

**THE EFFECT OF A WORKPLACE INTERVENTION PROGRAMME ON RETURN TO  
WORK AFTER STROKE**

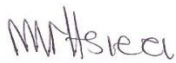
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A thesis submitted to the Faculty of Health Sciences, University of the Witwatersrand, in  
fulfilment of the requirements for the degree  
of  
Doctor of Philosophy

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## DECLARATION

I, Mokgobadibe Veronica Ntsiea declare that this thesis is my own work. It is being submitted for the degree of Doctor of Philosophy 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]

21<sup>st</sup> day of May, 2013

## **DEDICATION**

I would like to dedicate this thesis to my late father Lekau Enos Mamabolo and to my mother Emelia Mamabolo who instilled a culture of learning, spirit of perseverance and a sense of responsibility in me. Without their tireless efforts and gentle pressure I would not have reached my current general life and academic milestones.

## **PUBLICATIONS AND PRESENTATIONS ARISING FROM THIS STUDY**

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## ABSTRACT

Stroke impacts on a survivor's ability to participate in community activities such as return to work (RTW) and affects people who are still within the working age. Return to work contributes to life satisfaction and social identity at least partly through independence gained from income-generation. The impact of RTW programmes for stroke survivors is limited and not generalisable to South Africa. This study aimed to bridge this gap in South Africa, and was conducted within the Gauteng province as it comprises the largest share of the South African population.

### **Objectives and Methodology:**

The aim of the study was to determine the current practice in RTW intervention programmes for stroke survivors in the Gauteng Province of South Africa and to establish the effect of a workplace intervention programme on the rate of RTW of previously employed stroke survivors. This study had two stages:

Stage one: A cross sectional survey was performed using a self administered questionnaire to establish current practice in RTW intervention programmes and the therapists' perceived barriers and enablers of RTW after stroke.

Stage two study included: a) a randomised controlled trial (RCT) to evaluate a six week RTW intervention, with follow-up at three and six months. The workplace intervention programme was tailored according to the functional ability and workplace challenges of each stroke survivor and was as follows: Week one: Assessment for work skill. The assessment included work modules which identified potential problems such as: visual discrimination; eye hand coordination; form and spatial perception; manual dexterity; colour discrimination; cognitive problems, and job specific physical demand factors. Week two: The therapist interviewed the stroke survivor and employer separately to establish perceived barriers and enablers of RTW. This was followed by a meeting between the therapist, stroke survivor and employer/supervisor to discuss and develop a plan to overcome identified barriers and to strengthen identified enablers based on consensus between stroke survivor and employer. Week three: A work visit for the stroke survivor to demonstrate what they did at work and identify what they could still do safely and what they could not do. This included vocational counselling and coaching; emotional support; adaptation of the working environment; advice on coping strategies to compensate for mobility and upper limb functional limitations; and fatigue management. Weeks four, five and six:

continuation of the work visits, while monitoring progress, and making necessary adjustments as per stroke survivor and employer's needs. This was done at the workplace while the participants continued with their usual therapy at the hospital. The control group received usual care. The primary outcome was RTW rate. The secondary outcomes included activities of daily living (measured with the Barthel Index); mobility (measured with the Modified Rivermead Mobility Index); basic cognitive function (measured with the Montreal Cognitive Assessment) and perceived quality of life (measured with the Stroke Specific Quality of life Scale). Another aim of stage two study was to: b) establish the stroke survivors' and employers' perceived barriers and enablers of RTW (this was done with the experimental group only); and to: c) identify predictors of RTW.

Stage one study results: Thirty six (68%) of the 53 questionnaires sent to stroke rehabilitation facilities were returned. Seventeen (47%) of the 36 clinical settings referred stroke survivors to facilities offering RTW services; 12 (33%) facilities did not refer stroke survivors for RTW and did not offer RTW services; and seven (20%) facilities offered RTW services. Of the seven facilities that rendered RTW services for stroke survivors, five (71%) communicated with the employer to discuss reasonable accommodation and four (57%) did assessments for potential to RTW. The most common reason given by the 29 facilities for not offering RTW services was that they referred stroke survivors to other therapists who offered these services. The second most common reason was the unemployment status of the stroke survivor at the time of having stroke. The therapists' most commonly perceived barriers of RTW were the severity of the stroke survivors' physical impairments ( $n = 3$ ) (36%) and their employment status ( $n = 11$ ) (31%) at the time of having stroke. The most commonly perceived enablers were willingness of the employer to reasonably accommodate the stroke survivor at work ( $n = 12$ ) (33%), family support ( $n = 8$ ) (22%) and increased length of hospital stay to allow for intensive rehabilitation ( $n = 7$ ) (19%). Stigma in the workplace was the only variable which had a statistically significant relationship with the type of clinical facility therapists worked at ( $p = 0.02$ ).

Stage two study results: The average age for the study group was 45 (SD: 8.7) years and the average stroke duration was 4.6 (SD: 1.8) weeks. There were 41 (51%) male stroke survivors and 39 (49%) female stroke survivors. Majority (55%) of the stroke survivors were breadwinners (63%), had a grade 11 to 12 educational level (64%), an income above R5000 (46%) and had a helper (74%) whom they did not have to pay (81%). Stroke survivors who returned to work had better quality of life at six months after stroke than those who did not RTW ( $p = 0.05$ ).

Results from the qualitative study indicated that the perceived enablers of RTW included: ability of the employer to provide reasonable accommodation and good interpersonal working relationships between stroke survivor, employer and co-workers. The perceived barriers of RTW included: unaffordable reasonable accommodation costs; inaccessible transport; having cognitive (memory and attention) and speech impairments and high unemployment rates.

The overall RTW rate was 20% at three months follow-up and 40% at six months follow-up. Twenty seven percent of the stroke survivors in the intervention group returned to work at three months compared to 12% in the control group ( $p = 0.13$ ). At six months, the majority of stroke survivors (60%) in the intervention group returned to work compared to 20% in the control group ( $p < 0.001$ ).

The following factors were predictive of RTW: male gender ( $p = 0.03$ ); fewer speech problems ( $p = 0.02$ ); increased time off work post stroke ( $p = 0.001$ ); ability to perform activities of daily living ( $p = 0.02$ ); good mobility ( $p = 0.01$ ) and good cognitive ability ( $p = 0.02$ ). The stroke survivors in the intervention group were 5.2 times more likely to RTW than those in the control group at six months following stroke, and for every unit increase in the activities of the Barthel Index and Montreal Cognitive assessment score, the likelihood of RTW increased by 1.7 and 1.3 respectively.

**Conclusion:** A RTW intervention consisting of workability assessments and workplace visits was effective in facilitating RTW for stroke survivors in Gauteng province, South Africa. Key predictors of RTW included male gender; increased time off work post stroke; ability to perform activities of daily living; good mobility and good cognitive ability and were identified as facilitating RTW; speech problems were identified as barriers to RTW. Overall, these results suggest the need to direct resources towards increasing work place intervention strategies after stroke.

**Key words:** stroke; return to work; functional capacity assessment; activities of daily living; mobility; cognitive function; quality of life; factors that influence RTW; workplace intervention programme.

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## LIST OF ABBREVIATIONS

|                 |                                            |
|-----------------|--------------------------------------------|
| <b>ADLs</b>     | Activities of Daily Living                 |
| <b>AIDS</b>     | Acquired Immunodeficiency Syndrome         |
| <b>BI</b>       | Barthel Index                              |
| <b>CI</b>       | Confidence interval                        |
| <b>CVA</b>      | Cerebrovascular accident                   |
| <b>FIM</b>      | Functional Independence Measure            |
| <b>HIV</b>      | Human Immunodeficiency Virus               |
| <b>HPCSA</b>    | Health Professions Council of South Africa |
| <b>ICH</b>      | Intra-Cerebral Haemorrhage                 |
| <b>ITT</b>      | Intention to treat                         |
| <b>JCQ</b>      | Job Content Questionnaire                  |
| <b>RCT</b>      | Randomised Controlled Trial                |
| <b>RMI</b>      | Rivermead Mobility Index                   |
| <b>RTW</b>      | Return to work                             |
| <b>SA-SIP30</b> | Stroke Adapted Sickness Impact Profile     |
| <b>SE</b>       | Standard error                             |
| <b>SEM</b>      | Standard error of measurement              |
| <b>SIS</b>      | Stroke Impact Scale                        |
| <b>SSQoL</b>    | Stroke Specific Quality of Life Scale      |
| <b>MCI</b>      | Mild cognitive impairment                  |
| <b>MMSE</b>     | Mini-Mental state examination              |
| <b>MoCA</b>     | Montreal Cognitive Assessment              |
| <b>MRMI</b>     | Modified Rivermead Mobility Index          |
| <b>MAS</b>      | Motor Assessment Scale                     |
| <b>MTM</b>      | Methods time measurement                   |
| <b>N</b>        | Sample size                                |
| <b>OR</b>       | Odds ratio                                 |
| <b>OT</b>       | Occupational therapist                     |
| <b>Per prot</b> | Per protocol analysis                      |
| <b>SAM</b>      | Portable skills assessment module          |
| <b>SD</b>       | Standard deviation                         |

|             |                                         |
|-------------|-----------------------------------------|
| <b>TPAL</b> | Therapists portable assessment lab      |
| <b>UK</b>   | United Kingdom                          |
| <b>WCPT</b> | World Confederation of Physical Therapy |
| <b>WHO</b>  | World Health Organisation               |
| <b>WQP</b>  | Worker qualification profiles           |

## CHAPTER 1

### 1. INTRODUCTION

#### 1.1 BACKGROUND

Stroke impacts on a survivor's ability to participate in community activities such as returning to work (Treger et al., 2007) and affects people who are still within the working age (Wolf, Baum, and Connor, 2009). About 50% of stroke survivors have some residual physical disability (Ashburn, 1999) and 66% of survivors of stroke in South Africa need help with at least one activity of daily living (Connor et al., 2004). Most of these stroke survivors are still within the working age group (Vestling, Tufvesson, and Iwarsson, 2003). Working age group stroke survivors need more complex and cognitively demanding activities during rehabilitation to prepare them for possible cognitively demanding activities in the workplace (Holmqvist, Kamwendo, and Ivarsson, 2009).

Professor Stephen Hawking who had motor neurone disease all his life has managed to continue with his career. In his foreword within the World Health Organisation Report on Disability (2011, pg ix) he says: *"The majority of people with disabilities in the world have an extremely difficult time with everyday survival, let alone productive employment and personal fulfilment"*. Living with a disability can interfere with a person's ability to participate actively in economic and social life (Phillips and Noubissi, 2004). Lack of participation in social life may lead to poor quality of life.

Stroke survivors experience lower quality of life than healthy controls (Akinpelu and Gbiri, 2009) and worse psychosocial outcomes (Vesting et al., 2003; Roding et al., 2003). Return to work can improve these outcomes by contributing to life satisfaction, wellbeing, self worth and social identity, at least partly through independence gained from income generation (Vestling, Tufvesson, and Iwarsson, 2003; Medin, Barajas, and Ekberg, 2006).

As expected, an independent income is more financially beneficial than relying on a social grant (de Koker C, de Waal L, and Vorster J 2006). It is thus important to focus the rehabilitation programmes on resumption of work (McLean, 2007) rather than to encourage stroke survivors to apply for early retirement or disability grants. Timing is important; return to work (RTW) interventions ideally begin before disability benefits are introduced, which may encourage

dependency. Timing is also important because efficacy of RTW programmes wane over time (Waddell and Aylward, 2005).

Thus rehabilitation has to promote early RTW rather than focusing just on restoring bodily functions and return to activities of daily living (Medin, Barajas, and Ekberg, 2006; Peters, et al., 2012). Rehabilitation programmes should be structured in a way that meets the requirements of the patient, as some stroke survivors have reported that rehabilitation was only aimed at restoring the body functionally, but did not help the individual to RTW (Roding et al., 2003; Medin, Barajas, and Ekberg, 2006).

Research concerning RTW has been conducted mostly in developed countries with limited applications elsewhere. Also, evidence regarding the effect of a workplace intervention programme on the rate of RTW of previously employed stroke survivors is lacking. This study aimed to bridge this gap in South Africa, and was conducted within the Gauteng province as it comprises the largest share of the South African population (Statistics South Africa, 2010).

## **1.2 PROBLEM STATEMENT**

The prevalence of disability is expected to increase in the coming decades because of an increase in chronic diseases which is coupled with improved health and rehabilitation services that aim to preserve and prolong life (World Health Organisation Report on Disability, 2011). The incidence of stroke in people younger than 65 years has also increased over the past few years with almost 5% occurring in those younger than 45 years of age (Roding et al., 2003). Wolf, Baum, and Connor (2009) also found that a significant number of people who have stroke are less than 55 years old. This implies that with the increasing number of young stroke survivors and the improved health services, stroke survivors are likely to live longer and thus would need to continue working for financial sustainability and to have a sense of purpose in life.

Employment rates for people with disabilities, including stroke survivors, are below that of the overall population with employment ratio of people with disabilities when compared to non-disabled people being the lowest (30%) in South Africa (Mitra, 2008) and the highest (92%) in Malawi (Loeb and Eide, 2004). Thus, in South Africa, there is still a need to increase the number of people with disabilities who return to the workplace. People who have suffered a stroke are sometimes forced into early retirement because of the perception of the employer or healthcare

provider that the person is unable to do the job (Alaszewski et al., 2007). The perception that an employee is unable to do the work was expressed by stroke survivors in Alaszewski et al.'s 2007 study on stroke survivors over a period of 18 months. They did in-depth interviews and thus were able to get detailed information about the stroke survivors' experiences and perceptions. According to Medin, Barajas, and Ekberg (2006), if a person is given flexibility and trust, they can generally work adequately even after suffering a stroke. This is also in line with the Constitution of South Africa (Act 108: 1996) which provides protection against direct and indirect discrimination against people with disabilities. RTW will also reduce the devastation of unemployment which is closely linked with financial hardship and the inability to meet basic needs (Coetzee et al., 2011).

### **1.3 RESEARCH QUESTIONS**

- 1.3.1 What is the current practice in RTW intervention for stroke survivors?
- 1.3.2 What are the stroke survivors', therapists' and employers' perceived barriers and enablers of RTW after stroke?
- 1.3.3 What is the effect of a workplace intervention programme on the rate of return to work of previously employed stroke survivors?
- 1.3.4 Which factors are predictive of RTW after stroke?

### **1.4 HYPOTHESIS**

#### **Hypothesis (H<sub>1</sub>):**

A workplace intervention programme increases the rate of RTW for stroke survivors.

#### **Null Hypothesis (H<sub>0</sub>):**

A workplace intervention programme does not increase the rate of RTW for stroke survivors.

### **1.5 AIM OF THE STUDY**

To establish the effect of a workplace intervention programme on the rate of RTW of previously employed stroke survivors within the Gauteng province of South Africa.

### **1.6 OBJECTIVES OF THE STUDY**

#### **1.6.1 Study 1:**

- 1.6.1.1** To determine the current practice in RTW intervention programmes for stroke survivors in the Gauteng Province of South Africa.

### **1.6.2 Study 2:**

- 1.6.2.1** To establish the characteristics (demographic information; premorbid job content and functional level (activities of daily living (ADLs), mobility and basic cognitive function) of the study group by eight weeks, three months and six months after stroke.
- 1.6.2.2** To determine the stroke survivors' perceived quality of life by eight weeks, three months and six months after stroke.
- 1.6.2.3** To explore the stroke survivors' and employers' perceived barriers and enablers of RTW.
- 1.6.2.4** To determine the rate of RTW after a six weeks workplace intervention for previously employed stroke survivors at three months and six months after stroke.
- 1.6.2.5** To identify factors which are predictive of RTW after stroke.

### **1.7 SIGNIFICANCE OF THE STUDY**

If the workplace intervention programme is found to improve RTW of previously employed stroke survivors it can be included in stroke rehabilitation and this may enable people with stroke to contribute their skills and abilities to the economy and society. The cost of claims on public social security and occupational benefit schemes can be reduced if employees with stroke are retained at work and this will also help to improve the stroke survivors' quality of life. Health professionals, employees and employers/work supervisors can possibly benefit from a structured approach to identify and discuss possible RTW work barriers and development of a consensus based RTW plan. Involving the employer by identifying their needs, expectations and potential accommodations in their workplace may help them make informed decisions about possible work adaptations and accommodations of the stroke survivors in the workplace. Evaluation of existing RTW programmes will also help improve rehabilitation outcomes for stroke survivors (Leng, 2008).

## **CHAPTER 2**

### **2. LITERATURE REVIEW**

#### **2.1. INTRODUCTION**

The magnitude of disability observed in stroke survivors is dependent on the severity of neurological deficits incurred (Kelly-Hayes et al., 2003) and stroke severity is a strong negative predictor of RTW (Wozniak et al., 1999); however, disability, no matter how severe, should not be an inhibitor of gainful employment especially if all possible reasonable workplace accommodations can be explored (Taylor Committee report No. 9, 2008).

This literature review looks at studies that have taken into consideration the rate of RTW, factors that influence RTW and perceived barriers and enablers of RTW after stroke. It will also focus on literature that defines work and RTW after sickness absence. Literature on the incidence and prevalence of stroke will also be presented.

The definition of stroke in this study is according to the World Health Organisation: *“rapidly developing clinical signs of focal (at times global) disturbance of cerebral function lasting more than 24 hours with no apparent cause other than vascular origin”* (WHO MONICA project, 1988). The literature search was conducted using the following sources: University of the Witwatersrand Health Sciences library catalogue; Pubmed; PEDRO; Medline; Cochrane; hand searches of relevant journals and reports; Google Scholar, and citation tracking. The following search words were used: stroke and return to work with a combination of any of the following: age, functional ability, stroke severity, stroke type, return to work assessment, work hardening, quality of life, factors that influence RTW, labour laws, sick leave, workplace, vocational rehabilitation; job content questionnaire, cognitive assessment, quality of life, functional ability assessment, therapist portable assessment lab and CENSUS South Africa.

#### **2.2 DEFINITION OF RETURN TO WORK AND VOCATIONAL REHABILITATION**

##### **2.2.1 Return to work**

The term “work” is broad and includes unpaid work in the home or in family enterprise, paid work for another person or organisation in the formal or informal economy, and self-employment (World Health Organisation Report on Disability, 2011). The formal economy is regulated by the government and includes employment in the public and private sectors where workers are hired

on contracts, and with a salary and benefits such as pension schemes and health insurance. The informal economy is the unregulated part of a country's economy (International Labour Organization, 2007).

There are various definitions of RTW after sickness absence. The following definitions were identified:

- Working at least 10 hours per week (Andersen et al., 2011).
- Active employment at the former or at a new occupation (full time or part time competitive employment, or self employment) (Saeki and Toyonaga, 2010).
- Return to paid work (Busch et al., 2009).
- Continuing occupation in the production of supplies and services for payment. This includes formal paid work both on a full-time or part-time basis (Vestling, Tufvesson, and Iwarsson, 2003).
- Return to school or to household activities (Black-Schaffer and Osberg, 1990; Hsieh and Lee, 1997; Teasell, McRae, and Finestone, 2000).
- Any employment plus homemaker, volunteer activities, or students (Malm et al., 1998).
- One month or more duration of work in an active employment after stroke or the ability to continue housework or studies as before (Saeki et al., 1993).

Saeki and Toyonaga (2010) and Vestling, Tufvesson, and Iwarsson (2003)'s definitions of work were used for this study as they include both part time and full time work, emphasise that the work done is for payment and have no limitations on the amount of hours to be worked. These definitions also cater for people who are economically active whether they get paid in their capacity as an employee or as an employer. They also cater for those who had workplace adaptation and those who had a new job description to reasonably accommodate them after stroke. Definitions that include house wives and students were not considered in this study as these occupations are not catered for within the South African labour laws, and thus factors which affect their RTW are likely to be different from those of people who work for economic provision and who are protected by labour laws.

### **2.2.2 Vocational rehabilitation**

Vocational rehabilitation, also called occupational rehabilitation or work rehabilitation is “a process that enables people with functional, psychological, developmental, cognitive and emotional impairments or health conditions to overcome barriers to accessing, maintaining or

*returning to employment or other useful occupations*” (A delivery framework for adult rehabilitation in Scotland, 2007, pg 32). It was also defined by Waddle et al. (2008) as whatever helps a person with a health problem to stay at, return to and remain in work.

Escorpizo et al. (2011, pg 130) defined vocational rehabilitation using the international classification of functioning, disability and health as follows: *“a multi-professional approach that is provided to individuals of working age with health-related impairments, limitations, or restrictions with work functioning and whose primary aim is to optimise work participation”*. Thus the focus of vocational rehabilitation is to help people retain or regain the ability to participate in work. Vocational rehabilitation should be differentiated from treatment interventions which are directed mainly at pathology and relieving the symptoms resulting in RTW as an indirect secondary outcome (Waddell and Burton, 2004).

According to the Health Professions Council of South Africa (HPCSA), rehabilitation includes: getting the patient to maximum potential in both work and sport, and community care includes offering services at day hospitals, rehabilitation centres, schools, industries and other organisations. The World Confederation for Physical Therapy (WCPT) also acknowledges that rehabilitation services may include assessment of ability to assume or resume work, ability to gain access to work and safety in work (WCPT entry level education guideline, 2011). The WCPT also acknowledges that rehabilitation can be offered within a variety of settings including (but not limited to) industrial and occupational settings (WCPT education policy statement, 2011). Thus the HPCSA and WCPT acknowledge the role of therapists in vocational rehabilitation.

In this current study the process of facilitating RTW is at the workplace but does not cater for people who are already out of the job market. The process in this study can thus be considered as a workplace intervention (facilitating return to current job), not a full vocational rehabilitation programme as defined in various studies which cater for those who have a job that they need to return to and those who are unemployed and seek a job.

### **2.3 THE INCIDENCE AND PREVALENCE OF STROKE AND AGE OF STROKE SURVIVORS**

In South Africa the only study showing stroke incidence was done in 1986 by Rosman who established that 101/100 000 patients admitted to hospital had stroke. Stroke prevalence was found to be 300/100 000 in a study by Connor et al. (2004) done in a rural setting in South

Africa. This study by Connor et al. (2004) has shown that even though the stroke prevalence is high in rural South Africa, it is still lower than in high income countries. A stroke prevalence report by Mensah (2008) has shown a crude stroke prevalence of 58 per 100 000 and 15 per 100 000 in Nigeria and Ethiopia respectively. Another study done in sub-Saharan Africa by Connor et al. (2007) has shown a stroke prevalence of 114-315/100 000 for women and 154 – 281/100 000 for men.

The crude annual incidence of stroke in Brazil was found to be 108/100 000 by Minelli, Fen, and Minelli (2007). In the United Kingdom (UK), stroke incidence decreased by 30% (148/100 000 to 104/100 000) and stroke prevalence increased by 12.5% (640/100 000 to 720/100 000) between 1999 and 2008 (Lee, Shafe, and Cowie, 2011). They attribute this decreased incidence to improvements in drug treatment in primary care with better control of risk factors before and after stroke.

The prevalence rates in African studies seem to be less than those in developed countries but this is not a full reflection of the African stroke prevalence considering that there are no community-based incidence studies to determine whether the low prevalence is from low incidence or from high case fatality or both (Connor et al., 2007). Strong, Mathers, and Bonita (2007) also established that 87% of the 5.7 million annual world stroke related deaths occur in low-income and middle-income countries. Thus when compared to developed countries, the low prevalence rates in African countries as reflected in studies by Connor et al. (2004, 2007) and Mensah (2008) is more likely to be the result of high case fatality. Thus stroke is no longer a disease of the developed world only. Developing countries like South Africa also need to pay more attention to stroke related issues like prevention and management including helping the stroke survivor to RTW.

Stroke is no longer a disease of older people. The incidence of stroke in people younger than 65 years has increased over the past few years with almost 5% occurring in those younger than 45 years of age (Roding et al., 2003). Wolf, Baum, and Connor (2009) also found that a significant number of people who have stroke are less than 55 years old. The reason for the decreasing stroke age can possibly be due to the rising obesity and diabetes prevalence (Flegal et al., 2010) as diabetes may particularly increase ischaemic stroke risk in young people (Kissela, Khoury, and Kleindorfer, 2005). Stroke survivors in a study done within the Gauteng province of South Africa by Duff (2012) had a mean age of 51 years and those in a study by Rhoda, Mpofu,

and DeWeerd (2011) done in the Western Cape had a mean age of 61 years. This shows that the majority of stroke survivors still have a number of working years ahead of them. This assumption is based on the recommended retirement age of 65 years within the South African basic conditions of employment Act (1997). This retirement age is not unique to South Africa as Korean people also retire at the age of 65 years (Drummond et al., 2006).

The information above suggests that the incidence of stroke is high and continues to increase and affects people within the working age group. This indicates that there may be a need for previously employed young stroke survivors to be assisted with RTW programmes for them to remain economically active.

## **2.4 THE RATE OF RETURN TO WORK AFTER STROKE**

Daniel et al. (2009) identified RTW as one of the most important social outcomes of rehabilitation for working age stroke survivors. RTW is only a first step to re-employment. Most of the people who RTW, do so within three to six months, with a second peak of RTW at 12 to 18 months after stroke (Treger et al., 2007). Performance on the job is also of major importance (Possl et al., 2001). There is a dearth of literature on RTW after stroke in developing countries. Duff (2012) found a RTW rate of 34% for stroke survivors within the Gauteng province of South Africa up to two years after stroke. Peters et al. (2012) in their Nigerian study found a RTW rate of 55% for stroke survivors up to eight years after stroke.

Stroke survivors in both the South African and Nigerian studies did not receive vocational rehabilitation. Four percent of the stroke survivors in Duff (2012)'s study had no residual disability after their stroke; 34% and 30% had slight and moderate disability respectively and 32% had severe disability. Peters et al. (2012)'s study does not give an indication of how many stroke survivors were less functional, however they do indicate that none of the severely disabled stroke survivors in their study returned to work. Both these African studies used the same definition of RTW (paid employment) and thus their results could be compared if the functional level of the stroke survivors in the Nigerian study was known. The RTW rate reported in Duff's study is less than that reported by Peters et al. from Nigeria. However Peters et al.'s study included stroke survivors up to eight years after stroke, thus some could have returned to work after the two year period used in Duff's South African study.

High unemployment rate and poor socio-economic status may lead to the tendency to have more disability insurance benefits and routine social security benefits (Treger et al., 2007), and may result in reduced RTW rates. The unemployment rates for Nigeria and South Africa cannot even account for the differences in RTW in Duff (2012) and Peters et al. (2012)'s studies as they are similar. South Africa had a 25% unemployment rate in mid 2011 (Statistics South Africa, 2011) and Nigeria had 23.9% during the same period (Nigeria National Bureau of Statistics, 2011). RTW rates for stroke survivors in other countries outside Africa are similar even though comparisons cannot be made because of different methodologies and socioeconomic conditions.

A nationwide prospective cohort study done in Denmark has shown a RTW rate of 62% in stroke survivors two years after stroke (Hannerz et al., 2011). Their study included people who were employed and those who were house executives but did not establish the functional level of the stroke survivor. In Singapore the RTW for stroke survivors was 7%, and these were stroke survivors referred to the vocational assessment unit between 2004 and 2005 (Leng, 2008). One of the major reasons for not returning to work in Leng (2008)'s study was that some stroke survivors needed further rehabilitation. An explanation for the low RTW in Leng's study could be that the focus was mainly on stroke survivors that came to the vocational assessment unit and thus may have missed those who did not use these services.

A precise comparison of these studies is difficult because they report RTW in different populations with varying follow up periods. Differences in the definition of work can also be the reason for a wide range of RTW rates across studies (Saeki, 2000). Differences found may also be a reflection of varying economic conditions across countries. These include unemployment rate, retirement age and cultural factors such as the availability of help from family members and the disability compensation structure (Saeki, 2000). Because of the abovementioned factors, an overall rate of RTW after stroke cannot be estimated. Future studies need to have uniform follow up time, ideally six to twelve months after stroke (to allow for rehabilitation effect) and uniform definition of RTW, to enable researchers to make overall estimation of RTW after stroke (Daniel et al., 2009).

## **2.5 WORK READINESS ASSESSMENT**

Appropriate assessment is important, but is not a once off event as a person's functional ability changes over time. Every form of intervention should begin only after the patient is assessed;

however, not all stroke survivors get an opportunity to be assessed for work readiness as indicated in a study by Ntsiea et al. (2012) which found that only four of the 36 clinical facilities included in their study assessed their stroke survivors for work readiness. Fadyl and McPherson (2009)'s study which was a review of evidence on approaches to vocational rehabilitation after traumatic head injury identified three models of vocational rehabilitation as follows: a case coordination approach; the individual placement model of supported employment; and programme based vocational rehabilitation. Each of these approaches started with assessment to establish eligibility for RTW. Without the work readiness assessment it would not be possible to identify which of these models will be suitable for a person when they need to return to work.

The importance of assessment for work ability is also emphasised within the South African Employment Equity Act No. 55 (1998) which states that an employee should get a proper objective assessment to establish the following: the extent to which he/she is able to perform work; the extent to which work conditions may be adapted; and the availability of a suitable alternative job. A workability assessment covers the following components: occupational competence; health required for the occupational competence; and the occupational virtues that are required for managing the work tasks, assuming that the tasks are reasonable and that the work environment is acceptable (Tengland, 2011).

Knowledge of factors associated with RTW can assist when assessing a person's work readiness and work potential (Stergiou-Kita, Yantzi, and Wan, 2010). However it is still unclear which factors are the most significant in assessment of work readiness. Stergiou-Kita et al., (2009) identified five key processes for the evaluation of work readiness as indicated in Figure 2.1 on the next page.

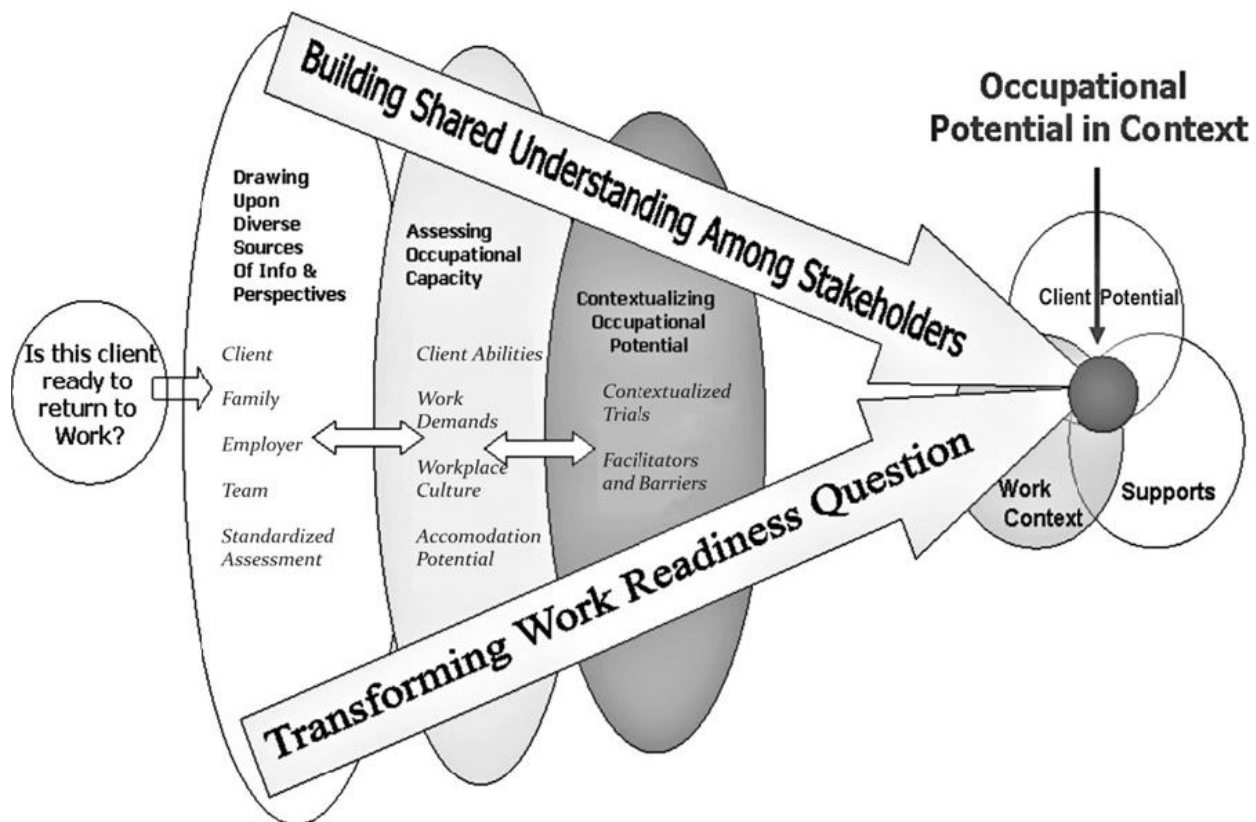


Figure 2.1: The work readiness evaluation model (Developed by Stergiou-Kita et al., 2009)

This model looks at the client in relation to their family, employer, and colleagues to determine if any of these stakeholders may have an effect on the decision to return to work and to ensure that there is shared understanding among all stakeholders. The model ends by comparing the client potential to the work context and the support systems that are available to promote and enable work readiness. The primary goal for this work readiness evaluation model is to determine the potential for successful RTW. Determining potential successful RTW requires identification of the employee's work potential, employer support and the work context (Stergiou-Kita, Yantzi, and Wan, 2010). Thus there is a need for communication between the health professional, employee and employer when workability is assessed (Campbell et al., 2007).

## **2.6 FACTORS WHICH INFLUENCE RETURN TO WORK AFTER STROKE**

### **2.6.1 Demographic factors**

#### Age and gender

Stroke in younger age results not only in impairment and limitation in basic ADLs, it also has an effect on activities such as RTW (Treger et al., 2007); however younger age has been associated with better RTW (Wozniak et al., 1999; Rollnik and Allman, 2011). Jorgensen et al. (1999) also established that younger survivors of stroke had better functional outcomes. The older age group was found to deteriorate significantly more in ADLs than the younger age group even in a study by Pohjasvaara et al. (1997). Increased age was also associated with higher rates of disability, inactivity and cognitive impairments in a study by Wolfe et al. (2011).

According to Black-Schaffer and Osberg (1990), younger stroke survivors seem to have better adjustment to residual disability, higher motivation to work and there seems to be greater willingness of the employer to take them back. However, younger age is also associated with poor mental health after stroke and this is attributed to the higher expectations of recovery in younger stroke survivors (Patel, Greasley, and Watson, 2007). Thus poor mental health may lead to poor quality of life and this may reduce the rate of RTW (Hommel et al., 2009). In these studies, younger stroke survivors refer to those younger than 65 years of age. Most people at the age of 65 consider retirement rather than RTW after stroke (Saeki, 2000).

In a study by Kelly-Hayes et al. (2003), more women experienced stroke and were more disabled at six months after stroke than men. However, older age at stroke onset, not gender or stroke subtype was associated with greater disability. This study also established that initial stroke occurred approximately five years later in women than in men hence more disability in women than men. Petre et al. (2009)'s study also showed that although severity of neurological deficits could be the same for both genders, women were found to have more functional problems.

The literature above suggests that age contributes more than gender in predicting functional independence after stroke including RTW. Thus if both women and men were to have a stroke at the same age, there would be no significant difference in their functional independence.

### Marital status

Being married carries a risk for low quality of life for stroke survivors; conversely, those who are unmarried cope well with their impairments (Kauhanen et al., 2000). Living with a spouse was also found to be a negative predictor of social activity in a study by Schepers et al. (2005). These studies however emphasise the need to take into consideration pre-stroke social activities when establishing rehabilitation goals, rather than focusing just on marital status. In a traditional model, women do the majority of household work, leading to higher scores on functional activities after stroke if they live with a partner, and lower scores for men living with a partner (Schepers et al., 2005). This indicates that women are likely to continue doing household activities after stroke and thus may appear to be doing more than men whose spouses take over the household activities resulting in lower quality of life scores for male stroke survivors. However this cannot be applied to all stroke survivors as women were found to have less functional ability than men in a study by Petre et al. (2009). However, most women in their study were older than men. Thus age might be more of a contributory factor to functional ability than gender and marital status differences.

The following reasons were attributed to poor quality of life in married stroke survivors: spouses may underestimate the need for support of stroke survivors with only mild stroke disorders; stroke may lead to changes in the interaction between spouses and in family roles; and spouses may react by being overprotective and over caring (Anderson et al., 1995; Kauhanen et al., 2000). However, in the absence of the above-mentioned reasons for poor quality of life in married stroke survivors, the spouse/partner can constitute another type of primary support network that has been associated with decreased mortality, particularly among men. The services provided by a marriage network also include cooking, bathing, dressing and shopping; and these can improve the quality of life (Boden-Albala et al., 2005). Jorgensen et al. (1999) also established that the existence of a spouse at home increased the chance of having a good functional outcome after stroke; however, no association was found between marital status and vocational outcome (Hsieh and Lee, 1997).

Information from these studies indicates that being married cannot be considered a negative or positive predictor of functional independence without considering the pre-morbid role of the spouse or stroke survivor within the family unit; however marital status has not been shown to have an influence on RTW after stroke.

### Educational level

A low educational level reduces the rate of RTW (Rollnik and Allman, 2011). Stroke survivors, whose general education is better, seem to understand their medical condition better and this in turn may lead to better functional ability. This has been confirmed by Bergmann et al. (1991). They established that having a high school qualification which meets the requirements for university entry is correlated with a higher percentage of people returning to their job after stroke.

Trygged, Ahacic, and Kareholt (2011) also found that stroke survivors with a higher level of education have a high probability of RTW after stroke, with those with university education being 13% percent more likely to RTW than those who had completed compulsory education; however educated stroke survivors are vulnerable to post stroke depression (Paulocci et al., 1999). This is attributed to the fact that they understand their medical condition better and are also more likely to have been working prior to the stroke, and thus become anxious of the possibility of not being able to go back to work and their previous social life. A higher educational level may also mean that a person is likely to be in a white collar occupation which is less labour intensive and thus may increase the likelihood of RTW (Noreau et al., 2010). People with a higher educational level are also more likely to receive assistance to facilitate their RTW as they have better job prospects (Joling et al., 2004).

These results suggest that the education status of a stroke survivor can have either a negative or positive effect on the functional outcome after having a stroke. It shows that a greater knowledge or understanding of the medical condition and the consequences of non-compliance is likely to improve RTW especially for those people with higher levels of formal education. People with higher educational levels are however likely to be depressed because of a better understanding of their medical condition and this in turn may affect functional outcome including RTW negatively.

### **2.6.2 Stroke type**

The location of the stroke was shown not to be a significant predictive factor of RTW after stroke (Saeki et al., 1993; Saeki et al., 1995; Wozniak et al., 1999). Stroke survivors with right and left cerebrovascular accident (CVA) were found to have similar abilities when performing ADL tasks and actions (Rexroth et al., 2005). A study by Bernspang and Fisher (1995), also established that stroke survivors with right and left CVA have hemispheric-specific differences in motor

impairments, but do not differ significantly in domestic ADLs. Social functioning, including RTW, is also not significantly related to hemisphere lateralisation of stroke (Hommel et al., 2009).

Stroke survivors with intra-cerebral haemorrhage (ICH) have greater functional impairment than those with cerebral infarction at admission; however, there is no difference in the Functional Independence Measure on discharge (Kelly-Hayes et al., 2003). This means that stroke survivors with ICH resulting in the most disabling strokes had significantly greater recovery than those with cerebral infarction. Paolucci et al. (2003) also established that stroke survivors with ICH had more functional independence than those with ischaemic stroke (IS) on discharge from the hospital. A study by Sturm et al. (2004) also established that there is no significant difference in activity limitations between people with IS and ICH two years after stroke. Thus on admission, stroke survivors with ICH have less functional independence than those with IS, but on discharge those with ICH have more functional independence than those with IS. However two years after stroke there is no difference in functional outcomes between people with ICH and IS. Stroke can also be classified using the Oxfordshire Community Stroke Project system which has the following categories: Lacunar Circulation Syndrome (LACS); Posterior Circulation Syndrome (POCS); Total Anterior Circulation Syndrome (TACS) and Partial Anterior Circulation Syndrome (PACS) (Bamford et al., 1991). Bamford et al. (1991) have found that patients with TACS have worse prognosis when compared to those with LACS, however the prognosis was not linked to long term functional outcomes such as return to work.

A conclusion that can be drawn from this literature is that the location or type of stroke cannot be linked to return to work outcome. Having an ischaemic or a haemorrhagic stroke makes no significant difference to the functional outcome. Older age at stroke onset has more influence on functional independence and RTW than the stroke subtype. This is an expected finding as it has been shown that stroke subtype does not have an effect on functional independence in the long term when a stroke survivor would need to go back to work. It has also been shown that older stroke survivors have increased disability rates, inactivity and cognitive impairments (Wolfe et al., 2011) and that employers show greater willingness to take younger stroke survivors back at work (Black-Schaffer and Osberg, 1990).

### **2.6.3 Functional ability in activities of daily living and mobility**

Not all stroke survivors are functionally independent at discharge from hospital, but their level of function improves over time (Mamabolo et al., 2009). It is thus important to follow them up after

discharge to establish their ultimate functional outcome including RTW. Roding et al. (2009) did a study that involved all first ever stroke survivors aged 18-55 years registered in the Swedish national quality register for stroke and established that 83% of the stroke survivors perceived themselves to be independent in ADLs at 8-36 months after stroke. Thus the stroke survivors in Roding et al. (2009)'s study may have potential to RTW because independence in ADLs is an important indicator of whether a stroke survivor would RTW (Saeki, 2000).

RTW intervention in some instances may be considered by three months after stroke because most patients improve significantly in their functional ability during this time, from measuring a median Barthel index (BI) score of nine at baseline, to 18.5 at three-months (McCullagh et al., 2005). However, deciding whether a person can RTW depends on the job requirements which may require either ability to walk or use of both upper limbs.

About 80% of all stroke survivors have an upper limb paresis immediately after stroke with only about 30% to 40% regaining some dexterity within six-months following conventional treatment programs (Kwakkel et al., 2003). This indicates that functional recovery of upper limb function is concentrated in the early months following stroke and reaches a plateau six months following stroke (Toschke et al., 2010). Thus even though McCullagh et al. (2005)'s study indicated that most stroke survivors have improved functional ability by three months after stroke, it is likely that those survivors whose upper limb is affected may only be considered for RTW after six months if their job requires bilateral upper limb use.

Besides use of the upper limb, a person may need ability to walk to cope in some working environments or get to work. According to Dunskey et al. (2008), walking disabilities are considered to be one of the most devastating disabilities after stroke. They further state that the recovery of walking ability is usually achieved about three months after stroke; however recovery is usually incomplete, leaving stroke survivors with gait impairments usually characterised by an asymmetrical pattern and reduced speed. According to Bowden et al. (2008), of those who survive the acute phase of stroke, about 20% to 30% are unable to walk and many others have moderate to severe walking disability with reduced walking speeds many months after stroke. Reduced walking speed may add to the travelling time of the stroke survivor if they have to walk to get public transport on their way to work. This may result in them either arriving late at work or having to wake up much earlier than usual to get to work on time.

Thus getting to and from work may be a tedious process for some stroke survivors and this difficulty with community ambulation may be a deterrent for RTW.

Community ambulation is defined by Lord and Rochester (2005) and Buurke et al. (2008) as the ability to mobilise independently outside the home, including confidently negotiating uneven terrain, shopping centres and other public venues. Less than 50% of stroke survivors progress to independent community ambulation (Buurke et al., 2008). This further suggests that most stroke survivors may have difficulty getting to work if they have to walk within the community to get to their workplace.

Stroke survivors often rank the restoration of walking ability as their number one goal of rehabilitation (Dunsky et al., 2008). It is therefore necessary that a large portion of the rehabilitation efforts are focused on achieving walking where possible as well as home and community-based ambulation in order to achieve community reintegration (Lord and Rochester, 2005; Michael, Allen, and Macko, 2005) which may enhance ability to RTW. Vestling, Tufvesson, and Iwarsson (2003) also established that being able to walk greatly increases the chance of returning to work after stroke.

A study by Hale and Eales (1998) assessed the functional abilities of persons with stroke living in a South African community. They found that 88% of those who were under 50 years of age could walk without assistance. Of these independently mobile stroke survivors 94% walked outside 'many times a day' and 56% could climb stairs independently. The measure used to determine 'handicap of gait' was the ability to catch a taxi, and 69% were able to manage this activity. These stroke survivors were assessed 12-14 weeks after discharge and the average length of hospital stay was 12 days. They were approximately four months after stroke, which indicates that if they needed to go back to work at this stage, travelling to work may not have been one of the barriers.

Limitations in general activities may also be a major challenge to stroke survivors as can be seen in a longitudinal observational study done on 100 stroke survivors by Rhoda, Mpofu, and DeWeerd (2011) which found that most of the stroke survivors at six months after stroke could still not perform stair climbing and bathing independently. These stroke survivors would thus have difficulty accessing public buildings which have stairs and thus they may have difficulty going back to work. These results are different from the ones presented above which indicated

better functional ability at six months after stroke. In Rhoda's study stroke survivors who could not walk to the clinics were visited and assessed at home. This could be a reason why they had more stroke survivors with limitations in general activities in their study. As much as it is acknowledged that there are stroke survivors who are functionally independent at six months after stroke, it has to be noted that there are those who are less functional who may not be considered for RTW. Rhoda, Mpofu, and DeWeerd (2011) also highlighted the fact that environmental barriers such as inaccessible bathrooms and lack of ramps could be more limiting for the stroke survivor than the neurological deficits. It can be deduced from this that in some instances it may be the environmental barriers that limit RTW rather than the impairments.

Even though most stroke survivors have shown functional improvements after stroke, the likelihood of achieving functional independence was found to be lower in those who were unemployed before having a stroke (Stineman et al., 1997). The ability to achieve functional independence, in the previously employed group, was attributed to the fact that they were more accustomed to the type of goal directed behaviour, which is necessary for the success of a rehabilitation programme. What is gleaned from this literature is that a stroke survivor will need to regain functional ability in order to overcome possible barriers for RTW. This is confirmed by Peters et al. (2012) in their study on Nigerian stroke survivors who showed that the absence of disability and mild disability are the significant determinants of RTW after stroke.

#### **2.6.4 Cognitive ability**

Deteriorated cognitive function was reported by 57% of stroke survivors 8-38 months after stroke in a Swedish study on people aged 18-55 years (Roding et al., 2009). When a person has cognitive impairments, they experience the lowest employment rates as they are less likely to be employed in the competitive labour market (Jones, Latreille, and Sloane, 2006). The following cognitive domains are relevant to the evaluation of work readiness: attention (ability to engage in work tasks for a prolonged period of time); memory (ability to recall the steps required to perform work tasks from one day to another); self awareness (ability to identify their skill level in relation to their job demands and ability to anticipate possible barriers) and judgement (ability to make logical decisions and behave in a manner that is appropriate to their work setting) (Stergiou-Kita, Yantzi, and Wan, 2010).

Problems with memory, impaired ability to concentrate or losing a train of thought were also mentioned by stroke survivors as reasons for not being able to return to or cope in their work

(Gilworth et al., 2009). The same was established by Possl et al. (2001) who showed that memory deficits reduce the rate of RTW in people with head injuries. Similarly inability to predict the actions of others and remember previous interactions will affect relationships and possibly reduce social support and thus may reduce the possibility of returning to work (Mitchell et al., 2010). Poor concentration and impaired problem solving also reduce the likelihood of RTW (Kiessling and Henriksson, 2005). It is important to identify people with cognitive impairments early so that efforts can be made to increase awareness of the potential role that the cognitive impairment may play in vocational rehabilitation (O'Connor et al., 2011). Knowledge of a stroke survivors' cognitive level will also increase their chances of receiving attention and memory training during the rehabilitation process (McDowd et al., 2003).

### **2.6.5 Co-morbidities**

The presence of hypertension and diabetes is associated with the likelihood of having a stroke, but is not associated with functional independence after stroke as reported by Sturm et al., (2004). Heart diseases were also found to contribute more to physical disability in a study by Guccione et al. (1994) on elderly patients. Thus elderly stroke survivors are likely to have more physical disability if they have these "other" conditions in conjunction with a stroke. This may not be a problem in RTW rehabilitation programmes as those above the age of 65 are usually excluded from RTW rehabilitation programmes as they usually opt for retirement from work (Saeki, 2000).

Human immunodeficiency virus (HIV) infection is associated with stroke (Connor et al., 2004). This can also be seen in a population based study from Baltimore in the United States of America, in which the incidence of stroke in people with acquired immunodeficiency syndrome (AIDS) was 0.2% per year (Berger, 2004). The use of antiretrovirals has also been associated with cerebrovascular disease (Modi, 2006; Cruse et al., 2012). It has also been established that people with HIV infection who do not have full blown AIDS or pulmonary infection have reduced work capacity, lower aerobic threshold, and poorer aerobic capacity than age matched controls (Mars, 2004). Quality of life in the domain of mobility, usual activities, pain/discomfort and anxiety/depression was also found to be compromised in people living with HIV, especially those in stages (World Health Organisation classification) three and four (Hughes et al., 2004).

Furthermore in South Africa, one third of HIV infected stroke survivors have a recent or recurrent opportunistic infection (Tipping et al., 2007). The quality of life of people who have HIV

in conjunction with stroke is likely to be more compromised than for those who have stroke only. This may affect the person's ability to go back to work after stroke.

The HIV-associated neurocognitive disorders that result in poor executive function, slow information processing, and deficits in retrospective memory have also been found to reduce the likelihood of RTW (Gorman et al., 2009). It is important to consider HIV as a possible deterrent of RTW as in South Africa it has been found to affect 17% of people aged 15 to 49 years who are mostly of working age (Statistics South Africa, 2010). This is similar to Tipping et al. (2007)'s Groote Schuur hospital population findings which show that HIV positive stroke survivors are predominantly young with 91% of them being less than 46 years.

Fatigue is also a factor which would limit accessibility of the clinical facilities or workplace as it was shown in a study by Kahonde, Mlenzana, and Rhoda (2010) that stroke survivors who stay next to the clinical facilities or workplace could not walk to these facilities as they got very tired while walking. Such survivors may have the ability to walk and use their upper limbs but have poor endurance. Fatigue was also reported as a consistent problem for stroke survivors in a study by Gilworth et al. (2009).

Depression is common amongst stroke survivors as can be seen in Kouwenhoven et al. (2011)'s study that shows that the psychological consequences of stroke may vary from mild stress to depression and anxiety. In a study by Chau et al. (2010) 20% of the stroke survivors reported mild depression and 33% reported severe depression. Depression in Chau et al. (2010)'s group was associated with low levels of self esteem and low functional ability. Lack of engagement in meaningful activities such as going back to work may also lead to low self esteem and depression (Kirkevold et al., 2011). It is also important that people are treated fairly in the workplace as the stress of unfairness in the workplace can lead to higher rates of illness and longer and less successful recovery (Shain, 2001). A worker with psychological complaints also has a lower probability of RTW (Joling et al., 2004).

These results suggest that the presence of co-morbidities such as HIV/AIDS, depression and fatigue may reduce the likelihood of RTW after stroke. HIV/AIDS may reduce RTW rates due to fatigue which may result in difficulty coping with all day activities in the workplace. The presence of HIV/AIDS related opportunistic infections may result in frequent absence from work as well as

weakness which may lead to settlement to take sick pension, as a person would constantly exhaust all their leave days.

### **2.6.6 Motivation and support**

Stroke survivors may need support to regain their self esteem and motivation to engage in meaningful activities such as returning to work (Salter et al., 2008). There is also a need for flexibility in the scheduling of the work as some people may require extra time to prepare for work and to travel to and from work (World Health Organisation Report on Disability, 2011). The most significant factor however, is the person's desire or motivation to go back to work (Stergiou-Kita, Yantzi, and Wan, 2010). The stroke survivor is the ultimate decision maker in the RTW process as they have to make a final decision of going back to work; however, they need information, motivation and support to make an informed decision (Franche and Krause, 2002). Most assistance and support may also come from family members or social networks (Fisher and King, 2008). Lack of family support has been identified as a factor that reduces the RTW rate of stroke survivors (Holmqvist, Kamwendo, and Ivarsson, 2009). Lack of support from employer and colleagues also reduces the rate of RTW after stroke (Van Velzen et al., 2011; Muijzer et al., 2012). Participants in a study by Haugli, Meland, and Magnussen (2011) on experiences after occupational rehabilitation identified support from peers, employer and social welfare as factors that facilitated the process leading to their RTW.

Stereotypes against people with disabilities such as employers who may think that a person with a disability is unprofessional, slow, constantly absent from work and unsuitable for a company's reputation also reduce RTW (Treger et al., 2007). Some employers fear that people with disabilities cannot be productive in the work environment (Roberts et al., 2004) and even if a stroke survivor can overcome physical barriers, negative attitudes can still hinder their RTW. It should be noted that some labour laws mandate an employer to provide shorter hours, shorter working days, more rest periods, longer paid leave and higher severance pay for workers with disabilities. This may be costly for the employer and may discourage the employer from considering retaining a person with a disability in their workplace (Kuddo, 2009).

Direct advice from health care providers may also increase the rate of RTW after stroke, but the advice needs to take into consideration severity of lesion, socio-demographic factors and workplace factors (Franche and Krause, 2002). The need for advice on whether the stroke survivor can go back to work and when they can resume work was expressed by stroke

survivors who indicated that they were not sure when to resume work as they were not given clear advice by their health providers (Gilworth et al., 2009).

Advice and motivation is required because for those who do not go back to work, about half are considered to do so for psychological reasons and not because of their physical condition (Mital, Desai, and Mital, 2004). Advice given about possible RTW is important as it has a major and lasting impact on the individual, their family and employer's beliefs about possible RTW (Frank and Thurgood, 2006). It is not easy for service users to articulate their needs and suggested that supported decision making around RTW may be necessary as some people with disabilities have low self expectations about their ability to be employed and may not even try to RTW unless they get external motivation (International Labour Organisation, 2006).

### **2.6.7 Socioeconomic status**

Higher income is associated with higher probability of returning to work after stroke, with individuals in the highest income quartile being twice more likely to RTW than those in the lowest quartile (Trygged, Ahacic, and Kareholt, 2011). Grammenos (2003) also found that in Europe wealth and status can help overcome activity limitations and participation restrictions.

Stroke survivors may have participation limitations as a result of their socioeconomic status. This can be seen in Rhoda, Mpofu, and DeWeerd (2011)'s study which established that 80.7% of the stroke survivors in the Western Cape had an income below R1000 per month and this implied that only a small number owned a car and therefore needed to be able to use public transport in order to participate in community activities, including work. If the use of public transport was not practical, they had to hire a car which became more costly. This concurs with the 2002-2004 World Health Survey report that showed that transport costs ranked high as a barrier to health care and participation for people with disabilities.

The costs that stroke survivors incur are likely to be higher than those of people without a disability due to disability related expenditure (Zaidi and Burchadt, 2005; Braithwaite and Mont, 2009). This finding is similar to that of Trani et al. (2010) who showed that households which had a person with a disability in Sierra Leone, spent on average 1.3 times more on health care than households with non-disabled members. The World Health Survey (2002-2004) results also showed that people with disabilities (29%) were more vulnerable to catastrophic health expenditure (spending more money on health care to a point of becoming poor as a result of

this expenditure), when compared to 18% of nondisabled people. A stroke survivor may therefore benefit more from RTW which will enable her/him to generate income. This is so because independence with income generated is more beneficial than relying on a social grant as it is a well known fact that households in South Africa with employed members are better off than those who rely only on social grants (de Koker C, de Waal L, and Vorster J 2006).

### **2.6.8 Environmental factors**

Inaccessible environments create disability by creating barriers to participation and inclusion (World Health Organisation Report on Disability, 2011). The following factors have been mentioned as barriers of RTW: architectural barriers limiting accessibility to the building; lack of appropriate transportation; poor local economy with many young unemployed people (Treger et al., 2007). The United Nations Convention on the rights of persons with disabilities stipulates the importance of interventions to improve access to different domains of the environment including buildings and roads, transportation, information, and communication. These domains are interconnected. In other words people with disabilities will not be able to benefit fully from improvements in one domain if others remain inaccessible.

Transport accessibility difficulties were reported in a South African study by Kahonde, Mlenzana, and Rhoda (2010) which showed that some patients had difficulty accessing public transport and this resulted in poor attendance of follow-up treatment sessions and also resulted in difficulty accessing services like schools, shops, workplaces and recreational places. Travelling by public transport has also been identified as the most common instrumental ADL that stroke survivors are not able to perform (Rhoda, Mpofu, and DeWeerd, 2011). Oxley (2007) also showed that most taxis are not accessible and that there have been many instances of discrimination by taxi operators against people with disabilities. This confirms the need to acknowledge that people are disabled by environmental factors as well as by their physical impairments, and this can limit their ability to RTW (World Health Organisation Report on Disability, 2011).

### **2.6.9 Rehabilitation services**

Therapists consider staff shortage as one of the barriers for RTW as it makes it difficult and in some instances impossible for therapists to provide full rehabilitation services including work ability assessment (Coetzee et al., 2011). The shortage of rehabilitation staff was also found to be a challenge in a study by Rhoda et al. (2009) that looked at rehabilitation of stroke survivors

at community health centres in the Western Cape. They established that of the 39 community health centres situated in various districts within the Western Cape only 20 offered rehabilitation services. All the centres that offered rehabilitation services in this study had physiotherapy services, and only half offered occupational therapy services. This limited availability of therapy services is not in line with the national rehabilitation policy (2000) of South Africa which states that rehabilitation services provided should be accessible to all. This policy does not specify duration of stroke rehabilitation; however it does cater for vocational rehabilitation with the focus on developing vocational skills and aptitudes and provision of job options.

Hachinski et al. (2010) also acknowledges the need for rehabilitation services and highlights the fact that stroke rehabilitation is successful, but is largely unavailable for the time and intensity required. They indicated that in South African hospitals, stroke survivors are discharged home before they are functionally independent even though there are often no systems in place for continued rehabilitation after discharge. This early discharge is more likely to be due to shortage of stroke rehabilitation units that stroke survivors can be sent to, for long term inpatient rehabilitation. It is acknowledged that in South Africa, the stroke unit model of care has not been widely implemented despite compelling evidence of efficacy, including published data from a stroke unit in a small secondary level South African hospital in Cape Town (de Villiers, Kalula, and Burch, 2009). The reason for this lack of stroke unit model implementation is that the majority of stroke survivors in South Africa are treated in the public health care sector where there is a shortage of inpatient rehabilitation beds; however efforts are still underway to implement the stroke unit model on a wider scale in our country (Bryer et al., 2010).

Longer term rehabilitation is required and can be provided within the community settings and facilities such as primary health centres and workplaces (Haig, 2007; Ottenbacher and Graham, 2007). Multidisciplinary rehabilitation is more beneficial than that provided by a single healthcare professional, especially if continued long after discharge from early post acute rehabilitation (Campbell et al., 2007). Rehabilitation can also be offered within the workplace as this concept is in line with the neuroscience argument that what a person does and experiences in rehabilitation, and the rehabilitation environment itself, must affect the recovery process (Carr and Shepherd, 2010).

### **2.6.10 Type of occupation**

Occupations will be considered as white collar or blue collar in this literature review. A white collar worker typically performs work in an office environment and may involve sitting at a computer or desk. They are usually blended with pink collar workers who are typical service workers whose labour is related to customer interaction, entertainment, sales and other service orientated work (Encyclopedia). A blue collar worker is a member of the working class who performs manual labour which may involve skilled and unskilled, manufacturing, mining, construction, mechanical, maintenance, technical installation and many other types of physical work (Encyclopedia).

Stroke survivors with white collar jobs are more likely to RTW than those in blue collar jobs (Saeki et al., 1993; Wozniak et al., 1999; Vestling, Tufvesson, and Iwarsson, 2003). Saeki et al. (1995) also found that in Japan white collar workers tended to RTW more often (66.4%) than blue collar workers (48.5%) and that stroke survivors in professional managerial positions were five times more likely to RTW than blue collar workers. The same was established by Bergmann et al. (1991) who showed that a well paid and better qualified professional was more likely to regain their employment after stroke.

Stroke survivors who need workplace modifications and those with physically demanding jobs are less likely to go back to work or may take longer before returning to work (Hsieh and Lee, 1997). This explains the reduced RTW rate among blue collar workers as most of their jobs are physically demanding and are more likely to require modifications to accommodate them after stroke.

Another reason for the difference in RTW between blue and white collar occupations could be that general physicians and specialists in the public sector are more likely to issue sick leave certificates and grant disability pension than private sector general physicians and specialists (Beckman et al., 2006). People in blue collar occupations are more likely to consult public sector specialists as consultations would cost relatively less than those of private sector specialists. The varying practices between public and private sector specialists may play a role in the RTW rate of people in blue collar occupations compared to those in white collar occupations. This expectation is based on Beckman et al. (2006)'s finding as indicated above and Saeki (1995)'s findings that social security benefits delay people from RTW.

### **2.6.11 Labour laws and sickness benefits**

The United Nations Convention on the rights of persons with disabilities (2006) recognises the right of people with disabilities to work, on an equal basis with others. This includes the opportunity to gain a living by work freely chosen or accepted in a labour market and a work environment that is open, inclusive and accessible to persons with disabilities. Furthermore this convention promotes access to vocational training and reasonable accommodation in the workplace. In South Africa government departments and state bodies are bound by statutory provisions stipulating that at least 2% of their workforce must consist of people with disabilities; however this quota has not been met yet (Commission for employment equity, 2008).

Labour laws, sickness benefits and RTW rates differ across countries. Saeki (2000) established that sickness benefits received for a prolonged period of time influence the length of the interval between stroke onset and RTW. Prolonged absence from work has also been shown to result in a lack of social structure and meaningful activity and is associated with reduced RTW (Henderson, Glozier, and Holland, 2005). Social protection systems such as those that provide disability grants create an incentive for people with disabilities to exit employment (Paris Organisation for Economic Co-operation and Development Report, 2010).

Sick leave duration in South Africa is calculated within a three year period and is an equivalent of the number of days worked during a six week period within a 36 month period (Basic Conditions of Employment Act: No. 75 of 1997). This usually adds up to six weeks (30 working days) within a three year cycle. The waiting period for declaration of disability by most insurance companies is a continuous period of six months (a client with a disability is expected to resume work by the end of a six month period and if this is not the case, they are declared to have a disability). This six month waiting period is also in line with Wolfenden and Grace (2009)'s recommendations for enhancement of RTW after stroke based on the literature review and the personal experience of one of the authors. One of their recommendations is that workplaces should consider holding the job of the stroke survivor open as long as is possible especially within the first six months post stroke.

The Employment Equity Act No. 55 (1998) of South Africa states that an employer has to adhere to Code of Good Practice on Employment of people with disabilities which ensures that an employee gets a proper objective assessment to establish: a) the extent to which he/she is able to perform work; b) the extent to which work conditions may be adapted; and c) to establish

the availability of a suitable alternative job. The South African Department of Health National guidelines on stroke management (2001) also consider vocational training to be an important part of the post acute rehabilitation phase.

Despite these laws and guidelines which protect people with disabilities, including stroke survivors, the employment rate for people with disabilities in South Africa is still lower than that of other countries (Mitra, 2008). This may be due to poor enforcement of these laws and that they are not well known by the employees who do not exercise their right to exhaust all possible avenues before opting for disability related incapacity retirement. The laws that govern employment of people with disabilities seem to be successful in preventing discrimination among people who are already employed and thus it should be relatively easier to enforce when assisting a person with a disability to RTW than to find a new job (World Health Organisation Report on Disability, 2011). It is possible that some employers may prefer to have employees who become disabled on incapacity retirement than to carry the costs of reasonably accommodating them in the workplace (Mont, 2004; Mitra, 2008).

## **2.7 QUALITY OF LIFE AFTER STROKE**

Stroke survivors have lower quality of life than their apparently healthy counterparts (Akinpelu and Gbiri, 2009). The decrease in quality of life applies even to people who have suffered a mild stroke (Duncan, 1997). Hommel et al. (2009) also found that 68% of the stroke survivors complained of significant work and social dysfunction despite a good clinical outcome. There is a need to ensure that people who can go back to work after stroke do so, because returning to work may contribute significantly to their life satisfaction, wellbeing, self worth and social identity, giving them an opportunity to maintain independence with the income generated through employment (Vestling, Tufvesson, and Iwarsson, 2003; Medin, Barajas, and Ekberg, 2006).

Apart from income generated, returning to work brings social benefits which add to a sense of human dignity (Becker et al., 2007). There is also evidence that people who do not go back to work after stroke have poor psychosocial outcomes (Niemi et al., 1988; Roding et al., 2003; Vesting et al., 2003). This affects young stroke survivors the most as they were found to have less physical and mental health after stroke, despite better functional outcome associated with young age (Patel, Greasley, and Watson, 2007). Going back to work should be the first option when planning reintegration of stroke survivors into the community.

It is important for stroke survivors to be believed in and enabled rather than disabled in their endeavours, both within education and within the workforce. They may also require advocacy to help to build understanding among peers and colleagues, and to optimize their contribution within the community (Wolfenden and Grace, 2009). Social consequences of stroke also include poor family life and relationships and an increased risk of separation among couples below retirement age (Trygged, Hedlund, Kareholt, 2011).

## **2.8 RETURN TO WORK INTERVENTION PROGRAMMES**

There is no question about the availability of stroke survivors who may need RTW rehabilitation services after stroke, as illustrated in a study by Ntsiea et al. (2012) which established that on average the mean and standard deviation for stroke survivors who require RTW intervention on a monthly basis within the Gauteng province is  $4\pm3$ .

Rehabilitation has traditionally focused on recovery of activities necessary for daily living, while often overlooking psychosocial recovery which includes RTW (Guise, McKinlay, and Widdicombe, 2010). Ideally the process of a RTW intervention is addressed within the rehabilitation phase of recovery (Koch et al., 2005). Consideration should be given to the limiting impact of early discharge from hospital with no or minimal follow-up rehabilitation sessions. People who were employed at the time of their stroke have a constitutional right to be supported on discharge regarding future employment opportunities, and how they maximise these (Wolfenden and Grace, 2009). Rehabilitation programmes should therefore be structured in a way that meets the requirements of the stroke survivor, as some stroke survivors have reported that rehabilitation was only aimed at restoring the body functionally, but did not help the individual to RTW (Roding et al., 2003; Medin, Barajas, and Ekberg, 2006).

The intervention has to be individual specific because individuals with the same impairments may have different experiences and needs (World Health Organisation Report on Disability, 2011). Stroke survivors are not homogeneous and thus some may have activity limitations for the upper limb only, lower limb only, or both; others may have speech problems or cognitive problems and others may have spatial perceptual deficits. Rehabilitation should be tailored according to the individual's specific activity limitations. The effectiveness of an intervention is not only determined by its content, but also by other aspects such as who is selected for the intervention and when the intervention takes place (Joling et al., 2004).

In Duff (2012)'s study on stroke survivors within the Gauteng province, which included 97 stroke survivors up to two years after stroke, only one stroke survivor had vocational rehabilitation. RTW intervention programmes are limited in South Africa, in part due to large numbers of people (90%) being assessed for disability grant applications (Coetzee et al., 2011). Therapists tend to focus more on disability grant assessments than workability assessments. However it is worth noting that RTW intervention is not only dependent on availability of therapists or healthcare alone. Proactive company approaches to sickness and work accommodations are also more beneficial in RTW intervention programmes when combined with healthcare (Waddell, Burton, and Kendall, 2008). Coetzee et al. (2011) recommends that in addition to therapist and employer involvement, vocational rehabilitation should be centralised within the Department of Labour with support services from the Departments of Health, Education and the South African Social Services Agency. In this model they recommend that the health sector should focus primarily on workability assessments instead of job placements which can be done by the Department of Labour.

The American Physical Therapy Association has Occupational Health Guidelines (2002) for work hardening programmes. Stroke survivors who are not work ready can be enrolled in a work hardening programme which covers the following: a) development of program goals and outcomes in relation to specific job requirements; b) interventions to develop joint integrity and mobility, motor function (motor control and motor learning), muscle performance (including strength, power, and endurance), range of motion, and cardiovascular/pulmonary capacity related to the performance of work tasks; c) practice, modification, and instruction in simulated or real work activities; d) education related to safe job performance and injury prevention; e) provision of behavioral and vocational services as determined by the respective work hardening provider; f) promotion of patient/client responsibility and self-management. This model was used when developing a workplace intervention programme for stroke survivors in this current study. This model also takes into consideration the building of self confidence, stress management and cognitive approaches such as awareness and general coping strategies which are required for an individual to cope in a work environment (Haugli, Meland, and Magnussen, 2011).

Work visits are also an essential component of a work ability assessment (Buys and Van Biljon, 2007). Work visits are recommended by Franche et al. (2004) who established that they reduce work disability duration. During the work visit, workability and ergonomic assessment as well as education of the supervisors and managers about ergonomics and safety issues is

recommended (Franché et al., 2004). Interventions that involve the employee, health professional and employer are more consistently effective than those that involve only one or two of these stakeholders (Carroll et al., 2010). Various studies on cardiac illness, musculoskeletal injuries and mental illness have also shown that the RTW process and interventions are more effective if they are closely linked to, or located in the workplace (Hagberg, 2005; Ostelo et al., 2005; Breen, Langworthy, and Baghurst, 2007). All of these interventions need to be done early in the rehabilitation process to facilitate early RTW where possible (Kosny et al., 2006). Communication between all stakeholders (employee, employer and health provider) has to start early, even before the employee is ready to RTW as it can be a barrier of RTW if not done early (MacEachen et al., 2006; Campbell et al., 2007).

Thornton et al. (2003) did a comprehensive study of the United Kingdom and United States of America's policies and practices of facilitating return to work for people with disabilities and found that no vocational rehabilitation interventions have been shown to be effective for people who have been out of work for more than one year. It is important that RTW intervention starts before people are trapped on disability benefits which they start receiving when out of work for a prolonged period (Waddell and Aylward, 2005). This need for early intervention is also emphasised by Joling, Groot and Janssen (2006) who found in their study with backache sufferers that workers who were off work for 4-12 weeks had a 10-40% risk of still being off work at one year after disease onset. In instances where early RTW is not possible, it is advisable to consider temporary provision of modified work as it reduces the duration of sickness absence and increases RTW rates (Hanson et al., 2006; Burton et al., 2008). This will help the stroke survivor as it has been shown that beneficial effects of work on physical and mental health and well-being generally outweigh the harmful effects of prolonged sick leave (Waddell and Burton, 2004).

People who cannot cope with their pre-morbid work can be reasonably accommodated within their workplace. This includes adapting the job and the workplace to make it easier for the person with a disability to work (Convention on the Rights of People with Disabilities, 2006). The adaptations may also include modifying working times and working arrangements and providing assistive technologies. Requirements for employers to make reasonable accommodations can be voluntary or mandatory. The cost of the accommodations can be carried by employers, employees, or both (World Health Organisation Report on Disability, 2011). In South Africa the cost of workability assessments and reasonable accommodation are expected to be carried by

the employer as stated in the Code of Good Practice on employment of people with disabilities (The Employment Equity Act No. 55 of 1998). This can be costly for the employer, especially those with small companies, and thus it can be expected that stroke survivors who work in small companies will have reduced RTW as it will be costly for the employer to reasonably accommodate them if there is a need to do so (Hannerz et al., 2012). In situations where an employee cannot RTW early, arrangements can be made for transitional work (temporary modified work) as this has been shown to facilitate early and sustained RTW (Campbell et al., 2007).

There is no literature on the optimum multidisciplinary team composition to deliver effective RTW interventions. The following core multidisciplinary team is recommended by Campbell et al. (2007): a physiotherapist, an occupational therapist, a psychotherapist, an occupational health professional, a social worker, a clinical psychologist, an employment adviser or RTW coordinator, and a representative with knowledge of social security and benefits system. The specific professional input required will vary according to the individual needs and clinical presentation of the stroke survivors. In the Netherlands the RTW intervention is initiated by the occupational physician who supervises the sickness absence process as follows: supporting the sick worker by enlarging their work capacity and adapting their workload; help change the workers' attitude towards work and the planning of RTW activities and goals; stimulate the worker to put more effort to RTW (Joling et al., 2004). In Joling et al.'s study however, the probability of receiving RTW intervention from the occupational physician and the probability of RTW was not statistically significant. This is possibly due to lack of a control group in their study.

There are very few studies that present RTW intervention programmes, specifically for stroke survivors. Some of the studies present programmes which are generally available to all sick listed employees (including stroke survivors) and to all people with disabilities who have either been on sick leave or were looking for a new job placement. Table 2.1 on the next page presents a summary of some of the RTW intervention programmes:

**Table 2.1 Summary of return to work intervention programmes**

| Author/s                        | Vocational rehabilitation programme                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Professionals involved and/or Setting                                                   | Results/Comments                                                                                                                                                                                                                                                                                      |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Black-Schaffer and Osberg ,1990 | Stroke survivors were in the same ward and the therapist communicated to determine RTW goals and to tailor therapy. Treatment was: Physiotherapy and occupational therapy 10 times per week; speech pathology up to 10 times per week as needed (with each session lasting 30 to 45 minutes); group psychological counselling (60 minutes per week); stroke education classes (60 minutes per week); social service consultation; vocational rehabilitation evaluation and counselling; neuropsychological testing and medical support | Professionals mentioned in the vocational rehabilitation programme<br>Setting: hospital | 49% returned to work: full-time, part time, homemaking, and university studies.<br><br>All participants were employed before stroke.<br><br>The length of hospital stay for those who returned to work was on average 35.8 ( $\pm 17.5$ ) days and 59.4 ( $\pm 20.1$ ) days for those who did not RTW |
| Joling et al., 2004             | A client receives a call by the occupational physician who mostly supervises the sickness absence process of workers. The clients receives support in enlarging their work capacity and adapting their workload, receives advice to help them put forth more effort to RTW                                                                                                                                                                                                                                                             | Occupational physician (OP)<br>Setting: community                                       | The probability of receiving an intervention from the OP was not correlated with the probability of RTW                                                                                                                                                                                               |
| Turner-Stokes et al., 2005      | Content was not described in detail. The following were done: Intensive arm/leg training by either Physiotherapist (PT) or OT with additional multidisciplinary team members as required (four hours per day for some and four days per week for others; two visits per week from community based outreach                                                                                                                                                                                                                             | PT and, or OT and community based outreach team<br>Setting: hospital and community      | This was a systematic review and work related outcomes included work status, RTW and fitness for military duty<br><br>Most patients made good recovery with                                                                                                                                           |

|                              |                                                                                                                                                                                                                                                           |                                                                                                                                |                                                                                                                                                                                                                                                                                                               |
|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                              | team). Some had an eight week intensive inpatient programme (not specified)                                                                                                                                                                               |                                                                                                                                | provision of appropriate specific RTW related information without additional specific intervention.                                                                                                                                                                                                           |
|                              |                                                                                                                                                                                                                                                           |                                                                                                                                | More intensive programmes were associated with earlier functional gains                                                                                                                                                                                                                                       |
| Bisiker and Millinchip, 2007 | Identifying RTW goals and current skills with affected person; pursuing vocational possibilities including either returning to current job or retraining; graded RTW programmes and regular support once a person has returned to work.                   | Occupational therapist (OT), clerical support, project coordinator with a vocational training background<br>Setting: community | 26% returned to doing light duties.<br><br>This study is for the entire population (not just for stroke survivors).<br><br>86% were employed before vocational rehabilitation, 10% unemployed and 4% were students                                                                                            |
| Leng, 2008                   | The client is interviewed by a work placement officer, and then assessed by an OT, psychologist and social worker (SW). The client may receive further OT, job placement, job trials, or may be referred back to the hospital for further rehabilitation. | OT, SW, Psychologist, and work placement officer<br>Setting: Community                                                         | 34% returned to open employment, 21% participated in sheltered workshops, 21% needed further rehabilitation, 10% failed to return for assessment, 7% were unfit for work.<br><br>It was not stated whether the participants were working before getting involved in this vocational rehabilitation programme. |

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|                     |                                                                                                                                                                                                                                                                                                                                                         |                                                                        |                                                                                                                                                                                                                                                                                                                         |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Carrol et al., 2010 | Intervention took place in full or part at the workplace or involved direct contact with the employer or a representative (employee's supervisor or employer's occupational health services). The workplace formed either the entirety of the intervention or only a component. The control treatment did not include any involvement of the workplace. | Professional were not specified<br><br>Setting: hospital and workplace | This was a systematic review for employees with back pain<br><br>Interventions involving employees, health practitioners and employers working together, to implement work modifications were more consistently effective than exercises. Workplace related exercises were more effective than exercise in the hospital |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

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The interventions in Table 2.1 above were generally done within the hospital and community. Only Carrol et al. (2010) had workplace interventions in their study; however these were for backache sufferers. None of the studies listed in Table 2.1 mentioned doing a workplace intervention specifically for stroke survivors. Black-Schaffer and Osberg (1990)'s study included only exercise to improve impairments and activity limitations in a hospital setting. None of their interventions were directed specifically at RTW; however the therapists discussed treatment goals in relation to RTW. There seems to be high RTW rates (48%) in Black-Schaffer and Osberg's study. This might be due to inclusion of home makers and students in their study, which may increase the pool of those with potential to RTW. The studies reviewed by Turner-Stokes et al. (2005) did not present specific RTW intervention and their primary outcomes seem to focus just on functional outcome. None of the studies in Table 2.1 had a RTW intervention programme for stroke survivors which was offered only at the workplace and only one of these studies (Black-Schaffer and Osberg, 1990) related just to stroke. This type of intervention will be researched in the current study.

The RTW intervention literature above indicates that early RTW interventions which include communication between the employer, employee and health provider as well as workability assessments which include a work visit may increase the rate of RTW for stroke

survivors. The benefits of reasonable accommodation are also highlighted; however there can be a disadvantage if the employer has to carry all the costs of work adaptations. The intervention has to be individual specific as stroke survivors are heterogeneous.

## **2.9 SUMMARY OF LITERATURE REVIEW**

A full vocational rehabilitation programme as defined in various studies caters for people who were previously employed and need to return to employment after being on sick leave or after temporary incapacity; it also caters for people who lost their jobs or who were never employed. Vocational rehabilitation should be differentiated from treatment interventions which are directed mainly at pathology and relieving the symptoms resulting in RTW as an indirect secondary outcome.

There is a wide range of RTW rates for stroke survivors across studies. Differences found may also be a reflection of varying economic conditions across countries such as unemployment rate, retirement age and cultural factors such as the availability of help from family members and the disability compensation structure.

The following factors were found to increase the likelihood of RTW: younger age; higher educational level; higher income; white collar jobs; advice given to the stroke survivor about possible RTW; the person's desire or motivation to go back to work; flexibility in the scheduling of the work; having workability assessments; and holding the stroke survivor's job open for at least six months. The following factors were found to decrease the likelihood of RTW: blue collar jobs; reduced functional ability in ADLs and mobility; deteriorated cognitive function; the presence of co-morbidities such as HIV/AIDS, depression and fatigue; lack of family support; negative employer attitude; costly work accommodations; architectural barriers limiting accessibility to the building; lack of appropriate transportation; poor local economy with many young unemployed; and social protection systems that provide more disability grants than enable RTW.

Determining potential successful RTW requires identification of the employee's work potential, employer support and the work context. Thus there is a need for communication between the health professional, employee and employer when workability is assessed. There are very few studies that present RTW intervention programmes specifically for stroke survivors. The literature indicates that early RTW intervention which includes communication between the employer, employee and health provider and workability assessment which includes a work visit may increase the rate of RTW for stroke survivors. The benefits of reasonable accommodation for RTW are also highlighted; however there can be a disadvantage if the employer has to carry all the costs of work adaptations. The RTW intervention has to be individual specific as stroke

survivors are heterogeneous. In this literature review, no study could be identified that investigated the effects of a RTW intervention programme for stroke survivors offered at the workplace only.

## **CHAPTER 3**

### **3. METHODOLOGY**

The methodologies used to answer the objectives for stage one (current practice in RTW invention programmes offered in Gauteng) and stage two (RTW intervention) of the study are presented in this chapter. The methodology for stage one is presented in section 3.1 and for stage two in section 3.2 below. Data analysis is discussed at the end of each section. Ethical considerations are discussed towards the end of the chapter.

#### **3.1 STAGE ONE METHODOLOGY**

The objective for the stage one study was to establish current practice in RTW intervention programmes for stroke survivors in the Gauteng province of South Africa.

##### **3.1.1 Research design**

A cross sectional observational quantitative study was done using a self administered questionnaire to establish current practice in RTW intervention programmes for stroke survivors in the Gauteng province of South Africa.

##### **3.1.2 Sample selection and size**

All stroke rehabilitation facilities within the Gauteng province were included in the stage one study. These facilities included private and government stroke rehabilitation units, government hospitals and primary health care facilities.

##### **3.1.3 Instrumentation**

A questionnaire was developed (See Appendix A) to determine current practice in work place intervention programmes in the Gauteng province of South Africa. The questionnaire had sections that covered the following: basic information about the clinical facility; in-patient rehabilitation services in preparation for RTW; out-patient rehabilitation services in preparation for RTW; commonly used assessment tools; whether the tools used were standardised or not; content of workplace intervention programme; perceived barriers of RTW, perceived enablers of RTW and employer involvement.

### **3.1.4 Procedure**

#### **3.1.4.1 Content validity of the questionnaire and pilot study**

A project development group meeting with stroke rehabilitation therapists was held to validate the content of the current practice questionnaire. The project development group was made up of two physiotherapists working in the field of neurological rehabilitation, two occupational therapists with vocational rehabilitation experience, three therapists with research experience, and one therapist working in the field of public health. Each question on the questionnaire was validated against the aim and objective of the study. Essential questions were added and invalid and redundant questions were removed. Some of the questions were rephrased to improve clarity and questions were rearranged to improve flow of information. After corrections were made the final document was sent to the project development team for final endorsement. At this stage the questionnaire was considered ready for the pilot project as no further recommendations were made by the project development group.

The purpose of stage one pilot study was to enable the researcher to: determine clarity of the current practice questionnaire and to check if what was being asked could be captured on a statistical spread sheet for analysis; identify any unforeseen problems that could occur during the data collection process; and establish internal consistency of the test scores. See Appendix B for details of the pilot study.

#### **3.1.4.2 Main study**

The stroke rehabilitation facilities were identified from the Gauteng Provincial Department of Health database of clinical facilities within the province. After ethical clearance and the Gauteng department of health permission were sought and granted for this study, fifty three questionnaires were posted with an enclosed self addressed stamped envelope and information sheet to the identified hospitals, rehabilitation units and primary health care facilities that offer stroke rehabilitation services within the Gauteng province of South Africa. Each facility received one questionnaire and was requested to send the responses based on consensus among therapists working with stroke survivors in that particular facility. Responses that required patient statistics were based on the daily patient statistics which therapists record on a regular basis at their clinical facilities, which is standard practice for all clinical facilities. A phone call to these institutions was made during the third week after postal of questionnaires to verify receipt and to remind them to return the questionnaire. Arrangements were made to deliver and collect questionnaires where feasible.

Anonymity of the participating institutions was maintained throughout; however the type of institution could be identified as they were required to indicate this on the questionnaire. Participants were given an option of ticking on the questionnaire to show that they agreed to participate in this study. Data from the questionnaires was entered as they returned and the last questionnaire was received four months after distribution. Thirty six (68%) of the questionnaires were returned.

### **3.1.5 Data analysis**

The STATA 10 software version 10.2 was used to analyse data. Continuous data was summarised using means and standard deviations and categorical data was summarised using frequencies and percentages. Responses to open ended questions were categorised into themes and items within each theme were summarised using frequencies and percentages. Logistic regression was done to establish the odds of offering RTW services per clinical setting. A Fisher's exact test was used to establish the relationship between clinical facility and perceived barriers and enablers of RTW.

## **3.2 STAGE TWO METHODOLOGY**

The objectives for stage two were to establish:

- The characteristics (demographic information; premorbid job content and functional level (ADLs, mobility and basic cognitive function) of the study group by eight weeks, three and six months after stroke.
- The stroke survivors' perceived quality of life by eight weeks, three and six months after stroke.
- The stroke survivors' and employers' perceived barriers and enablers of RTW.
- The rate of RTW after a six week workplace intervention for previously employed stroke survivors at three and six months after stroke.
- Factors which are predictive of return to work in this study group.

### **3.2.1 Study design**

Stage two had three study designs.

- i) A randomised controlled trial (RCT) with a follow-up of three and six months to establish pre and post intervention outcomes (primary outcome: RTW rate; secondary outcomes included functional level (ADLs, mobility and basic cognitive function) and perceived quality of life).
- ii) A quantitative cross sectional study to establish factors which were predictive of RTW.
- iii) A qualitative study to establish the stroke survivors' and employers' perceived barriers and enablers of RTW (this was done with the experimental group only).

This study consisted of two groups: the experimental group that received usual stroke care and a six week workplace intervention programme; the control group that received usual stroke care only.

### 3.2.2 Variables

#### Dependent variables:

- The rate of RTW
- Stroke survivors' quality of life
- Stroke survivors' and employers' perceived barriers and facilitators of RTW
- Functional level (ADLs, mobility and cognitive)

**Independent variable:** six week workplace intervention programme.

### 3.2.3 Sample selection and size

Participants who were working at the time of having stroke were recruited from Chris Hani Baragwanath academic hospital, Helen Joseph hospital and Kensington Life rehabilitation centre. Chris Hani Baragwanath academic and Helen Joseph hospital were selected as they are the University of the Witwatersrand teaching hospitals and have stroke clinics. Kensington Life rehabilitation was selected because it has a stroke rehabilitation unit. The sample consisted of stroke survivors who were blue and white collar employees and worked in various employment sectors.

- i. STATA 9 was used to calculate the sample size for the RCT. Sample size calculations were based on the findings from Alaszewski et al., (2007) (38%) and Leng (2008)'s (7%) RTW rates for stroke survivors. An assumption was made that those without intervention will have a minimum RTW of about 7% while the RTW rate of the experimental group was estimated to be at least 38%. A two group continuity corrected  $c^2$  test with a 0.050 one-sided significance level had a 90% power to detect the difference between a Group 1 proportion ( $p_1$ ) of 0.380 and a Group 2 proportion ( $p_2$ ) of 0.070 (odds ratio of 0.123) when the sample size in each group is 36 (72 participants without inflation; 80 with inflation for 15% possible dropouts).
- ii. Sample size calculations for the quantitative cross sectional study to establish factors which are predictive of RTW were based on the following seven broad categories of factors that may influence RTW identified from literature: age, type of job, reasonable accommodation, functional ability, the presence of co-morbidities, family support, and environmental barriers (community and work). For every factor that is considered to have a possibility of influencing the results of the study, at least ten participants are required (Nunnally, 1978). In this study seven factors were identified

as factors that may have an influence on RTW. Thus the minimum sample size for this study was 70 participants. All RCT participants were included in this study.

- iii. No sample size calculations were made for the qualitative study to establish the stroke survivors' and employers' perceived barriers and enablers of RTW which was done with the experimental group only. The interviews were conducted until data reached saturation point (when the same issues were emerging from the interviewees). Purposeful sampling method was used to include stroke survivors and employers in blue and white collar occupations.

**Randomisation procedure:** Participants were given an information letter and asked to give consent if willing to take part in the study. After consent was obtained they were screened to identify those who met the inclusion criteria. The participants were allocated consecutive numbers and then randomly allocated to either intervention or control group using an Excel computer generated randomisation list. There was no stratification. Concealment was ensured by having a research assistant placing allocations in sequentially numbered opaque envelopes without the researcher's involvement. Failure to conceal the allocation schedule has been shown to be one of the most important sources of bias in randomised trials (Schulz et al., 1995). The researcher remained blinded to participant allocation throughout the study while doing assessments. The research assistants did the intervention. The stroke survivors and their employers were not blinded to allocation.

### **3.2.4 Inclusion criteria**

Stroke survivors who met the following criteria were included in this study:

- Between the ages of 18 and 60 years (to exclude children and people who were likely to opt for early retirement).
- Employed in the formal sector at the time of stroke (blue collar and white collar workers).
- Barthel Index score of at least 60% (to exclude those with severe functional limitations).
- Reside and work in the Gauteng province (to be able to participate in the RTW intervention programme).
- Stroke for less than eight weeks at the time of baseline assessment (to start the intervention just after the end of the general official sick leave period).

### **3.2.5 Exclusion criteria**

- Global and receptive aphasia.
- Dependence in ADLs before stroke.
- Involvement in another workplace intervention programme at the time of the study.
- Existence of a conflict between the employee and the employer with legal involvement.

### **3.2.6 Instrumentation**

The following instruments were used for the data collection process and to answer each of the objectives.

**3.2.6.1 A demographic questionnaire** (Appendix C) was developed to establish the characteristics of all stroke survivors included in the RCT. The following were covered in this questionnaire: age; gender; marital status; side of hemiplegia; date of stroke; educational level; premorbid occupation; length of employment at current job; dependents; support from caregiver; co-morbidities; type of rehabilitation received; premorbid financial role in the family; monthly household income; sick leave duration; disability insurance and state disability grant.

A project development group meeting with stroke rehabilitation therapists was held to validate the content of this demographic questionnaire. The project development group was made up of two physiotherapists working in the field of neurological rehabilitation, two occupational therapists with vocational rehabilitation experience, three therapists with research experience, and one therapist working in the field of public health. Each question on the questionnaire was validated against the aims and objectives of the study. Essential questions were added and invalid and redundant questions were removed. Some of the questions were rephrased to improve clarity and questions were rearranged to improve flow of information. After corrections were made the final document was sent to the project development team for final endorsement. At this stage the questionnaire was considered ready for data collection.

#### **3.2.6.2 Functional level (ADLs) was established for all study participants using the Barthel Index (BI) (Appendix D)**

Functional ability as measured with the Barthel Index (BI) is an important predictor of RTW after stroke (Wozniak et al., 1999). The BI was developed to measure functional independence in personal care and mobility and it has been used with rehabilitation of patients to predict length

of hospital stay, estimate prognosis, and to anticipate discharge outcomes. The BI and Functional Independence Measure (FIM) are the most common measures of disability used in RCTs examining stroke rehabilitation. However, the BI is used more often than the FIM (Sangha et al., 2005).

The BI and FIM are recommended for group comparison studies and not for individual patient decision making (Hobart et al., 2001). The FIM score has been shown to correlate with vocational outcomes in patients with traumatic brain injury, but no such relationship has been demonstrated in patients with stroke (Keyser-Marcus et al., 2002). It is on this basis that the BI was chosen for use in the current study.

The BI is easy to apply and has been well validated for use with stroke survivors (Collin et al., 1988; Green, Forster, and Young, 2001). Non-medical personnel can use the BI reliably, as established by Schlote et al. (2004). There is no difference in the results of the BI when using four different methods of obtaining the score (i.e. self reporting, asking a trained nurse, and separate testing by two skilled observers) (Collin et al., 1988). The coefficient alpha of the BI was found to be 2.0 by Green, Forster, and Young (2001).

A BI score of at least 60% indicates that a person is independent for vital care, such as moving around unassisted, sphincter control, and eating in addition to personal toileting (Sulter, Steen, and de Keyser, 1999). Independence with minimal assistance (e.g. ability to get dressed and move from arm-chair to bed unassisted) was found to coincide with a score of 85% (Sulter, Steen, and de Keyser, 1999). A BI score of 90% (18/20) signifies the turning point whereby help from another person is not required (Uyttenboogaart et al., 2005).

There are many versions of the BI, but the 10 item BI with a total score of 20 (Collin et al., 1988) was used in this study. This choice was based on the high reliability coefficient of this version (0.99) when compared with the original BI (0.87), Modified BI (0.95) and the Modified scoring (0.90) (Shah, Vanclay, and Cooper, 1989). This tool was tested for inter and intra rater reliability in a study population similar to the one in this study (Johannesburg area of the Gauteng Province) and yielded a 98% inter- and 94% intrarater reliability (Mamabolo, 2005). There was thus no need to establish reliability of this tool for this study.

### **3.2.6.3 Functional level (mobility) was established for all study participants using the Modified Rivermead Mobility Index (MRMI) (Appendix E)**

The MRMI is a valid and reliable tool that requires minimal training before use (Johnson and Selfe, 2004). It has eight tasks which cover a range of activities from turning over in bed to walking. It is designed for all levels of patients, is easy to administer, requires no equipment and can be used in any setting. If the patient is unable to perform the aspect of mobility they score a zero; if they are able to perform it independently they score a five. The original Rivermead Mobility Index (RMI) was shown to be valid and reliable in a study by Chen et al. (2007). The standard error of measurement and smallest real differences were used to determine the absolute reliability of the RMI and it had a score of 0.8 and 2.2 respectively (Chen et al., 2007). However despite the validity and reliability of the RMI, there were concerns that it may not be responsive to small clinically significant changes in mobility of the stroke survivor (Wright, Cross, and Lamb, 1998). The MRMI was developed from the RMI to provide a more responsive measure of mobility (Lennon and Hastings, 1996).

Responsiveness of the MRMI was found to be high with a standardized response mean greater than 0.83 and it has a high concurrent, convergent and predictive validity when compared to the RMI (Hsueh et al., 2003). The MRMI also has responsiveness (effect size =1.15), test-retest reliability ( $r = 0.731$ ), inter-rater reliability (ICC = 0.98) and internal consistency (Cronbach's alpha = 0.93). The high responsiveness of the MRMI is attributed to its six point scoring system as opposed to the dichotomous scoring of the RMI (Hsueh et al., 2003). The major difference in scoring the patient when using the MRMI is that the therapist has to observe the activity. The patient is scored on the ability to carry out an activity. For there to be a significant change in the patient's mobility level, there has to be a greater than 4.5 change in the score (Lennon and Johnson, 2000).

Another mobility measure for stroke survivors is the motor assessment scale (MAS) which is a validated and reliable scale and measures mobility related activities similar to the MRMI (Carr et al., 1985); however it lacks clinical sensitivity when measuring stair-mobility in patients following stroke (Malouin et al., 1994). The MRMI was thus considered for use in this current study as it is responsive to clinically significant changes in mobility and sensitive when measuring stair-mobility.

#### **3.2.6.4 Perceived quality of life was measured with the Stroke Specific Quality of Life Scale (SSQoL) (Appendix F)**

The SSQoL scale is a patient-centred outcome measure intended to provide a quality of life assessment specific to stroke survivors (Salter et al., 2008). It consists of 49 items in 12 domains: energy, family roles, language, mobility, mood, personality, self care, social roles, thinking, upper extremity function, vision and work/productivity. Higher scores indicate better function. All domains of the SSQoL have an internal reliability  $\geq 0.73$  and most domains are responsive to change with a standardized effect size  $>0.4$  (Williams et al., 1999a). The SSQoL scale yields both domain scores and an overall summary score (Williams et al., 1999b). The use of proxies to complete the SSQoL scale is not reliable as the proxies' rate all domains of the SSQoL lower than the patient (Williams et al., 2006). This limitation applies to all stroke specific quality of life measures (Murphy et al., 2001), however for the patients who require a proxy, the Stroke Impact Scale is a more reliable and valid measure of health related quality of life after stroke (Duncan et al., 2002).

There are three stroke specific quality of life measures: The stroke adapted sickness impact profile (SA-SIP30); the stroke impact scale (SIS) and the stroke specific quality of life measure (SSQoL) (Kranciukaite and Rastenyte, 2006). The SA-SIP30 is an adapted version of the generic health quality of life Sickness Impact Profile (van Straten et al., 1997). The SIS is a stroke specific assessment scale which was developed with input from both stroke survivors and caregivers and is comprised of 59 items in eight domains (Duncan et al., 2003). The SSQoL was developed from a series of focused interviews with stroke survivors and thus is considered to be a patient centred outcome measure (Kelly-Hayes, 2000).

The four SIS physical domains can be summed together to create a single physical domain score whereas all other domains should remain separate (Duncan et al., 1999) whereas the SSQoL scale can yield both domain scores and an overall SSQoL score. The SSQoL even though more complex than the SIS (Kranciukaite and Rastenyte, 2006) was selected for use in the current study as it is a patient-centred outcome measure, allows for summary scores of all 12 domain scores and no proxies were required as stroke survivors with receptive aphasia were not included in the study.

### **3.2.6.5 The job content questionnaire**

The job content questionnaire (JCQ) (Appendix G) was used to gain insight about the stroke survivors' job skill discretion and job demands. This is a questionnaire based instrument designed to measure content of respondents' task(s) in a general manner which is applicable to all jobs. It assesses the following aspects of the job: decision latitude (skill discretion and decision authority); psychological demands (workload, mental requirements and organisational constraints put on the worker); social support; physical demands and job insecurity. In addition to the standard JCQ questions, users of this questionnaire are encouraged to add their own specific "umbrella questions" that refer to the measurement of specific job conditions in their study group (Karasek et al., 1998). Internal consistency of the JCQ is similar across populations and it has a Cronbach's alpha of 0.73 for women and 0.74 for men (Karasek et al., 1998).

The JCQ has been tested and successfully used in a variety of populations (Ostry et al., 2001; Landsbergis et al., 2002; Ferrario et al., 2005). Its use has been tested in both developed and developing countries and in formal and informal jobs and found to have good performance (de Araujo and Karasek, 2008). The following are considered to be normal score ranges for job aspects included in this study: skill discretion ( $33.5 \pm 8.5$ ) and job demands ( $30.9 \pm 8.48$ ) (combined physical and psychological job demands) (Spring, 2007).

### **3.2.6.6 The Montreal Cognitive Assessment (MoCA) (Appendix H)**

The MoCA and the Mini-mental state examination (MMSE) are commonly used in screening for post stroke cognitive impairment (Folstein, Folstein, and McHugh, 1975; Nasreddine et al., 2005). The MoCA assesses different cognitive domains namely attention and concentration; executive functions; memory; language; visuoconstructional skills; conceptual thinking; calculations and orientation. The total possible score is 30 points and a score of 26 or above is considered normal. An additional point is added if a person has 12 or fewer years of formal education. A score of  $22.1 (\pm 3.11)$  signifies mild cognitive deficits and that of  $16.2 (\pm 4.8)$  indicates that there is severe cognitive impairment (Nasreddine et al., 2005). The MoCA has sensitivity of 90% and 94% when using a cut-off score of 26 (Nasreddine et al., 2005; Smith, Gildeh, and Holmes, 2007). The test-retest reliability of the MoCA is 0.92 with an internal consistency of 0.83 (Nasreddine et al., 2005).

Despite its high sensitivity, the MoCA has lower specificity than the MMSE and thus in some instances it may show cognitive impairments when there are none (Schweizer, Al-Khindi, and Macdonald, 2012). The lower specificity of the MoCA should however be interpreted with

caution as it assesses a variety of cognitive domains and thus the total score is a reflection of performance in various cognitive domains (Schweizer, Al-Khindi, and Macdonald, 2012). Relative to the MMSE, the MoCA has been shown to detect more cognitive impairments in stroke survivors (Pendlebury et al., 2010). The MoCA is also more reliable as an indicator of cognitive functional status and has less ceiling effect than the MMSE (Toglia et al., 2011). The MMSE is less capable of detecting complex cognitive impairments in domains such as visuospatial, executive function and abstract reasoning, and in addition the MMSE domains of attention and delayed recall contain subsets which are not as challenging as those on the MoCA (Dong et al., 2010). The MoCA was thus considered the assessment of choice for the current study as it assesses more complex cognitive function required for a stroke survivor who considers returning to work.

### **3.2.6.7 The therapist portable assessment lab (TPAL)**

The TPAL was used in this study to gain insight into the participants' work skills – it contains 12 work modules designed to assess cognitive and psychomotor abilities. It is portable and can be used in a variety of settings. The modules are as follows: mail sort (sort 100 preaddressed post cards by zip code and file in a 21 slot mail box – for clerical perception, manual coordination, and visual discrimination); alphabetizing (sort 50 index cards by name and file in a standard 3x5 card box with index tabs – for clerical, verbal and sequencing ability); visual maze (use an etch-a-sketch to draw a line through a special maze overlay – for visual motor coordination); payroll computation (use an electronic calculator to calculate simple payroll information and record it on a summary sheet – for clerical, numerical ability and perception); patient information memo (read several short biographies and transfer pertinent facts to patient information sheets – for reasoning and language ability and clerical perception); small parts A (use tweezers to make simple assemblies from washers and brads – for fine motor coordination); small parts B (use fingers and a small screw driver to drive screws into a metal plate – for eye hand coordination); ruler reading (use a standard ruler to make various measurements and record them on a work sheet – for reasoning and measurement ability); pipe assembly (use a small pipe wrench and a screw driver to make an eleven item pipe assembly from a diagram – for reasoning ability, spatial perception and manual dexterity); O-rings (sort 50 O-rings by size into compartments in a tray. There are 12 sizes, each with three to five O-rings – for form perception and reasoning ability); block design (use 20 blocks to reproduce a design from a diagram – for spatial perception); colour sort (separate 50 multi-coloured cards into seven stacks according to the colour at a particular location on the card – for colour discrimination) and circuit board (follow a

diagram to construct a simple electrical circuit from wires and switches – for reasoning ability, spatial and form perception, and motor coordination).

The modules aid in formulating treatment plans by providing insight into the patients' skills. The scoring is based on the methods-time measurement (MTM) rate of work which refers to the time in which well trained workers would be expected to perform the task repeatedly over the course of the eight hour working day in a typical industrial setting (See Appendix I for the MTM rate of work percent table). If a test-taker can perform the module quickly enough, it will be concluded that he or she has the capacity to perform similar work at a competitive pace; however the scoring does not take into consideration endurance. The MTM scoring system provides a method of interpreting work module scores. A score which indicates normal working capacity is 87 – 112.5%, and those who score between 60 and 86% may meet the open labour market requirements if they receive rehabilitation (Valpar International corporation, 1992). This assessment will be done during week one of the intervention programme.

#### **3.2.6.8 Return to Work questionnaire**

A RTW questionnaire was used to establish the rate of RTW (Appendix J). This questionnaire was developed and validated for content by Duff (2012), who also established inter and intrarater agreement greater than 80% for all items on the questionnaire. This questionnaire is in the form of a tick list indicating whether stroke survivors returned to work (premorbid job or new job), how long they had been back at work, if they intended to stay at work or resign, if adaptations were made to the working environment, and current financial role in the family. If they did not RTW, a list of possible reasons was provided for the stroke survivor to select from (e.g. family did not allow her/him to go back to work; lack of transport; embarrassed about the disability; building not accessible; requires further rehabilitation).

#### **3.2.6.9 Schedule of interview questions to establish stroke survivor and employer perceived barriers and enablers of return to work**

A schedule of interview questions was developed based on schedules developed by Medin, Barajas, and Ekberg (2006). Content validity of these interview questions was done during the project development group meeting with stroke rehabilitation therapists. The project development group was made up of two physiotherapists working in the field of neurological rehabilitation, two occupational therapists with vocational rehabilitation experience, three therapists with research experience, and one therapist working in the field of public health. Each question was validated against the aims and objectives of the study. Clarity was provided and

questions were rearranged to improve flow of information. After corrections were made the final schedule was sent to the project development team for final endorsement. At this stage the interview schedule was considered ready for data collection. Questions were asked at baseline assessment and sub questions were asked at the end of the intervention programme. The interviews were semi structured and tape recorded. Interview notes were taken for those who refused to be recorded. Below is the schedule of interview questions:

- In your managerial (stroke survivor version: work) experience, what do you think makes people stay long in their job?
- What is it that you look for in an employee in this situation (stroke survivor version: from an employer when you are in this situation)?

**Sub question**

- How has (will) your employee's stroke affected the working environment? (For stroke survivor: How has stroke affected your working life?)
- Please tell me about factors that you believe could facilitate and promote the RTW after stroke.
- Please tell me about factors that you believe could be obstacles for RTW after stroke.

**Sub questions:**

- If you (employee) have (has) returned to work, what challenges were faced on coming back to work? How have these been handled?
- If you (employee) have (has) not returned to work, how do you feel about (them) continuing to work in future?
- What did you think about the intervention? (Which aspects of the intervention worked well and which aspects did not work well?)
- Is there anything else that you think I should ask about that you would like to tell me?

At the end of the study the tape recordings were transcribed and combined with the interview notes. Data cleaning was done by listening to the tape recordings while reading transcribed notes. Similar items were coded by hand and validation of these codes was done by asking one therapist with experience in research to do the codes and compare to the researcher's codes before creating themes which were analysed.

### **3.2.7 The workplace intervention programme**

The main purpose of the workplace intervention programme was to facilitate RTW. Development of this intervention programme was based on literature findings and input from the project development team which was involved with validation of the study questionnaires and interview question schedules. The programme was tailored according to the functional ability and workplace challenges of each stroke survivor. All intervention sessions except for week one (assessment) took place at the stroke survivors' place of work. This programme was administered by a physiotherapist and an occupational therapist who were trained to be research assistants. A social worker/psychologist/speech and hearing therapist were involved when necessary. The stroke survivors were seen once per week for one hour per session except for work skill assessment sessions which took a minimum of four hours depending on the amount of time it took to administer TPAL modules and the JCQ which varied from person to person. Below is an outline of the workplace intervention programme:

#### **Week one**

Purpose: Assessment for work skill using TPAL and administration of the JCQ. This was done by an occupational therapist who was one of the intervention research assistants. The assessment included work modules which identified potential problems such as: visual discrimination; eye hand coordination; form and spatial perception; manual dexterity; colour discrimination; cognitive problems, and job specific physical demand factors.

#### **Week two**

Purpose: To explore the stroke survivor and employer's perceived barriers to and enablers of RTW. The therapist (intervention research assistant) interviewed the stroke survivor and employer separately to establish perceived barriers and enablers of RTW. This was followed by a meeting between the therapist, stroke survivor and employer/supervisor to discuss and develop a plan to overcome identified barriers and to strengthen identified enablers based on consensus between stroke survivor and employer. At this stage it was emphasised that the workplace intervention plan does not mean that the employee is urged to RTW immediately and that the employer was also not obliged to offer the employee their job/work and that this was still part of rehabilitation.

### **Week three**

Purpose: To work on problems/barriers identified during week two. This differed between individuals and workplaces. It was mainly a work visit for the stroke survivor to demonstrate what they do at work and identify what they can still do safely and what they cannot do. This included vocational counselling and coaching; emotional support; adaptation of the working environment; advice on coping strategies to compensate for mobility and upper limb functional limitations, and fatigue management. The programme was individual specific. A social worker/psychologist/speech therapist was involved when necessary. A plan for reasonable accommodation was discussed where possible (e.g. working half day at the beginning; being allowed to come to work later; using head phones instead of hand held phone; doing light duty such as administration instead of lifting heavy objects while recovering).

### **Weeks four, five and six**

Purpose: Continuation of the intervention programme, while monitoring progress, and making necessary adjustments as per stroke survivor and employer's needs. This was done at the workplace while the participants continued with their usual therapy at the hospital. Final interviews of the stroke survivors and employers were conducted using sub questions in the schedule of interview questions.

### **Control group:**

The control group continued with usual therapy at the hospital provided by the physiotherapist and occupational therapist (with speech therapist and/or social worker when necessary). Usual care in these study settings included general activities to improve impairments and activity limitations and prepare the stroke survivor for return home. The treatment took into consideration the stroke survivor's job requirements, but without work visits and workplace intervention. All therapy was hospital based (inpatient and outpatient).

## **3.2.8 Procedure**

### **3.2.8.1 Pilot study**

The stage two pilot study was conducted prior to the main study (See Appendix B for pilot study details). The purposes of the stage two pilot study were to: establish understanding of the demographic questionnaire, BI, MRMI, MoCA, SSQoL, and the JCQ to this study group and to the researcher and research assistants; establish if there was agreement between the two sets of data (researcher's and research assistant's data); establish if it would be possible to recruit

stroke survivors who met the inclusion criteria for the main study by six weeks after stroke; enable the research assistants to familiarise themselves with administration of the TPAL; establish the amount of time it took to administer the instruments; and to identify any unexpected problems that could arise during the data collection process.

After completion of the pilot study the researcher and the research assistants were well prepared to do all patient assessments and there was generally a good agreement between the scores. Items which had poor agreement were clarified between the assessors and adjustments made to the questionnaires. It was realistic to expect to find patients with a stroke duration of less than six weeks who also had the following characteristics: age range of 18 – 55 years; employed at the time of having stroke; independent in activities of daily living as indicated by a BI score of at least 60% and have cognitive ability of at least 19 out of 30 (63%) on the Montreal cognitive assessment.

#### **3.2.8.2 Main study**

Research assistants (two physiotherapists and two occupational therapists) with experience in research were recruited and appointed. The research assistants were trained to give them an understanding of the study and instruments to be used. Two occupational therapists and one physiotherapist were appointed as intervention therapists who were not blinded to participant allocation. One physiotherapist and the main researcher were the assessing therapists and remained blinded to participant allocation throughout the study. The stroke survivors and their employers were not blinded to allocation.

Physiotherapists in charge of the neurological rehabilitation sections at the Chris Hani Baragwanath academic hospital, Helen Joseph hospital and Kensington rehabilitation unit were contacted by the researcher on regular basis to check if there were new stroke survivors who were working prior to having stroke. Diagnosis of stroke was primarily based on the history of the present medical condition and clinical presentation.

Whenever potential research participants (stroke survivors) were identified by physiotherapists at the research sites, the researcher/research assistant would go and determine if they met the inclusion criteria. Employers of stroke survivors who met the inclusion criteria were contacted by the researcher and informed about this study and then asked for permission to take part in this study. The employers were also informed about the possibility of the stroke survivor not being

allocated to the intervention group. A research assistant who was appointed to do the random allocations did random computer allocations and placed the numbers in opaque sealed envelopes. These were given to the researcher. As the researcher identified stroke survivors who met the inclusion criteria she wrote the name of that stroke survivor on the front of the sealed envelope. The researcher handed the envelope to the intervention research assistant who opened it to identify the group to which the stroke survivor was allocated.

The researcher/assistant administered the demographic questionnaire (including the MoCA, MRMI, BI and SSQoL). This was done for all stroke survivors in this study.

The intervention research assistants began to implement the workplace intervention.

- The Occupational therapist (OT) did work skill assessment using the TPAL including administration of the JCQ.
- An interview was conducted by the intervention research assistant (OT/Physiotherapist) with the stroke survivor to establish the perceived barriers and enablers of RTW. This was followed by an interview with the employer to also establish perceived barriers and enablers. These interviews were semi structured guided by the interview questions schedule developed for this study.
- This was followed by a meeting between the research assistant, employer and stroke survivor to discuss possible solutions to perceived barriers.
- The interviews were tape recorded and transcribed. Interview notes were taken for participants who refused to be tape recorded.
- Intervention research assistants implemented possible solutions towards the intervention based on the interview and work skill assessment (this included vocational counselling and coaching; emotional support; adaptation of the working environment; advice on coping strategies to compensate for mobility and upper limb functional limitations, and fatigue). The programme was individual specific. A social worker/psychologist/speech therapist was involved when necessary.
- The stroke survivor and employer were interviewed in English (which was their preferred language) by the intervention research assistants at the end of the intervention programme to ask them sub questions on the schedule of interview questions.
- The interview transcripts were cleaned by listening to the tapes again while reading the transcripts to check that all the information had been captured correctly. Codes were then allocated to common items on the interview notes and transcripts. A therapist with

experience in the field of research did the second coding for validation of the selected codes. Themes were formulated from the validated coded items.

- The researcher administered the RTW questionnaire, BI, MRMI, MoCA and SS-QOL on all stroke survivors in the study at three and six months after onset of stroke.
- Stroke survivors who could not RTW were sent for further rehabilitation if indicated or referred to the nearest sheltered employment or stroke support group if there was one within their area or within reach by their means of transport.
- All stroke survivors in the study continued with their usual stroke care throughout the study period.

### **3.2.9 Ethical considerations**

- Permission to conduct the study at the research sites and Gauteng Department of Health was sought and granted.
- Ethical clearance was granted by the University of the Witwatersrand committee for research on human subjects: Clearance number **M081132** (See Appendix K).
- The RCT was listed on the South African National Clinical Trials register. DOH Trial Number: **DOH-27-0512-4079**
- Participation in this study was voluntary and stroke survivors and employers could withdraw from the study at any time without penalty.
- An information and consent letter was given to the stroke survivors and employers to sign prior to participation in this study.
- Information received from the stroke survivors and employers was treated confidentially.
- Each stroke survivor and employer was allocated a code to ensure anonymity.
- Permission was sought from the hospital/stroke rehabilitation unit management prior to data collection at each institution.

### **3.2.10 Data analysis**

#### **The characteristics and perceived quality of life of stroke survivors in this study**

Descriptive statistics were used to compare baseline characteristics of stroke survivors between the control and intervention groups. Categorical data were summarised as numbers and percentages. Continuous data were summarised as means and standard deviations. At baseline, three and six months after stroke, a two sample t-test was used to compare the means of continuous variables that were normally distributed (age and SS-QoL) between the groups. At

these same time points the Mann-Whitney U-test was used to compare the medians of continuous variables that were not normally distributed (stroke duration, dependants, years in current job, total years worked, sick leave duration, BI, MRMI and MoCA) between the groups. The Fisher's exact test was used to establish the relationship between categorical variables of the control and intervention groups for variables which had less than five observations per category (marital status, educational level, monthly income, having a helper at home, having to pay helper, type of speech problem, co-morbidities, type of occupation, and key physical job demands). The Chi-squared test was used to establish the relationship between categorical variables of the control and intervention groups for variables which had more than five observations per category (gender, side of hemiplegia, financial role and having speech problem). These analyses were done at baseline.

### **The stroke survivors' and employers' perceived enablers and barriers of return to work**

The qualitative information obtained for stroke survivors' and employers' perceived barriers and enablers of RTW were analysed as follows: assembled qualitative data of stroke survivors' and employers' perceived barriers and enablers of RTW were examined, compared, contrasted, coded and meaningful patterns and themes were interpreted. See 3.2.6.9 for details.

### **The rate of return to work after stroke**

The rate of RTW at three and six months after stroke was analysed as follows: percentage of stroke survivors that returned to work and those that did not RTW between control and intervention groups was determined. A two sample test of proportions was used to establish if there was a statistically significant difference between the proportion of those that returned to work and those that did not RTW between in the control and intervention groups.

### **Factors which are predictive of return to work after stroke**

Factors that are predictive of RTW were analysed as follows: an initial univariate logistic regression was done to identify all the variables that were to have significance in the prediction of RTW. This was followed by a multivariate analysis – stepwise, dropping insignificant variables in the process. Variables which were found to have a statistically significant difference between the control and intervention groups were controlled for to ensure that the intervention benefits were not affected by the group differences (these were side of stroke, educational level, cognitive function, ADL functional ability and mobility (BI and MRMI)).

**Data consideration**

The STATA 12 software version 12.1 was used to analyse data. All statistical analyses were performed according to the intention to treat analysis (ITT). The ITT analysis was used to establish adherence to the workplace intervention programme and the pragmatic estimate of the benefit of this intervention. Per protocol analysis was used to establish if any protocol deviations had caused bias. Per protocol analysis (also known as efficacy or explanatory analysis) is a comparison of treatment groups that includes only participants who complete the treatment originally allocated, and can lead to bias if not done together with intention to treat analysis (Shah, 2011).

Missing data was not imputed. Participants who could not complete the intervention were followed up to obtain the six month RTW outcome. Analysis was done at 95% confidence interval level with a p value  $\leq 0.05$  deemed as statistically significant.

## CHAPTER 4

### 4. RESULTS

#### 4.1 STAGE ONE: CURRENT PRACTICE IN RETURN TO WORK INTERVENTION

The results of the questionnaire based study on current practice in RTW intervention programmes for stroke survivors in the Gauteng province of South Africa are presented in this section. The return rate of the questionnaires was 68% (n = 36). Non-responders did not answer in spite of the telephone reminder. The highest numbers of non-responders were those from primary health facilities (n=10; 59%), followed by hospital based rehabilitation facilities (n=4; 23%), and the lowest was those from stroke rehabilitation units (n=3; 18%). Reasons for non-response are unknown to the researcher.

##### 4.1.1 Clinical setting in which therapists in this study worked

The clinical setting in which therapists in this study worked is shown in Table 4.1.

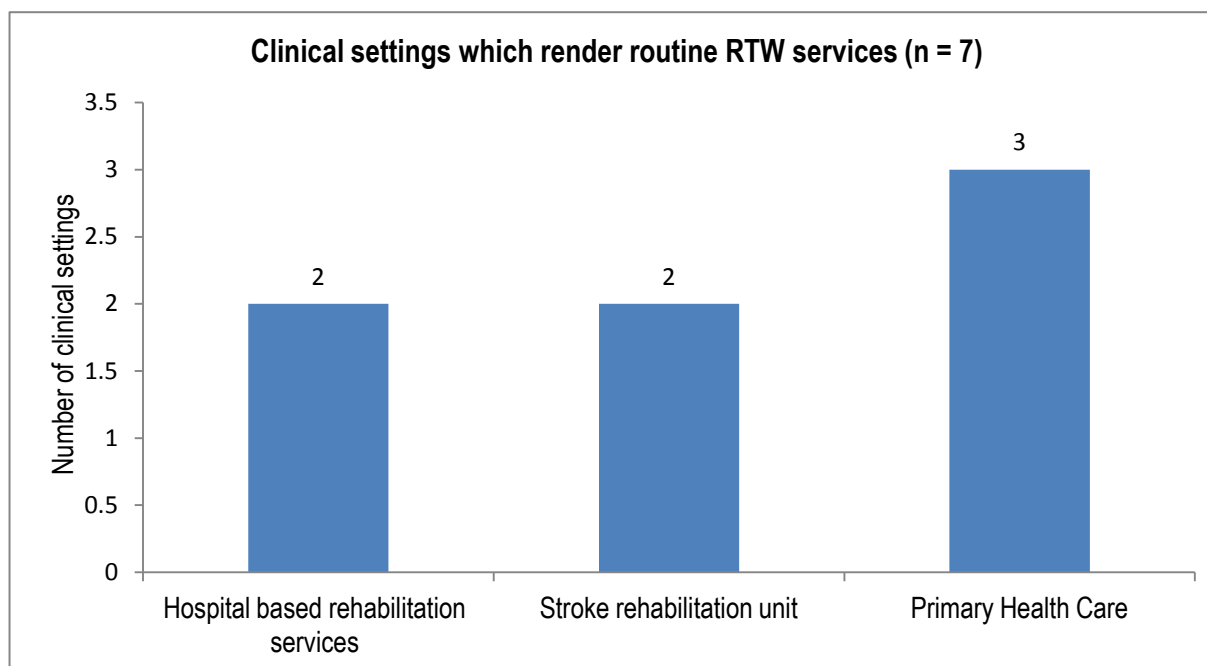
**Table 4.1 The clinical setting in which therapists in this study worked (n = 36)**

| <b>Clinical setting</b>                       | <b>n (%)</b>    |
|-----------------------------------------------|-----------------|
| <b>Hospital based rehabilitation services</b> | 18 (50)         |
| <b>Primary Health Care</b>                    | 13 (36)         |
| <b>Stroke rehabilitation unit</b>             | 5 (14)          |
| <b>Total</b>                                  | <b>36 (100)</b> |

The highest number of clinical settings that participated in this study were hospital based rehabilitation setting (n=18; 50%) followed by primary health care (n=13; 36%).

##### 4.1.2 Clinical facilities that rendered routine return to work services for stroke survivors

Seven (19%) clinical facilities rendered routine RTW intervention for stroke survivors. The distribution of these seven clinical facilities is shown in Figure 4.1 on the next page.



**Figure 4.1: The distribution of clinical settings which rendered routine return to work intervention (n = 7)**

RTW services were rendered more at the primary health care facilities (n=3; 43%) than at the hospital and stroke rehabilitation units.

#### **4.1.3 Reported number of stroke survivors and those who required return to work intervention**

Twenty seven (75%) of the clinical facilities in this study provided care for stroke survivors who may require intervention to help them RTW. On average 13 ( $\pm 15$ ) stroke survivors were seen at the clinical settings on a monthly basis and of these, an average of four ( $\pm 3$ ) people required RTW intervention on a monthly basis (see Table 4.2).

**Table 4.2 Reported number of stroke survivors and those who require return to work intervention (n = 36)**

| Clinical setting                       | Average stroke survivors/month<br>n | Stroke survivors who required RTW intervention<br>n (%) |
|----------------------------------------|-------------------------------------|---------------------------------------------------------|
| Hospital based rehabilitation services | 18.3                                | 3.9 (21)                                                |
| Stroke rehabilitation unit             | 11.3                                | 4.5 (40)                                                |
| Primary Health Care                    | 6.1                                 | 2.8 (46)                                                |

The average number of stroke survivors was higher (18.3) at the hospital based rehabilitation setting; however despite this high number those that required RTW intervention were mostly at a primary health care setting (n=2.8; 46%) compared to hospital based rehabilitation services (n=3.9; 21%).

#### 4.1.4 Return to work services rendered for stroke survivors

The number of clinical facilities which offered RTW services and those that did not render these services is shown in Figure 4.2 below.

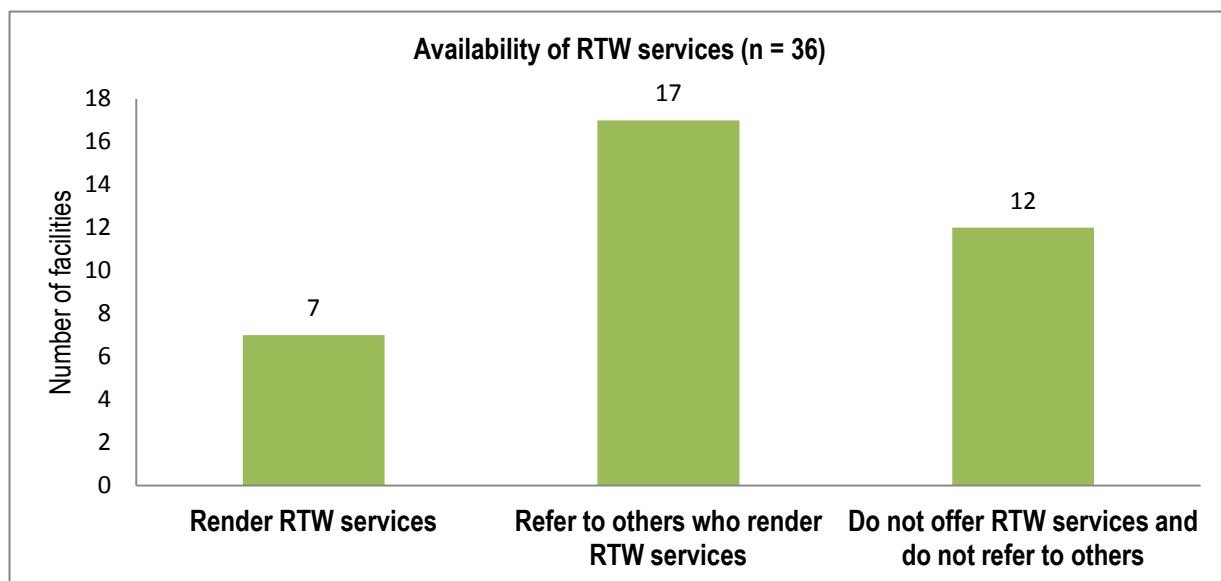


Figure 4.2 The number of clinical facilities which offered return to work services and those that did not render these services (n = 36)

Seventeen of the clinical settings (47%) referred stroke survivors to facilities which offered RTW services and twelve (33%) of the facilities did not refer stroke survivors for RTW and did not offer RTW services themselves.

The type of RTW intervention services rendered for stroke survivors is shown below in Table 4.3. Some facilities provided more than one type of service.

**Table 4.3 The type of return to work intervention services rendered for stroke survivors (n = 7)**

| <b>Service</b>                                                                       | <b>n (%)</b> |
|--------------------------------------------------------------------------------------|--------------|
| Communicated with the employers to discuss reasonable accommodation                  | 5 (71)       |
| Did assessments for potential to RTW                                                 | 4 (57)       |
| Used work samples to assess for potential to RTW                                     | 3 (43)       |
| Rendered rehabilitation services within the hospital and at the workplace            | 3 (43)       |
| Did work visit to assess physical job demands                                        | 2 (29)       |
| Used Functional Independent Measure and the Barthel Index to assess potential to RTW | 1 (14)       |
| Gave the employers regular feedback about stroke survivors' progress                 | 1 (14)       |

Five (71%) of the facilities communicated with the employer to discuss reasonable accommodation and four (57%) did assessments for potential to RTW.

#### **4.1.5 Reasons for not rendering return to work services (n = 29)**

The reasons for not rendering RTW intervention services for stroke survivors are shown in Table 4.4. Some facilities listed more than one reason.

**Table 4.4 Reasons for not offering return to work services (n = 29)**

| <b>Reason</b>                                                                          | <b>n (%)</b> |
|----------------------------------------------------------------------------------------|--------------|
| Refer the patients to other professionals who offer vocational rehabilitation services | 17 (59)      |
| Rehabilitation staff shortage                                                          | 10 (35)      |
| Patients were unemployed before having stroke                                          | 9 (30)       |
| Short hospital stay                                                                    | 6 (21)       |
| There is no appropriate equipment for RTW assessments                                  | 4 (14)       |
| Patients are too old to consider returning to work after stroke                        | 3 (10)       |

The most common reason for not rendering RTW services for stroke survivors was that those facilities referred their patients to other therapists who offered such services (n=17) (59%). This was followed by the rehabilitation staff shortage (n= 10; 35%).

#### **4.1.6 The odds of offering return to work services per clinical setting**

The logistic regression results for the odds of offering RTW services per clinical setting are shown in Table 4.5. The hospital based rehabilitation service was used as a reference.

**Table 4.5 The odds of offering return to work services per clinical setting (n = 36)**

| Clinical setting           | Odds Ratio | Std. Err | Z    | P>  z | 95% CI         |
|----------------------------|------------|----------|------|-------|----------------|
| Stroke rehabilitation unit | 5.33       | 6.30     | 1.42 | 0.15  | 0.526 – 54.032 |
| Primary Health Care        | 2.4        | 2.39     | 0.88 | 0.38  | 0.339 – 16.968 |

\*CI = Confidence interval

Although not statistically significant, the odds of offering RTW intervention services in a stroke rehabilitation unit seem to be 5.33 greater than in a hospital based rehabilitation facility. The odds of offering RTW intervention services at a primary health care facility seem to be 2.4 times greater than that for a hospital based rehabilitation facility.

#### 4.1.7 Therapists' perceived common barriers of return to work after stroke

An open ended question was asked about commonly perceived barriers of RTW. All answers were coded and categorised into common themes. Commonly perceived barriers of RTW after stroke are presented in Table 4.6 below.

**Table 4.6 Therapists' perceived common barriers of return to work after stroke (n = 36)**

| Barriers                                                                         | n (%)   |
|----------------------------------------------------------------------------------|---------|
| Severity of the patients' physical impairments                                   | 13 (36) |
| Patients unemployed at the time of having stroke                                 | 11 (31) |
| Inability to drive or access transport                                           | 5 (14)  |
| Lack of skills for less labour intensive work                                    | 5 (14)  |
| Therapists do not have equipment to assess patients for return to work potential | 5 (14)  |
| Want to receive a government disability grant                                    | 5 (14)  |
| Cognitive and visual problems                                                    | 5 (14)  |
| Stigma in the workplace                                                          | 4 (11)  |
| Rehabilitation staff shortage                                                    | 4 (11)  |
| HIV/AIDS complications of stroke                                                 | 1 (3)   |

The most commonly perceived barriers of RTW after stroke from therapists' perspective were the severity of the stroke survivors' physical impairments (n = 13; 36%) and their employment status at the time of having stroke (n = 11; 31%). The least perceived barrier of RTW was HIV/AIDS complications of stroke (n = 1; 3%).

#### 4.1.8 Therapists' perceived common enablers of return to work after stroke

An open ended question was asked about commonly perceived enablers of RTW. All answers were coded and categorised in common themes. Commonly perceived enablers of RTW after stroke are presented in Table 4.7 below.

**Table 4.7 Therapists' perceived common enablers of return to work after stroke (n = 36)**

| Barriers                                                                                   | n (%)   |
|--------------------------------------------------------------------------------------------|---------|
| Long hospital stay to allow for intensive rehabilitation                                   | 7 (19)  |
| Willingness of the employer to reasonably accommodate the stroke survivor at work          | 12 (33) |
| Family support                                                                             | 8 (22)  |
| Stroke survivors' motivation to go back to work                                            | 5 (14)  |
| Younger age at the time of having stroke                                                   | 5 (14)  |
| Higher educational level                                                                   | 3 (8)   |
| Long duration of employment at the time of having stroke                                   | 1 (3)   |
| Being a breadwinner at the time of having stroke                                           | 1 (3)   |
| Ability to communicate                                                                     | 1 (3)   |
| Multidisciplinary intervention between occupational therapy, physiotherapy and social work | 5 (14)  |

The most commonly perceived enablers of RTW after stroke from therapists' perspective were willingness of the employer to reasonably accommodate the stroke survivor at work (n = 12; 33%); family support (n = 8; 22%) and increased length of hospital stay to allow for intensive rehabilitation (n = 7; 19%). The least commonly perceived enablers of RTW were long term duration of employment at the time of having stroke; being a breadwinner at the time of having a stroke and ability to communicate (n = 1; 3%).

#### 4.1.9 The relationship between clinical facility and commonly perceived barriers and enablers of return to work after stroke

Results of a Fisher's exact test show that stigma in the stroke survivors' workplace was the only variable which had a statistically significant relationship with the type of clinical facility therapists worked at (p = 0.02). Therapists at primary health care facilities perceived stigma in the stroke survivors' workplace to be a barrier to RTW after stroke although none of the therapists from the hospital based rehabilitation facilities and stroke units perceived stigma in the workplace as a barrier of RTW.

#### **4.1.10 Summary of stage one main results**

Thirty six (68%) of the 53 questionnaires were returned. Seventeen (47%) of the 36 clinical settings referred stroke survivors to facilities offering RTW services; 12 (33%) facilities did not refer stroke survivors for RTW and did not offer RTW services; and seven (20%) facilities offered RTW services. Of the seven facilities that rendered RTW services for stroke survivors, five (71%) communicated with the employer to discuss reasonable accommodation and four (57%) did assessments for potential to RTW. The most common reason given by the 29 facilities for not offering RTW services was that they referred stroke survivors to other therapists who offered these services. The second most common reason was the unemployment status of the stroke survivor at the time of having stroke. The therapists' most commonly perceived barriers of RTW were the severity of the stroke survivors' physical impairments ( $n = 13$ ; 36%) and their employment status ( $n = 11$ ; 31%) at the time of having stroke. The most commonly perceived enablers of RTW were willingness of the employer to reasonably accommodate the stroke survivor at work ( $n = 12$ ; 33%), family support ( $n = 8$ ; 22%) and increased length of hospital stay to allow for intensive rehabilitation ( $n = 7$ ; 19%). Stigma in the stroke survivors' workplace was the only variable which had a statistically significant relationship with the type of clinical facility therapists worked at ( $p = 0.02$ ).

## **4.2 STAGE TWO: RETURN TO WORK INTERVENTION PROGRAMME**

The results of stage two of this study are presented in this section. The loss to follow-up that occurred during the study and the reasons for drop out and exclusion of some of the stroke survivors will also be explained in this section. The results for the intention to treat analysis are presented in this section and those for per protocol analysis are attached as Appendix T.

### **4.2.1 The distribution of the study sample and reasons for drop out and exclusion**

Eighty three stroke survivors who fulfilled the inclusion criteria for the study were invited to participate. Three declined to participate, and 80 were accordingly screened. The sample size for the RCT study was  $n=80$  stroke survivors. All 40 employers of stroke survivors in the intervention group agreed to participate in the study (to let the researcher visit the workplace for intervention). None of the stroke survivors who met the inclusion criteria and agreed to participate in the study were excluded. Eighty five of the stroke survivors approached, who were working before stroke, did not meet the inclusion criteria. Reasons for not meeting the inclusion criteria were: BI scores less than 60% at eight weeks after stroke ( $n = 52$ ); planned to reside outside the Gauteng province after discharge from the hospital ( $n = 24$ ); and were above the age 60 years ( $n = 9$ ).

When the sample size was initially calculated (see 3.2.3, i), RTW of stroke survivors in the control group was expected to be 7% and 38% for those in the intervention group. This would have resulted in a 31% RTW rate difference between the groups. In this study, 20% of those in the control group and 60% in the intervention group returned to work resulting in a 40% difference between groups. The increase in the difference between the groups means the sample size remained adequately powered at 90% to detect change in RTW rate between the control and intervention group in this study.

The sample size for the quantitative cross sectional study (see 3.2.3, ii) was also adequate as there were eight factors which had an influence on RTW (gender, sick leave duration, speech function, cognitive ability, ADLs functional ability, mobility functional ability, receiving workplace intervention and cholesterol), however cholesterol was not considered as a main factor as it does not have a direct relationship with RTW (see 5.2.5.3). Thus a total of 72 stroke survivors were adequate for the seven factors identified to influence RTW in this study. The distribution of the study sample over the course of the study is displayed in Figure 4.3.

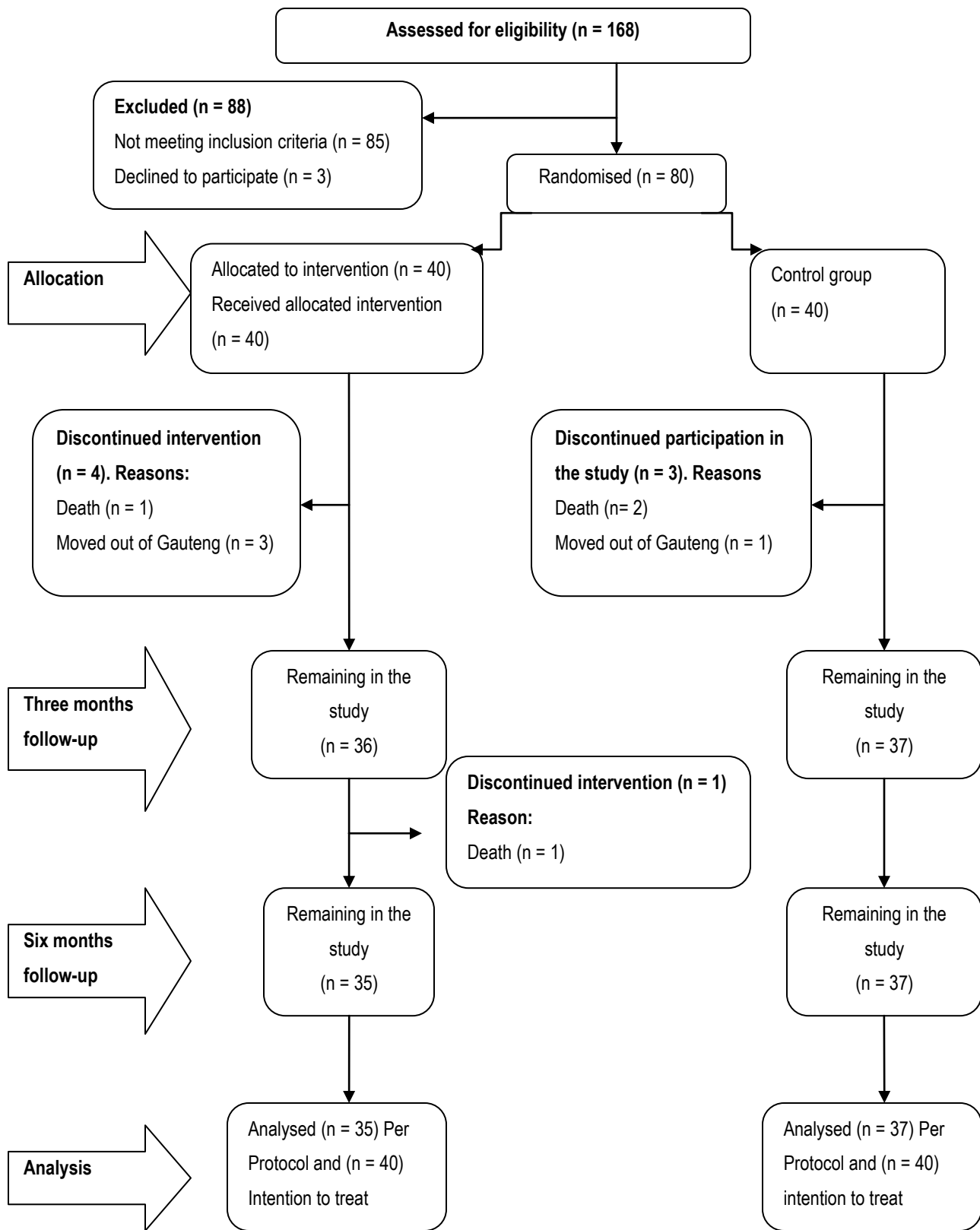


Figure 4.3 Distribution of the study sample over the course of the study

Eight (10%) of the stroke survivors could not complete the study (See Figure 4.3 for reasons). This is an acceptable number as it is less than the 15% anticipated loss to follow-up when the sample size for this study was calculated. The same number ( $n = 2$ ) of stroke survivors died in the intervention compared to the control group. All participants who were still alive at the end of the study were traceable for the researchers to establish RTW outcome.

## **4.2.2 The characteristics of the stroke survivors in this study**

### **4.2.2.1 Demographic information**

The demographic data of the intervention and control groups are presented in Table 4.8.

**Table 4.8 Demographic information of the stroke survivors (n = 80)**

|                                               | <b>Total<br/>(n = 80)</b>    | <b>Intervention group<br/>(n = 40)</b> | <b>Control group<br/>(n = 40)</b> | <b>p<br/>value</b> |
|-----------------------------------------------|------------------------------|----------------------------------------|-----------------------------------|--------------------|
| <b>Average age (years)</b>                    | <b>Mean (SD)</b><br>45 (8.7) | <b>Mean (SD)</b><br>45 (8.5)           | <b>Mean (SD)</b><br>44 (8.9)      | 0.47               |
| Minimum and Maximum age (years)               |                              | 29 – 60                                | 26 – 50                           |                    |
| <b>Average stroke duration (weeks)</b>        | 4.6 (1.8)                    | 4.4 (1.9)                              | 4.7 (1.5)                         | 0.42               |
| <b>Average number of financial dependants</b> | 2.7 (1.8)                    | 2.6 (2.6)                              | 2.7 (1.7)                         | 0.76               |
| <b>Gender</b>                                 | <b>n (%)</b>                 | <b>n (%)</b>                           | <b>n (%)</b>                      |                    |
| Male                                          | 41 (51)                      | 21 (52)                                | 20 (50)                           |                    |
| Female                                        | 39 (49)                      | 19 (48)                                | 20 (50)                           | 0.82               |
| <b>Marital status</b>                         |                              |                                        |                                   |                    |
| Single                                        | 16 (20)                      | 8 (20)                                 | 8 (20)                            |                    |
| Divorced                                      | 3 (4)                        | 3 (8)                                  | 0 (0)                             |                    |
| Live in Partner                               | 15 (19)                      | 10 (25)                                | 5 (13)                            | 0.16               |
| Married                                       | 44 (55)                      | 18 (45)                                | 26 (65)                           |                    |
| Widow                                         | 2 (2)                        | 1 (2)                                  | 1 (2)                             |                    |
| <b>Side of hemiplegia</b>                     |                              |                                        |                                   |                    |
| Left                                          | 39 (49)                      | 24 (60)                                | 15 (37)                           |                    |
| Right                                         | 41 (51)                      | 16 (40)                                | 25 (63)                           | <b>0.04</b>        |
| <b>Educational level</b>                      |                              |                                        |                                   |                    |
| Degree                                        | 6 (7)                        | 6 (15)                                 | 0 (0)                             |                    |
| Grade 12 + 3 years                            | 16 (20)                      | 7 (17)                                 | 9 (22)                            |                    |
| Grade 12 or equivalent                        | 24 (30)                      | 15 (38)                                | 9 (22)                            |                    |
| Grade 11                                      | 27 (34)                      | 10 (25)                                | 17 (43)                           | <b>0.03</b>        |
| Grade 7 and below                             | 7 (9)                        | 2 (5)                                  | 5 (13)                            |                    |
| <b>Financial role</b>                         |                              |                                        |                                   |                    |
| Breadwinner                                   | 50 (63)                      | 25 (63)                                | 25 (63)                           |                    |
| Contributing to family income                 | 30 (37)                      | 15 (37)                                | 15 (37)                           | 1.00               |
| <b>Monthly income (Rands)</b>                 |                              |                                        |                                   |                    |
| 0 – 800                                       | 2 (2)                        | 1 (2)                                  | 1 (2)                             |                    |
| 801 – 2000                                    | 14 (18)                      | 7 (18)                                 | 7 (18)                            |                    |
| 2001 – 5000                                   | 27 (34)                      | 8 (20)                                 | 19 (48)                           | 0.03               |
| More than 5000                                | 37 (46)                      | 24 (60)                                | 13 (32)                           |                    |
| <b>Have helper at home</b>                    |                              |                                        |                                   |                    |
| No                                            | 6 (7)                        | 6 (15)                                 | 0 (0)                             | <b>0.03</b>        |
| Yes                                           | 74 (93)                      | 34 (85)                                | 40 (100)                          |                    |
| <b>Have to pay helper</b>                     | <b>n = 74</b>                | <b>n = 34</b>                          | <b>n = 40</b>                     |                    |
| No                                            | 60 (81)                      | 25 (74)                                | 35 (88)                           |                    |
| Yes                                           | 14 (19)                      | 9 (26)                                 | 5 (12)                            | 0.15               |

\*SD = Standard deviation

The average age for the study sample was 45 (SD: 8.7) years and the average stroke duration was 4.6 (SD: 1.8) weeks. There were 41 (51%) male stroke survivors and 41 (51%) of them had right hemiplegia. Majority (55%) of the stroke survivors were married, breadwinners (63%) had a grade 11 to 12 educational level (64%), an income above R5000 (46%) and had a helper (74%) whom they did not have to pay (81%).

The differences between intervention and control group's demographic variables were not statistically significant for age, stroke duration, gender, marital status, financial role, and having a paid helper. The differences were statistically different for side of hemiplegia, educational level, monthly income and having a helper at home. Between groups differences in education were as a result of the high number of degree participants in the intervention group in relation to the control group.

#### 4.2.2.2 Speech problems, co-morbidities and rehabilitation received

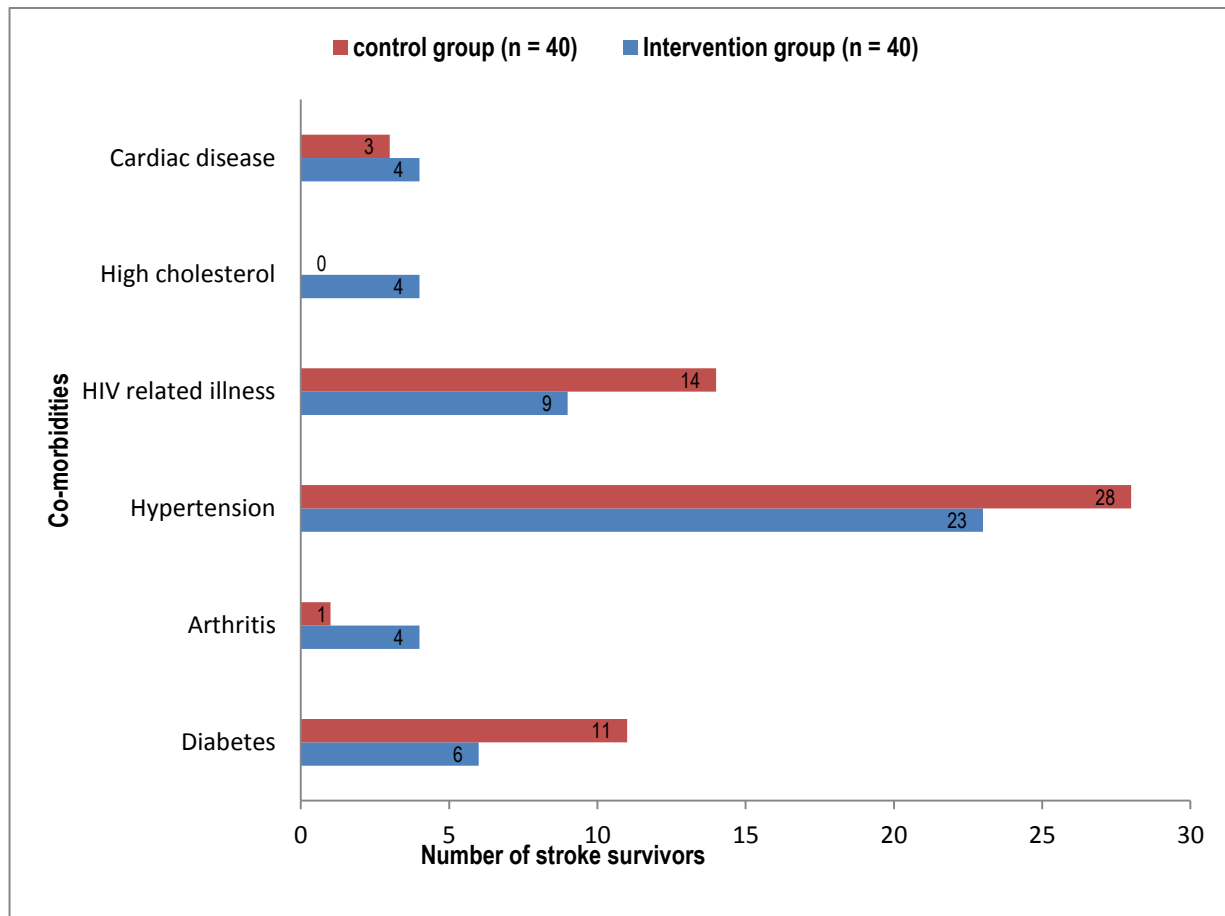
The results for speech problems of the stroke survivors in the control and experimental groups are presented in Table 4.9.

**Table 4.9 Speech problems of the stroke survivors in the study (n = 80)**

|                               | <b>Total<br/>(n = 80)</b> | <b>Intervention group<br/>(n = 40)</b> | <b>Control group<br/>(n = 40)</b> | <b>p value</b> |
|-------------------------------|---------------------------|----------------------------------------|-----------------------------------|----------------|
|                               |                           | n (%)                                  | n (%)                             |                |
| <b>Have speech problem</b>    |                           |                                        |                                   |                |
| No                            | 49 (61)                   | 25 (62)                                | 24 (60)                           | 0.82           |
| Yes                           | 31 (39)                   | 15 (38)                                | 16 (40)                           |                |
| <b>Type of speech problem</b> | n = 31                    | n = 15                                 | n = 16                            |                |
| Dysphasia                     | 14 (45)                   | 6 (40)                                 | 8 (50)                            | 0.19           |
| Expressive aphasia            | 6 (19)                    | 5 (33)                                 | 1 (6)                             |                |
| Dysarthria                    | 11 (36)                   | 4 (27)                                 | 7 (44)                            |                |

Majority (61%) of the stroke survivors did not have speech problems. For those who had speech problems, dysphasia was the most common (45%). The differences between the study group's speech problems were not statistically significant.

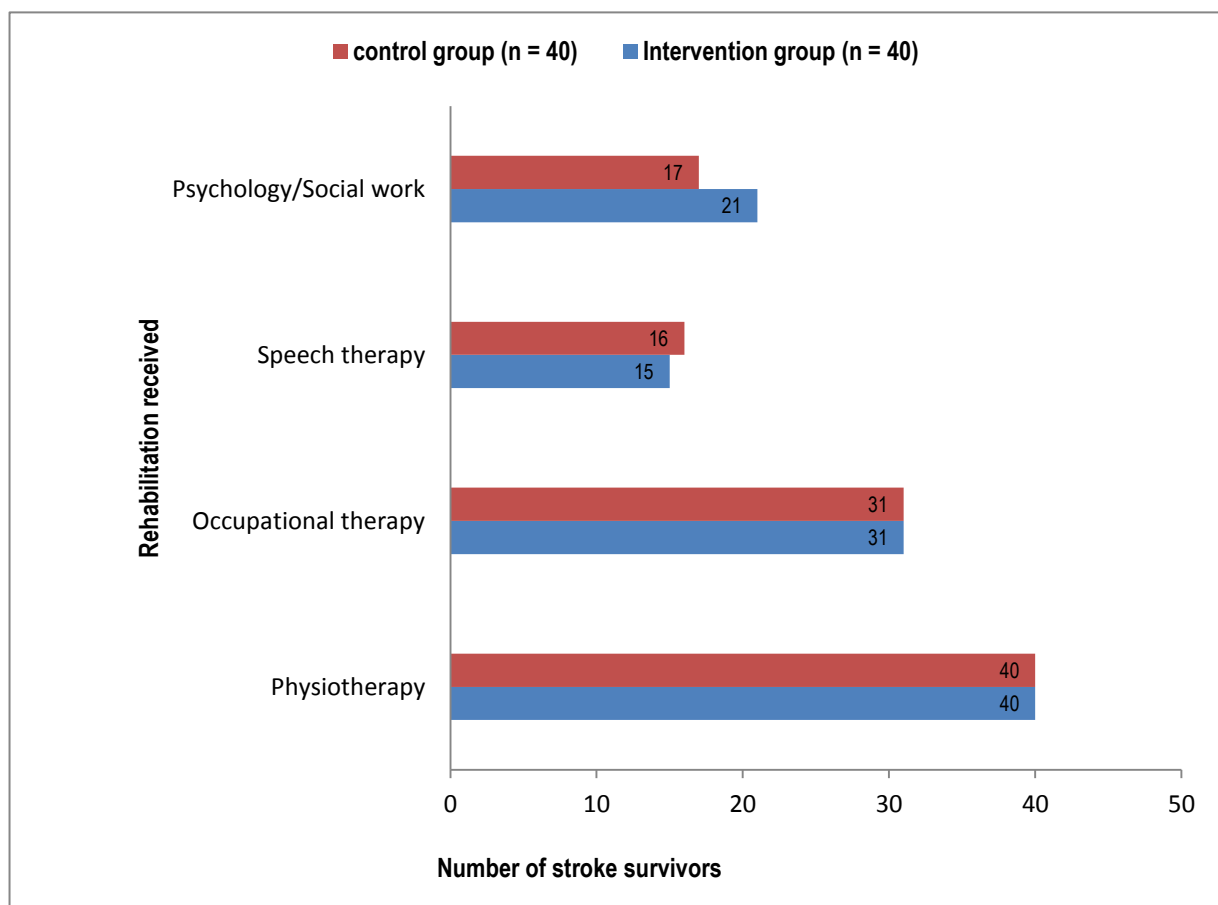
Co- morbidities that stroke survivors in this study had are shown in Figure 4.4. Some of the stroke survivors suffered from more than one co-morbidity.



**Figure 4.4 Co-morbidities of the stroke survivors in the study (n = 80)**

The most common co-morbidity in both the intervention and control group was hypertension (64%) followed by HIV related illness (29%); diabetes (21%), cardiac disease (9%), arthritis (6%) and high cholesterol (5%). The differences between the control and intervention group for hypertension and HIV related illness were not statistically significant ( $p = 0.33$  and  $0.35$  respectively).

Results of rehabilitation received by stroke survivors in this study are shown in Figure 4.5 below.



**Figure 4.5 Rehabilitation received by stroke survivors in the study (n = 80)**

All stroke survivors in this study received physiotherapy, followed by occupational therapy (78%), psychology/social work (48%) and speech therapy (44%).

#### 4.2.2.3 Occupation related information of the stroke survivors in this study

The results for the type of occupation, key physical job demands, years in current job, total years working, and sick leave duration are presented in this section. Figure 4.6 shows the type of occupations of stroke survivors in this study.

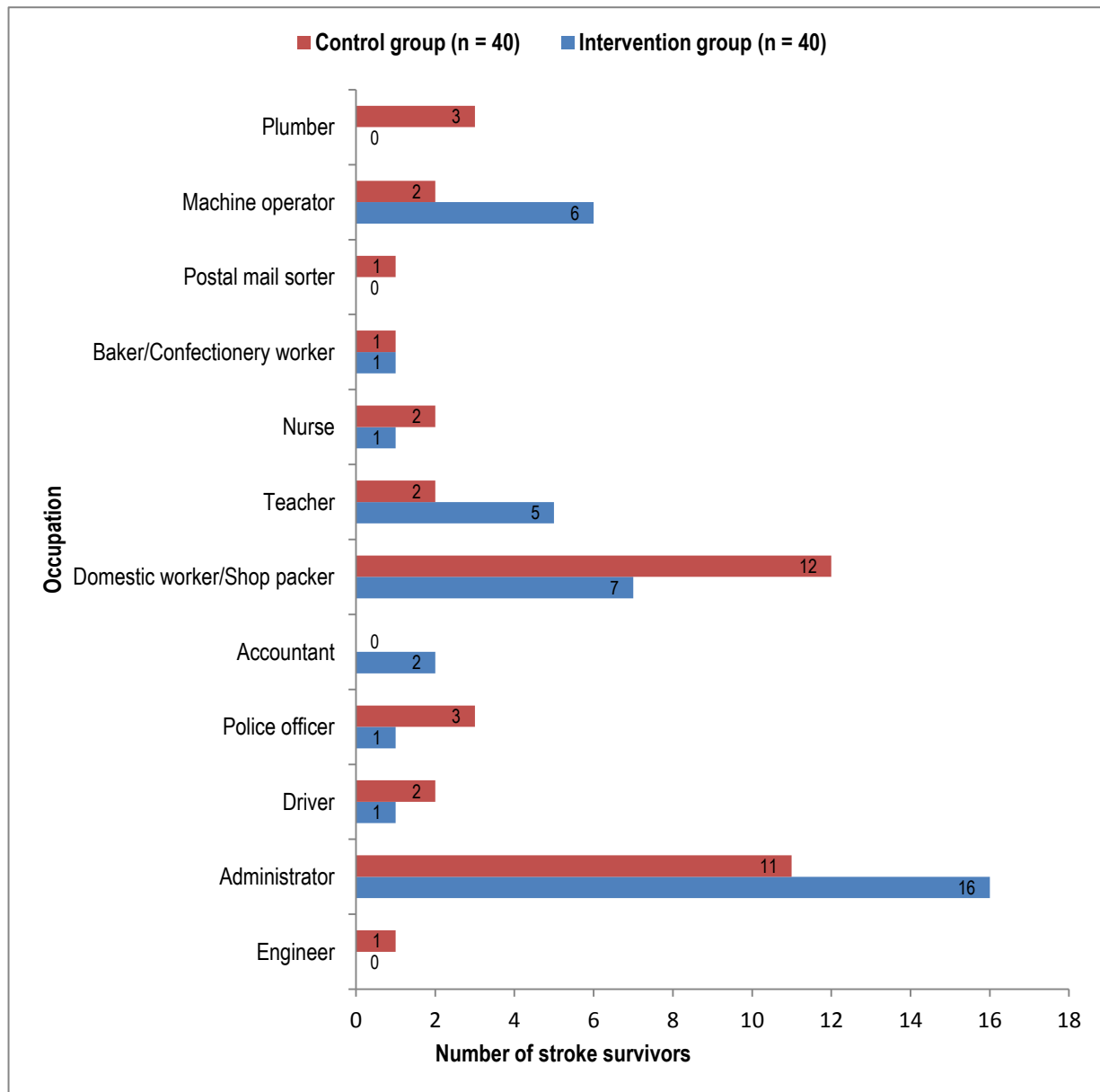
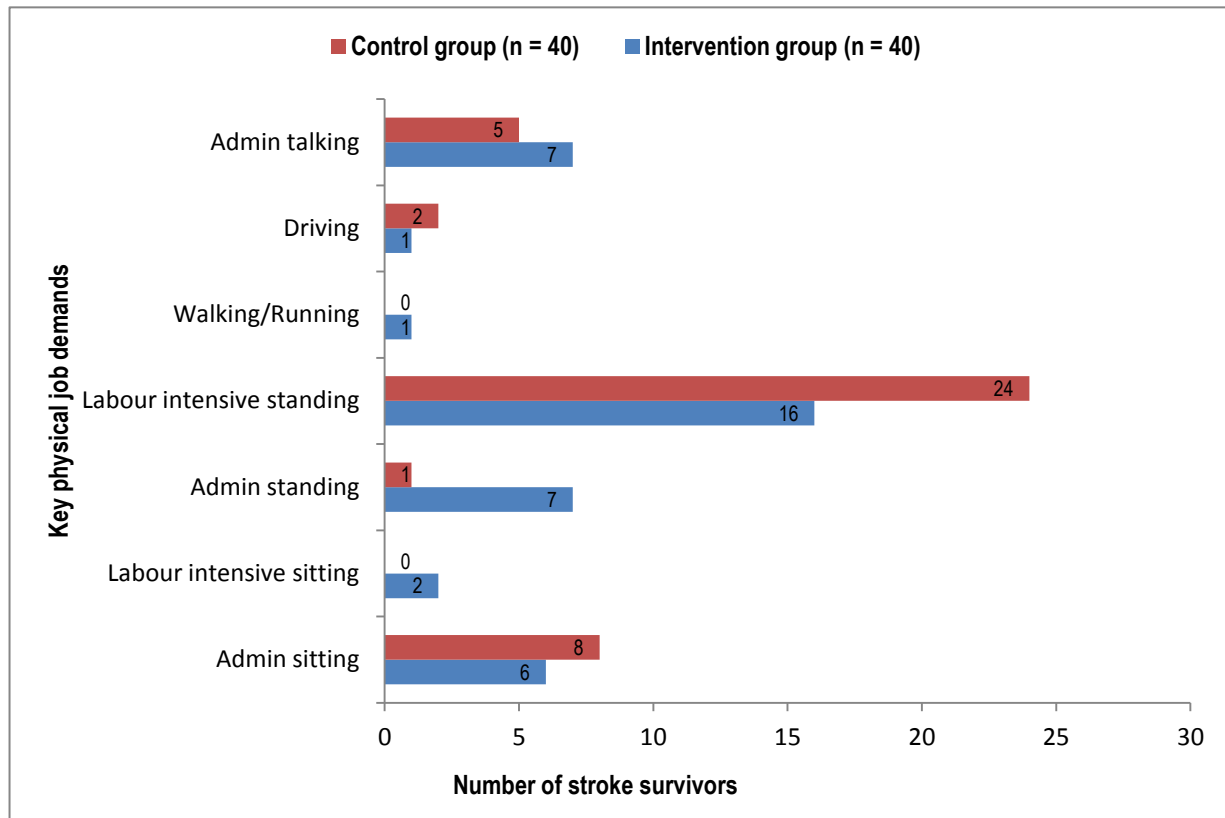


Figure 4.6 Occupations of stroke survivors in the study (n = 80)

The most common occupation in both the intervention and control group was that of administrator (34%) followed by domestic worker/shop packer (23%); however there were more

blue (55%) than white (45%) collar occupations in total. Blue collar occupations in Figure 4.6 refer to all occupations except teacher, accountant and administrator. The differences in occupations for stroke survivors between the control and intervention group were not statistically significant ( $p = 0.68$ ).

Key physical job demands for the stroke survivors in the study are shown in Figure 4.7.



**Figure 4.7 Key physical job demands for the stroke survivors in the study (n = 80)**

The following were regarded as labour intensive work: labour intensive standing, labour intensive sitting, walking/running, and driving. Less labour intensive work was regarded as admin standing, admin sitting, and admin talking. More stroke survivors (57%) performed labour intensive work compared to those who did less labour intensive work (43%) as can be observed from Figure 4.7. Fifteen percent of the stroke survivors were in jobs that required the ability to talk. The differences between the control and intervention group's physical job demands were not statistically significant ( $p = 0.72$ ).

Table 4.10 shows results of the occupations and key physical job demands of stroke survivors who returned to work and those who did not RTW at six months follow-up.

**Table 4.10 Occupations and key physical job demands of stroke survivors who returned work and those who did not RTW at six months follow-up (n = 80)**

|                                 | Did not RTW<br>(n = 48 ) | Returned to work<br>(n = 32) | p value |
|---------------------------------|--------------------------|------------------------------|---------|
|                                 | n (%)                    | n (%)                        |         |
| <b>Occupation</b>               |                          |                              |         |
| Engineer                        | 0 (0)                    | 1 (3)                        | 0.54    |
| Administrator                   | 16 (33)                  | 11 (34)                      |         |
| Driver                          | 2 (4)                    | 1 (3)                        |         |
| Police officer                  | 2 (4)                    | 2 (6)                        |         |
| Accountant                      | 0 (0)                    | 2 (6)                        |         |
| Domestic worker/Shop packer     | 15 (31)                  | 4 (13)                       |         |
| Teacher                         | 4 (9)                    | 3 (10)                       |         |
| Nurse                           | 2 (4)                    | 1 (3)                        |         |
| Baker/confectionery worker      | 1 (2)                    | 1 (3)                        |         |
| Mail sorter                     | 0 (0)                    | 1 (3)                        |         |
| Machine operator                | 4 (9)                    | 4 (13)                       |         |
| Plumber                         | 2 (4)                    | 1 (3)                        |         |
| <b>Key physical job demands</b> |                          |                              |         |
| Admin sitting                   | 7 (15)                   | 7 (22)                       | 0.74    |
| Labour intensive sitting        | 1 (2)                    | 1 (3)                        |         |
| Admin standing                  | 4 (8)                    | 4 (12)                       |         |
| Labour intensive standing       | 27 (56)                  | 13 (41)                      |         |
| Walking/running                 | 0 (0)                    | 1 (3)                        |         |
| Driving                         | 2 (4)                    | 1 (3)                        |         |
| Admin talking                   | 7 (15)                   | 5 (16)                       |         |

There was no statistically significant difference between RTW rate and the stroke survivors' occupation and physical job demands. The highest number of stroke survivors in the administrative occupation category returned to work (34%), and this was similar to the group that did not RTW (33%). The second highest number of stroke survivor that did not return to work was that of domestic workers/shop packers (31%). Majority (56%) of stroke survivors who did labour intensive work standing did not RTW.

Results for the duration of time in current job, total years worked and sick leave duration for the stroke survivors are presented in Table 4.11.

**Table 4.11 Years in current job, total years working and sick leave duration for the stroke survivors (n = 80)**

|                                    | <b>Total<br/>(n = 80)</b> | <b>Intervention group<br/>(n = 40)</b> | <b>Control group<br/>(n = 40)</b> | <b>p value</b> |
|------------------------------------|---------------------------|----------------------------------------|-----------------------------------|----------------|
|                                    | <b>Mean (SD)</b>          | <b>Mean (SD)</b>                       | <b>Mean (SD)</b>                  |                |
| <b>Years in current job</b>        | 10.5 (8.6)                | 11.3 (9.2)                             | 9.6 (7.9)                         | 0.38           |
| <b>Total years working</b>         | 15.8 (10.5)               | 16.7 (11.3)                            | 14.9 (9.6)                        | 0.47           |
| <b>Sick leave duration (weeks)</b> | 7.2 (3.3)                 | 7.5 (3.4)                              | 6.8 (3.1)                         | 0.43           |

*\*SD = Standard deviation*

The stroke survivors in this study worked on average more than ten years in their current job and had on average more than seven weeks sick leave duration.

#### 4.2.2.4 Job skill discretion; job demands and Therapists Portable Assessment Lab scores of the stroke survivors in the intervention group

Results of the job content questionnaire (job skill discretion and job demands) and TPAL scores for stroke survivors in the intervention group are presented in Table 4.12. Stroke survivors completed only TPAL modules which were appropriate for their current job description. TPAL scores are presented as MTM rate of work percentages except for patient information memo which is in minutes. The total possible score for job skill discretion and job demands was 48 each.

**Table 4.12 Job skill discretion, job demands and TPAL scores for intervention group stroke survivors**

| <b>Variable</b>                     | <b>Mean<br/>score</b> | <b>SD</b> | <b>Minimum</b> | <b>Maximum</b> |
|-------------------------------------|-----------------------|-----------|----------------|----------------|
| JCQ - Job skill discretion (n = 38) | 37.8                  | 4.7       | 28             | 48             |
| JCQ - Job demands (n = 38)          | 31                    | 4.6       | 21             | 39             |
| TPAL - Mail sort (n = 36)           | 40                    | 15.8      | 8              | 75             |
| TPAL - Alphabetising (n = 37)       | 33.4                  | 9.2       | 5              | 54             |
| TPAL - Visual maze (n = 21)         | 31.6                  | 5.3       | 23             | 37             |
| TPAL - Payroll computation (n = 31) | 40.7                  | 14.2      | 16             | 80             |
| TPAL - Small parts A (n = 14)       | 27.4                  | 4.6       | 18             | 35             |
| TPAL - Small parts B (n = 15)       | 77                    | 22.4      | 47             | 130            |
| TPAL - Ruler reading (n = 19)       | 17                    | 3.6       | 7              | 25             |
| TPAL - Pipe assembly (n = 26)       | 17                    | 5.5       | 5              | 25             |
| TPAL - O-Rings (n = 27)             | 33.1                  | 10.5      | 23             | 68             |
| TPAL - Block design (n = 27)        | 11.1                  | 7.7       | 7              | 45             |
| TPAL - Colour-sort (n = 19)         | 17.4                  | 12        | 7              | 56             |
| TPAL - Circuit board (n = 18)       | 11.6                  | 3.2       | 7              | 20             |
| TPAL total score (n = 38)           | 38.6                  | 10.7      | 5              | 71             |

*\*SD = Standard deviation*

The mean job skill discretion score was 37.8 ( $\pm 4.7$ ) which is within the normal average score ranges ( $33.5 \pm 8.5$ ) for JCQ. The mean job demands score was 31 ( $\pm 4.6$ ), which is also within the normal reported average score ranges ( $30.9 \pm 8.4$ ) for JCQ. The highest item scores were small parts B (77%); followed by payroll computation (41%); mail sort (40%); alphabetising (33%) and O rings (33%). The lowest item scores were block design and circuit board (11%). The total TPAL score was very low (38.6%) considering that the minimum score for a person to meet the open labour market with rehabilitation is reported to be 60%.

Table 4.13 shows results of the job skill discretion, job demands and total TPAL score by six months RTW group comparison. The JCQ and TPAL were administered only on intervention group. Thus comparisons between those who returned to work and those who did not RTW below were only for the intervention group.

**Table 4.13 The job skill discretion, job demands and total TPAL scores by six months RTW group comparison (n = 38)**

| Variable                          | RTW | n (%)   | Mean score | Mean Difference | Standard error | 95% CI      | p value |
|-----------------------------------|-----|---------|------------|-----------------|----------------|-------------|---------|
| <b>JCQ - Job skill discretion</b> | No  | 14 (37) | 38         | 0.2             | 1.6            | -3.1 – 3.6  | 0.88    |
|                                   | Yes | 24 (63) | 37.8       |                 |                |             |         |
| <b>JCQ - Job demands</b>          | No  | 14 (37) | 31.1       | 0.3             | 1.6            | -2.9 – 3.6  | 0.82    |
|                                   | Yes | 24 (63) | 30.8       |                 |                |             |         |
| <b>TPAL total score</b>           | No  | 14 (37) | 36         | 3.4             | 3.3            | -10.2 – 3.2 | 0.29    |
|                                   | Yes | 24 (63) | 39.4       |                 |                |             |         |

*\*SE = Standard error; CI = Confidence interval; Mean difference = mean (Yes, RTW) - mean (No, RTW)*

The differences in the JCQ and TPAL scores for stroke survivors who returned to work and those who did not RTW were not statistically significant, however those who returned to work had lower job skill discretion and job demands and higher TPAL scores than those who did not RTW.

#### 4.2.2.5 Stroke survivors' activity of daily living functional level

The average BI item and total scores indicating the stroke survivors' activity of daily living functional level at baseline, three months and six months are displayed in Tables 4.14 and 4.15.

**Table 4.14 Stroke survivors' activity of daily living functional level: BI item score**

|                                        | Baseline Assessment      |                     | Three months follow-up   |                     | Six months follow-up     |                     |
|----------------------------------------|--------------------------|---------------------|--------------------------|---------------------|--------------------------|---------------------|
|                                        | Intervention<br>(n = 40) | Control<br>(n = 40) | Intervention<br>(n = 36) | Control<br>(n = 37) | Intervention<br>(n = 35) | Control<br>(n = 37) |
| <b>BI Items<br/>(total item score)</b> | mean (SD)                | mean (SD)           | mean (SD)                | mean (SD)           | mean (SD)                | mean (SD)           |
| <b>Bowel (2)</b>                       | 1.9 (0.2)                | 2 (0)               | 1.9 (0.1)                | 2 (0)               | 2 (0)                    | 2 (0)               |
| <b>Bladder (2)</b>                     | 1.9 (0.3)                | 2 (0)               | 1.9 (0.1)                | 2 (0)               | 2 (0)                    | 2 (0)               |
| <b>Grooming (1)</b>                    | 0.9 (0.3)                | 0.8 (0.4)           | 1 (0)                    | 0.9 (0.2)           | 1 (0)                    | 0.9 (0.1)           |
| <b>Toilet use (2)</b>                  | 1.8 (0.4)                | 1.6 (0.6)           | 1.9 (0.2)                | 1.9 (0.2)           | 2 (0)                    | 2 (0)               |
| <b>Feeding (2)</b>                     | 1.8 (0.3)                | 2 (0)               | 1.9 (0.1)                | 2 (0)               | 2 (0)                    | 2 (0)               |
| <b>Transfer (3)</b>                    | 2.8 (0.5)                | 2.5 (0.5)           | 2.9 (0.2)                | 2.9 (0.2)           | 3 (0)                    | 2.9 (0.1)           |
| <b>Mobility (3)</b>                    | 2.7 (0.4)                | 2.3 (0.6)           | 2.9 (0.2)                | 2.6 (0.5)           | 3 (0)                    | 2.9 (0.1)           |
| <b>Dressing (2)</b>                    | 1.5 (0.6)                | 1.3 (0.5)           | 1.8 (0.4)                | 1.7 (0.5)           | 1.9 (0.1)                | 1.8 (0.4)           |
| <b>Stairs (2)</b>                      | 1.1 (0.8)                | 0.6 (0.8)           | 1.4 (0.6)                | 1.2 (1.8)           | 1.9 (0.1)                | 1.6 (0.5)           |
| <b>Bathing (1)</b>                     | 0.4 (0.5)                | 0.4 (0.5)           | 0.8 (0.4)                | 0.7 (0.4)           | 0.9 (0.1)                | 0.8 (0.3)           |

\*SD = Standard deviation

The BI item scores generally increased over the study period for both the intervention and control groups, however the intervention group scores were generally higher and in some instances equal to the control group's score throughout the study period. The only item for which the control group had a relatively higher score was feeding. The item scores which had statistically significant differences between intervention and control groups were as follows: baseline: feeding ( $p = 0.02$ ), transfer ( $p = 0.006$ ), mobility ( $p = 0.002$ ), dressing ( $p = 0.04$ ), and stairs ( $p = 0.008$ ); three months follow-up: mobility ( $p = 0.004$ ); and six months follow-up: stairs ( $p = 0.002$ ).

**Table 4.15 Stroke survivors' activity of daily living functional level: BI total score**

|                                               | Baseline Assessment      |                     | Three months follow-up   |                     | Six months follow-up     |                     |
|-----------------------------------------------|--------------------------|---------------------|--------------------------|---------------------|--------------------------|---------------------|
| <b>BI total score</b><br><b>(total of 20)</b> | Intervention<br>(n = 40) | Control<br>(n = 40) | Intervention<br>(n = 36) | Control<br>(n = 37) | Intervention<br>(n = 35) | Control<br>(n = 37) |
| <b>Mean (SD)</b>                              | 17.2 (2.6)               | 15.6 (2.8)          | 18.8 (1.6)               | 18.2 (2.2)          | 19.9 (0.1)               | 19.2 (0.3)          |
| <b>Minimum score</b>                          | 12                       | 12                  | 13                       | 12                  | 17                       | 16                  |
| <b>Maximum score</b>                          | 20                       | 20                  | 20                       | 20                  | 20                       | 20                  |
| <b>Mean difference</b>                        | 1.6                      |                     | 0.6                      |                     | 0.7                      |                     |
| <b>Group comparison</b>                       | <b>p = 0.01</b>          |                     | <b>p = 0.32</b>          |                     | <b>p = 0.001</b>         |                     |

*\*Mean difference = intervention group mean – control group mean*

The BI total scores generally increased over the study period for both the intervention and control groups and at three and six months follow-up the mean score was above 18 (90%) for both control and intervention groups. A score above 18 (90%) indicates that no assistance is needed from another person for ADLs. The differences in baseline and six months follow-up scores were statistically significant with the intervention group scoring relatively higher than the control group.

#### 4.2.2.6 Stroke survivors' mobility functional level

The stroke survivors' mobility functional level was assessed using the MRMI. The MRMI item and total scores at baseline, three and six months are shown in Tables 4.16 and 4.17. Each item was scored out of a maximum of five points.

**Table 4.16 Stroke survivors' mobility functional level: MRMI item score**

| MRMI Items                 | Baseline Assessment   |                       | Three months follow-up |                       | Six months follow-up  |                       |
|----------------------------|-----------------------|-----------------------|------------------------|-----------------------|-----------------------|-----------------------|
|                            | Intervention          | Control               | Intervention           | Control               | Intervention          | Control               |
|                            | (n = 40)<br>mean (SD) | (n = 40)<br>mean (SD) | (n = 36)<br>mean (SD)  | (n = 37)<br>mean (SD) | (n = 35)<br>mean (SD) | (n = 37)<br>mean (SD) |
| <b>Turning over</b>        | 4.9 (0.3)             | 4.9 (0.4)             | 5 (0)                  | 5 (0)                 | 5 (0)                 | 5 (0)                 |
| <b>Lying to sitting</b>    | 4.9 (0.3)             | 4.9 (0.3)             | 5 (0)                  | 5 (0)                 | 5 (0)                 | 5 (0)                 |
| <b>Sitting balance</b>     | 4.9 (0.5)             | 5 (0)                 | 5 (0)                  | 5 (0)                 | 5 (0)                 | 5 (0)                 |
| <b>Sitting to standing</b> | 4.8 (0.5)             | 4.4 (1.1)             | 4.9 (0.2)              | 4.9 (0.2)             | 5 (0)                 | 4.9 (0.1)             |
| <b>Standing</b>            | 4.8 (0.5)             | 4.5 (1.0)             | 4.9 (0.1)              | 4.9 (0.1)             | 5 (0)                 | 5 (0)                 |
| <b>Transfers</b>           | 4.6 (0.8)             | 3.9 (1.2)             | 4.9 (0.3)              | 4.8 (0.6)             | 5 (0)                 | 4.9 (0.1)             |
| <b>Walking indoors</b>     | 4.2 (1.3)             | 3.3 (1.4)             | 4.8 (0.5)              | 4.2 (1.1)             | 5 (0)                 | 4.8 (0.3)             |
| <b>Stairs</b>              | 2.8 (2.1)             | 1.7 (2.2)             | 3.8 (1.4)              | 3.2 (1.9)             | 5 (0)                 | 4.1 (1.4)             |

The mean item score increased for both study groups over the entire study period. At three months follow-up the mean item score was above four, for all items except stairs, indicating mobility without assistance even though an aid or appliance may be needed. At six months follow-up the mean score was above four for all items including stairs for both groups. The following items had statistically significant between group differences: baseline: transfers ( $p = 0.002$ ), walking indoors ( $p = 0.008$ ), and stairs ( $p = 0.004$ ); three months follow-up: walking indoors ( $p = 0.009$ ); and six months follow-up: stairs ( $p = <0.001$ ).

**Table 4.17 Stroke survivors' mobility functional level: MRMI total score**

|                                                 | <b>Baseline Assessment</b> |                     | <b>Three months follow-up</b> |                     | <b>Six months follow-up</b> |                     |
|-------------------------------------------------|----------------------------|---------------------|-------------------------------|---------------------|-----------------------------|---------------------|
| <b>MRMI total score</b><br><b>(total of 40)</b> | Intervention<br>(n = 40)   | Control<br>(n = 40) | Intervention<br>(n = 36)      | Control<br>(n = 37) | Intervention<br>(n = 35)    | Control<br>(n = 37) |
| <b>Mean (SD)</b>                                | 36.2 (4.9)                 | 32.8 (6)            | 38.5 (2)                      | 37.2 (3.5)          | 40 (0)                      | 38.9 (1.7)          |
| <b>Minimum score</b>                            | 15                         | 22                  | 33                            | 26                  | 40                          | 34                  |
| <b>Maximum score</b>                            | 40                         | 40                  | 40                            | 40                  | 40                          | 40                  |
| <b>Mean difference</b>                          | 3.4                        |                     | 1.3                           |                     | 1.1                         |                     |
| <b>Group comparison</b>                         | <b>p = 0.02</b>            |                     | <b>p = 0.05</b>               |                     | <b>p &lt; 0.001</b>         |                     |

*\*Mean difference = intervention group mean – control group mean*

The MRMI score increased from baseline for the entire study period with the intervention group having relatively higher mean scores. The differences between the total MRMI scores for the control and intervention groups were statistically significant. The change in mobility for the control group from baseline to six months follow-up was clinically significant (mean change of 6.1 from 32.8 at baseline to 38.9 at six months follow-up): significant change in mobility is equal to a greater than 4.5 change in score (Lennon and Johnson, 2000).

#### 4.2.2.7 Stroke survivors' cognitive ability

The cognitive ability of the stroke survivors in this study was assessed using the MoCA. The MoCA item and total scores at baseline, three and six months are shown in Tables 4.18 and 4.19.

**Table 4.18 Stroke survivors' cognitive ability: MoCA item score**

| MoCA Items<br>(Item score) | Baseline Assessment   |                       | Three months follow-up |                       | Six months follow-up  |                       |
|----------------------------|-----------------------|-----------------------|------------------------|-----------------------|-----------------------|-----------------------|
|                            | Intervention          | Control               | Intervention           | Control               | Intervention          | Control               |
|                            | (n = 40)<br>mean (SD) | (n = 40)<br>mean (SD) | (n = 36)<br>mean (SD)  | (n = 37)<br>mean (SD) | (n = 35)<br>mean (SD) | (n = 37)<br>mean (SD) |
| <b>Visuo spatial (5)</b>   | 3.5 (1.6)             | 2.85 (2)              | 3.6 (1.5)              | 3 (2)                 | 4.1 (1.3)             | 3.3 (2.0)             |
| <b>Naming (3)</b>          | 2.8 (0.5)             | 2.7 (0.6)             | 2.6 (0.8)              | 2.7 (0.7)             | 2.7 (0.8)             | 2.8 (0.5)             |
| <b>Attention (6)</b>       | 4.7 (1.5)             | 4.1 (1.6)             | 5 (1.6)                | 4.8 (1.4)             | 5.2 (1.3)             | 5.2 (0.9)             |
| <b>Language (6)</b>        | 2.1 (1.1)             | 1.8 (1.1)             | 2.1 (0.9)              | 2.2 (1.0)             | 2.4 (0.8)             | 2.3 (0.9)             |
| <b>Abstraction (2)</b>     | 1.25 (0.8)            | 0.8 (0.8)             | 1.4 (0.8)              | 1.2 (0.7)             | 1.5 (0.7)             | 1.4 (0.7)             |
| <b>Delayed recall (5)</b>  | 3 (1.6)               | 3.2 (1.6)             | 3.5 (1.5)              | 3.7 (1.1)             | 4.1 (1.2)             | 3.9 (1.2)             |
| <b>Orientation (6)</b>     | 5.4 (1.2)             | 5.5 (1.2)             | 5.8 (0.7)              | 5.7 (1.1)             | 5.9 (0.4)             | 5.9 (0.6)             |

The mean item score increased for both study groups over the entire study period. The item scores were generally the same between groups throughout the study except for attention ( $p = 0.05$ ) and abstraction ( $p = 0.04$ ) which had statistically significant differences at baseline assessment, with the intervention group scoring more than the control group.

**Table 4.19 Stroke survivors' cognitive ability: MoCA total score**

|                                                 | Baseline Assessment      |                     | Three months follow-up   |                     | Six months follow-up     |                     |
|-------------------------------------------------|--------------------------|---------------------|--------------------------|---------------------|--------------------------|---------------------|
| <b>MoCA total score</b><br><b>(total of 30)</b> | Intervention<br>(n = 40) | Control<br>(n = 40) | Intervention<br>(n = 36) | Control<br>(n = 37) | Intervention<br>(n = 35) | Control<br>(n = 37) |
| <b>Mean (SD)</b>                                | 23 (6.2)                 | 21.1 (6.1)          | 24.3 (5.7)               | 23.5 (5.8)          | 25.8 (4.9)               | 24.7 (4.7)          |
| <b>Minimum score</b>                            | 0                        | 0                   | 5                        | 0                   | 6                        | 9                   |
| <b>Maximum score</b>                            | 30                       | 30                  | 30                       | 30                  | 30                       | 30                  |
| <b>Mean difference</b>                          | 1.9                      |                     | 0.8                      |                     | 1.1                      |                     |
| <b>Group comparison</b>                         | p = 0.16                 |                     | p = 0.57                 |                     | p = 0.33                 |                     |

*\*Mean difference = intervention group mean – control group mean*

All the mean scores throughout the study indicate that most stroke survivors had mild cognitive impairments. The mean score for normal cognitive ability is 27.37 ( $\pm 2.2$ ). The differences in cognitive ability between the intervention and control groups over time were not statistically significant.

#### **4.2.3 Stroke survivors' perceived quality of life**

Perceived QoL of stroke survivors was measured using the SSQoL questionnaire. The SSQoL item and total scores at baseline, three and six months are summarised in Tables 4.20 and 4.21.

**Table 4.20 Stroke survivors' perceived quality of life: SSQoL item scores expressed as mean (SD)**

| <b>SSQoL Items<br/>(Item score)</b>      | <b>Baseline Assessment</b> |                     | <b>Three months follow-up</b> |                     | <b>Six months follow-up</b> |                     |
|------------------------------------------|----------------------------|---------------------|-------------------------------|---------------------|-----------------------------|---------------------|
|                                          | Intervention<br>(n = 40)   | Control<br>(n = 40) | Intervention<br>(n = 36)      | Control<br>(n = 37) | Intervention<br>(n = 35)    | Control<br>(n = 37) |
| <b>Energy (15)</b>                       | 11.0 (3.9)                 | 10.8 (4.5)          | 12.3 (2.6)                    | 12.8 (2.4)          | 13.1 (2.7)                  | 13.4 (2.5)          |
| <b>Family roles (15)</b>                 | 8 (5.1)                    | 7.5 (4.8)           | 12.4 (2.5)                    | 12 (2.8)            | 13 (2)                      | 12.8 (2.5)          |
| <b>Language (25)</b>                     | 21.5 (6.3)                 | 19.3 (6.9)          | 23.4 (2.4)                    | 22.9 (3.1)          | 23.6 (2.3)                  | 23.4 (2.5)          |
| <b>Mobility (30)</b>                     | 25.4 (5.1)                 | 21.4 (7)            | 28.2 (2)                      | 27.5 (2.5)          | 29 (0.9)                    | 29 (1.4)            |
| <b>Mood (25)</b>                         | 20.5 (5.1)                 | 18 (6.2)            | 22.7 (2.8)                    | 21.7 (3.5)          | 23.7 (1.9)                  | 22.6 (3.1)          |
| <b>Personality (15)</b>                  | 12.5 (3.6)                 | 12.4 (4.1)          | 13.9 (2.5)                    | 13.2 (2.5)          | 14.1 (1.3)                  | 13.8 (1.9)          |
| <b>Self care (25)</b>                    | 20.1 (4.9)                 | 18.4 (4.8)          | 23.5 (2)                      | 23.3 (2.2)          | 24.2 (1.3)                  | 24 (1.5)            |
| <b>Social roles (25)</b>                 | 11.4 (7.2)                 | 10.4 (6.5)          | 18.5 (4.4)                    | 18 (5.1)            | 20.3 (3.2)                  | 20.2 (3.5)          |
| <b>Thinking (15)</b>                     | 13 (3.2)                   | 12.3 (3.8)          | 12.9 (2.8)                    | 13.5 (2.2)          | 14.1 (1.5)                  | 14.2 (1.4)          |
| <b>Upper extremity<br/>function (25)</b> | 16.4 (5.7)                 | 15.5 (6.7)          | 22 (2.3)                      | 21 (3.2)            | 23 (2.4)                    | 21.9 (3.3)          |
| <b>Vision (15)</b>                       | 14.4 (1.8)                 | 14.4 (2.5)          | 14.4 (1.1)                    | 14.6 (0.7)          | 14.2 (1.3)                  | 14.7 (0.7)          |
| <b>Work/Productivity (15)</b>            | 6.9 (4.2)                  | 6.5 (4)             | 11.6 (2.2)                    | 11.7 (2.6)          | 12.5 (2.7)                  | 12.7 (2.3)          |

The mean item score increased for both study groups over the entire study period. The following items had statistically significant between group differences: baseline: mobility ( $p = 0.02$ ); three months follow-up: mobility ( $p = 0.05$ ); and six months follow-up: upper extremity function ( $p = 0.03$ ) and vision ( $p = 0.04$ ), with the intervention group scoring relatively higher than the control group.

**Table 4.21 Stroke survivors' perceived quality of life: SSQoL total score**

|                                                   | Baseline Assessment      |                     | Three months follow-up   |                     | Six months follow-up     |                     |
|---------------------------------------------------|--------------------------|---------------------|--------------------------|---------------------|--------------------------|---------------------|
| <b>SSQoL total score</b><br><b>(total of 245)</b> | Intervention<br>(n = 40) | Control<br>(n = 40) | Intervention<br>(n = 36) | Control<br>(n = 37) | Intervention<br>(n = 35) | Control<br>(n = 37) |
| <b>Mean (SD)</b>                                  | 180.8 (30.5)             | 166.7 (37.7)        | 215.5 (19.8)             | 208.9 (27.1)        | 225.5 (18.1)             | 219.5 (24.3)        |
| <b>Minimum score</b>                              | 102                      | 90                  | 163                      | 124                 | 162                      | 151                 |
| <b>Maximum score</b>                              | 242                      | 239                 | 245                      | 244                 | 245                      | 245                 |
| <b>Mean difference</b>                            | 14.1                     |                     | 6.6                      |                     | 6                        |                     |
| <b>Group comparison</b>                           | p = 0.07                 |                     | p = 0.24                 |                     | p = 0.24                 |                     |

*\*Mean difference = intervention group mean – control group mean*

The mean SSQoL score increased over the study period with the intervention group scoring relatively higher; however the differences in the mean scores between the intervention and the control groups were not statistically significant.

The SSQoL score to compare scores of stroke survivors who returned to work and those who did not RTW at six months follow-up are presented in Table 4.22.

**Table 4.22 Comparison of SSQoL total scores of stroke survivors who returned work and those who did not RTW at baseline (n = 80) and at six months follow-up (n = 72)**

| <b>Variable</b>                                       | <b>RTW</b> | <b>n (%)</b> | <b>Mean score</b> | <b>Mean difference</b> | <b>Standard error</b> | <b>95% CI</b> | <b>p value</b> |
|-------------------------------------------------------|------------|--------------|-------------------|------------------------|-----------------------|---------------|----------------|
| <b>Baseline (n = 80)</b><br><b>SSQoL out of 245</b>   | No         | 48 (60)      | 171.1             | 6.6                    | 8.1                   | -22.7 – 9.6   | 0.41           |
|                                                       | Yes        | 32 (40)      | 177.7             |                        |                       |               |                |
| <b>Six months (n = 72)</b><br><b>SSQoL out of 245</b> | No         | 41 (57)      | 218.2             | 9.7                    | 5                     | -19.8 – 0.3   | <b>0.05</b>    |
|                                                       | Yes        | 31 (43)      | 227.9             |                        |                       |               |                |

*\* CI = Confidence interval; Mean difference = mean (Yes, RTW) - mean (No, RTW)*

The baseline and six months SSQoL scores were higher for the stroke survivors who returned to work. Stroke survivors who returned to work had better quality of life than those who did not RTW at six months after stroke.

#### **4.2.4 Employers' and stroke survivors' perceived enablers and barriers of return to work**

Stroke survivors who received the workplace intervention programme as well as their employers were interviewed to establish their perceived barriers and enablers of RTW after stroke. In the case of big companies, direct supervisors or human resource managers were interviewed depending on the company's recommendations of the person who would have been able to answer the questions in relation to the stroke survivor. In this section, the term employer will be used to also refer to the supervisors and human resource managers.

The number of interviews conducted was as follows: six employers in white collar occupations and six in blue collar occupations; twelve stroke survivors in white collar occupations and twelve in blue collar occupations. This number of interviews was considered sufficient as the groups were homogenous and Kuzel (1992) recommends that a minimum of six data sources is sufficient when homogeneous samples are selected in qualitative research. Information gathered from stroke survivors and their employers' interviews is presented in this section.

##### **4.2.4.1 Stroke survivors' perceived enablers of return to work**

The stroke survivors were asked a question about what they thought would be enablers for RTW after stroke. Eleven enablers of RTW were identified from the transcript codes. These were classified into three categories as follows: stroke survivor related enablers (4); employer and co-worker support (5); and communication (2). These enablers and categories are shown in Table 4.23.

**Table 4.23 Stroke survivors' perceived enablers of RTW after stroke**

| Category                                   | Enabler                                                                                    |
|--------------------------------------------|--------------------------------------------------------------------------------------------|
| <b>A. Stroke survivor related enablers</b> | a. Good balance and upper limb function                                                    |
|                                            | b. Psychological wellbeing                                                                 |
|                                            | c. Ability to work fast and accurately                                                     |
|                                            | d. Good interpersonal working relationships                                                |
| <b>B. Employer and co-worker support</b>   | e. Allowance of time for rehabilitation                                                    |
|                                            | f. Employer willingness to reasonably accommodate for impairments and activity limitations |
|                                            | g. Workplace accessibility                                                                 |
|                                            | h. Employer's knowledge of the medical condition                                           |
|                                            | i. Supportive co-workers                                                                   |
| <b>C. Communication</b>                    | j. Communication between employer and therapist                                            |
|                                            | k. Communication between stroke survivor and employer                                      |

#### **A. Stroke survivor related enablers**

- a. Good balance and upper limb function: ability to balance when walking, climbing stairs and even climbing a ladder at work was identified as an important factor if one is to RTW, especially if working in a labour intensive occupation. The following quote from one of the stroke survivors confirms that ability to balance is required in the workplace: *"I also lose balance sometimes when walking especially down the stairs. I need to improve on this because there are stairs at work and we don't have a lift. My office is on the first floor"* (P01W). In some companies, entering and leaving the building and performing some tasks required ability to climb stairs and walk on uneven terrain. Poor balance and gait would make it difficult or even impossible to perform work in these types of companies: *"the department I was working in requires that I lift heavy objects and climb steep stairs and do all of this fast to avoid slowing production"* (P30B).

The need for upper limb function was expressed as a means to doing job tasks which require bilateral arm use like filing documents and lifting objects: *"I also think I will struggle with putting the files in the cabinet when this hand is not working. I can't imagine how I am going to do that. I hope this hand will get better"* (P03W).

- b. Psychological wellbeing: The importance of having good psychological wellbeing was emphasised by stroke survivors who indicated that dealing with the fact that one has a stroke in combination with work challenges could be stressful: *"I need them to help me with psychological support and continuous support. My job is full of stressful situations. I don't know how I will manage with me getting stress from my disease and also having to worry about work stress"* (P10B).
- c. Ability to work fast and accurately: Most of the companies which thrive on production require their employees to work fast in order to meet the production demands. The stroke survivors would also be expected to make sure that they do not compromise the company product quality. This stroke survivor's words clearly express the need for this ability: *"I will need to have good time keeping and accuracy in doing my work because they (employers) don't allow mistakes which will mean that the company will lose money"* (P51B).
- d. Good interpersonal working relationships: This was viewed as an important factor in the workplace. The stroke survivors expressed the need to show respect for co-workers and employers in order to get their assistance when needed. Some of the stroke survivors also indicated that if the interpersonal working relations are not good, the employer may not make an effort to provide reasonable accommodation. Good working relationships were also associated with honesty and consideration for others as can be seen in the following quote: *"I will have to work hand in hand with my supervisor so that we can communicate and know what is going on with me. I should not have secrets. I will also not take myself to be better off than my colleagues by wanting my supervisor to always focus on me"* (P51B).

## **B. Employer and co-worker support**

- e. Allowance of time for rehabilitation: Some stroke survivors indicated that their employers focus a lot on production and do not give an allowance for therapy time during working hours. Being able to practice doing their duties under therapy supervision was considered as an important aspect in aiding RTW. One stroke survivor said this: *"I expect management to give me time with my therapist at work to do exercises"* (P11W).

f. Employer willingness to reasonably accommodate for impairments and activity limitations:

Stroke survivors indicated that their RTW was highly dependant on the employers' willingness to have them RTW even if it means doing only duties they can cope with while recovering: *"the only thing that will make it difficult (to go back to work) is if they don't want to give me a chance to come and do light duty"* (P12B). They believed that if their job is kept for them, they will be more likely to stay focused on the possibility of returning to work and thus will always work towards the goal of RTW unlike if they know that there is no job to go back to. Some indicated that sitting at home all day will be difficult as all family members go out to either work or school and thus they will have nothing to do at home. Thus there was an indication of a need to keep working as indicated by this quote: *"If the employer could be convinced to consider keeping me at work I will be very happy as I won't know what to do all day alone at home"* (P27W).

While expressing the need to have their job kept, some stroke survivors also indicated that they would like to go back to work as soon as possible and that given a chance to do less work per day at the beginning would be useful: *"I need to work half day while recovering and progress to full day work gradually. I really get tired and don't think I can work a full day now without getting tired. It is a lot of work to do things when half of your body is weak"* (P39W). The perceived possibility of working, given a chance to be reasonably accommodated can also be seen in these quotes: *"I will ask that they allow me to do something else at work because I really want a job"* (P27W); *"The employer agreeing..... to allow me..... to do.... work which does not... require talking to customers. This will help"* (P29W).

g. Workplace accessibility: Ability to walk within the workplace in order to interact with co-workers and to perform duties outside the workstation was mentioned as a factor which can contribute positively to RTW. The disadvantage of lack of accessibility of some workplaces is expressed in this quote: *"What will help is building of ramps in areas where there are stairs on the ground floor as I still struggle with climbing of stairs even with tripod. I might get better. So we will see how it goes. But I still believe that we need ramps even if I get better because my situation has helped me to see that if we have somebody like me who wants to come to our company or one of our co-workers gets sick, it means they will struggle to walk in our company yard"* (P53W). This stroke survivor emphasised that having good accessibility in the workplace should not be only for them (stroke survivor). It should take into

consideration the general public and other employees within the company who may need to RTW after an illness resulting in physical impairments.

- h. Employers' knowledge of the medical condition: The need for the employer to know what is going on in the stroke survivors' life especially their medical condition, was believed to have potential to make the employer keep the job for the stroke survivor as they will have an idea of what is happening. The stroke survivors indicated that even if the employer does not keep the job open for them, they will still find peace in the knowledge that the employer made an informed decision based on their knowledge and understanding of their medical condition. One stroke survivor said this to indicate the need for the employer to have knowledge of their condition: *"They (employer) have to talk about my disease and wait for me to get better. They have to be patient and understand that it does not get better quickly. They must not give up on me. We (stroke survivor and therapist) have to keep talking with them (employer) and they must know how I am doing. Whether I am getting better or worse?" (P63B).*
- i. Supportive co-workers: Supportive co-workers are believed to help keep the work flowing smoothly while one is on sick leave. Having supportive workers was also identified as a means for the stroke survivor to get assistance even when they are back at work. This quote indicates the need for supportive co-workers: *"It helps to have supportive colleagues who don't always complain to the manager about doing things to help me while I recover. We should all help each other. I have always helped them. I think they need to know that I am really sick and I am not just sitting at home or pretending that I am not able to do things at work" (P79W).*

*"If your colleagues don't help you at work when you have a problem it will be difficult to go back to work. Sometimes you may want them to do something for you like taking a message when you are on the phone" (P79W).* The following is an example of a case where co-worker assistance helped with RTW: *"I could not lift heavy meeting documents: this has been handled by asking others to lift and bring the documents to meetings. I still continue doing all my work except the lifting" (P57W).*

## C. Communication

- j. Communication between employer and therapist: The importance of communication between employer and therapist as an enabler of RTW is expressed in the following quotes: *“they (employers) should avail themselves to speak to the therapist when the need arises” (P11W)*; *“What will help is talking to human resource and my supervisor to help them find out if I am coping about my situation and to also make them understand my situation. That I can try to work. I am weak but not too bad. I don’t do heavy job because I sit all day and only walk short distances to the board rooms for meetings. I want to try because I am going to feel useless being at home. I am still very young” (P57W)*. From these quotes, it can be seen that stroke survivors believe that having this communication will help the employer to understand their situation and possibly consider having them RTW.
- k. Communication between stroke survivor and employer: The following quotes indicate how the stroke survivors believe that communication with the employer will help with RTW: *“Availability of the line manager to discuss my situation and let me show them that I am able to do the job or alternative job within the company will be helpful” (P30B)*; *“I think what will also help is openness between me and employer. They have to tell me the honest truth about what they are thinking or planning to do with me. They must not surprise me at the end by telling me that my job is finished” (P52B)*.

### 4.2.4.2 Employers’ perceived enablers of return to work

The employers were asked a question about what they thought would be enablers for RTW after stroke. Ten enablers of RTW were identified from the transcript codes. These were classified into four categories as follows: stroke survivor related enablers (3); work environment (2); and employer and co-worker support (5). These factors and categories are shown in Table 4.24.

**Table 4.24 Employers' perceived enablers of RTW after stroke**

| <b>Category</b>                            | <b>Factors</b>                                                                                                                                                                                                                                                                                                                                         |
|--------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>A. Stroke survivor related enablers</b> | <ul style="list-style-type: none"> <li>a. Willingness to work</li> <li>b. Less severe stroke</li> <li>c. Psychological wellbeing</li> </ul>                                                                                                                                                                                                            |
| <b>B. Work environment</b>                 | <ul style="list-style-type: none"> <li>d. Accessible work environments</li> <li>e. Safe work environments</li> </ul>                                                                                                                                                                                                                                   |
| <b>C. Employer and co-worker support</b>   | <ul style="list-style-type: none"> <li>f. Ability to provide reasonable accommodation</li> <li>g. Ability to help the stroke survivor without compromising the organisation</li> <li>h. Moral support from co-workers</li> <li>i. Communication between stroke survivor and employer</li> <li>j. Advice from therapists with regards to RTW</li> </ul> |

#### **A. Stroke survivor related enablers**

- a. Willingness to work: Some employers indicated that a person who is willing to RTW will make an effort to do their best when given an opportunity to work despite having stroke: *"An employee who is willing to come back to work, will do their best when given a chance"* (E11W.)
- b. Less severe stroke: A severe stroke was associated with more limitations in ability to do the work, and thus some employers indicated that they would consider taking a stroke survivor back into the work place only if the stroke was less severe: *"We also need to consider how serious the person's stroke is, because a debilitating stroke would make it impossible for ...(employee name).. to come back to work even if the company wants to take them back"* (E11W).
- c. Psychological wellbeing: Availability of psychological support to both the stroke survivor and co-workers was considered an enabler as indicated by one of the employers in the following quote: *"I think they will benefit a lot from making use of the psychologist to help them and colleagues deal with their psychological problems. I mean, the psychologist will have to talk to the other employees because, you know what? It will affect the other people who work with him. They have to understand what is going on and what is going to happen"* (E10B).

## B. Work environment

- d. Accessible work environments: *"Another thing that can help a person return to work is if the working environment is good. By this I mean if it has ramps for a weak person who cannot climb stairs" (E51B).*
- e. Safe work environments: *"Willingness of the employee to try the best to do the work but not to force coming back to work as we don't want them to put their life at risk" (E52B).*

## C. Employer and co-worker support

- f. Ability to provide reasonable accommodation:

The following quotes are examples of what employers said to indicate that reasonable accommodation could be an enabler of RTW: *"they (stroke survivor) should be able to come back to work even if it means doing less workload or light duty. They can even work in the office because doing visits and talks requires more walking and driving. This will all depend on whether they will cope. The question is whether they are also willing to try. We can help with what needs to be done but there has to be something that they can do here at work" (E12B).*

Having a way of allowing the stroke survivor to RTW at their own pace would facilitate the RTW process; however it was highlighted that this has financial implications which may be beyond the company's means: *"If we could afford to hire another person to help we could let her come and work slowly while the other person also helps to push the job. But unfortunately there is not enough money" (E51B).*

- g. Ability to help the stroke survivor without compromising the organisation: Some employers raised the issue of company image, indicating that if the company is willing to 'compromise' its image by letting the stroke survivor come into the workplace and try working, that will facilitate the process of returning to work. This quote shows an example of an employer who worries about the company image: *"Giving the employee an opportunity... This should be done without denting the image of the company by letting a person who is sick sit at reception and do the work" (E57W).*

- h. Moral support from co-workers: employers indicated that having supportive co-workers would motivate the stroke survivor to RTW with the knowledge that they would get all the necessary help they may require while settling back into the workplace: *“Getting weekly moral support to motivate him to stay strong and come back to work. He needs to know that we care and we want him back” (E12B); “She will also need to get support by other staff members and me (employer). She has to know that we want her to get better and will help with whatever we need to do which is possible within our means” (E53W).*
- i. Communication between stroke survivor and employer: employers indicated the need for ongoing communication between them and the stroke survivor in order to come up with solutions for challenges faced on a regular basis instead of letting the stroke survivor struggle and eventually consider giving up: *“they (stroke survivor) should try to work and if they see that they have limitations, they should try to let the supervisor know as soon as possible, to get help. This means communication is very important here. If a person cannot communicate, the supervisor will never know when they have a problem” (E79W).*
- j. Advice from therapists with regards to RTW: The importance of employers receiving advice from therapists with regards to the RTW process was identified as one of the factors which could enable the stroke survivor to RTW: *“This communication is good when it is also done with you people (therapists) because it helps us understand what is going on and what can be done to help. This is very difficult. I mean trying to help a person but not knowing what to do and what is safe to do” (E79W).*

#### 4.2.4.3 Stroke survivors’ perceived barriers of return to work

The stroke survivors were asked a question about what they thought would be barriers for RTW after stroke. Nine barriers of RTW were identified from the transcript codes. These were classified into three categories as follows: stroke survivor related barriers (4); employer related barriers (3) and environmental barriers (2). These barriers and categories are shown in Table 4.25.

**Table 4.25 Stroke survivors' perceived barriers of RTW after stroke**

| Category                            | Factors                                                                                                                                                                                      |
|-------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A. Stroke survivor related barriers | <ul style="list-style-type: none"> <li>a. Cognitive impairments (memory and attention)</li> <li>b. Fatigue</li> <li>c. Poor vision</li> <li>d. Fear of mocking</li> </ul>                    |
| B. Employer related barriers        | <ul style="list-style-type: none"> <li>e. Employer not giving time off for rehabilitation purposes</li> <li>f. Employers' unrealistic expectations/Increased physical job demands</li> </ul> |
| C. Environmental barriers           | <ul style="list-style-type: none"> <li>g. High unemployment rate</li> <li>h. Poor transport accessibility</li> <li>i. Inaccessible work environment</li> </ul>                               |

#### **A. Stroke survivor related barriers**

- a. Cognitive impairments (memory and attention): The need to have good memory and attention were identified as the main cognitive domains required in order to cope in the workplace. The following quotes from some of the stroke survivors indicate how lack of these cognitive domains affected them: *"I need to learn techniques to use in order to remember things, so that I don't miss meetings and appear incompetent in front of my manager and colleagues" (P01W). "I need training on money management. I think I might forget to count properly because now I see that my mind is not working the same as before" (P03W). "I forgot about meetings and other scheduled activities all the time. I got help from therapist with techniques to manage my schedule and setting reminders" (P01W). "I think I would only be able to go back to work if I can remember things especially to count money as they will never allow me back at work if I can't count money because the company would lose a lot of money if I make mistakes" (P31W).*
- b. Fatigue: Being tired at all times was considered a factor that would make it difficult to do usual work all day and at the required pace: *"I get tired all the time. I just want to sleep or rest. It becomes impossible to do the usual job all day" (P11W).*

- c. Poor vision: One of the stroke survivors had poor vision after stroke and this has made it impossible for her to RTW as her job involved reading and writing: *"I can only go back to work if I recover my vision as I cannot read and write because I can't see clearly"* (P33W).
- d. Fear of mocking: Some stroke survivors indicated that there is a need to counsel the co-workers to prepare them for their RTW as they were concerned that if they did not understand and accept their medical condition, they may mock them: *"If I struggle the learners and colleagues will mock me"* (P53W).

## **B. Employer related barriers**

- e. Employer not giving time off for rehabilitation purposes: Some stroke survivors indicated that they fear going back to work because the employer may not give them time off during the day to attend their therapy sessions. They would therefore rather be on extended sick leave and know that they can go for their therapy sessions without having to ask for permission all the time: *"What will also make it difficult is if my supervisor will stand in my way when I have to go for treatment"* (P51B).
- f. Employers' unrealistic expectations/Increased physical job demands: An employer who is not willing to reasonably accommodate the stroke survivor back at work may demand that they continue to perform at the same rate that they did before stroke without giving them an opportunity to ease slowly into the job. This was raised as a barrier as can be seen in the following quote: *"The employer might demand that I work at the speed that I used to have. This will not be possible"* (P51B).

Some stroke survivors indicated that their jobs are labour intensive with long working hours and thus it would be difficult for them to go back to work until they have regained the strength and endurance to cope. *"Hard labour like lifting and moving heavy boxes, standing for too long and walking around a lot. Working long hours. This will make it difficult for me to go back to work unless my employer allows me to do other things (light duty)"* (P52B).

## C. Environmental factors

- g. High unemployment rate: Some considered the high unemployment rate to be a barrier to RTW as they thought the employers would rather hire one of the unemployed people than to let them continue working. Their worst fear was that if they lost their current job because of stroke, they may never work again in future: *“My fear is that I may not be able to find a new.... job as there are no jobs.... in South Africa. It will be worse for me because I can’t ....talk properly” (P29W).*
- h. Poor transport accessibility: Some stroke survivors who use public transport indicated that going back to work would be difficult as some have to walk up and down several flights of stairs at the train station and thus it will be difficult as they would be tired by the time they reach their workplace. Some indicated that walking long distances to catch a taxi was also a challenge: *“It was difficult to get public transport because of long distance from home to taxi” (P10B).*
- i. Inaccessible work environment: Difficulty walking with and around the workplace was considered a deterrent for RTW: *“There are lots of steps around the school and the school is an upstairs (double storey) building. Toilets do not have rails for me to hold onto for balance when I need to use them” (P52W).*

### 4.2.4.4 Employers’ perceived barriers of return to work

The employers were asked a question about what they thought would be barriers for RTW after stroke. Nine barriers of RTW were identified from the transcript codes. These were classified into three categories as follows: stroke survivor related barriers (5); employer and co-worker related barriers (2) and environmental barriers (2). These barriers and categories are shown in Table 4.26.

**Table 4.26 Employers' perceived barriers of RTW after stroke**

| <b>Category</b>                            | <b>Factors</b>                                                                                                                                                                                                                                 |
|--------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>A. Stroke survivor related barriers</b> | <ul style="list-style-type: none"> <li>a. Working slowly</li> <li>b. Poor cognitive function (memory and attention)</li> <li>c. Speech problems</li> <li>d. Poor upper limb use</li> <li>e. Stroke survivors' lack of communication</li> </ul> |
| <b>B. Employer related barriers</b>        | <ul style="list-style-type: none"> <li>f. Costs to company</li> <li>g. Prolonged sick leave duration</li> </ul>                                                                                                                                |
| <b>C. Environmental barriers</b>           | <ul style="list-style-type: none"> <li>h. Inaccessible work environment</li> <li>i. Unsafe work environment/conditions</li> </ul>                                                                                                              |

**A. Stroke survivor related barriers**

- a. Working slowly: Employers felt that some stroke survivors work relatively slower than other employees and that this may make it difficult for them to cope in the work environment: *"...(Employee name)...was working slower than other employees" (E10B).*
- b. Poor cognitive function (memory and attention): Being able to remember job specifications and instructions and being able to pay attention to avoid making mistakes when doing the work was considered an important aspect in the workplace that will help to prevent mistakes which in some instances could be fatal. Some employers indicated that these cognitive abilities would be required before they could consider accepting the stroke survivor back at work: *"If ...(employee name).. can recover her memory and be able to pay attention to detail she can come back to work. If there is anything that can help her with this, we know it can help with how she will do her work" (E27W).* *"...(employee name)...was brought to work and she was tested in the work environment and could see that she would not cope as her memory problem and lack of attention only became apparent to her when she was tested in the office. She could see that she was making lots of errors and this is something we cannot accommodate in our industry" (E27W).*
- c. Speech problems: Employers of stroke survivors whose job required that they speak to customers such as those who were in sales, having to market the company products to customers; educators and those who were at the company front desk such as receptionists,

emphasised the need for the stroke survivor to regain speech before coming back to work: *“she has to talk properly again so that she can come back to work and be able to speak to customers” (E29W). “Not being able to talk because ...(employee name)..’s job requires that she should speak to customers. Another thing which will make returning to work difficult is the fact that we are not able to offer her another job in the company except what she was doing before” (E29W).*

- d. Poor upper limb use: Some of the employers indicated that if the stroke survivor cannot use both hands at work, it will not be possible for them to cope with the work demands: *“What will make it difficult for her to cope here at work is if she is not able to use both hands as she is supposed to scan documents and she can’t do this with one hand” (E51B).*
- e. Stroke survivors’ lack of communication: A stroke survivor who does not contact the employer to update them of their progress and to discuss their plans will make it difficult for the employer to help them RTW: *“It is difficult to deal with an employee who does not communicate and expects the employer to help them. We can only help if we discuss these things. ...(employee name)....took a very long time away from work without contacting us to let us know what was happening since she had stroke and it was difficult for us to get hold of her” (E52B).*

## **B. Employer related barriers**

- f. Costs to company: Some employers indicated that they were willing to accommodate the stroke survivor back at work, but could not do this due to cost implications, as they would have to hire another person to cover some of the duties which the stroke survivor was no longer able to do because of their impairments: *“Our company does not have the financial ability to get an additional staff member” (E29W).*
- g. Prolonged sick leave duration: Being on prolonged sick leave was considered a barrier for RTW by some employers as they indicated that it would be better to have a person go on physical incapacity pension which would take care of their salary. They indicated that having a person who does not cope with their work is also difficult as it costs the company to have less production: *“She was tired most of the time and wanting to leave early. It was difficult for the company as we can’t afford to have a staff member who does not complete a shift and*

*who cannot finish their allocated duties. We had to let her stay at home for a while and get a person to relieve her while she regains strength” (E52B).*

### **C. Environmental barriers**

- h. Inaccessible work environment: *“If the work environment is not conducive to accommodate her. Like when there are no ramps. We don’t have ramps and have lots of stairs around the school. Our school is also a double storey building as you can see. This can make it difficult for her to walk around the school and to various classes” (E53W).*
- i. Unsafe work environment/conditions: Not having a safe working environment was considered a hazard which could have cost implications in the long term, should the stroke survivor get injured while trying to work: *“If the work environment is not safe, like if a person has to lift heavy things which can hurt them, if they are still weak, this can cost the company a lot of money on insurance” (E57W).*

#### 4.2.4.5 Comparison of perceived barriers and enablers of return to work between groups

The employers and stroke survivors generally identified similar enablers and barriers of RTW. Stroke survivors however, raised more workplace related barriers of RTW which were within the control of the employer such as increased job demands and lack of opportunities to be reasonably accommodated. Issues raised by the employers, which the stroke survivors did not mention were safety in the workplace, willingness of the stroke survivor to RTW, unaffordable costs for reasonable accommodation and of maintaining production while the stroke survivor was on prolonged sick leave.

Stroke survivors in blue collar occupations identified the lack of light duty while regaining physical strength as the main barrier and having an opportunity to practice job skills within the workplace as the main enablers of RTW. Those in white collar occupations identified lack of support in the form of motivation and communication from employer as the main barrier of RTW and considered good cognitive function and good interpersonal working relationship to be the main enablers of RTW.

During the employers’ and stroke survivors’ interviews, the following additional questions were asked: strategies used by stroke survivors and employers in this study to overcome barriers of

return to work after stroke; stroke survivors' and employers' expectations after stroke; aspects of the workplace intervention programme that worked well and those that did not work well and what makes people stay longer in their job. Their responses to these questions are presented in Appendix U.

#### 4.2.5 Return to work after stroke

Results of the rate of RTW at three and six months after stroke; duration of time worked since stroke; working conditions after stroke; main reasons for returning to work; and main reasons for not returning to work are presented in this section.

##### 4.2.5.1 The rate of return to work at three and six months after stroke

Results of the RTW rate for stroke survivors at three and six months follow-up are presented in Table 4.27. The RTW final outcome for all stroke survivors who participated in the study, including those who did not complete the study, was included in this analysis.

**Table 4.27 The rate of RTW at three and six months after stroke**

|                           | Three months follow-up   |                    | Six months follow-up     |                    |
|---------------------------|--------------------------|--------------------|--------------------------|--------------------|
|                           | Intervention<br>(n = 40) | Control<br>(n =40) | Intervention<br>(n = 40) | Control<br>(n =40) |
|                           | n (%)                    | n (%)              | n (%)                    | n (%)              |
| <b>No return to work</b>  | 29 (73)                  | 35 (88)            | 16 (40)                  | 32 (80)            |
| <b>Returned to work</b>   | 11 (27)                  | 5 (12)             | 24 (60)                  | 8 (20)             |
| <b>Total of those who</b> | n (%)                    |                    | n (%)                    |                    |
| <b>RTW (n = 80)</b>       | 16 (20)                  |                    | 32 (40)                  |                    |

*\*Total of those who RTW = those who RTW in intervention + RTW in control group*

The overall RTW rate was 20% at three months follow-up and 40% at six months follow-up. Twenty seven percent of the stroke survivors in the intervention group returned to work at three months compared to 12% in the control group ( $p = 0.13$ ). At six months, the majority of stroke survivors (60%) in the intervention group returned to work compared to 20% in the control group ( $p < 0.001$ ).

#### 4.2.5.2 Work situation for those who returned to work

Results to show how long the stroke survivors who returned to work were working at six months follow-up; whether their job description changed; whether they had work adaptation; and whether they were working full time or part time after stroke are presented in Table 4.28.

**Table 4.28 Changes in job description for those who returned to work at six months following stroke (n = 31)**

|                                | <b>Total group<br/>(n = 31)</b> | <b>Intervention<br/>(n = 23 )</b> | <b>Control<br/>(n = 8 )</b> | <b>p value</b> |
|--------------------------------|---------------------------------|-----------------------------------|-----------------------------|----------------|
| <b>Job description changed</b> | <b>n (%)</b>                    | <b>n (%)</b>                      | <b>n (%)</b>                |                |
| Yes                            | 17 (55)                         | 12 (52)                           | 5 (63)                      |                |
| No                             | 14 (45)                         | 11 (48)                           | 3 (37)                      | 0.49           |
| <b>Work adaptation made</b>    |                                 |                                   |                             |                |
| Yes                            | 7 (23)                          | 5 (22)                            | 2 (25)                      |                |
| No                             | 24 (77)                         | 18 (78)                           | 6 (75)                      | 0.42           |
| <b>Working</b>                 |                                 |                                   |                             |                |
| Full time                      | 30 (97)                         | 22 (96)                           | 8 (100)                     |                |
| Part time                      | 1 (3)                           | 1 (4)                             | 0 (0)                       | 0.16           |

The mean work duration at six months after stroke was more than eight weeks for both groups, indicating that most stroke survivors returned to work within four months of having stroke. The job description was changed for most (55%) of the stroke survivors; however very few (23%) had work adaptations made. Majority (97%) of the stroke survivors returned to full time work. The differences between the intervention and control groups for all items in Table 4.21 were not statistically significant. The average number of weeks the stroke survivors worked since having a stroke was 9.2 (SD: 6.5; n = 31).

#### 4.2.5.3 The main reasons for RTW after stroke

Figure 4.8 summarises the main reasons given by stroke survivors for returning to work.

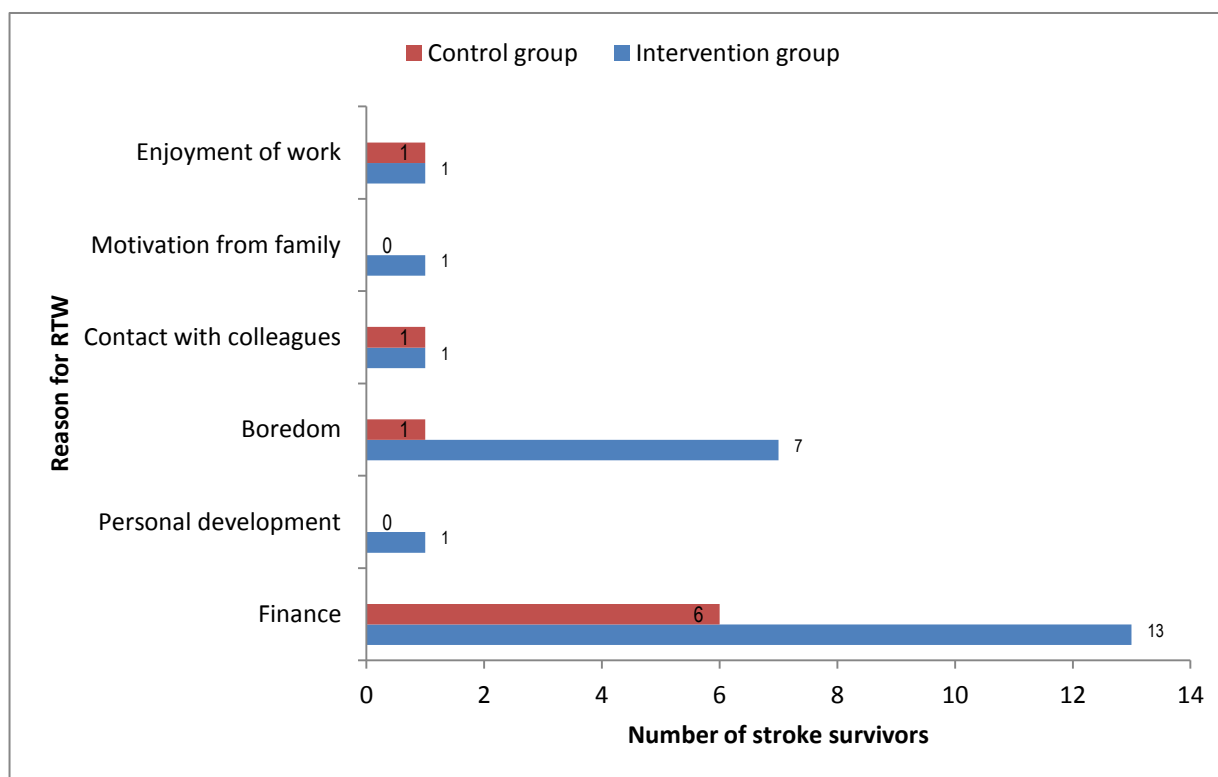


Figure 4.8 The main reasons for RTW after stroke (n = 31)

The most common reasons for RTW were financial (61%) followed by boredom (26%).

#### 4.2.5.4 The main reasons for not returning to work after stroke

Figure 4.9 summarises the main reasons why stroke survivors did not return to work after stroke.

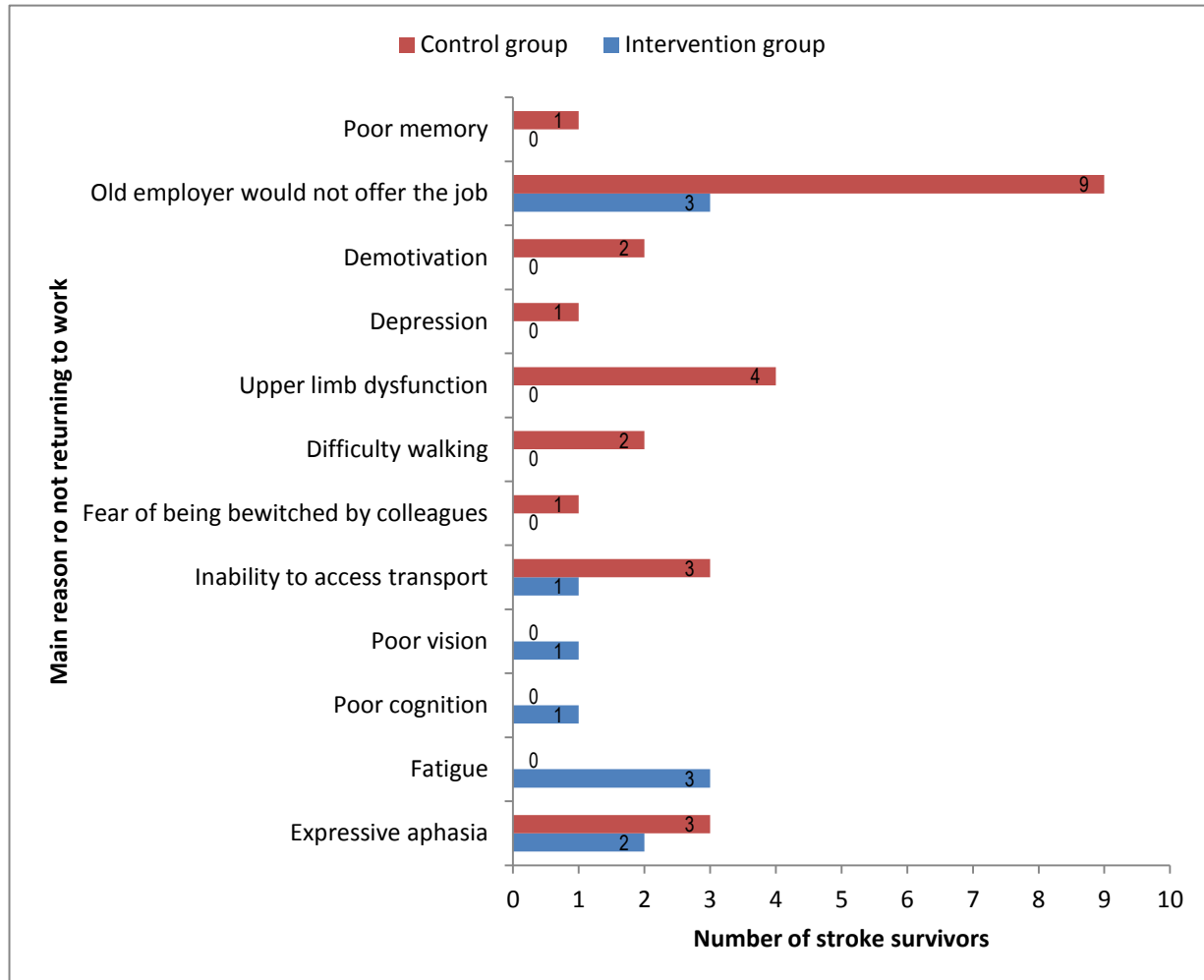


Figure 4.9 Main reasons for not returning to work after stroke

The most common reason for not returning to work after stroke in both the intervention and control groups was that the old employer would not offer the job. This was followed by fatigue for intervention group and upper limb dysfunction for the control group.

#### 4.2.6 Factors which are predictive of return to work after stroke

Tables 4.29 and 4.30 summarise results for factors which had an influence on RTW during univariate and multivariate analysis respectively. The following variables were controlled for during the regression analysis: side of stroke, educational level, cognitive function, ADL

functional ability and mobility (BI and MRMI). These are variables which showed a statistically significant difference between the control and intervention group.

**Table 4.29 Factors that had an influence on RTW after stroke: univariate analysis results**

| Variable                      | OR  | SE   | z    | p> z  | 95% CI       |
|-------------------------------|-----|------|------|-------|--------------|
| Sick leave duration           | 1.3 | 0.1  | 3.2  | 0.001 | 1.11 - 1.55  |
| Female gender                 | 0.2 | 1.2  | -1.9 | 0.05  | 0.05 – 0.92  |
| Left hemiplegia               | 6.2 | 3.7  | 3.1  | 0.002 | 1.95 – 20.08 |
| Speech problem                | 0.3 | 0.02 | -2.4 | 0.02  | 0.11 – 0.82  |
| Intervention group allocation | 5.8 | 3.6  | 2.9  | 0.004 | 1.77 – 19.42 |
| BI six month score            | 1.3 | 0.1  | 2.6  | 0.01  | 1.05 – 1.49  |
| MoCA baseline score           | 1.3 | 0.1  | 2.6  | 0.009 | 1.05 – 1.49  |
| MoCA six month score          | 1.3 | 0.2  | 2.0  | 0.05  | 1.06 – 1.62  |
| MRMI six month score          | 5.6 | 3.4  | 2.9  | 0.01  | 1.42 – 15.3  |

Stroke survivors in the intervention group had 5.8 times greater odds of RTW at six months follow-up than those in the control group and those who had left hemiplegia had 6.2 times greater odds of RTW than those with right hemiplegia. Stroke survivors with speech problems were 0.3 times less likely to RTW than those without speech problems. For every unit increase in the six month BI, MRMI and MoCA score, the likelihood of RTW increased by 1.3, 5.6 and 1.3 respectively.

**Table 4.30 Factors that had an influence on RTW after stroke: multivariate analysis results**

| Variable             | OR  | SE  | z   | p> z  | 95% CI     |
|----------------------|-----|-----|-----|-------|------------|
| Intervention group   | 5.2 | 2.8 | 3.1 | 0.002 | 1.8 – 15.0 |
| BI six month score   | 1.7 | 0.4 | 2.3 | 0.02  | 1.1 – 2.6  |
| MoCA six month score | 1.3 | 0.1 | 2.4 | 0.02  | 1.1 – 1.6  |
| Left hemiplegia      | 4.4 | 2.3 | 2.8 | 0.005 | 1.5 – 12.5 |

*\*OR = odds ratio; SE = standard error; CI = confidence interval*

Stroke survivors in the intervention group had 5.2 times greater odds of RTW at six months follow-up than those in the control group and those who had left hemiplegia had 4.4 times greater odds of RTW than those with right hemiplegia. For every unit increase in the six month BI and MoCA score, the likelihood of RTW increased by 1.7 and 1.3 respectively.

An analysis to establish if the influence of side of hemiplegia on RTW could be due to speech problems was done. Stroke survivors with right hemiplegia were 7.1 times more likely to have speech problems than those with left hemiplegia ( $p < 0.001$ ; CI = 2.4 – 20.7). Stroke survivors in the intervention group had 2.4 times greater odds of RTW at three months follow-up than those in the control group, however this was not statistically significant ( $p = 0.14$ ; Confidence Interval: 0.74 – 8.1).

#### 4.2.7 Comparison of intention to treat and per protocol analysis main findings

The main findings between the intention to treat and per protocol analysis are presented in Table 4.31.

**Table 4.31 Comparison of intention to treat and per protocol analysis main findings**

|                                                                         | ITT<br>p value | Per prot<br>p value |
|-------------------------------------------------------------------------|----------------|---------------------|
| <b>Return to work rate differences between control and intervention</b> |                |                     |
| Three months follow-up                                                  | 0.13           | 0.14                |
| Six months follow-up                                                    | <0.001         | <0.001              |
| <b>Factors which had an influence on RTW at six months follow-up</b>    |                |                     |
| Sick leave duration                                                     | 0.001          | 0.01                |
| Female gender                                                           | 0.05           | 0.02                |
| Left hemiplegia                                                         | 0.002          | 0.005               |
| Speech problem                                                          | 0.02           | 0.05                |
| Intervention group allocation                                           | 0.004          | 0.003               |
| BI six month score                                                      | 0.01           | 0.003               |
| MoCA baseline score                                                     | 0.009          | 0.001               |
| MoCA six month score                                                    | 0.05           | 0.04                |
| MRMI baseline score                                                     | 0.005          | 0.02                |
| MRMI six month score                                                    | 0.01           | 0.03                |

*ITT – intention to treat analysis; Per prot = per protocol analysis*

The results of the ITT and per protocol analysis for the relationship between RTW and group allocation and for the factors which influenced RTW did not differ. This indicates that the protocol deviations that were accommodated in per protocol analysis did not cause bias in study outcome.

#### **4.2.8 Summary of the main study two results**

The average age for the study sample was 45 (SD: 8.7) years and the average stroke duration was 4.6 (SD: 1.8) weeks. There were 41 (51%) male stroke survivors and 41 (51%) had right hemiplegia. Majority (55%) of the stroke survivors were breadwinners (63%), had a grade 11 to 12 educational level (64%), an income above R5000 (46%) and had a helper (74%) whom they did not have to pay (81%). The six months SSQoL scores were higher for the stroke survivors who returned to work.

The most commonly perceived enablers of RTW for both the employers and stroke survivors were: ability of the employer to provide reasonable accommodation for stroke; good interpersonal working relationships between stroke survivor, employer and co-workers; psychological wellbeing of the stroke survivor; less severe stroke (with good balance and ability to walk and use of the upper limb); communication between employer, therapist and stroke survivor; and having accessible work environments.

The most commonly perceived barriers of RTW for both the employers and stroke survivors were: having cognitive (memory and attention) and speech impairments; fatigue and inability to work fast. Employers also identified unaffordable reasonable accommodation costs and unsafe working environments, and stroke survivors also mentioned unrealistic physical job demands, inaccessible transport and high unemployment rates as barriers of RTW.

The RTW rate at six months following stroke was 40%. Twenty seven percent of the stroke survivors in the intervention group returned to work at three months follow-up compared to 12% in the control group. At six months follow-up, the majority of stroke survivors (60%) in the intervention group returned to work compared to 20% in the control group.

The stroke survivors in the intervention group were 5.2 times more likely to RTW than those in the control group at six months follow-up. The following factors increased the likelihood of RTW: male gender; fewer speech problems; increased time off work post stroke; ability to perform ADLs; good mobility and good cognitive ability. For every unit increase in the BI and MoCA score, the likelihood of RTW increased by 1.7 and 1.3 respectively. Stroke survivors who returned to work had better quality of life at six months after stroke than those who did not RTW.

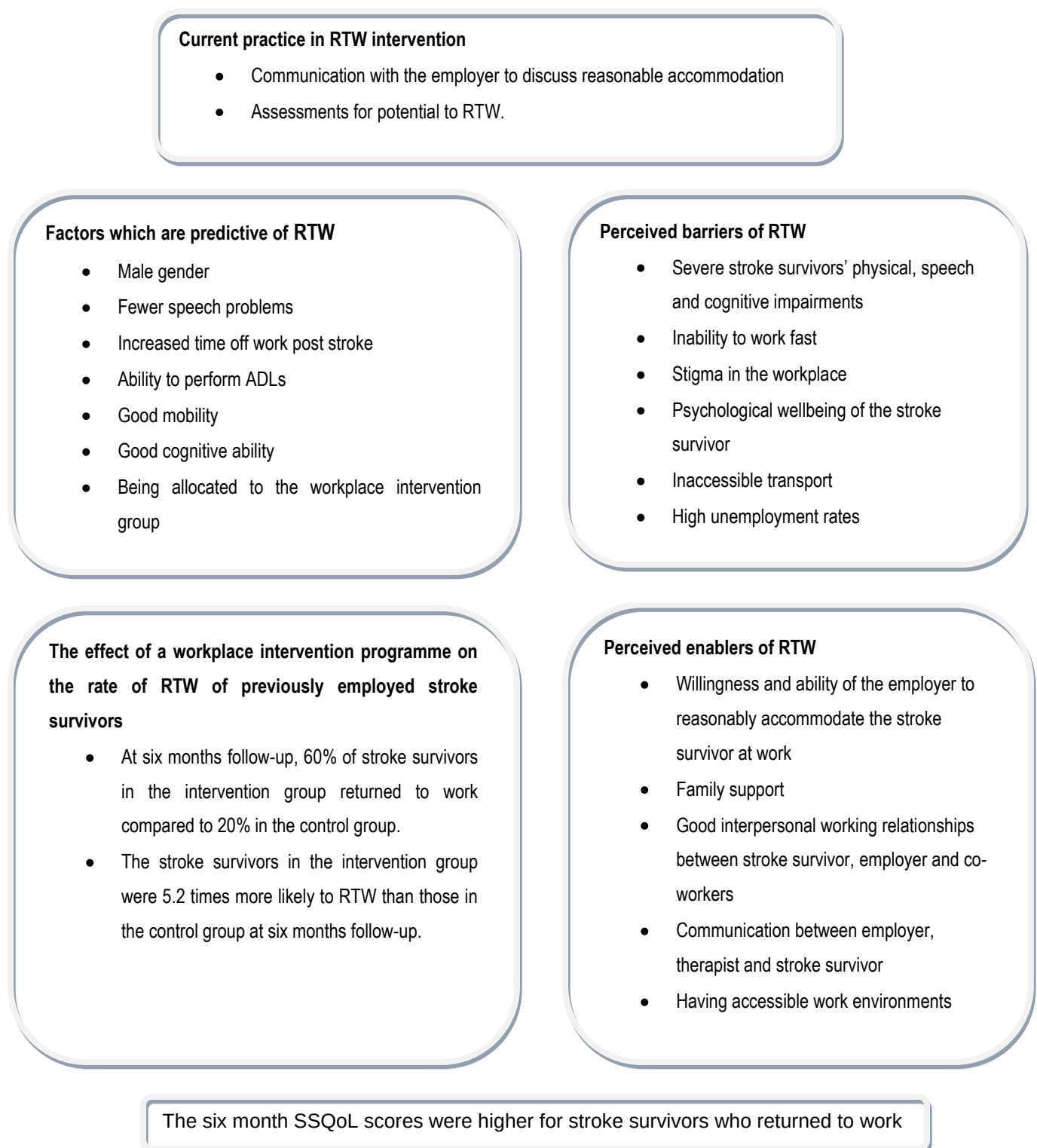
These results will be discussed in the next chapter.

## **CHAPTER 5**

### **5. DISCUSSION**

The primary goal of this thesis was to explore issues related to RTW after stroke. To this end the following questions were asked and answered: 1) what is the current practice in RTW intervention for stroke survivors? 2) What is the effect of a workplace intervention programme on the rate of RTW of previously employed stroke survivors? 3) What are the stroke survivors', therapists' and employers' perceived barriers and enablers of RTW after stroke? 4) Which factors are predictive of RTW after stroke?

Chapters one to four detailed the research programme that was undertaken to answer these questions. This chapter synthesises the findings from the results chapter and considers them with reference to earlier work to provide a comprehensive overview. The chapter concludes with a consideration of the limitations of the research and highlights recommendations for future research. Figure 5.1 provides a summary of the key findings of this study.



**Figure 5.1 A summary of study key findings**

The discussion chapter is presented according to the headings outlined in the 'map' for this chapter in Figure 5.2.

**5.1 Stage one: current practice in return to work intervention**

- 5.1.1 Return to work services rendered for stroke survivors
- 5.1.2 Therapists' perceived common barriers and enablers of return to work after stroke
- 5.1.3 Conclusion of discussion of stage one
- 5.1.4 Study limitations related to stage one
- 5.1.5 Research and clinical recommendations for stage one

**5.2 Stage two: return to work intervention programme**

- 5.2.1 Characteristics and perceived quality of life of stroke survivors
- 5.2.2 Stroke survivors' and employers' perceived barriers and enablers of return to work
- 5.2.3 Return to work rate after stroke
- 5.2.4 Factors which were predictive of return to work after stroke
- 5.2.5 Conclusion of discussion of stage two
- 5.2.6 Limitations of stage two
- 5.2.7 Research and clinical recommendations for stage two
- 5.2.8 Challenges in implementation of the workplace intervention programme for stroke survivors

**Figure 5.2 A 'map' of the discussion chapter headings that follow**

## **5.1 STAGE ONE: CURRENT PRACTICE IN RETURN TO WORK INTERVENTION**

The results of the questionnaire based study on current practice in RTW intervention programmes for stroke survivors in Gauteng, South Africa will be discussed in this section. The discussion will cover key findings from the results chapter. These key findings will be discussed in relation to the literature review and conclusions will be made based on the main discussion items.

The highest number of clinical facilities that participated in this study was from the government sector followed by primary health care facilities. This can be explained by the fact that the number of government hospitals and primary health care facilities in the Gauteng province of South Africa is more than that of the private health care facilities which offer stroke rehabilitation services.

### **5.1.1 Return to work services rendered for stroke survivors**

Results from this survey support the availability of stroke survivors who may need RTW rehabilitation services as a high number of clinical settings indicated that they had stroke survivors who require such services. There is however little clear evidence on what should be considered a “best practice” approach to RTW intervention (Fadyl and McPherson, 2009). Every form of intervention should begin only after patient assessment. Only four of the clinical facilities in this study assessed their patients in order to establish potential for RTW after stroke. This number is very low considering that one of the essential services for rehabilitation is functional capacity evaluation which covers patient evaluation amongst other things (Buys and van Biljon, 2007). This finding is similar to that of Coetzee et al. (2011) whose study was carried out in the Western Cape province of South Africa. These researchers established that most clinical facilities in the Western Cape do not offer work ability assessments. Those that offer these assessments have very long waiting lists as they are overwhelmed with requests from the South African social services agency to do eligibility assessments for disability grant applications.

Stroke survivors who were working at the time of having stroke need to be assessed in order to establish eligibility for ability to RTW irrespective of the type of vocational rehabilitation approach used. This would also be in line with Fadyl and McPherson (2009)’s study which was a review of evidence on approaches to vocational rehabilitation after traumatic injury. They identified three models of vocational rehabilitation (case coordination approach; individual placement model of supported employment, and program based vocational rehabilitation). Each

of these approaches started with assessment of the patient to establish eligibility for RTW. Without the work readiness assessment it would not be possible to identify which of these models will be suitable for a person when they need to return to work. According to Alaszewski et al. (2007) stroke survivors are sometimes forced into early retirement because of the perception of the employer or health care provider that the person is unable to do the job. Based on this information, every effort needs to be made to assess stroke survivors for potential to RTW. This would also be in line with the Employment Equity Act No. 55 (1998) of South Africa which requires that an employee gets a proper objective assessment to establish the extent to which he/she is able to perform work amongst other things. Coupled with the importance of assessment is the importance of a work visit.

The number of clinical facilities which performed work visits was very low considering that functional capacity evaluation requires that a work visit be done (Buys and van Biljon, 2007). According to Buys and van Biljon (2007) it will be difficult to identify potential work challenges without evaluating the workplace. Work visits are also recommended by Franche et al. (2004) as they established that they reduce work disability duration. One of the possible reasons for this low number of work visits could be shortage of rehabilitation staff which may limit the amount of time the therapists have available to spend with patients within their clinical facilities in addition to doing work visits. Therapists in primary health care facilities regularly do home visits for their patients, and therefore, doing a work visit with a stroke survivor would be relatively easy as they are not confined to an inpatient clinical facility all day and have access to clinic/health facility community outreach transport. It is therefore not surprising that they were the only therapists who did a work visit to assess their patients' job demands in this survey. It would however be expected that all primary health care facilities do such work visits. A possible explanation for our findings could be that not all these facilities have regular access to community outreach transport and the patient-therapist ratio may vary between the various primary health care facilities.

A high number (47%) of clinical facilities referred their stroke survivors to facilities which offered RTW services. This number is high considering that very few facilities (19%) offer RTW intervention, and thus there would be relatively fewer clinical facilities to refer to. Some facilities did not refer and also did not offer RTW services. RTW rehabilitation was found to increase the rate of RTW after traumatic brain injury in a study by Kendall, Muenchberger, and Gee (2006).

Stroke survivors that are rehabilitated in clinical settings which do not offer RTW intervention could benefit more if referred to a clinical setting that does offer such services.

### **5.1.2 Therapists' perceived common barriers and enablers of return to work after stroke**

Severity of the stroke survivors' physical impairments was considered the most common barrier of RTW in this study. This is likely to be due to the fact that severe impairments result in functional limitations which may also reduce the ability to RTW (Gabriele and Renate, 2009). This perceived barrier is similar to that established by Stergiou-Kita, Yantzi, and Wan (2010) who indicated that a person should be fairly capable of managing most of their self care before they can RTW. Physical abilities of stroke survivors should be considered in relation to the physical demands of their jobs (Stergiou-Kita et al., 2009). Therapists in this study did not specifically mention the link between severity of physical impairments and the physical job demands, but did indicate that one of the barriers of RTW is lack of skills for less labour intensive work, and conversely that a higher educational level is an enabler for RTW. This finding is similar to that of other researchers indicating that people with higher levels of education are more likely to do white collar jobs, and are thus more likely to RTW after suffering a stroke (Vestling, Tufvesson, and Iwarsson, 2003; Coetzee et al., 2011). It is worth noting that physical impairments cannot be considered in isolation when considering RTW.

Willingness of the employer to reasonably accommodate the person back at work can also influence the process of RTW (Medin, Barajas, and Ekberg, 2006; Alaszewski et al., 2007; Koch et al., 2005). In South Africa the state has made available a code of good practice for employers which specify the role of the employer as an enabler of RTW within the Employment Equity Act No. 55 of 1998. Physical impairments should not be a barrier if there is sufficient support in the form of increased access to vocational rehabilitation; increased financial resources to purchase assistive devices to facilitate reasonable accommodation; decreased disincentives created by disability benefits and accessibility of the workplace (World Health Organisation Report on Disability, 2011).

The second most commonly perceived barrier of RTW in this study was premorbid unemployment which meant that there was no work to which they could return. The unemployment rate in South Africa was 25% during the first quarter of 2011 (Statistics South Africa, 2011). High unemployment rates may lead to a tendency to have more disability insurance benefits and routine security benefits because it would be easier for companies to

recommend disability benefits than to spend money on reasonable accommodation costs as indicated in Treger et al. (2007)'s systematic review of the stroke rehabilitation literature pertaining to RTW after stroke. This explains why therapists in this study also identified social grants as one of the barriers for RTW. High unemployment rates may lead to a tendency to have more disability grants or insurance benefits than job placements or RTW.

Cognitive problems were also considered to be barriers of RTW for survivors after stroke. Cognitive impairments are a significant barrier of RTW (Lock et al., 2005) and decreased cognitive ability is more of a barrier to RTW than physical impairments (Stergiou-Kita, Yantzi, and Wan, 2010). Only five of the 36 clinical facilities in this study considered cognitive ability to be a barrier to RTW. The reason why few clinical facilities identified cognitive ability as a possible barrier may be linked to Holmqvist, Kamwendo, and Ivarsson (2009)'s finding that most therapists do not use standardised cognitive assessment tools; this is done to avoid subjecting the stroke survivor to too many tests in addition to doing physical assessment tests.

Willingness of the employer to reasonably accommodate the stroke survivor at work was considered as the main enabler of RTW in this study. This enabler was also identified in various studies which established that employer flexibility is one of the factors that enable successful RTW (Koch et al., 2005; Medin, Barajas, and Ekberg, 2006; Alaszewski et al., 2007). This enabler was also identified by stroke survivors in a study by Liv, Silje, and Liv (2011) in which stroke survivors indicated that willingness by the employer to reorganise their work and to believe in their capacity would enable them to RTW. Work adaptation requires resources and may affect productivity, thus it becomes difficult to have a balance between being sensitive to employers' needs while accommodating the stroke survivors back at work (Stergiou-Kita, Yantzi, and Wan, 2010). Involving the employers by identifying their needs, expectations and potential accommodations in their workplace may help them make informed decisions about reasonably accommodating the stroke survivor at work and making work adaptations where possible (Stergiou-Kita et al., 2009).

Therapists in this study mentioned a shortage of work ability assessment equipment and staff shortage as barriers of RTW. This finding is similar to that of Coetzee et al. (2011) who established that most clinical facilities in the Western Cape do not offer work ability assessments and those that do have very long waiting lists as they are overwhelmed with

requests from the South African social services agency to perform disability grant eligibility assessments.

Inability of the stroke survivor to drive or use public transport was also identified as a barrier to RTW. Treger et al. (2007) reported that lack of transportation is one of the barriers of RTW. This was echoed by Coetzee et al. (2011) who made recommendations that the Department of Transport should assist the Department of Labour in South Africa in order to remove this barrier which impeded participation of people with disabilities.

Therapists in this study identified workplace stigma as a possible barrier to RTW. This indicates that even if the employer is willing to accommodate a person back at work, there is also a need to have support from colleagues (Van Velzen et al., 2011). Family support was also identified as an enabler of RTW in this study. It was similar to the finding of Holmqvist, Kamwendo, and Ivarsson (2009) who reported that some families promote dependence by carrying out the ADLs for stroke survivors even though they could manage themselves, and some made decisions for them without asking for their opinion. The family could therefore in some circumstances make a decision for the stroke survivor not to RTW even though he/she would have preferred to RTW.

Willingness of the stroke survivor to RTW was also identified by therapists as an enabler of RTW. This is similar to Stergiou-Kita, Yantzi, and Wan (2010)'s study which indicated patient willingness to be the most significant predictor of RTW. They established that the goal of RTW must be initiated by the person with an acquired brain injury and not the therapist. It is important for the therapist to find out why a stroke survivor is not willing to RTW in order to help him/her overcome self esteem barriers if these are found to be the reason for lack of willingness to RTW.

HIV/AIDS related infections were identified as a barrier to RTW. This perception may be based on the fact that people with HIV infection (not AIDS or pulmonary infection) were reported to have reduced work capacity, lower aerobic threshold, and poorer aerobic capacity than age matched controls in a study by Mars (2004). None of the studies reviewed identified HIV as a barrier to RTW. This is not surprising as most of the RTW studies for stroke survivors were done in developed countries where HIV/AIDS is not a major problem. According to the Joint United Nations programme on HIV/AIDS 2010 report, 5% of people in Sub Saharan Africa have HIV/AIDS whereas in other countries the prevalence is less than 1% (UNAIDS, 2010). This explains why HIV/AIDS was not considered on the list of barriers to RTW in studies done in

developed countries. It should however be noted that a person may not be discriminated against because of their HIV status as the South African Employment Equity Act No. 55 (1998) clearly states that everyone has a right to have a full assessment to establish possible RTW and consideration for possible reasonable accommodation at work.

### **5.1.3 Conclusion of discussion of stage one**

A small number of clinical facilities within the Gauteng province of South Africa assess their patients in order to establish potential for RTW after stroke. A small number of clinical facilities render RTW intervention for stroke survivors. The therapists' most commonly perceived barrier of RTW for stroke survivors is severe physical impairments and the most commonly perceived enabler is willingness of the employer to reasonably accommodate the person at work.

### **5.1.4 Study limitations related to stage one**

- The number of stroke survivors who were referred to vocational rehabilitation services and the number of survivors who successfully RTW was not established in this part of the study. It would have been beneficial to know if therapists have a record of this information, especially those who mentioned that they offer RTW services.
- Characteristics of the clinical facilities that participated in this study were not given in detail. The primary health care facilities are the local clinics; however details of the size of the clinic, hospital or rehabilitation unit were not included in the questionnaire. This information can give an indication of the characteristics of the facilities which offered RTW services. Large facilities usually have more therapists, thus it would be beneficial to know if this might be one of the factors that determine whether the facility would offer RTW services.
- The information gathered about therapists' perceived barriers and enablers of RTW for stroke survivors could have been more enriched if the data collection method was through interviews with appropriate follow-up questions instead of using a self administered questionnaire with open ended questions.
- The questionnaire did not ask for demographic information and feedback from individual therapists. Such information could have been beneficial in the interpretation of results to help establish the profile of therapists who were likely to render RTW services.

#### **5.1.5 Research and clinical recommendations for stage one**

- Therapists' perceived barriers and enablers of RTW for stroke survivors need to be explored further using qualitative research methods.
- Involving the employer by identifying their needs, expectations and potential accommodations in their workplace may give them an opportunity to make informed decisions about reasonable accommodation and work adaptation for the stroke survivor.
- Clinical facilities which offer rehabilitation for stroke survivors should review their provision of RTW support for stroke survivors, given the lack of RTW services available for the number of patients reported by respondents to need RTW services.

## **5.2 STAGE TWO: RETURN TO WORK INTERVENTION PROGRAMME**

The results of the stroke survivors' characteristics and their perceived quality of life; stroke survivors' and employers' perceived barriers and enablers of RTW; RTW rate; and factors that are predictive of RTW after stroke are discussed in this section. This discussion covers key findings from the results chapter. These key findings are discussed in relation to the literature review and conclusions are made based on the main discussion items.

The differences between the intervention and control group's age, educational level, type of occupation, key physical job demands, cognitive function, and co-morbidities (including HIV/AIDS) were not statistically significant at baseline. Thus the groups' characteristics with regards to factors which may influence RTW after stroke were similar at baseline with no group having an advantage over another. The BI score, mobility functional level (MRMI) and monthly income, however were different between the groups at baseline, with the intervention group scoring relatively higher than the control group. This is not of major concern as the control group's scores improved by three months follow-up and there was no statistically significant difference between groups at this point. Both the intervention and control group had a score which indicated ability to do all ADLs and mobilise without help from another person by three months follow-up when the RTW rate was first established. The difference in monthly income between the groups was controlled for through educational level in the logistic regression analysis of factors that are predictive of RTW after stroke.

### **5.2.1 Characteristics and perceived quality of life of stroke survivors**

The average age of stroke survivors in this study was 45 (SD: 8.5) years for the intervention group and 44 (SD: 8.9) years for the control group. The inclusion criterion for this study was up to the age of 60 years and thus was not only restricted to young stroke survivors. The younger average age found in this study is confirmation that stroke is no longer a disease of older people as indicated by Roding et al. (2003). They reported that the incidence of stroke in people younger than 65 years has increased over the past few years with almost 5% occurring in those younger than 45 years. Stroke survivors in Duff's study (2012), in the Gauteng province of South Africa, had an average age of 51 years. In that study the inclusion criteria was up to the age of 64 years. Exclusion of those above the age of 60 years, as was the case in this study and Duff's study, did not have an influence on the general average age of stroke survivors in the Gauteng province of SA. This is confirmed by Mudzi, Stewart, and Musenge (2012) who reported the average age of stroke survivors in Gauteng to be 53 years. Their inclusion criterion

was open to all above the age of 18 years. These young average ages confirm that the majority of stroke survivors still have a number of working years ahead of them based on the recommended retirement age of 65 years in South Africa (Basic conditions of employment Act, 1997).

There were slightly more males than females in the current study. This is similar to what Appelros, Stegmyr, and Terent (2009) established in their systematic review of sex differences between stroke survivors. They found that in most instances male stroke incidence and prevalence was higher than that of females and that stroke tended to be more severe in women than in men. They attributed this to the possible protective effect of oestrogen in females. Similar to our findings the average number of male stroke survivors was higher in other studies done within the Gauteng province (Duff, 2012; Dearle, 2009). Mudzi, Stewart, and Musenge (2012) found that there were more female than male stroke survivors. Mudzi et al's study included stroke survivors who were more severe (BI <12), and only 22% were functionally independent (BI >12) at 12 months follow-up. This might be an explanation for the increased number of female stroke survivors in Mudzi's study when compared to this study and that of Appelros, Stegmyr, and Terent (2009), given that females are more disabled at six months following stroke than men (Kelly-Hayes et al., 2003). In this study stroke survivors were only included if they had a BI of more than 12 and this may explain the relatively higher number of male compared to female stroke survivors.

Connor et al. (2004) reported findings similar to that of Mudzi, Stewart, and Musenge (2012) with more female stroke survivors than males. This relatively higher number of females in Connor et al.'s study can be attributed to the age ranges of the stroke survivors in their study which had the highest number of 75 – 84 year olds. Within this age range it can be expected that females will be more than males as females have stroke at a relatively older age than males (Kelly-Hayes et al., 2003) and females within this age group would have lost the protective effect of oestrogen (Appelros, Stegmyr, and Terent, 2009).

The majority of stroke survivors in the current study had an educational level below grade 12. This educational level is comparable with that of stroke survivors in Duff's study (2012) that found that 44% of the stroke survivors had an educational level below grade 12; however, in Mudzi's study (2010), also done within the same province, 78% stroke survivors who had an educational level below grade 12. Exclusion of stroke survivors who were unemployed in this

study and Duff's study could be a possible explanation for the relatively higher educational level reported compared to Mudzi's study in which 71% of the stroke survivors were unemployed. Majority of stroke survivors did not have speech problems. Those who did have speech problems, mostly presented with dysphasia. Slightly more stroke survivors had right hemiplegia compared to left hemiplegia. Speech problems are common in stroke survivors with right hemiplegia (Foerch et al., 2005) and thus if there were more survivors with right hemiplegia, more stroke survivors might have presented with speech problems.

The most common co-morbidity in both the intervention and control groups was hypertension followed by HIV related illness. This finding is not surprising as the presence of hypertension is associated with the likelihood of having a stroke (Sturm et al., 2004) and the presence of HIV infection is also associated with stroke (Conner et al., 2004). South Africa is also known to be one of the countries with the highest number of HIV infections in the world (UNAIDS, 2010) and this is confirmed by the fact that 29% of the stroke survivors in this study had HIV/AIDS related illness.

Occupation related information: Stroke survivors had an average of seven weeks sick leave within a three year cycle which was more than the minimum recommended sick leave duration of six weeks per three year cycle (Basic conditions of Employment Act: No. 75, 1997). The mean job skill discretion score was 37.8 ( $\pm 4.7$ ) and the mean job demands score was 31 ( $\pm 4.6$ ). These scores are within the normal score ranges for JCQ (Spring, 2007). The difference in scores between those who returned to work and those who did not RTW was not statistically significant, however the JCQ scores were slightly lower and TPAL scores slightly higher for those who RTW. This indicates that those who returned to work were in jobs which did not have discretionary powers and which had relatively lower psychological and physical demands.

The total TPAL score was very low (38.6%) considering that the minimum score for a person to meet the open labour market if they receive rehabilitation is 60 to 86% (Valpar International corporation, 1992). These low TPAL scores indicate that stroke survivors performed the modules at a slower pace compared to people in the competitive employment setting. This slower pace could be explained by the fact that assessments were done up to two months after stroke, which seems to have been too early for the stroke survivors' skills to improve in order to attain high scores. The scores are based mainly on people with potential to be in the competitive employment setting, and thus it is understandable that the stroke survivors scored

low, as most of them were not yet functionally independent at two months following stroke. The workplace intervention was however implemented despite these low scores, as the intervention did not require that the stroke survivor attain full functional capacity. This decision was based on the fact that some employers offer reasonable accommodation at the workplace for the stroke survivors' activity limitations.

The BI total scores generally increased over the study period for both the intervention and control group subjects. At three and six months follow-up the mean score was above 18 (90%) for both the control and intervention groups. A score above 18 signifies a turning point whereby help from another person is not required for ADLs (Uyttenboogaart et al., 2005). Most stroke survivors in this study were completely independent in ADLs at three and six months following stroke. This confirms McCullagh et al. (2005)'s finding that most stroke survivors improve significantly in their functional ability measuring a median BI score of 18.5 by three months after stroke.

The MRMI total score increased from baseline for the duration of the study period with both intervention and control group scoring more than 37 out of 40 (90%) at three months and six months. There is no specific cut off score to indicate functional mobility when using the MRMI, however for there to be change in the stroke survivors' mobility level, there has to be a greater than 4.5 change in score (Lennon and Johnson, 2000). The change in mobility for the control group from baseline to six months follow-up was clinically significant (6.1) with that of the intervention group being only 3.8 (not significant). Stroke survivors in the control group therefore had more improvements in mobility over the study period. This can be attributed to the fact that at baseline their scores were relatively lower (32.8) than those of the intervention group; thus the change in scores over time was more noticeable in the control group. The intervention group score was 36.2 at baseline and thus even with great improvements, the change in score would never reach the specified significant change of 4.5 as there could only be a maximum increase of 3.8 to reach total score. The main difference between the control and intervention group was that most stroke survivors in the intervention group did stair climbing independently, whereas some of those in the control group required the use of an aid when climbing stairs at six months following stroke.

The mean MoCA total scores throughout the study indicate that most stroke survivors in this study had mild cognitive impairments. The mean score for normal cognitive ability is 27.37

( $\pm 2.2$ ) (Nasreddine et al., 2005). This finding is not surprising as cognitive impairments are common after stroke. Deteriorated cognitive function was reported by 57% of Swedish stroke survivors aged 18 – 55 years (Roding et al., 2009). Forty percent of stroke survivors in Trygged's study (2012) also had cognitive impairments.

The SSQoL scores improved from baseline to six months for stroke survivors in both the control and intervention group, with the intervention group having relatively higher SSQoL scores even though the differences in scores between the control and intervention group were not statistically significant. Score comparison between those who returned to work and those who did not RTW revealed that stroke survivors who returned to work scored relatively higher and the differences in scores were statistically significant when compared to those who did not RTW. These results confirm that people who do not go back to work after stroke have poor psychosocial outcomes (Roding et al., 2003). The poor quality of life generally experienced by stroke survivors as reported by Akinpelu and Gbiri (2009) may be compounded by the inability to RTW.

## **5.2.2 Stroke survivors' and employers' perceived enablers and barriers of return to work**

Discussion of the stroke survivors' and employers' perceived barriers and enablers of return to work is presented in this section.

### 5.2.2.1 Having an opportunity to be reasonably accommodated

Having an opportunity to be reasonably accommodated at work was mentioned by stroke survivors as an enabler of RTW. It was acknowledged that for a person to RTW, there has to be changes to either their work schedule or job description initially to give them an opportunity to be gradually reintroduced to the workplace. This enabler was also identified in various studies which established that employer flexibility and allowance for job modifications is one of the factors that enables successful RTW (Koch et al., 2005; Medin, Barajas, and Ekberg, 2006; Alaszewski et al., 2007). This enabler was also identified by stroke survivors in a study by Liv, Silje, and Liv (2011) in which stroke survivors indicated that willingness by the employer to reorganise the work and to believe in their capacity would enable them to RTW.

Reasonable accommodations mentioned by stroke survivors in this study included mostly the need to reduce working hours. This need is not unique as about 66% of

stroke survivors in Treger et al. (2007)'s study reduced their working hours on RTW. There is also a need for flexibility in the scheduling of the work as some people may require extra time to prepare for work and to travel to and from work (World Health Organisation Report on Disability, 2011). In situations where a stroke survivor cannot RTW early, arrangements can be made for transitional work (temporary modified work) as this has been shown to facilitate early and sustained RTW (Campbell et al., 2007).

Stroke survivors who need workplace modifications for them to be accommodated back at work and those with physically demanding jobs are less likely to go back to work or may take longer before returning to work (Hsieh and Lee, 1997). The need for reasonable accommodation mentioned by stroke survivors and employers in this study, was however, not only limited to physical job demands. Being accommodated for cognitive and speech impairments was also mentioned as an enabler of RTW.

Stroke survivors also mentioned that after RTW, they would need to continue with rehabilitation. They indicated that having an opportunity to attend rehabilitation sessions which take place during working hours would help them regain functional ability and enable them to RTW or work better. This expectation can be met if the employer can allow them to attend rehabilitation services during working hours at clinical facilities and even availing services within the workplace. This should be possible because longer term rehabilitation is required and can be provided within workplaces (Haig, 2007; Ottenbacher and Graham, 2007).

#### 5.2.2.2 Having good interpersonal working relationships

Some stroke survivors and their employers mentioned the importance of having good working relationships with co-workers. Even though some employers did not want the stroke survivor to expect co-workers to assist them with their work, they acknowledged the importance of not having unreasonable expectations of the stroke survivor. This reflects the importance of treating people fairly in the workplace as the stress of unfairness in the workplace can lead to longer and less successful recovery (Shain, 2001).

Having good working relationships results in cooperation amongst workers as could be seen in some of the cases in this study when a stroke survivor's co-workers would help

her/him carry heavy documents to meetings. This illustrates that even if the employer is willing to accommodate a person back to work, there is a need to have support from co-workers as well (van Velzen et al., 2011). In some cases, advocacy is required to help build an understanding of disability among co-workers (Wolfenden and Grace, 2009) for them to provide assistance where necessary. If the working relationship is not supportive, it is unlikely that the stroke survivor would get assistance from co-workers. This confirms the findings of Lemieux, Durand, and Hong (2011) who showed that the presence of conflict with co-workers or the employer prior to the work absence can make the RTW process difficult.

#### 5.2.2.3 Communication and availability of advice from therapists for stroke survivor and employer with regards to the RTW process

Communication between employer, therapist and stroke survivor was identified as an enabler of RTW. This supports the findings of Campbell et al. (2007) that there is a need for communication between the health professional, employee and employer, especially when workability is assessed to keep all stake holders informed. The importance of interaction between employer, therapist and stroke survivor was also emphasized by Carrol et al. (2010). They showed that interventions that involve the employee, therapists and employer are more consistently effective than those that involve only one or two of these stakeholders.

The need for the employer and stroke survivor to be informed about RTW possibilities was identified by most participants in this study. Some employers indicated that lack of knowledge of the stroke survivor's condition and whether they would be able to RTW was very important. There is thus a need for the therapists to be well informed about the stroke survivor's work potential as they cannot give RTW advice if they have not assessed potential to RTW and work context (Stergiou-Kita, Yantzi, and Wan, 2010).

The need to be informed about the possibility of RTW was also expressed by stroke survivors in a study by Gilworth et al. (2009). Some employers fear that stroke survivors cannot be productive in the work environment, especially as they are not well informed about stroke outcomes (Roberts et al., 2004). Direct advice from therapists to stroke survivors and employers is necessary, but the advice needs to take into consideration severity of the lesion, socio-demographic factors and workplace factors (Franche and

Krause, 2002). One of the benefits of direct advice about RTW is that it has a major and lasting impact on the stroke survivor's and employer's beliefs about possible RTW. Advice and motivation is also required because for those who do not go back to work, about half are considered to do so for psychological reasons and not because of their physical condition (Mital, Desai, and Mital, 2004).

#### 5.2.2.4 Stroke survivors' psychological wellbeing

Good psychological wellbeing was identified as an enabler of RTW by stroke survivors and employers. Employers who participated in this study indicated that the stroke survivor's psychological wellbeing was associated with willingness to RTW. This enabler of RTW was also reported by Stergiou-Kita, Yantzi, and Wan (2010). They indicated that the goal of RTW must be initiated by the stroke survivor, not the therapist or employer. It is important to establish why some stroke survivors are not willing to RTW. This will assist to help them overcome self esteem barriers if they are found to be the reason for lack of willingness to RTW. Low self esteem and fear of social stigma can discourage a stroke survivor from making a choice to RTW (Alaszewski et al., 2007). This agrees with Joling et al. (2004). They showed that a worker with poor psychological wellbeing has a lower probability of RTW.

Importantly, a stroke survivor is the ultimate decision maker in the RTW process as he/she has to make the final decision of going back to work. Good psychological wellbeing is necessary to make the decision about RTW; however, information, motivation and support to make an informed decision need to be provided (Franché and Krause, 2002). The psychological wellbeing needs to be taken into consideration as work can also be a stressing factor that can worsen poor health further, especially if a person returns to work too soon instead of dealing with the difficulties that he/she may have (Trygged, 2012).

#### 5.2.2.5 Cognitive impairments

The presence of cognitive impairments was identified as a barrier of RTW by both the stroke survivors and the employers and this confirms the findings reported by Lock et al. (2005). Some stroke survivors in this study could not RTW due to poor memory and attention span, despite them not suffering from any physical impairment. Attention is the ability to engage in work tasks for a prolonged period of time and memory is ability to

recall the steps required to perform work tasks from one day to another (Stergiou-Kita, Yantzi, and Wan, 2010). This agrees with what was reported by Stergiou-Kita, Yantzi, and Wan (2010), that decreased cognitive ability is more of a barrier to RTW than physical impairments. Cognitive impairments were also identified as barriers of RTW by Roding et al. (2003) and Alaszewski et al. (2007). When a person has cognitive impairments they experience the lowest employment rates as they are less likely to be employed in the competitive labour market (Jones, Latreille, and Sloane, 2006).

The cognitive impairments identified by stroke survivors and their employers in this study were poor attention and memory. Attention; memory; self awareness (ability to identify their skill level in relation to their job demands and ability to anticipate possible barriers) and judgement (ability to make logical decisions and behave in a manner that is appropriate to their work setting) were also identified by (Stergiou-Kita, Yantzi, and Wan, 2010) as key cognitive abilities for RTW. Even though self awareness and judgement were not specifically mentioned by stroke survivors and employers in this study, they did identify the willingness to RTW, psychological well being and ability to work fast and accurately, which encompass the self awareness and judgement components of the cognitive domains.

Problems with memory, impaired ability to concentrate or losing train of thought were also mentioned by stroke survivors as reasons for not being able to RTW or cope in their work in a study by Gilworth et al. (2009). The same was established by Possl et al. (2001) who showed that memory deficits reduce the rate of RTW. It is thus important to identify stroke survivors with cognitive problems especially attention and memory deficits. McDowd et al. (2003) also mentioned that knowledge of stroke survivors' cognitive level will increase their chances of receiving attention and memory training during the rehabilitation process.

#### 5.2.2.6 Less severe stroke with good functional ability (balance and ability to walk and use the upper limb)

The need to have good walking ability and speed, upper limb function and good balance, and ability to work fast and accurately were the main aspects of functional ability requirements mentioned by stroke survivors and employers. Ability to work fast and accurately was emphasised mainly by employers. Muscle strength was not specifically

mentioned as an enabler of RTW in this study even though it was identified in other studies (Saeki et al., 1993; Hsieh et al., 1997; van de Port, 2007). Activity limitations such as poor balance, upper limb function and walking however, may also be caused by poor muscle strength. The mention of these activity limitations may indicate that muscle strength is also implied as one of the enablers of RTW.

Some stroke survivors and employers identified ability to use the affected upper limb as an enabler of RTW. This is not surprising as most stroke survivors have an upper limb paresis immediately after stroke with only 30% to 40% regaining some dexterity within six months following conventional treatments (Kwakkel et al., 2003). Functional recovery of upper limb function is concentrated in the early months after stroke and reaches a plateau six months after stroke (Toschke et al., 2010). Stroke survivors who need to use both upper limbs in their job will not be able to RTW unless reasonably accommodated for upper limb dysfunction. Upper limb function and walking ability were reported to have strong correlations with increased RTW rates in many studies (Treger et al., 2007; Giaquinto et al., 2007; Gabriele et al., 2009; Trygged, Ahacic, and Kareholt, 2011).

#### 5.2.2.7 Speech impairments and fatigue

Speech impairments were mentioned by some stroke survivors and employers as barriers of RTW. As discussed in 5.2.5.2, speech impairments were found to influence RTW in stroke survivors in this study and therefore it is thus not surprising for them and their employers to raise this as a barrier of RTW. This was more applicable to the 15% of stroke survivors in occupations which required ability to talk. Those who could be given an opportunity to do an alternative job in their company managed to RTW, however there were employers who could not offer an alternative job for the stroke survivor. The limiting effect of speech impairments was also identified by stroke survivors in Alaszewski et al. (2007) in a qualitative study on stroke survivors over a period of 18 months following stroke. Those who had speech problems indicated that they had difficulty returning to work due to the speech problems. Black-Schaffer and Osberg (1990) also found a negative association between RTW and aphasia. Thus the limiting effect of speech impairments is not unique to this study.

Fatigue was mentioned as a possible RTW barrier by stroke survivors in this study. This was also reported as a consistent problem for stroke survivors in a study by Gilworth et

al. (2009). Kahonde, Mlenzana, and Rhoda (2010) reported that stroke survivors who stay next to the clinical facilities or workplace could not walk to these facilities as they got tired while walking. Stroke survivors may have the ability to walk and use their upper limbs but may still suffer from poor endurance. This might limit their ability to cope in the workplace which requires ability to first of all, get there, and to work for several hours of the day at a fast pace.

#### 5.2.2.8 Unaffordable work adaptation costs to company, and high unemployment rate

Some employers mentioned that financial difficulties would make it impossible to make work adaptations to enable the stroke survivor to RTW. Involving the employers by identifying their needs, expectations and potential accommodations in their workplace may help them make informed decisions about making work adaptations where possible (Stergiou-Kita et al., 2009). Work adaptations require resources and may affect productivity, thus it becomes difficult to have a balance between being sensitive to employers' needs while accommodating the stroke survivors back at work (Stergiou-Kita, Yantzi, and Wan, 2010). Employers in the study by Kaye, Jans, and Jones (2011) were also worried about costs of reasonable accommodations, seeing it as a financial burden which may also require them to make the entire workplace accessible. In South Africa, the costs of workability assessments and of making work adaptations are expected to be carried by the employer as stated in the Code of Good Practice on employment of people with disabilities (The Employment Equity Act No. 55, 1998). This can be costly for the employers, especially those with small companies (Hannerz et al., 2012).

Stroke survivors identified the high unemployment rates as a possible barrier of RTW mentioning that employers would rather offer the job to another person who can do the job faster, than to retain them at work. The unemployment rate in South Africa was 25% during the first quarter of 2011 (Statistics South Africa, 2011). High unemployment rates may lead to a tendency to have more disability insurance benefits and routine security benefits (Treger et al., 2007). The stroke survivors were worried that if they lost their current jobs, it would be difficult to find another job. This fear is supported by the World Health Organisation Report on Disability (2011), which states that laws that govern employment of people with disabilities seem to be successful in preventing discrimination among people who are already employed and thus it should be relatively easier to enforce when assisting a person with a disability to RTW than to find a new job.

#### 5.2.2.9 Poor transport accessibility and unsafe work environment

Inability to drive or use public transport was identified as a barrier to RTW in this study and similar findings were reported by Treger et al. (2007). This barrier was echoed by Coetzee et al. (2011) and they also made recommendations that the Department of Transport in South Africa should assist the Department of Labour in order to remove this barrier which impeded participation of people with disabilities. Accessing transport is not only about getting to the taxi. It also involves transport costs which can be a barrier for RTW especially if a person has to hire a car to move from one point to another due to transport accessibility limitations (Biggs, 2005). This concurs with the 2002-2004 World Health Survey report that showed that transport costs ranked high as a barrier to participation for people with disabilities.

Thirty one percent of stroke survivors in the study by Duff (2012) mentioned the lack of accessible transport as a barrier to RTW. This barrier confirms the report by Hale et al. (1998) that 31% of the younger stroke survivors were unable to catch a taxi to travel for community participation. This would make it difficult for a person to RTW especially if they had to use public transport to get to their workplace. Rhoda, Mpofu, and DeWeerd (2011) also highlighted the fact that environmental barriers such as lack of ramps, could be more limiting for the stroke survivor than the neurological deficits. It is thus important to address accessibility issues as well as impairments and activity limitations. The United Nations Convention on the Rights of Persons with Disabilities stipulates the importance of interventions to improve access to different domains of the environment including buildings and roads, transportation, information and communication. In other words, stroke survivors may benefit significantly from improvements in their impairments as well as in their community and workplace environment.

Employers also mentioned the risk of injury while working as a barrier of RTW. Employers in a qualitative study by Kaye, Jans, and Jones (2011) were concerned about the increased possibility of a workplace injury or accident that involves the stroke survivor and the resultant increased insurance costs. It is important to ensure that stroke survivors and employers receive education related to safe job performance and injury prevention (Haugli, Meland, and Magnussen, 2011). It is also important to do a work visit to do workability assessment as well as education of employers about safety issues (Franche et al., 2004).

### **5.2.3 Return to work rate after stroke**

Forty percent of the stroke survivors returned to work at six months following stroke. This RTW rate is higher than the 34% shown by Duff (2012) in the Gauteng province of South Africa. Stroke duration in the current study was six months. The stroke duration for participants in Duff's study was between 18 and 24 months and they did not receive any form of vocational rehabilitation. The functional ability of stroke survivors in the current study is similar compared to Duff's study in that most were independent in ADLs and mobility. In both studies stroke survivors had a mean age less than 50 years. A possible explanation for the higher RTW rate is the availability of the RTW intervention programme for stroke survivors in the current study.

The increase in RTW rate at three and six months in this study is not surprising as most people who RTW, do so within three to six months (Treger et al., 2007). This is further confirmed by the fact that the mean work duration at six months after stroke was nine weeks, indicating that most stroke survivors in this study returned to work within four months of having stroke. The number of stroke survivors who RTW in this study is expected to increase further by 18 months because the second peak of RTW occurs at 12 and 18 months (Treger et al., 2007). Therefore the RTW rate in this study may far exceed that reported by Duff (2012) if stroke survivors are followed up for the same duration of time (18 months to two years).

Peters et al. (2012) showed a RTW of 55% in Nigeria for stroke survivors who also did not receive vocational rehabilitation. The high RTW in Peters et al.'s study can be attributed to the relatively longer stroke duration (eight years) compared to six months in this study. Because the specific functional ability of stroke survivors in Peters et al.'s study (2012) is not known, no further comparisons can be made. The RTW rate in Denmark was reported to be 62% two years after stroke; however their definition of work included house executives (Hannerz et al., 2011). Their results cannot be compared with those for this study as only those who worked for economic provision and whose occupations were affected by labour laws were included in this study. Hackett et al. (2012) has shown a RTW of 75% in the year following stroke, mostly within three months. This RTW rate is very high; however it cannot be compared with results of this study because they defined paid work as any type of work in the month before stroke, including casual or temporary, for one hour or more for which some form of payment was received. A precise comparison of these studies is difficult because they report RTW with varying follow up periods and use different definitions of work.

#### 5.2.3.1 Work situation for those who returned to work

The mean work duration at six months after stroke was nine weeks, as mentioned previously, indicating that most stroke survivors returned to work within four months of having stroke. This timing of RTW is similar to that shown by Treger et al. (2007) as discussed above. This is different from that of Hackett et al. (2012) in which the RTW occurred on average nine weeks after stroke. This early RTW can be attributed to their definition of work which included casual work for one hour or more per day for which some form of payment was received. Under such a definition for work, the researchers would have more people reporting that they returned to work early after stroke, especially those who could do some form of work in the early days after stroke. Most studies focus on RTW at one year after stroke and it is difficult to compare as they did not indicate the work duration or the amount of time it took to RTW after stroke.

The majority of stroke survivors who returned to work, returned to full time work. This is in contrast to the findings reported by Duff (2012) (62% RTW rate) and Hackett et al (2012) (71% RTW rate). The only major difference between stroke survivors in this study and those in Duff and Hackett's studies is that a RTW intervention was offered. Such an intervention could have helped the stroke survivor settle back at work, or encouraged the employer to accommodate the stroke survivor in a way that enabled them to cope with the full time workload. This assumption needs to be taken with caution as the follow-up period in this study was only six months and in Duff and Hackett's studies the stroke survivor's report was taken more than a year after stroke. It is not yet known what the work situation for the current study group would be a year or two after stroke as working life is fragile and uncertain even long after stroke (Trygged, 2012).

The job description was changed for most of the stroke survivors in this study; however very few (23%) had work adaptations made. The number of those who had their job description changed and work adaptations made is relatively higher than the five percent reported by Hackett et al. (2012)). These differences could be due to the fact that only 2% of stroke survivors in Hackett et al.'s study received RTW intervention whereas in this study 50% received intervention. Most stroke survivors in the intervention group had work adaptations and job description changes following communication and contact between employer and therapist. The high number of changed descriptions in this study is similar to that of Treger et al. (2007) who indicated that 58% of the stroke survivors had their job descriptions changed because of accommodative employers.

#### 5.2.3.2 Reasons for returning or not returning to work after stroke

The most common reason that stroke survivors offered for RTW was financial demands. This is not surprising considering that most were still below the age of 50 years and early retirement would result in lower pension due to the reduced number of working years they would have to contribute into their retirement fund. This concern was also raised by Trygged (2012) and Lemieux, Durand, and Hong (2011) echoed these sentiments by stating that people may RTW prematurely because of financial pressure.

In the current study the majority of stroke survivors were breadwinners and needed money to sustain their families. This could offer another explanation for the high RTW rate. Sole reliance on government disability grants (<R2 000 per month) would have been insufficient for family support as most (46%) of the subjects had a monthly income greater than R5 000 and it is likely that their expenditures would be within this income range. Hackett et al. (2012) showed that the odds of RTW for breadwinners were 1.88 more than those who were not breadwinners and this supports our findings. In Duff's study (2012), financial pressures was also one of the common reasons given by 77% of stroke survivors for RTW.

Boredom was mentioned as one of the main reasons for RTW by 26% of the stroke survivors. The fear of not knowing what to do at home all day can be a motivating factor for RTW (Alaszewski et al., 2007) because staying at home may result in social isolation due to the loss of the socialising effect at the workplace (Lemieux, Durand, and Hong, 2011). Boredom is not a unique reason for stroke survivors to RTW as the majority of those in Duff's study (2012) also mentioned that they returned to work to relieve boredom. Kirkevold et al. (2011) reported that stroke survivors who did not engage in meaningful activities such as returning to work, were at risk of developing low self esteem and depression. It would be reasonable to conclude that even if a stroke survivor did not have financial problems, he/she may want to RTW to avoid getting bored at home and to avoid losing their sense of self worth and life satisfaction (Vestling, Tufvesson, and Iwarsson, 2003).

The most common reason why stroke survivors in the current study did not return to work was that the old employer would not offer the job. The inability of stroke survivors to perform the job they were doing before the onset of stroke (especially in labour intensive occupations) or the inability to speak clearly (especially in occupations where communication was a priority) influenced stroke survivors' opportunities to RTW after stroke. The biggest category of stroke

survivors who did not RTW was domestic workers/shop packers. This could be due to the labour intensive nature of their occupations. This confirms what Hsieh and Lee (1997) showed in their study, namely that stroke survivors in physically demanding jobs are less likely to RTW.

Fatigue was also mentioned as a reason for not returning to work. Most stroke survivors in Trygged's study (2012) also complained about fatigue, which is a consistent problem after stroke (Gilworth et al., 2009) and supports our findings. Another reason for not returning to work was upper limb dysfunction. This is understandable as most of the stroke survivors in this study were in blue collar occupations which were labour intensive. Inability to use the upper limb would have made RTW difficult, unless the employer provided light duty or made work adaptations.

#### **5.2.4 Factors which were predictive of return to work after stroke**

The variables which had a statistically significant relationship with RTW on univariate analysis were gender, side of hemiplegia, sick leave duration, speech problems, six months ADLs functional ability, six months mobility functional ability, baseline and six months cognitive ability, and receiving a workplace intervention programme. Factors which had a statistically significant relationship with RTW on the multivariate analysis included receiving a workplace intervention programme; six months follow-up BI and MoCA scores; and side of hemiplegia (due to speech problems). Only the factors which had a statistically significant relationship with RTW on univariate and multivariate analyses will be discussed in this section.

Age, educational level, higher income and type of occupation were found to have an influence on RTW in other studies (Rollnik and Allman, 2011; Trygged, Hedlund, and Kareholt, 2011; Grammenos, 2003; Vestling, Tufvesson, and Iwarsson, 2003), but did not have an influence on RTW in this study. This might be due to the intervention received as the studies referred to were mainly observational with no intervention to facilitate the RTW. Return to work this study may have been facilitated more by the RTW intervention which resulted in employer understanding and willingness to accommodate some of the stroke survivors, irrespective of their age, educational level and type of occupation.

##### **5.2.4.1 Gender**

Significantly more males than females returned to work in the current study. This finding is similar to that of Hackett et al. (2012) in which 74% of the male stroke survivors

returned to work. A similar association between male gender and RTW was also shown by Feuerstein et al. (2001). This may be because more women are most disabled at six months after stroke than men (Kelly-Hayes et al., 2003) and even in cases where severity of the neurological deficits is the same for both genders, women tend to have more functional problems (Petre et al., 2009). This can limit RTW for women when compared to men. Feuerstein et al. (2001) suggested that lower RTW rates among females may be related to greater physical, stress and time demands related to domestic and home duties. In a traditional model, women do the majority of household work (Schepers et al., 2005).

#### 5.2.4.2 Side of hemiplegia and speech problems

Majority of stroke survivors with left hemiplegia returned to work and had greater odds of RTW than those with right hemiplegia. It was also found that those with right hemiplegia had a much higher likelihood to suffer speech problems than those with left hemiplegia. Speech problems were more of a limiting factor for RTW than the hemisphere lateralisation of stroke. Bernspang and Fisher (1995) also established that stroke survivors with left and right CVA have hemispheric-specific differences in motor impairments, but do not differ significantly in ADLs. Social functioning, including RTW, was also not significantly related to hemisphere lateralisation of stroke in a study by Hommel et al. (2009). It would be reasonable to conclude that speech impairments, and not hemisphere lateralisation, influenced RTW in this study.

Since most jobs require speech skills, speech impairments could make some types of work difficult. This may result in some stroke survivors having to change jobs if not reasonably accommodated for speech impairments in their current occupation. The limiting effect of speech impairments was also identified by Alaszewski et al. (2007). Black-Schaffer and Osberg (1990) also found a negative association between RTW and aphasia. The results of this study confirm the findings of these researchers.

#### 5.2.4.3 Activities of daily living and mobility functional ability six months after stroke

Independence in ADLs six months after stroke influenced RTW as for every BI unit increase there was a 1.7 increase in the likelihood of RTW. Stroke survivors with higher MRMI scores six months following stroke returned to work more readily than those with lower scores. This confirms Saeki (2000)'s findings that independence with ADLs and

mobility is an important indicator of whether a stroke survivor would RTW. Independence in mobility and ADLs were also identified as significant determinants of RTW by other researchers (Treger et al., 2007; Giaquinto et al., 2007; Gabriele et al., 2009). Poor ADL and mobility functional ability is indicative of severity of hemiplegia which was also identified as a negative predictor of RTW (Wozniak et al., 2002; Treger et al., 2007; Peters et al., 2012).

Most stroke survivors in this study were independent in ADLs and mobility at three and six months following stroke but only 40% eventually returned to work. This indicates that functional ability cannot be considered in isolation as a factor that influences RTW. It has to be noted that mobility, as measured with the MRMI in this study, may have had a ceiling effect at six months following stroke. The results do not indicate the extent of community ambulation, which may have had an effect on RTW. Community ambulation was defined by Lord and Rochester (2005) and Buurke et al. (2008) as the ability to mobilise independently outside the home, including confidently negotiating uneven terrain, shopping centres and other public venues. The MRMI scores do not provide this information even though it does provide information about ability to walk and climb stairs independently, which most stroke survivors in this study could do at six months after stroke.

#### 5.2.4.4 Cognitive ability less than two months and six months after stroke

Higher MoCA scores at six months following stroke had an influence on RTW as for every unit increase in MoCA score there was a 1.3 increase in likelihood to RTW. Stroke survivors who had higher MoCA scores at baseline assessment (less than two months after stroke), returned to work more readily than those with lower MoCA scores. These findings agree with those reported by other researchers (Roding et al., 2003; Alaszewski et al., 2007). Jones, Latreille, and Sloane (2006) showed that when a person has cognitive impairments, they experience the lowest employment rates as they are less likely to be employed in the competitive labour market. If a less cognitively demanding job is not available for stroke survivors with cognitive impairments at their workplace, the employer might not be able to accommodate them. Baseline cognitive scores also had an impact on the RTW at six months after stroke and therefore it is important to identify people with cognitive impairments early after stroke so that efforts can be made to

increase awareness of the potential role that the cognitive impairment may play in the RTW process (O'Connor et al., 2011).

#### 5.2.4.5 Sick leave duration

Stroke survivors who returned to work had on average eight weeks of sick leave compared to six weeks for those who did not return to work. This is contrary to other researchers who have shown that sickness benefits received over a prolonged period of time are associated with reduced RTW (Saeki, 2000; Henderson, Glozier, and Holland, 2005). An explanation for this finding may be that even though those who returned to work had relatively longer sick leave duration, it was not as prolonged as when extensions are given up to six months or a year. The mean sick leave duration in this study was seven weeks and the mean difference of the sick leave duration between those who returned to work and those who did not RTW was just two weeks. The length of sick leave for those who returned to work could not have reached a stage for the stroke survivor or employer to provide sickness or incapacity benefits usually given six months after stroke (Wolfenden and Grace, 2009). The sick leave duration seems to have been just enough for rehabilitation with minimal transition to incapacity benefits.

#### 5.2.4.6 Receiving the workplace intervention

Stroke survivors in the intervention group had 5.2 times greater odds of returning to work at six months following stroke than those in the control group, indicating the benefits of having a workplace intervention programme. This is not surprising as stroke survivors in Duff's study (2012) in the same province had a RTW rate of 34% up to two years after stroke. In this study, the RTW rate was 40% at six months after stroke and the majority were in the intervention group. This indicates that the intervention was effective in facilitating RTW. It would be interesting to know what the RTW rate would be two years after stroke in order to compare with Duff's study. It should however, be noted that 100% of those who returned to work at three months after stroke, were still working during the six months follow-up. It is likely that the RTW intervention was sustainable; however conclusions about sustainability can only be made after long term follow-up (a year or two years).

### **5.2.5 Conclusion of discussion of stage two**

Stroke is no longer a disease of older people only. There is a need for previously employed young stroke survivors to be assisted with RTW for them to remain economically active. Most stroke survivors in the intervention group managed to RTW within four months of having stroke, despite having physical impairments and being employed in blue collar occupations which are physically demanding. Those who did not RTW still needed to regain cognitive ability; speech; and mobility functional ability which their employers could not reasonably accommodate. When assisting the stroke survivor with RTW, the economic conditions of the company should be taken into consideration. Stroke survivors and employers in this study stated that companies that have financial difficulties may not consider spending money on making reasonable accommodations for stroke survivors who want to RTW. It should be noted that not all stroke survivors may be reasonably accommodated for their impairments and activity limitations, as this is dependent on the workplaces' ability to offer an alternative job or make work adaptations. One of the reasons for not returning to work in this study was that the employer would not offer the job after stroke.

Stroke survivors with the following characteristics would need more attention to help them RTW: females; those with cognitive and speech impairments; and those who are not fully independent in ADLs and mobility functional ability. Most of the stroke survivors would seem independent in ADLs and functional ability even though they may still struggle with fatigue and inability to walk and work fast. Assessment and management of endurance and speed together, with function, are important for stroke survivors. People who survive the acute phase of stroke, present with reduced walking speeds many months after stroke (Bowden et al., 2008). Reduced walking speed may add to the travelling time of the stroke survivor if they have to walk to get public transport on their way to work.

Cognitive ability in relation to workability also needs to be assessed within two months of having stroke as the scores early after stroke had an influence on RTW. The ADLs and mobility functional ability only had an influence on RTW at six months after stroke, and thus assessment of these in relation to RTW can be done more than three months after stroke.

Regular early communication between the stroke survivor, employer and therapists is necessary in order to make well informed decisions about the RTW process and explore possibilities of reasonable accommodation at the workplace where possible. There is a need to advocate for

good interpersonal working relationships between employees, employers and colleagues for the public in general, as this has an effect on the way problems are resolved, such as when a person needs to RTW after having stroke. Advocating for accessible work environments and transport for stroke survivors is also necessary as this is a barrier for stroke survivors who need to RTW. Psychological counselling is required for stroke survivors and their co-workers to help them accept and learn to live with their condition and limitations. Counselling for stroke survivors needs to include issues of RTW, exploring various RTW possibilities and possible challenges. The employer needs to be part of the counselling process with regards to RTW.

Therapists need to implement a workplace intervention programme for all stroke survivors with potential to RTW as it has been shown to increase the likelihood of RTW despite the stroke survivors' impairments and physical job demands. RTW was made possible mainly by involvement of the employers who were willing to offer reasonable accommodations for some of the stroke survivors. Physical impairments should not be a barrier if there is sufficient support in the form of a workplace intervention programme and financial resources to facilitate reasonable accommodation. There is also a need for therapists to assess the stroke survivors' work potential as they cannot give RTW advice without knowledge of the stroke survivors' work potential and context. The hypothesis at the outset of the study was: "A workplace intervention programme increases the rate of RTW for stroke survivors". The null hypothesis stated: "A workplace intervention programme does not increase the rate of RTW for stroke survivors". The results of the study support the hypothesis and the null hypothesis is rejected.

It has been shown that a workplace intervention programme increases the rate of RTW after stroke and that stroke survivors who RTW have better quality of life than those who do not RTW. Thus an opportunity to receive a workplace intervention programme needs to be availed to all stroke survivors who have the potential to RTW. This will enable stroke survivors to contribute their skills and abilities to the economy of the country and to society. Retaining a stroke survivor at work will improve the stroke survivors' quality of life and may also reduce costs of claims on the public social security and occupational benefit schemes.

### **5.2.6 Limitations of stage two**

- Functional ability measures (BI and MRMI) did not include community ambulation and instrumental ADLs. It would have been beneficial to know how stroke survivors fared in these areas at six months follow-up.
- TPAL assessments were done within two months of having stroke and the scores were very low indicating that the stroke survivors would not cope in the competitive employment sector. These results were not a true reflection of the stroke survivors' work potential due to early test administration. Most of the stroke survivors were not functionally independent by two months after stroke, and thus could not have had MTM percentage scores similar to people with potential to be in the competitive labour market. The researcher decided to continue with the workplace intervention programme despite the low scores, as the intervention was meant to help improve function in the workplace and to explore possibilities of reasonable accommodations. Some of the stroke survivors returned to work despite the low TPAL scores, which confirms that the scores attained soon after stroke were not a true reflection of their functional capacity.
- Follow-up for this study was only to six months. Extension of this period to at least one year following stroke would enable the researcher to establish possible RTW at a later stage for those who still had limitations in ADL's, mobility, speech and cognitive function six months after stroke.

### **5.2.7 Research and clinical recommendations for stage two**

- There is a need for therapists to be involved in the RTW rehabilitation of stroke survivors, in order to do work ability assessments and to explore possibilities of reasonable accommodations.
- There is a need to communicate with employers and advise them about possible work accommodations including strategies for rethinking job duties and engaging with stroke survivors to understand accommodation needs and ways of achieving job tasks.
- It is important to identify people with cognitive impairments early after stroke so that efforts can be made to increase awareness of the potential role that cognitive impairments may play in RTW intervention.

- TPAL administration needs to be done when the stroke survivor has gained ADLs and mobility functional ability as the MTM percent scores are indicative of capacity to perform at a competitive pace, which was difficult for most stroke survivors, less than three months after stroke.
- Transport accessibility for people with disabilities needs to be improved.
- There is a need to include community ambulation and assessment of instrumental ADLs in future RTW intervention or assessment studies.
- Return to work studies need to have uniform follow up time and uniform definition of RTW, to enable researchers to make overall estimation of RTW after stroke.
- Follow-up of stroke survivors to establish sustainability of RTW needs to be done up to two years after stroke when permanent incapacity is declared in order to monitor the full RTW potential.

#### **5.2.8 Challenges in implementation of the workplace intervention programme for stroke survivors**

The workplace intervention programme in this study required that stroke survivors attend intervention sessions at the workplace and this was difficult for some stroke survivors, especially those who did not have transport. They found it difficult to use public transport due to poor walking endurance and speed early after stroke. The researcher had to provide transport for those with transport difficulties. Outside the research environment, the stroke survivors will not have such transport provision. When this intervention is implemented outside the research environment, it will be advisable to start the intervention when the stroke survivor is able to use public transport or has transport to go to the workplace for intervention. This way, it will not be necessary for the therapists to provide transport. This intervention programme requires several work visits by therapists and thus will require more human resources. Currently there is shortage of therapists for vocational rehabilitation in South Africa (Coetzee et al., 2011) and thus, there is a need to consider expansion of the RTW services beyond the health department in order to get more funding for human resources dedicated to RTW programmes.

## CHAPTER 6

### 6. GENERAL CONCLUSION

This conclusion will be based on the results and discussion of the study objectives, which were as follows: to determine the current practice in RTW intervention programmes for stroke survivors in the Gauteng Province of South Africa; to establish the profile (demographic information; premorbid job content and functional level (ADLs, mobility and basic cognitive function) of the study group by eight weeks, three months and six months after stroke; to determine the stroke survivors' perceived quality of life by eight weeks, three months and six months after stroke; to explore stroke survivors' and employers' perceived barriers and enablers of RTW; to determine the rate of RTW after a six weeks workplace intervention for previously employed stroke survivors at three months and six months after stroke and to identify factors which are predictive of RTW after stroke. The main conclusions of this study are summarised below:

- There is a need for previously employed young stroke survivors to be assisted with RTW in order to remain economically active.
- Stroke survivors who receive a workplace intervention programme are more likely to RTW than those who do not receive the intervention.
- Returning to work improves the quality of life of stroke survivors.
- The most common reasons for RTW are financial pressure and boredom, and the most common reasons for not returning to work are that the employer does not offer the previous job after stroke, as well as poor upper limb function.
- The following factors increase the likelihood of RTW: male gender; fewer speech problems; increased time off work post stroke; ability to perform ADLs; good mobility and good cognitive ability.
- It is important to identify stroke survivors with cognitive impairments early after stroke; include activities of daily living and mobility functional ability, and speech impairments when doing workability assessment.

- Regular early communication between the stroke survivors, employers and therapists helps the employers and stroke survivors to make well informed decisions about the RTW process and explore possibilities of reasonable accommodations where applicable.
- A small number of clinical facilities in the Gauteng province of South Africa assess stroke survivors in order to establish potential to RTW after stroke and a small number of clinical facilities render RTW intervention for stroke survivors. There is a need to increase RTW services for stroke survivors in Gauteng.
- Ability of the employer to provide reasonable accommodation; good interpersonal working relationships between stroke survivor, employer and co-workers; psychological wellbeing of the stroke survivor; less severe stroke (with good balance, ability to walk and use the affected upper limb); communication between employer, therapist and stroke survivor; and having accessible work environments are enablers of RTW for stroke survivors.
- Employers, stroke survivors and therapists identified similar barriers and enablers of RTW (severity of impairments, high unemployment rates in South Africa, psychological support and reasonable accommodation). Barriers that were identified by employers only were related to finance. They indicated that lack of finance to fund reasonable accommodations to the workplace was a deterrent. The possible resultant reduction in company production as a result of having an employee who may not work at the pace as other employees would be a barrier. This is understandable as employers are the ones that usually carry the costs for reasonable accommodations to be made at the workplace. Barriers that were identified by therapists only, were related to rehabilitation staff shortage as well as shortage of work ability assessment equipment.
- The benefits of a workplace intervention programme have to be shared continuously between therapists, health and labour policy makers and employers as it has been shown that stroke survivors who RTW have better quality of life than those who do not RTW.

## 7. REFERENCES

A Delivery Framework for Adult Rehabilitation in Scotland 2007 Co-ordinated, integrated and fit for purpose. Scottish Executive

Akinpelu A, Gbiri C 2009 Quality of life of stroke survivors and apparently healthy individuals in South Eastern Nigeria. *Physiotherapy Theory and Practice* 25: 14 – 20

Alaszewski A, Alaszewski H, Potter J, Penhale B 2007 Working after a stroke: Survivors' experiences and perceptions of barriers to and facilitators of the return to paid employment. *Disability and Rehabilitation* 29: 1858 – 1869

American Physical therapy association 2002 Occupational Health Guidelines: Work Conditioning and Work Hardening Programs. Amended BOD 03-00-25-62; BOD 03-99-16-49; BOD 11-94-33-109, Initial BOD 11-92-29-134

Andersen G, Christensen D, Kirkevold M, Johnsen S 2011 Post stroke fatigue and return to work: a 2-year follow-up. *Acta Neurologica Scandinavica* 125: 248 – 253

Anderson CS, Linto J, Stewart-Wynne ED 1995 A Population-Based Assessment of the Impact and Burden of Caregiving for Long-term Stroke Survivors. *Stroke* 26: 843 – 849

Altman DG 1991 *Practical Statistics for Medical Research* Page 404. London England: Chapman and Hall

Appelros P, Stegmyr B, Terent A 2009 Sex differences in stroke epidemiology. *Stroke* 40: 1082 – 1090 doi: 10.1161/STROKEAHA.108.540781

Ashburn A 1999 Physical recovery following stroke. *Physiotherapy* 83: 480 – 490

Bamford J, Sandercock P, Dennis M, Burn J, Warlow C 1991 Classification and natural history of clinically identifiable subtypes of cerebral infarction. *Lancet* 337: 1521 – