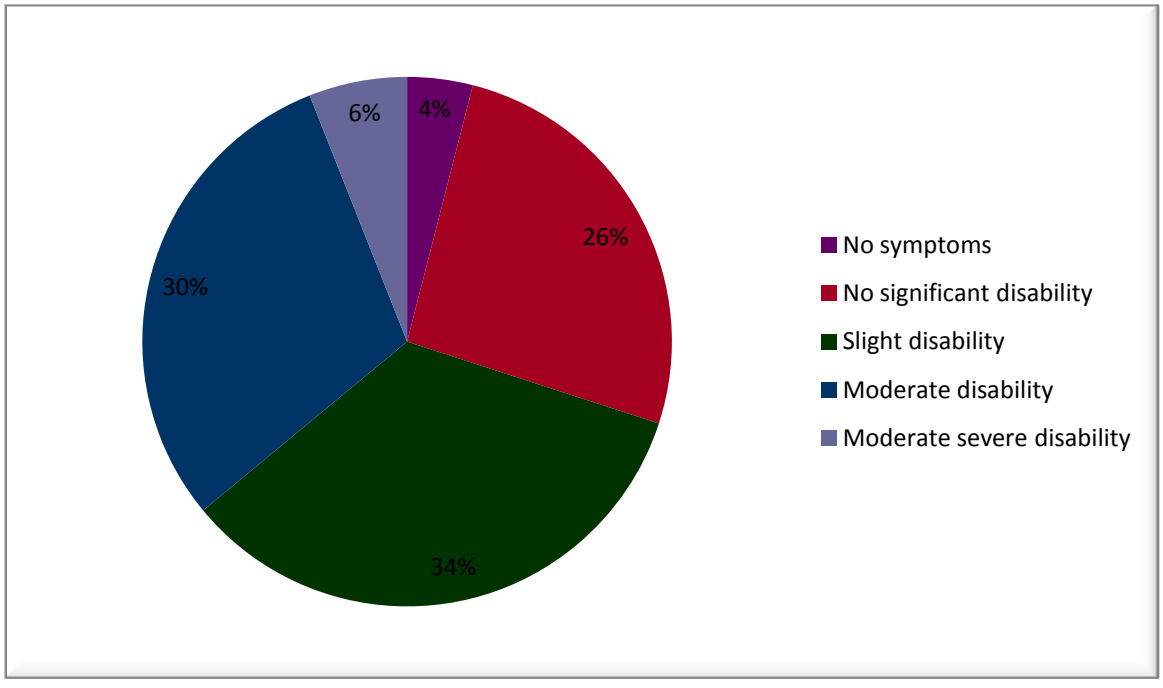

Figure 4.9: The Modified Rankin Scale Score results (n = 97)

Four percent of the patients had no residual disability after their stroke. Of the study sample, 34% and 30% had slight and moderate disability respectively.

4.3 Rate of return to work

Figure 4.10 below shows the rate of return to work for the study sample post-stroke.

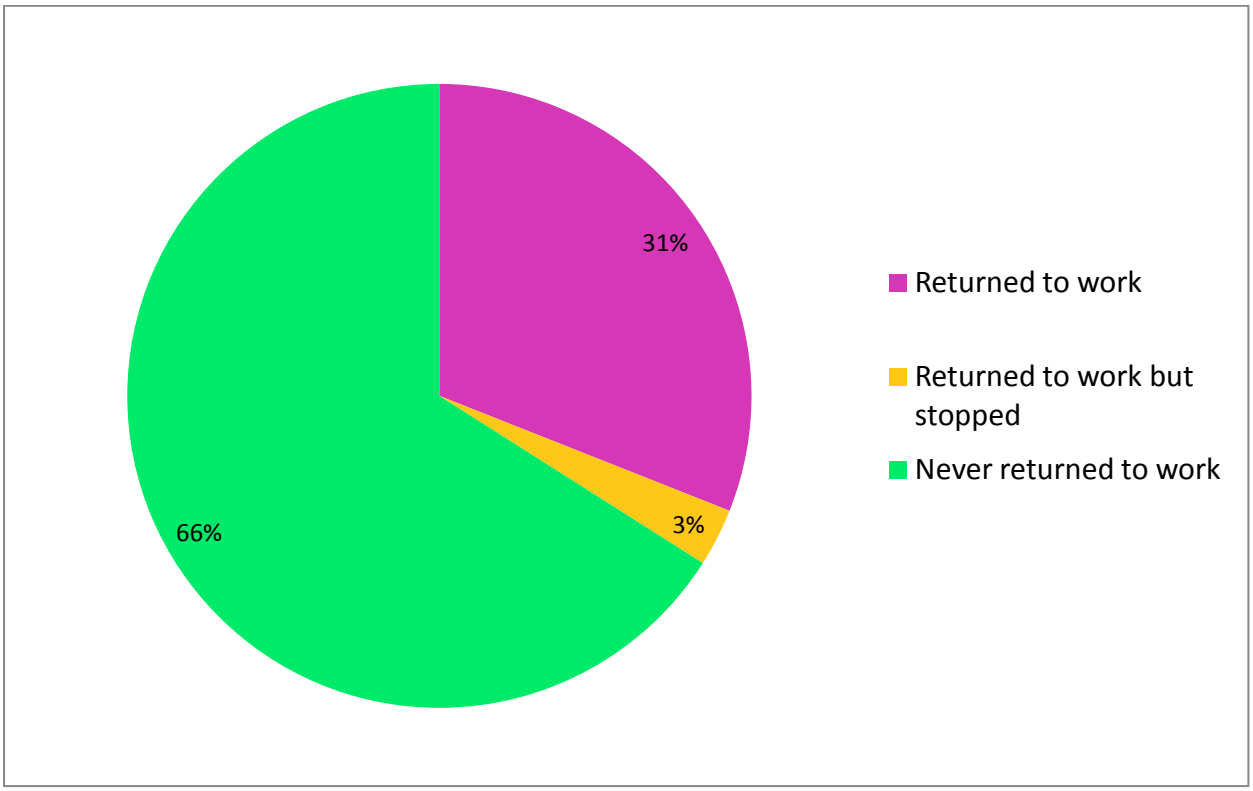

Figure 4.10: Return to work percentages of patients post stroke (n = 97)

The majority of the patients (66%) did not return to work after stroke.

Table 4.9 below shows the return to work information for those patients who returned to work and those who continued to work.

Table 4.9: Return to work information for those patients who returned to work and continued to work (n = 30)

Item	Percentage (%)
Returned to previous employment	26 (87)
Job description altered on return	14 (48)
Physical environment adapted	9 (32)
Full time employment	19 (62)

The majority (87%) of those who returned to work returned to their previous employment and did full time work (62%).

For the three individuals who had returned to work but stopped, they all returned to their previous employment and none of them had their job description or physical working environment altered for them. All those that returned to work reported that they enjoyed their work.

4.4 Reasons for returning to work post stroke

The reasons given for returning to work are presented in Figure 4.11 below

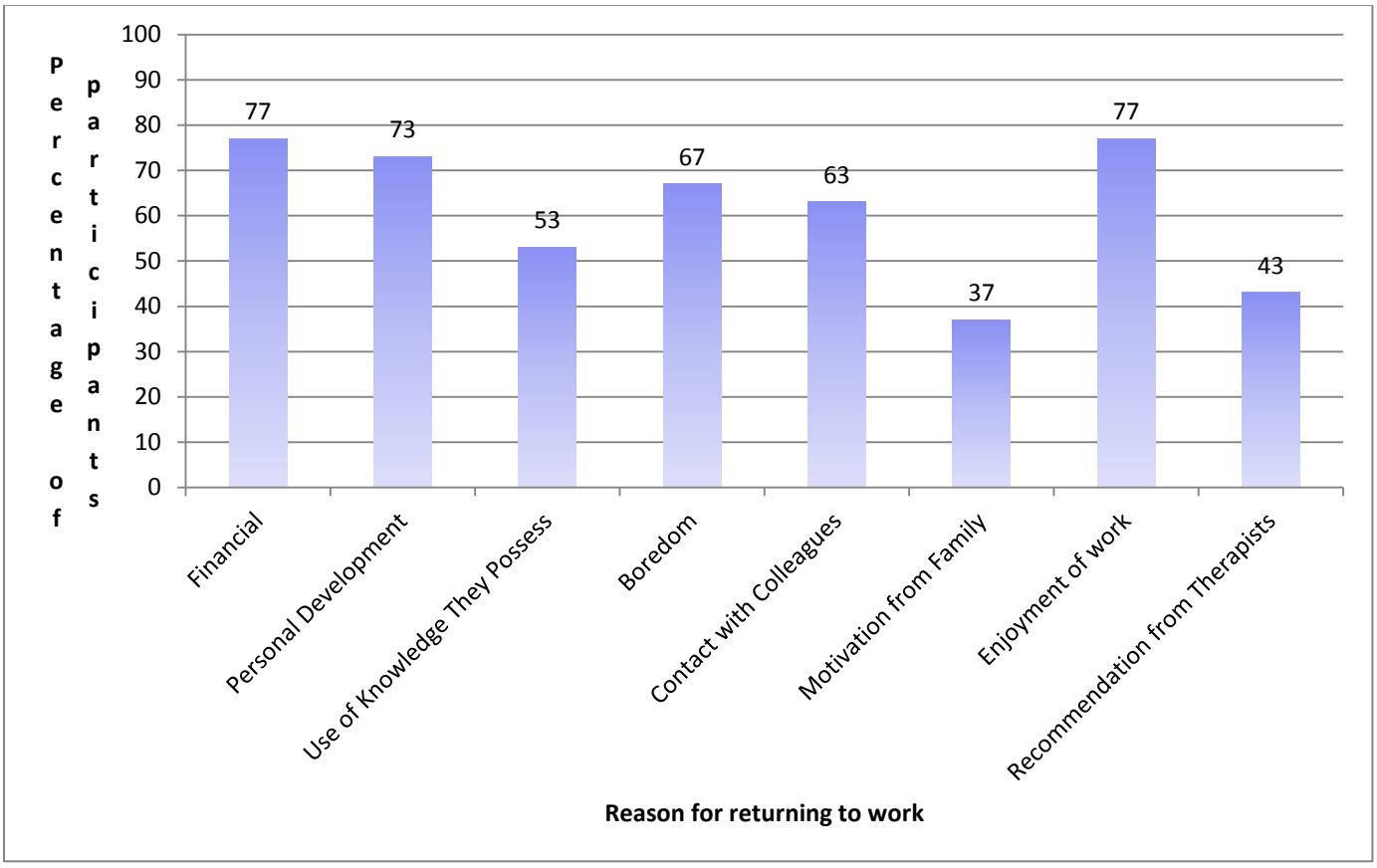

Figure 4.11: Reasons which the patients gave for returning to work (n = 30).

The two most common reasons given for returning to work were for financial reasons (77%) and enjoyment of work (77%). Motivation from family was selected the least by (37%) of the patients.

4.5 Reasons for stopping work post stroke

All the options for possible reasons why patients stopped working after having returned post stroke were chosen and hence no single reason stood out. The reasons selected were: Upper limb dysfunction (33%); Memory deficits (33%); No desire (33%); Financially unnecessary (33%); Fatigue (33%); Unsuitable work environment (33%); Unsupportive work environment (33%); and Other (33%) which was described as being due to divorce where the participant lost their business in the divorce.

4.6 Reasons for not returning to work post stroke

Figure 4.12 below represents the reasons why patients chose not to return to work

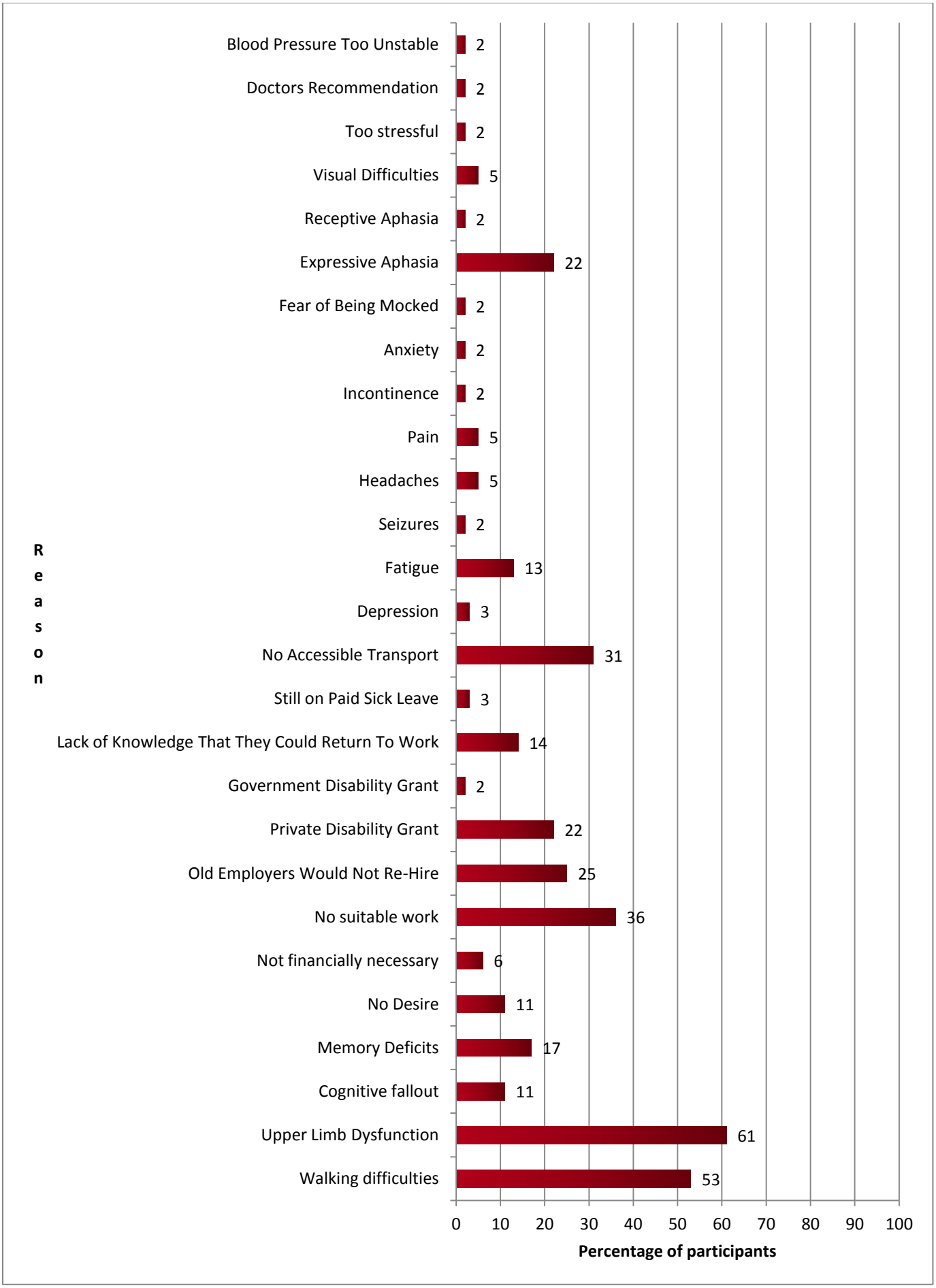

Figure 4.12: Reasons which the patients gave for not returning to work (n = 64)

The most common reasons for not returning to work were upper limb dysfunction (61%) and walking difficulties (53%).

4.7 Factors that Influence Return to Work after stroke

A univariate analysis was done on all items on the questionnaire and only those variables with a moderate significance ($p < 0.15$) were put into the multivariate analysis as per statistical analysis standard practice. Some of the items were eliminated from the analysis either because the reference category numbers were too small, some category cells were empty (zero observations) or the cell size was too small. These variables were: race, hemiplegic side, stroke duration, marriage length, caregiver working time, received physiotherapy, education level, sick leave, sick leave period, walking indoors, walking outdoors, ascending stairs, descending stairs, intensity of acute therapy, speech, cute hospital length of stay, still the primary breadwinner, out-patient length of therapy and intensity of out-patient therapy. The reference point for the odds ratio was based on inability to go to work. Therefore, all odds ratios above 1.0 reflect an increased likelihood to not return to work while odds ratios of less than 1.0 reflects a decreased likelihood to not return to work.

Table 4.10 below shows the results of factors which showed statistical significance on univariate analysis and which had cells large enough to be considered valuable.

Table 4.10: The results of factors which showed statistical significance on univariate analysis

Variable	**Odds Ratio**	**Std. Err.**	**z**	**P>|z|**	**95% C.I**
Being depressed	3.1	1.6	2.2	0.03	1.11 - 8.48
Not participating in family activities	8.1	8.6	2	0.05	1.01 - 64.5
Pays medical aid	0.3	0.1	-2.5	0.01	0.13 - 0.78
Pays short term insurance	0.2	0.1	-3.2	0.001	0.09 - 0.56
Pays car repayments	0.1	0.9	-2.7	0.007	0.02 - 0.53
Pays life insurance	0.1	0.7	-3.9	0.000	0.04 - 0.36
Did not receive dietetics	9.7	8.2	2.7	0.007	1.89 - 50.31
Receiving a government disability grant	9.4	7.3	2.9	0.004	2.07 - 0.9
mRS Score 1 compared with Score 0	3.5	2	2.2	0.028	1.15 - 10. 5

Patients who were depressed were three times more likely not to return to work while those patients who were paying their medical aid bills were 0.3 times more likely to return to work.
Table 4.11 below shows the results of the multivariate analysis with stepwise regression.

Table 4.11: Statistical values for the variables found significant after the multivariate analysis with step wise regression

Variable	**Odds ratio**	**Std. Err.**	**z**	**P>|z|**	**[95% Conf. Interval]**
Pays life insurance	0.1	0.09	-3.03	0.002	0.04 - 0.49
Did not receive dietetic counselling	18.6	18.9	2.88	0.004	2.54 - 136.62
Pays car repayments	0.1	0.09	-2.33	0.02	0.01 - 0.69
Being depressed	4	2.7	2.01	0.04	1.04 - 15.23

The participants who paid life insurance and had car repayments were 0.1 times more likely to go back to work while those who did not receive dietetics about 19 times less likely to go back to work.

CHAPTER 5

5. DISCUSSION

5.1 Introduction

The study set to answer three objectives: to describe the demographics of the study sample, to establish the rate of return to work among the study sample and to establish the patients' perceived factors that influenced return to work after stroke. The findings to these objectives will now be discussed in this chapter as follows:

5.2 The demographics of the study sample
5.3 The rate of return to work among the study sample
5.4 Reasons for returning to work and for not returning to work post stroke
5.5 Factors that influence return to work post stroke
5.6 Study limitations

5.2 The demographics of the study sample

The original recommended sample size was 97 subjects and this sample size was met for the study.

5.2.1 Gender, age, race and time since stroke

There were more men (56%) in the sample than women (44%). This finding is similar to that reported by Dearle et al. (2009) which was also done on a South African population. Dearle et al. (2009)'s study found a gender distribution of 56% males and 44% females. The fact that there were more male patients than female patients could be an indication that there are more males who are employed than females. Research has also shown that younger women are less affected by stroke due to the protective effect by oestrogen (Appelros et al., 2010; Kelly-Hayes et al., 2003). Therefore, as only working age individuals were included in this study, the population was a younger one and it is not surprising to have a higher proportion of men than women. In Connor et al. (2004)'s study, the male to female ratio was found to be 1:1.8, showing that more women had stroke than men. The differences in findings between Connor et al. (2004)'s study and this study could be because of differences in the age ranges of the study populations. In Connor et al. (2004)'s study, all patients with stroke over 15 years of age were included and the demographics

revealed that the largest age group in the study was 75 – 84 years old and this could account for the higher number of female stroke survivors as they would have lost the protective effect of oestrogen as they get older (Appelros et al., 2010; Kelly-Hayes et al., 2003).

The mean age of patients in this study was 51 years. This shows that the majority of patients still had at least 10-15 working years ahead of them since the recommended South African retirement age is 65 years (Basic Conditions of Employment Act, 1997). This is also the recommended retirement age from work in most countries worldwide and so most return to work studies include similar age ranges. (Wolfenden and Grace, 2009; Treger et al., 2007, Saeki et al., 1993).

The black population made up the majority (56%) of the sample. Current mid-year race demographics estimated for 2011 in South Africa show that the Black population accounts for 79.5% of the South African population, the White population 9%, the Coloured population 9% and the Indian and Asian population making up a combined 2.5% (Statistics South Africa, 2011). Therefore, this study sample adequately reflects the South African demographics with blacks forming the majority of the sample.

Sixty five percent of the sample were fluent in their speech and reported that they communicated easily. In a study by Andrew et al. (1982), it was reported that 51% of their sample had right hemiplegia and 49% left hemiplegia which is similar to this study's findings. Reading difficulties were reported by 49% of the study participants, this could be linked to receptive difficulties post-stroke especially for those with right hemiplegia.

More than half of the patients in this study had a stroke duration of 18 to 24 months. Saeki et al. (1995)'s study found that there are generally two distinct peaks in return to work, at six months and at 18 months post stroke. Treger et al. (2007) also found that patients with stroke usually continue to return to work up to 24 months post-stroke. Therefore most of the patients in this study were within the expected post stroke return to work period.

5.2.2 Co-Morbidities

The co-morbidity levels in this study showed that 63% suffered from hypertension, 16% from diabetes, 18% from cardiovascular problems and 33% smoked. Wolf (1985) states that hypertension is the single highest risk factor for stroke which is also reflected in this study's results. The study also states that cardiovascular problems, diabetes, increased serum cholesterol and smoking are co-morbidities which result in hardening of the arteries. Connor et al. (2004)

found that 71% of people in their study had confirmed hypertension with 84% presenting with symptoms of hypertension which is higher than this study's results. It should however be noted that their study population was much older, which could account for the differences. In addition their study found that 12% had diabetes and 9% were smokers. The prevalence of diabetes in Connor et al. (2004)'s study sample is similar to that of this study but this study had more patients that smoked. The difference in the number of smokers can be explained by the differences in the geographical locations of the two studies. Connor et al. (2004)'s study was done in the largely rural area of Limpopo and so smoking may not have been as prevalent as it is in urban Johannesburg. Increased advertising exposure, number of smokers and urban attitudes have resulted in an increase in the number of female smokers in urban South Africa (Williams et al., 2008).

Fatigue was found in the majority of patients (56%) in this study, a finding which is consistent with research elsewhere post-stroke (Van de Porti, 2007; Naess et al., 2004; et al., Giaquinto and Ring, 2007; Medin et al., 2006). Fatigue affects one's ability to carry out ADLs and may consequently affect one's ability to work. Depression was also common in this study sample affecting about 35% of the study sample. Dafer et al., (2008) found depression rates of 20% to 50% in other research and generally depression has been documented as a common post-stroke problem (Giaquinto and Ring, 2007; Gobelet et al., 2007; Treger et al., 2007; Van de Porti, 2007; Medin et al., 2006; Jonsson et al., 2005; Naess et al., 2004; Varona et al., 2004). Depressed patients may lack initiative and may consequently struggle to continue with work post stroke.

Fifty-three percent of this study sample had pain. The two most common body areas that had pain were the shoulders and knees. Literature reports that pain is a very common symptom post-stroke and most often occurs in the affected shoulder and can occur in up to 84% of the patients (Widar et al., 2002). The percentage of patients who complained of pain in this study was less than that reported by Widar et al. (2002) but agreed with the finding of occurring most often in the shoulder. A higher percentage of the presence of pain was reported by Dearle et al. (2009) with 71% of their study complaining of pain. Possible reasons as to why the levels of pain were lower in this study than those found by Dearle et al. (2009) could be attributed to this study sample being of working age and therefore patients were younger and could either cope with their pain better, manage it more easily or just experienced less pain due to their age. An earlier study that was done by Hale et al. (1998) reported that 13% of stroke survivors have knee pain which is less than that which was found in this study (24%). It is therefore clear that the knee is a common area of pain for stroke survivors. The knee pain can be attributed to arthritis although only 13% of participants

reported arthritis as a co-morbidity, and the pain is therefore more likely to be because of poor gait pattern and knee control resulting in ligament stretching which could cause pain. It follows that when one is in pain and experiencing discomfort, they are most likely not to consider going back to work.

5.2.3 Caregiver Information

A modest percentage of the patients (43%) had a caregiver and 12% of these caregivers gave up work to take care of their family member. It has been shown that 40% of patients will require a family member to take care of them after stroke and that this may either reduce their hours of employment or they may resign completely in order to be a caregiver (Mennemeyer et al., 2006; Van de Porti, 1997). The South African figure of caregivers who gave up work in this study is below that found in other studies done in the US (Mennemeyer et al., 2006) and the Netherlands (Van de Porti, 1997). This could be explained by South Africa's high unemployment rate of 25% in the last quarter of 2011 (Statistics South Africa, 2011) compared to the 8.3% in the UK in 2011(British Broadcasting Corporation, 2011), 8.3% in the US at the beginning of 2012 as reported by the US Department of labour and 5.8% in the Netherlands in December 2011 according to the Dutch Statistics Office. This means that less people in South Africa are employed and therefore, fewer people had to give up employment in order to assist their family member. It is also a possibility that fewer South Africans are able to, or are prepared to give up their jobs to take care of their family members as it may be difficult to find employment again at a later stage.

5.2.4 Rehabilitation

Ninety-eight percent of this study's sample received some form of rehabilitation, however, it was not recorded if the rehabilitation was received in private or government facilities. Current South African literature has shown that most patients do not receive rehabilitation post stroke. This can be seen in Mudzi et al. (2009)'s study which states that 50% of the patients who had stroke did not receive any rehabilitation while at the Chris Hani Baragwanath Academic hospital, and Dearle et al. (2009)'s study which also found that 38% of their patients never received any form of rehabilitation post stroke. These percentages of patients who did not receive rehabilitation are far higher than the 2% found in this study sample. This could be due to the fact that all the patients in this study were found through rehabilitation centres which would account for the higher percentage of rehabilitation. Rehabilitation has been shown to improve functional ability and improved functional ability in turn can lead to improved rate of return to work.

Only 23% of the sample received rehabilitation in all three settings namely acute hospital, in-patient and out-patient rehabilitation. The unit where rehabilitation was received the least was at specialised in-patient rehabilitation units, where only 36% received in-patient rehabilitation. Therefore, we can see that patients are not receiving sufficient rehabilitation generally, but more so at in-patient rehabilitation facilities. It is possible that this could be due to either lack of knowledge by acute hospital staff that patients should be referred for continuation of therapy or it could be due to lack of in-patient rehabilitation resources being available for patients with stroke.

In the acute hospital setting 68% of the study sample spent more than two weeks in the acute hospital setting. Current literature puts the length of hospital stay in South Africa as less than two weeks post stroke (Mudzi et al., 2009; Hale et al., 1998). However, it is important to note that these statistics come from research that was done primarily at Chris Hani Baragwanath Academic hospital, whereas our sample came from a variety of government and private hospitals across the Johannesburg region and this could account for the difference.

It was interesting to note that although the majority of the patients had a relatively long hospital stay (more than two weeks) in the acute hospital setting, only 47% received therapy once a week and more often than not receiving only one form of therapy. In contrast, another 40% of the sample reported receiving daily therapy. It becomes clear that there are two distinct groups within the acute hospital setting. It is possible that this could be due to either differences in therapy provision between government and private settings or this could stem from just having more hard working therapists at particular hospital(s). What is obvious from this data is that patients are being granted longer hospital stays in the acute setting, but this is not translating into better service provision and increased therapy provision. The fact that only 36% of the participants were admitted to rehabilitation units means that the rest of the participants had to get ready for home, had to mobilise and had to be independent in ADLs during their acute hospital stay. The once a week therapy that was received by most of them is obviously not adequate to achieve these goals. Research has shown that there is a dose-dependent effect of rehabilitation on functional improvement of stroke patients for the first six months post-stroke (Huang et al., 2009). Earlier delivery of rehabilitation has lasting effects on the functional recovery of stroke patients up to one year post stroke (Huang et al., 2009; Van de Porti, 2007; Lock et al., 2005). This means that the more therapy received and the earlier it is started, the better the functional outcome.

The most frightening statistic was that of the vocational rehabilitation statistics, with only one person receiving vocational rehabilitation. This means that the majority of the patients did not

receive any form of training that was specifically geared towards their returning to their previous employment. The lack of vocational rehabilitation services is a common problem world over (Treger et al., 2007; Angeleri et al., 1993; Tate, 1992). It is possible that the lack of vocational rehabilitation could have influenced the rate of return to work.

5.2.5 Activities of Daily Living

The majority of patients (64%) could walk indoors and outdoors without any assistance and had good endurance with them reporting being able to walk over 500 metres. Only one percent of patients reported regular falls which is positive in terms of safety for the participants. However, when it came to stairs the norm was definitely that participants required at least one rail to ascend and descend stairs. In a study at Chris Hani Baragwanath Academic hospital, 66% of older patients and 100% of younger patients could walk twelve to fourteen weeks post-discharge (Hale and Eales, 1998) and therefore, our results are in keeping with this literature.

Connor et al. (2004)'s study found that 66% of stroke survivors required help with at least one activity of daily living, which was comparable to developed country rates. About 74% of our study participants needed help with preparation of food a reflection of their dependency in ADLs. The number of people needing help with ADLs was higher in this study sample than that established by Connor et al. (2004). This is surprising given the fact that almost everybody was receiving rehabilitation. It therefore means that despite patients receiving rehabilitation, they still do not recover well enough to enable them to be independent in ADLs let alone return to work post stroke.

5.3 Rate of return to work

Thirty four percent of the study sample returned to work. At the time of the interview 31% were still working. As mentioned before, no return to work studies have been done in developing countries and those that were done in developed countries have shown results from countries such as the US, the UK, Sweden, Denmark, Finland, Japan and Singapore with rates of return to work ranging from 10% to 84% (Saeki, 2000). Morris (2011)'s review found a median value of return to work of around 50%. The 34% that was found in this study is less than the median found by Morris (2011) but it is still higher than the minimum return to work rate found by both Saeki (2000) in Japan and Gabriele et al. (2009) in Germany. The differences in return to work rates between countries could be due to the following: the different definitions of work used in the various studies such as only including full time work, whether home executives and students were included, if the age of the

patients used were different, if there were differences in the nature and intensity of the stroke rehabilitation program patients received, the period of time since stroke when the study was conducted and cultural factors such as availability of help from family members and disability compensation programs (Wozniak and Kittner, 2002; Saeki, 2000).

Another possible explanation for the low rate of return to work in this study could be due to the very low rate of vocational rehabilitation received with only one participant having received any. Vocational rehabilitation is well advocated for in literature, however, it is not being provided. This could be due to lack of specialist therapists in this area making referrals from therapists difficult. In addition, workplaces should be referring their returning staff for assessments to determine workplace suitability, but this too was not done. It therefore makes it clear that employers accepting patients with stroke back into their work environment need to be educated about the importance of vocational rehabilitation. Another possibility is that patients received some of vocational rehabilitation therapy within their out-patient or in-patient therapy sessions but as it was with the same therapist and not labelled as a new therapy, they may not have known that they received it and so could have indicated as such on the questionnaire. Whichever explanation is the correct one, the fact that more effort needs to be put into ensuring patients receive vocational rehabilitation post stroke if they working prior to the stroke cannot be overemphasised.

The differences in the return to work rates can also be explained by the differences in the geographical locations and socioeconomic status of this study sample and that from the developed countries (Ali et al., 2009; Dippel et al., 2006). These socioeconomic differences are however complex within their nature and have far extending influences but can include different risk factors between the countries, the degree of family support and standards of care (Ali et al., 2009).

With regards to risk factors, this study sample showed a high rate of smoking. This is cause for concern as smokers tend to suffer more severe strokes (Kerr et al., 2011). In addition, smoking is linked to cardiovascular disease (Dzien et al., 2004) and arteriosclerosis (McGill et al., 1997) especially of the small vessels (Weng et al., 2011), factors that can all contribute towards decreased return to work rates. Dickenson et al. (2007) revealed that smoking is linked to stroke recurrence which also decreases return to work (Treger et al., 2007). Linked to return to work is the patient's home situation which is often underestimated and under researched but is a definite factor in return to work (Giaquinto and Ring, 2007; Carod-Artal, 2000; Saeki et al., 1993). However, in this study this does not appear to be a huge factor as almost all the patients reported excellent family support and inclusion.

The type of work participants engaged in prior to the stroke could also have contributed to the low rate of return to work established in this study. About 46% of the study sample were physical labourers prior to stroke. Being a blue collar worker is well documented in literature as a factor that leads to decreased return to work as individuals are unable to return to their physical jobs (Hofgren et al., 2007; Treger et al., 2007; Medin et al., 2006; Saeki and Hachisuka, 2004).

Other socioeconomic issues that could have contributed to the low return to work rate include availability of transport. Lack of suitable public transport demands that patients have their own suitable transport which is expensive and if patients' finances do not allow for this, they are left stranded with no way of getting to work (Treger et al., 2007; Angeleri et al., 1993). For those individuals in this study who relied on public transport, it is a possibility that getting on and off buses and mini bus taxis may have proved too challenging, especially with such a high proportion of the sample requiring assistance with stairs.

The infrastructure within a country has strong influences on return to work (Shaw et al., 2002) including the actual architecture of a country's buildings. In developing countries, such as South Africa, this may not be as advanced as in developed countries (International Monetary Fund, 2011), and so the actual layout of buildings could inhibit return to work.

South Africa's high unemployment rate could also have contributed towards the low rate of return to work that was observed in this study. As stated before, the unemployment rate for South Africa is higher than that of the UK and US. The high unemployment rate could mean that employers may be less willing to reasonably accommodate them post stroke especially given the high rate of retrenchments (Solidarity Research Institute, 2008). Patients with stroke are however still protected by the constitution of South Africa which states that "every employer must take steps to promote equal opportunity in the workplace by eliminating unfair discrimination in any employment policy or practice. No person may unfairly discriminate, directly or indirectly, against an employee, in any employment policy, on one or more grounds, including race, gender, sex, pregnancy, marital status, family responsibility, ethnic or social origin, colour, sexual orientation, age, disability, religion, HIV status, conscience, belief, political opinion, culture, language and birth." (Employment Equity Act No. 55 of 1998).

This study revealed that 87% of the participants that returned to work returned to their previous employment with 62% returning to full time employment. This showed that either the employers

were accommodating or the patients recovered well enough to go back to their previous jobs. It was however the 48% who had their job altered for them which points more to the former. Similar results of employers being accommodative were found by Treger et al. (2007) who stated that 58% had their job descriptions changed for them. Employers who provide job flexibility and allow for job modifications allow for a higher rate of return to work than those who do not (Medin et al., 2006; Saeki and Hachisuka, 2004; Hsieh and Lee,1997).

About 66% of patients with stroke reduced their working hours on return to work in Treger et al. (2007)'s study. This percentage is higher than the 38% who did not return to full time work in this study. This could be due to either improved functional ability in this study of patients with stroke or as mentioned before, due to South Africa's socio-economic climate where people might be desperate to hold onto their jobs and therefore, are perhaps prepared to work full days, even if they are not coping due to a need to have job security.

Post-stroke, 23% of the participants who returned to work were self-employed. Only 19% of the participants were self-employed prior to stroke. This shows that more individuals returned to self-employment post-stroke and this is in keeping with Vestling et al. (2003)'s study which states that being self-employed leads to a higher life satisfaction which results in increased return to work.

The most common type of job which participants returned to was that of a desk job (43%) and a manager (27%). Prior to stroke the most common job type was physical labourer (46%) with only 23% returning to physical work post stroke. These findings agree with those from other countries where it was established that blue collar workers or physical labourers return to work far less than white collar workers (Hofgren et al., 2007; Treger et al., 2007; Medin et al., 2006; Saeki and Hachisuka, 2004). In addition, it has been shown in research that managerial staff return to work more than blue collar workers due to the higher esteem they hold in the company (Naess et al., 2004; Carod-Artal, 2000). About 30% of the participants in this study sample had post-graduate studies which could have contributed to the better return among white collar workers. Those who have a high school diploma or more have a better return to work rate (Gobelet et al., 2007; Treger et al., 2007; Saeki, 2000; Angeleri et al., 1993).

However, more important than just the rate of return to work percentage, is the reasons behind why the study sample participants did and did not return to work and this will be discussed in the next section.

5.4 Perceived reasons for returning and not returning to work after stroke

In this section, the most common reasons for returning or not returning to work will be discussed.

5.4.1 Perceived reasons for returning to work

There is a dearth of literature on perceived factors influencing return to work, but there is even less on why people went back to work as research tends to predominantly focus on what stopped people from returning to work. However, both are equally as important and valuable.

For those who returned to work, the three most common reasons given were financial (77%), enjoyment of work (77%), and personal development (73%) with about 50% of the sample stating that the single most important reason was financial. It is no surprise that the main driving force behind participants returning to work was the quest for financial independence. This agrees in part with 49% of the study sample who remained primary breadwinners after stroke. Only about 25% of the study sample were receiving a private disability grant with another 29% receiving a government disability grant, which when combined with the 31% still working leaves 15% of the study population with no alternative source of income post-stroke. Whether the 49% who remained primary breadwinners and the 47% who received no grant were one and the same, the data cannot tell us, but there is a large portion of the study sample that received no income and yet were responsible for their family.

It was promising to see that so many participants enjoyed their jobs and returned to work for other reasons other than money. Seventy-seven percent of the participants returned to work because they enjoyed working. Positive experiences that one can get from work can bring enriching experiences, challenges, personal development and fulfilment (Vestling et al., 2005). It is therefore possible that some of the participants had these experiences when working and so wanted to continue them. In addition, younger patients have a desire to return to work for intellectual fulfilment (Van de Porti, 2007). Fear of getting bored can also be a motivating factor for return to work (Alaszewski et al., 2007). About 67% of this study's participants returned to work because they were bored. In as much as the financial pull of work must be recognised the importance of other factors to the participants should not be underestimated (Vestling et al., 2005)

5.4.2 Perceived reasons for not returning to work.

The two most common reasons for not returning to work were upper limb dysfunction (61%) and walking difficulties (53%). Other inhibiting factors that were mentioned from studies elsewhere

include fatigue (Alaszewski et al., 2007; Van de Porti, 2007), unsatisfactory rehabilitation (Roding et al., 2003), cognitive deficits (Roding et al., 2003; Alaszewski et al., 2007), depression (Van de Porti, 2007; Alaszewski et al., 2007; Ash and Goldstein, 1995), low self-esteem (Alaszewski et al., 2007), fear of social stigma (Alaszewski et al., 2007), unsupportive work environment (Alaszewski et al., 2007), speech impediment (Alaszewski et al., 2007) and also motor impairments (Van de Porti, 2007). Unlike in the literature, fatigue was only given as a factor by 13% of the study sample. This could be because fatigue is a more common complaint in the acute phase of stroke and as the majority of this study's participants were more than 18 months post-stroke, fewer individuals could have been struggling with fatigue.

Upper limb dysfunction or walking difficulties are not mentioned in literature as reasons why patients felt they could not return to work but have been found to have strong correlations to decreased return to work rates (Trygged et al., 2011; Gabriele and Renate, 2009; Giaquinto and Ring, 2007; Gobelet et al., 2007; Hofgren et al., 2007; Treger et al., 2007). It follows logic that patients with walking difficulties or poor upper limb use would struggle going back to work especially given the fact that the majority of the patients did blue collar jobs. As stated by Van de Porti (2007), motor impairment is a significant reason for not returning to work, which concurs with this study's findings.

Thirty one percent of the participants mentioned the lack of accessible transport as a barrier to returning to work. This agrees with Hale et al. (1998)'s findings which showed that post-stroke 54% of older subjects and 31% of the younger group in their study were unable to catch a taxi after their stroke. Transport issues are a real concern for people in South Africa who rely heavily on buses and taxis for transport, but which are very challenging for those with disabilities. The finding of transport (costs of) being a barrier to return to work post stroke was reported in an earlier study in South Africa (Biggs and Rhoda, 2005).

The third highest reason for not returning to work was lack of suitable work. This ties in closely with the 25% who stated that their old employers would not re-hire them. The need for reasonable workplace accommodation and work place mediation by therapists and those involved in work rehabilitation is vital. Of those who went back to work 48% had their job description changed for them and 32% required their physical working environment to be adjusted for them. These findings suggest that a lot of work is required to find common ground with the employers so that they are more favourable towards work modification to ensure the accommodation of those employees who sustain stroke and may want to return to work.

5.5 Factors that Influence Return to Work after stroke

5.5.1 Factors which decreased the likelihood of returning to work after stroke

The following factors decreased the likelihood of returning to work after stroke: suffering from depression; not participating in family activities, not receiving dietetics, receiving government disability grants and having a score of one on the Modified Rankin Scale (mRS) when compared to a score of zero

a) Depression

From the univariate analysis, participants who were depressed were three times more likely not to return to work. This agrees with the well documented finding that depression can have severe negative effects on return to work (Giaquinto and Ring, 2007; Gobelet et al., 2007; Treger et al., 2007; Van de Porti, 2007; Medin et al., 2006). Depression had a prevalence of 35% among this cohort of participants and hence this finding is not very surprising. The 35% prevalence of depression falls within the range found by Dafer et al. (2008) of 20% to 50% but short of the range found by Kotila et al. (1998) of 42% and 55%. The slightly lower depression rates could be due to a lack of understanding of what depression is. A large portion of the sample had not completed high school and therefore, perhaps were unaware of what depression is, and may themselves not be aware of the its symptoms and yet they could be suffering from it. However, 35% is still a high rate within a sample. Depression can cause tiredness, apathy, anxiety, irritation, indifference, mood problems, decreased tolerance and loss of inhibition and these have all been shown to decrease return to work (Giaquinto and Ring, 2007; Treger et al., 2007). Therefore, even if individuals with depression are able to return to work, their moods may inhibit them from remaining employed or may ostracise them from colleagues, which will further exacerbate their depression. In addition those seeking new employment, may not be hired, not because of their disability but because of the fallout of their depression.

b) Not participating in family activities

Participants that did not participate in family activities were about eight (8) times more likely not to return to work than those who participated. However, the confidence interval for this factor was very large and therefore although significant, this influence is not a strong one. The majority of the participants in this study (85%) felt that they participated in and were included in family activities, that they felt like an active member of their family and that their family supported them always. Patients who are included by their families and participate in family social and leisure activities are more likely to return to work and have a decreased risk of anxiety and fear (Hartke et al., 2011;

Hofgren et al., 2007; Medin et al., 2006). Emotional problems such as anxiety, irritation, indifference, mood problems, decreased tolerance and loss of inhibition have all been shown to decrease return to work (Giaquinto and Ring, 2007; Treger et al., 2007; Saeki and Hachisuka, 2004). By participating in family activities, patients can relearn how to behave appropriately in society, they can begin to feel accepted again, which reduces their anxiety and this ultimately influences social integration in larger social circles and this can result in increased return to work (Dowswell et al., 2000; Clark and Smith, 1998; Angeleri et al., 1993).

c) Not receiving dietetics

From the univariate analysis, those participants who did not receive dietetics were 10 times less likely to return to work. However, these results should be interpreted cautiously as the confidence interval accompanying this analysis is very broad and so the significance does not carry much weight. The fact that the provision of dietetics has the potential to increase return to work is valuable information as only 9% of the participants received intervention on their diet. The presence of risk factors such as hypertension (63%) and diabetes (16%) means modification of diet can play an important role in patients post stroke. It has been established that comprehensive nutrition counselling interventions involving active participation in developing a personalised health plan, goal setting, and self-efficacy show the most promise in effecting positive outcomes in the nutrition status or nutrition-related outcomes in community-dwelling older adults (Bandayrel and Wong, 2011). The nutrition related outcomes included reduced number of days in bed, improved anthropometric measurements, decreased number of falls, improved memory information processing speed and sensorimotor speed, improved depression rating scale scores, better nutritional knowledge, higher quality of life, decreased blood pressure, better dietary and health related choices. This study did not target patients with stroke and so direct conclusions cannot be drawn but extrapolations can be made until nutrition related research regarding stroke patients id performed. Therefore, the most relevant outcomes which can be drawn from Bandayrel et al. (2011)'s study which relate to this study include reduced number of falls, improved memory and sensorimotor processing, improved depression rating scale scores, improved quality of life and decreased blood pressure, all of which are beneficial for patients with stroke and so this intervention in patients with stroke needs to be investigated.

Sixteen percent of the individuals with hypertension and 22% of those with diabetes in this study were uncontrolled. Uncontrolled diabetes and hypertension are risk factors for recurrent stroke (Dickerson et al., 2007). This could explain the 14% of participants who had recurrent strokes in this study. Patients' who have recurrent strokes, have a significantly lower return to work rate than

those suffering a single event (Treger et al., 2007). Recurrent strokes could be due to poor knowledge of the risk factors for stroke and how they can be controlled. Lack of knowledge on health literacy for those with chronic conditions including diabetes and hypertension leads to poor control of the chronic disease (William et al., 1998). For those modifiable risk factors like diabetes and hypertension, dietary changes can have a more lasting effect as opposed to medicine based interventions (Sacks et al., 2001; Delahanty and Halford, 1993). It is therefore possible that by seeing a dietician, patients were educated on how they could modify some of the risk factors which would prevent recurrent stroke and possible lead to increased return to work rates.

d) Receiving Government disability grants

Those receiving disability grants were 9.4 times more likely not to return to work. It is hypothesised that the availability of disability grants (public funds) could delay return to work (Gobelet et al., 2007; Hofgren et al., 2007; Mennemeyer et al., 2006; Shaw et al., 2002). About 29% of this study sample received government disability grants and therefore had access to funds without returning to work. About 27% of the participants said they did not return to work because they either had a private disability grant, government disability grant or were still on sick leave. This is a large percentage, which seems to concur with literature that provision of disability funds can inhibit return to work. However, one can also argue that it is not the receiving of disability grants per say that influences return to work, but rather the type of occupation which influences the need for disability grants which in turn might appear as influencing return to work. Take the 46% who were blue collar workers in this study, post stroke, they may not have been readily accepted back into their jobs due to their lack of specific skills and education. It is therefore possible that they may have been driven towards disability grants by their inability to go back to their previous work which was physical in nature.

Though receiving disability grants is linked with poor return to work it was disheartening that 15% of the participants received no disability grants and yet they were not working and therefore were receiving no income. It is not clear why they had not applied for disability grants but one cannot rule out that maybe they did not know that they could apply. It is also possible that maybe they were seeking employment and did not wish to receive a grant, but then all individuals must be made aware of temporary disability grants.

e) Having a score of one on the Modified Rankin Scale (mRS) when compared to score of zero

Those with a mRS score of one were four (4) times less likely to return to work than those with a score of zero. A mRS score of one indicates that a person is more disabled compared to a person who has a score of zero (who is considered less disabled). In this study, patients who had a score of one (26%) were less likely to return to work than those with a score of zero (4%). Those who scored a zero on the mRS did not have disability post-stroke and therefore were physically not restricted in their return to work. However, those that scored a one on the mRS showed some level of disability and therefore had decreased functional abilities which decreased their ability to return to work. This agrees with Shaw et al. (2002)'s statement that "the only consistent impairment factor found to predict return to work is severity of injury". Severe stroke leads to greater levels of disability. The severity of hemiplegia is a negative predictor of return to work (Treger et al., 2007; Wozniak et al., 2002; Saeki, 2000). Linked to the severity of the stroke is the degree of independence in ambulation and ADLs. Both independence in ambulation and ADLs are significant determinants of return to work (Trygged et al., 2011; Gabriele and Renate, 2009; Giaquinto and Ring, 2007; Gobelet et al., 2007; Hofgren et al., 2007; Treger et al., 2007). The more severe the stroke, the more severe the injury and the less likely the individual is to be independent in ambulation and ADLs, which will result in decreased return to work.

5.5.2 Factors which increased the likelihood of returning to work after stroke

The factors that increased the likelihood of returning to work after stroke were paying short-term insurance, having car instalments, medical aid and life insurance. All these factors have one thing in common in that they required money from the participants. At a glance, one could be forgiven for thinking that the participants felt pressured into returning to work so that they could meet their financial obligations. From the study sample, 31% paid medical aid, 32% paid for short term-insurance, 9% had car repayments, and 23% were paying for life insurance. No literature has been found to date which discusses these specific monthly obligations and their influence on return to work. However, a link has been proposed between education levels and return to work, with those having a high school diploma or more showing an improved return to work rate (Gobelet et al., 2007; Treger et al., 2007; Saeki, 2000; Angeleri et al., 1993). About 56% of the study matriculated with 30% having postgraduate qualifications. In addition, 70% of those who returned to work were white collar workers. There is a strong link between a white collar worker and having better education levels (Trygged et al., 2011).

White collar employees often have their companies contributing towards medical aid cover, disability insurance, life insurance and sometimes even providing a company car. Therefore, it may not be the fact that the individuals paid monthly for medical aid, car repayments, life insurance or short-term insurance that showed a positive influence on return to work, but rather the fact that those employees were white collar workers, and thus were more likely to return to work than blue collar workers. In addition, the ability to pay these monthly repayments is indicative of increased income and socio-economic status which has been linked to increased income (Trygged et al., 2011; Kerr et al., 2011; Gobelet et al., 2007; Treger et al., 2007; Medin et al., 2006).

The need for financial stability was given as the main motivating factor in return to work in this study. This could be because the participants wanted to avoid defaulting on car repayments and accruing bad debt. It could also be that they wanted to continue paying for their insurance which would otherwise be stopped for non-payment if not paid for as stipulated. Fear of, or pressure from debt could also have forced the participants to go back to work. For example, in 2010 in the UK, 56% of new mothers were forced to go back to work after their first child due to debt (The Guardian UK, 2010), a statement supported by Bergmark et al. (2011)'s finding among young spinal cord injured patients that their main worry post-injury was financial and being able to pay off debts. This could possibly be the same in patients of a working age with stroke.

5.6 Study Limitations

A quality of life questionnaire could have been included as research has shown that quality of life and return to work are closely linked and therefore, interesting relationships could have been drawn between the two.

A stress level measurement tool could also have been included to determine participants' stress levels and determine its role as a risk factor for stroke and its influence on return to work. This only became evident as a potentially valuable tool once the main study had begun and so it could not be added.

The "perceived factors influencing return to work" section could have been conducted qualitatively, as more reasons may have been drawn from the individuals, as opposed to asking them to tick boxes.

CHAPTER 6

6. CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

- The rate of return to work post stroke in this study sample was 34% which is in line with findings from other countries around the world.
- The main reasons for returning to work were financial and enjoyment of work while those for not returning to work were upper limb dysfunction and walking difficulties.
- Patients were more likely to return to work if they if they paid car repayments and had short-term insurance, life insurance and medical aid.
- Patients were less likely to return to work if they were depressed, did not participate in family activities, did not receive dietetics, received a government disability grant, and had a mRS score of one compared to a mRS score of zero.

6.2 Recommendations

- These conclusions suggest that although the current return to work rate is not as low as in some countries, it is definitely not as high and so there is room for improvement. The fact that only one person from the study sample received vocational rehabilitation is worrying. Effort should be put into ensuring that patients receive vocational rehabilitation post stroke.
- Therapists should place more emphasis on educating patients about possible job accommodations that can be made or other job opportunities post stroke. This should be coupled with increased mediation efforts between companies and individuals to ensure return to work post stroke.
- Education to employers on vocational rehabilitation and their responsibility is also a direction therapists need to focus their attention on
- The role of dieticians and psychologists post stroke cannot be overemphasised. They should be incorporated as part of the rehabilitation multi-disciplinary team to ensure successful rehabilitation of patients post stroke.
- A genuine effort to increase the intensity of therapy in the acute hospital setting in South Africa is vital.
- Increasing the provision of in-patient specialised rehabilitation is a must as so few patients appear to receive it.

- Fifteen percent of individuals were not working and were not receiving a disability grant. Therefore, more intensive education needs to be provided to patients with stroke and their families about this option.

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APPENDICES

Appendix A

Perceived Factors That Influence Return To Work After Stroke.

Nicole Duff

Questionnaire

SECTION A: DEMOGRAPHIC DETAILS

1) Patient Number……..

2) Age……

3) Gender: Male ☐ Female ☐

4) Race: White ☐ Black ☐ Coloured ☐ Indian ☐ Asian ☐

5) Side of Hemiplegia: Left ☐ Right ☐ Central ☐

6) Hand Dominance: Left ☐ Right ☐

7) Period of time since stroke 6-9months ☐ >9-12months ☐ >12-18months ☐ >18-24months ☐

8) General Orientation

Person ☐ Place ☐ Time ☐

9) Do you have any of the following medical conditions?

Hypertension	Yes ☐	No ☐
If yes, is it controlled	Yes ☐	No ☐
Diabetes	Yes ☐	No ☐
If yes, is it controlled	Yes ☐	No ☐
Epilepsy	Yes ☐	No ☐
If yes, is your epilepsy controlled	Yes ☐	No ☐
Cardio Vascular Problems	Yes ☐	No ☐
Headaches	Yes ☐	No ☐
Fatigue	Yes ☐	No ☐

Depression Yes ☐ No ☐

Arthritis Yes ☐ No ☐

COPD Yes ☐ No ☐

Other: ……

10) Have you had any previous strokes?

Yes ☐ No ☐

11) Marital status

Married ☐

Single ☐

Divorced ☐

Widow/ Widower ☐

Live-in partner ☐

Other……

12) How long have you been married for/ together with your partner?

0 – 1 year ☐

>1 – 2 years ☐

>2 – 5 years ☐

>5 – 10 years ☐

>10 – 20 years ☐

> 20 years ☐

13) Do you have a caregiver at home?

Yes ☐ No ☐

14) If yes, are they available

Fulltime (Day and night) ☐

During the day ☐

At night ☐

Half day ☐

15) Do they help you during

Weekdays & Weekends ☐

Weekdays only ☐

16) Do you remunerate your caregiver?

Yes ☐ No ☐

17) Is your caregiver a member of your family?

Yes ☐ No ☐

18) If yes, did that family member give up work to be your carer?

Yes ☐ No ☐

19) Do you participate in family and/or community activities?

Yes ☐ No ☐

20) Do you feel like an active member of your family?

Yes ☐ No ☐

21) My family is emotionally supportive:

Always ☐ Seldom ☐ Never ☐

22) Present Monthly Household Income

< R1500 ☐

R1501 – R5000 ☐

R5001 – R10000 ☐

R10001 – R15000 ☐

R15001 – R20000 ☐

> R20000 ☐

23) Were you the primary breadwinner in your family?

Yes ☐ No ☐

24) If yes to the above, are you still the primary breadwinner?

Yes ☐ No ☐

25) Is your residence:

Owned (Bond) ☐

Owned (Paid off) ☐

Rented ☐

Free ☐

26) What major monthly financial obligations do you have

Bond ☐

School Fees ☐

Medical Aid ☐

Short Term Insurance ☐

Car repayments ☐

Life Insurance ☐

Other (Specify) ----------

27) How many people live in your house with you

28) How many dependents do you have? ☐

29) Did you receive rehabilitation after having stroke?

Yes ☐ No ☐

30) If yes, was it:

In-patient (Rehabilitation Unit) ☐ Out-patient ☐

In-patient (Hospital) ☐

31) What type of rehabilitation did you receive?

Physiotherapy ☐

Occupational Therapy ☐

Speech Therapy ☐

Counselling ☐

Dietician ☐

Neuropsychologist ☐

Vocational rehabilitation ☐

Other ☐

Please specify……

32) If you received vocational rehabilitation was it through:

Therapists ☐ Your employer/company ☐

33) Length of Rehabilitation

In-patient (hospital)

0 – 1 week ☐

>1 – 2weeks ☐

>2 – 4 weeks ☐

>4 – 6 weeks ☐

>6 – 8 weeks ☐

> 8 weeks ☐

In-patient (rehabilitation unit)

0 – 1 week ☐

>1 – 2weeks ☐

>2 – 4 weeks ☐

>4 – 6 weeks ☐

>6 – 8 weeks ☐

> 8 weeks ☐

Out-patient

0 – 1 week ☐

>1 – 2weeks ☐

>2 – 4 weeks ☐

>4 – 6 weeks ☐

>6 – 8 weeks ☐

> 8 weeks ☐

34) Intensity of therapy (number of times/week and /day)

In-patient (hospital)

1 x /day ☐

2 x /day ☐

1 x /week ☐

2 – 3 x /week ☐

4 – 5 x /week ☐

In-patient (rehabilitation unit)

1 x /day ☐

2 x /day ☐

1 x /week ☐

2 – 3 x /week ☐

4 – 5 x /week ☐

Out-patient

1 x /week ☐

2 – 3 x /week ☐

4 – 5 x /week ☐

35) Level of Education

University degree ☐

Post High School Diploma ☐

Grade 12 or equivalent ☐

Up to grade 11 ☐

Up to grade 7 ☐

Other ☐

Specify……..

36) Occupation prior to stroke

Desk job ☐

Physical labourer ☐

Service Industry ☐

Manager ☐

Other (Specify) ----------

37) Were you

Self-Employed ☐

Employed by others ☐

38) Current Occupation

Desk job ☐

Physical labourer ☐

Service Industry ☐

Manager ☐

Other (Specify) ----------

39) Are you

Self-Employed ☐

Employed by others ☐

40) Did you receive sick leave from your work

Yes ☐ No ☐

41) Was your sick leave for

Full period ☐ Part ☐

42) Was it paid or unpaid sick leave

Paid ☐ Unpaid ☐

43) Do you have disability insurance?

Yes ☐ No ☐

44) Are you receiving a government disability grant?

Yes ☐ No ☐

45) Speech

Fluent ☐

Dysphasic ☐

Aphasic ☐

Dysarthric ☐

46) Do you feel you communicate:

Easily ☐ With difficulty ☐ Not at all ☐

47) Understanding

Good ☐ Fair ☐ Poor ☐

48) Did your ability to read change after you had your stroke?

Yes ☐ No ☐

49) Has your memory become worse after the stroke?

Yes ☐ No ☐

50) Do you struggle to concentrate after your stroke?

Yes ☐ No ☐

51) Can you wash yourself on your own?

Yes ☐ No ☐

52) Can you dress yourself on your own including buttons, laces, and zips?

Yes ☐ No ☐

53) Can you feed yourself?

Yes ☐ No ☐

54) Can you prepare you food for eating e.g. spread toast, cut food etc.?

Yes ☐ No ☐

55) Do you feel comfortable to eat and drink in public?

Yes ☐ No ☐

56) Can you brush your hair, brush your teeth etc.?

Yes ☐ No ☐

57) What assistance do you need to walk indoors?

None ☐ Walking stick ☐ Walking Frame ☐ 2 people ☐ 1 person ☐ Unable ☐

58) Can you use the toilet on your own?

Yes ☐ No ☐

59) Do you ever have any bladder accidents?

Yes ☐ No ☐

60) Do you ever have any bowel accidents?

Yes ☐ No ☐

61) What assistance do you need to walk outdoors?

None ☐ Walking stick ☐ Walking Frame ☐ 2 people ☐ 1 person ☐ Unable ☐

62) Do you fall:

Always ☐ Sometimes ☐ Never ☐

63) How far can you walk outdoors

0 – 10m ☐

10 – 50m ☐

50 – 100m ☐

100 – 500m ☐

>500m ☐

64) Do you feel you can walk:

Fast ☐ Intermediate ☐ Slow ☐

65) What assistance do you need to go upstairs?

None ☐ 1 Rail ☐ 1 Rail&1 Person ☐ Unable ☐

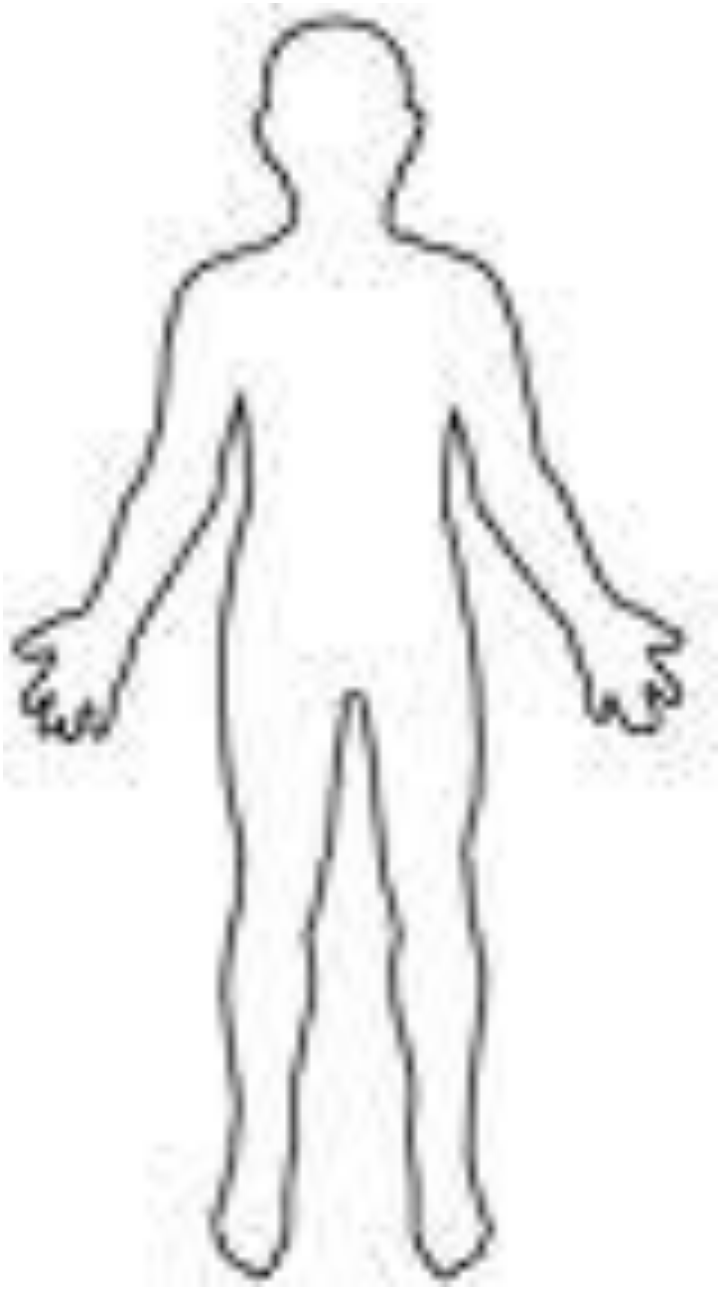
66) What assistance do you need to go down stairs?

None ☐ 1 Rail ☐ 1 Rail&1 Person ☐ Unable ☐

67) Do you have any pain?

Yes ☐ No ☐

68) Where is your pain?



69) What is your pain on a scale of 1-10 (1 being the lowest, 10 being the highest)

1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐

SECTION B: RETURN TO WORK

1.) Are you currently working? Yes ☐ No ☐

2.) For how long have you been working since your stroke?.....

3.) Did you return to your previous employment? Yes ☐ No ☐

4.) Was your job description changed at all for you? Yes ☐ No ☐

5.) Was your physical working environment adapted to accommodate you? Yes ☐ No ☐

6.) Are you working full-time or part time? Full-time ☐ Part-time ☐

7.) If no to question 1, have you previously returned to work after your stroke? Yes ☐ No ☐

If yes to the above:

a. How long after your stroke did you return to work?.....

b. How long did you work for before stopping?.....

c. Did you return to your previous employment? Yes ☐ No ☐

d. Was your job description changed at all for you? Yes ☐ No ☐

e. Was your physical working environment adapted to accommodate you? Yes ☐ No ☐

f. Were you working full-time or part time? Full-time ☐ Part-time ☐

g. Did you enjoy your most recent job? Yes ☐ No ☐

SECTION C: REASONS FOR RETURNING TO WORK

Financial ☐

Personal development ☐

Use of knowledge ☐

Boredom ☐

Contact with colleagues ☐

Pressure from family ☐

Motivation from family ☐

Enjoyment of work ☐

Recommended by therapists ☐

Other
……

Of all the reasons above what is the main reason why you chose to return to work…….....

SECTION D: REASONS FOR STOPPING WORK

- Difficulty with walking…… ☐
- UL dysfunction…… ☐
- Poor cognition…… ☐
- Poor memory …… ☐
- Demotivated/ No desire …… ☐
- Bored of work…… ☐
- Financially unnecessary…… ☐
- Inability to access transport…… ☐
- Incontinence…… ☐
- Depressed …… ☐
- Fatigue …… ☐
- Seizures …… ☐
- Headaches …… ☐
- Pain …… ☐
- Anxiety….. …… ☐
- Mocked by colleagues …… ☐
- Unsupportive work environment…… ☐
- Unsuitable work description…… ☐
- Expressive aphasia…… ☐
- Receptive problems …… ☐
- Unsuitable environmental changes made…… ☐
- Other …… ☐

Please specify……...

What is the main reason of those you have selected above that you felt you could not continue to work……..

SECTION E: REASONS FOR NOT RETURNING TO WORK

- Difficulty with walking…… ☐
- UL dysfunction…… ☐
- Poor cognition…… ☐
- Poor memory…… ☐
- Demotivation / No desire…… ☐
- Financially unnecessary…… ☐
- Lack of suitable new employment…… ☐
- Old employers wouldn't rehire…… ☐
- Got a disability pension…… ☐
- Got a government disability grant …… ☐
- Lack of knowledge you could return to work…… ☐
- Still on sick leave …… ☐
- Inability to access transport…… ☐
- Depressed …… ☐
- Fatigue…… ☐
- Seizures …… ☐
- Headaches …… ☐
- Pain…… ☐
- Incontinent …… ☐
- Anxiety…… ☐
- Fear of mocking…… ☐
- Expressive aphasia…… ☐
- Receptive problems…… ☐
- Other …… ☐

Please specify…….

What is the main reason of those you have selected above that you feel you could not return to work……..

Appendix B

MODIFIED RANKIN SCALE

0 = No symptoms at all

1 = No significant disability despite symptoms; able to carry out all usual duties and activities

2 = Slight disability; unable to carry out all previous activities, but able to look after own affairs without assistance

3 = Moderate disability requiring some help, but able to walk without assistance

4 = Moderate severe disability; unable to walk without assistance and unable to attend to own bodily needs without assistance

5 = Severe disability; bedridden, incontinent, and requiring constant nursing care and Attention

Appendix C

Miss Nicole Duff
P.O. Box 1328
Honeydew
2040

To:

I am a physiotherapist currently completing my second year of studies for a Master of Physiotherapy degree specialising in Adult Neurology. For the degree we are required in part to perform a research report. The topic of my study is: **"Perceived Factors That Influence Return to Work after Stroke".** For this study, I will need to have 97 patients who have had stroke for at least six months; suffered their stroke when they were younger than 65 and were working at the time that they suffered their stroke.

Currently there is no literature available on rate of return to work of patients with stroke in a South-African and African setting. There is also very little information regarding the factors that affect return to work in a South African population. In addition, no research has been conducted in South Africa whereby patients with stroke are able to express the reasons which they feel prevented them from returning to work. My study will address all three of these issues. This information will enable therapists to better understand the needs of our patients and so adjust vocational rehabilitation practices to better target the issues uncovered. This will therefore, have significant carryover to help both therapists and patients and hopefully allow us to increase rate of return to work of patients with stroke in our country.

This letter serves to ask for permission for me to attend the stroke groups that are run at the various government clinics around Johannesburg. The groups will be visited and the study discussed with the participants of the group. I anyone there matches the inclusion criteria and is prepared to meet with me, I will then conduct a questionnaire with them while at the clinics.. Informed consent will be obtained. The questionnaire takes 15-20minutes to complete and it is all verbal. No physical assessment is performed. If the patients do not wish to be part of the study no pressure will be placed upon them.

If you have any further questions or issues in this regard please feel free to contact me on the details provided below.

I appreciate you taking the time to read this letter and hope that we can work together for the duration of the study.

Regards

Nicole Duff
BSc Physiotherapy
Cell: 0741248810
E-Mail: jigglynduff@gmail.com

Appendix D

Perceived Factors That Influence Return To Work After Stroke

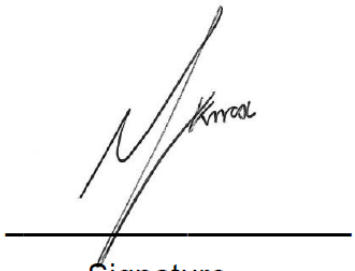
I LAILA PATEL hereby confirm that I have read the above information regarding the Masters research being conducted by Miss Nicole Duff. In my professional capacity as CHIEF SUPERVISORY PHYSIOTHERAPIST, I hereby grant Miss Nicole Duff permission to access our records for the information she requires.

Signature

12/01/2017

Date

I, Megan Knox hereby confirm that I have read the above information regarding the Masters research being conducted by Miss Nicole Duff. In my professional capacity as practice owner, I hereby grant Miss Nicole Duff permission to access our records for the information she requires.



Signature

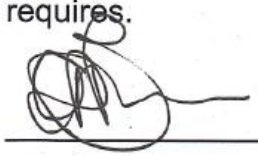
10th April 2010

Date

Appendix F

Perceived Factors That Influence Return To Work After Stroke

I Christine Buchanan, hereby confirm that I have read the above information regarding the Masters research being conducted by Miss Nicole Duff. In my professional capacity as Therapy Manager, Headway Hyde Park, I hereby grant Miss Nicole Duff permission to access our records for the information she requires.



Signature

15/11/2011

Date

Appendix G

Perceived Factors That Influence Return To Work After Stroke

I Amanda McCulloch hereby confirm that I have read the above information regarding the Masters research being conducted by Miss Nicole Duff. In my professional capacity as Practice Owner, I hereby grant Miss Nicole Duff permission to access our records for the information she requires.

mcculloch
Signature

13/10/2009
Date

Appendix H

I D. JOELSON hereby confirm that I have read the above information regarding the Masters research being conducted by Miss Nicole Duff. In my professional capacity as THERAPY MANAGER, I hereby grant Miss Nicole Duff permission to access our records for the information she requires.

Signature

March 2010

Date

Appendix I

Information Document

Perceived Factors Influencing Return To Work After Stroke

Regards Mr/ Miss/ Mrs……..

I, Nicole Duff, am a physiotherapist working at a neurological rehabilitation centre. I am currently conducting a research project on the rate of return work in people who have suffered a stroke. Research is the way that we are able to answer questions that we have, and so as part of my masters, I have chosen to undertake this research in order to answer the question of how many people who have suffered stroke, return to work after having suffered their stroke, as well as the reasons behind why people choose to, or not to, return to work. This information will allow us as physiotherapists to know if our rehabilitation to get to people to return to work is effective, as well as allowing us to better target our rehabilitation strategies to suit the problems that people who have suffered stroke find as the main cause for preventing them from returning to work.

I am inviting you to take part in this research study.

This will be a cross-sectional study which means that whoever takes part will be seen once off at one period in time only. If you agree to take part in the study it will involve myself, the researcher, meeting you at a place and time convenient to you and your carer, which will be pre-determined telephonically beforehand. I will then go through 1 questionnaire of 11 pages in total with you. This should take approximately one hour.

The first questionnaire involves 5 sections:

A demographic questionnaire where I will ask questions about you and details about your stroke.

A section on your work history, where you worked previously, what type of work you did, whether you have returned to work, how long have you been working for and what type of work are you doing now.

The 3rd section involves finding out, if you have returned to work, why you chose to and what motivated you to

The 4th section involves if you tried going to work, but stopped, what were the reasons that forced you to stop.

Lastly, if you never returned to work, this section details the reasons why you didn't.
The last questionnaire has 5 easy questions where you can rate how happy you are with your life at this stage.
All of these questionnaires will be administered by a researcher assistant or myself, so someone will be there to answer any questions you may have and help you with any difficult questions or ones you don't understand. I will give you plenty of time to answer the questions. A friend, family member of your carer will also be present to help you if needed. This will be a once off visit by myself and no further involvement will be required from you thereafter. 97 patients are required for the study. All of the people I need for the study are from the Johannesburg area.

There is no risk to yourself or your family in taking part in this study and there is no cost that will be incurred by you or your family.
The benefits of taking part in the study, is that you will be taking part in a study which can help improve the quality of vocational rehabilitation available in this country to you and other people who have suffered from a stroke.

The results from my questionnaire in terms of your score for the last 3 questionnaires will be made available to you if you wish to know them. Results from the study once it is completed will be also be made available to you for your interest.

The research may be stopped or postponed by the researcher at any point, but you will be given adequate notice of this, in such an event.

Participation is completely voluntary, there is absolutely no pressure on you to take part in the study, and if during the administration of the questionnaire you feel uncomfortable or unhappy in any way, you are more than entitled to ask to withdraw. No penalty will be incurred by you if you do choose to withdraw, and no hard feelings will be held by the researcher towards you in any way.

Every effort will be made to keep all documentation, which shows your name and answers to the questionnaires, confidential. No answers or personal information will be disclosed to anyone other than the researcher and the statistician, unless required by law.

The Research Ethics Committee may need to see personal details during the course of the study, and if the research is published they may need to disclose certain information but you will be contacted and this discussed with you prior to this happening.

If you would like any further information or have any questions please feel free to contact me, Nicole Duff on details mentioned below.

The contact details of the Research Ethics Committee are also available below. Please feel free to contact them if you have any complaints regarding how the researcher conducted themselves or the interview or their treatment towards you.

Research Ethics Committee: Anisa Keshav 011-717-1234 Fax 011-339-5708 Email anisa.keshav@wits.ac.za

Many Thanks

_____

Nicole Duff
BSc Physiotherapy
0787010697
jigglynduff@gmail.com

Appendix J

Informed Consent

Perceived Factors Influencing Return To Work After Stroke

I ……., consent to participate in **"Perceived Factors Influencing Return To Work After Stroke"** conducted by Nicole Duff. I have understood the nature of this project and wish to participate. I have read and understand the contents of the information sheet and understand that I have been invited to participate, that my agreeing is fully voluntary, and that I can withdraw at any time. I am not waiving any of my legal rights by signing this form. My signature below indicates my consent.

Signature Participant _____ Date_____

Signature Principal Investigator_____Date_____

Appendix K

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

Division of the Deputy Registrar (Research)

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)
R14/49 Duff

CLEARANCE CERTIFICATE	**PROTOCOL NUMBER M080953**
PROJECT	Rate of Return to Work Patients with Stroke
INVESTIGATORS	Miss N Duff
DEPARTMENT	Physiotherapy Department
DATE CONSIDERED	08.09.26
DECISION OF THE COMMITTEE*	Approved unconditionally

Unless otherwise specified this ethical clearance is valid for 5 years and may be renewed upon application.

DATE 08.09.29 **CHAIRPERSON** .....
(Professor P E Cleaton Jones)

*Guidelines for written 'informed consent' attached where applicable

cc: Supervisor : MV Mamabolo

DECLARATION OF INVESTIGATOR(S)

To be completed in duplicate and **ONE COPY** returned to the Secretary at Room 10004, 10th Floor, Senate House, University.
I/We fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee. **I agree to a completion of a yearly progress report.**

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES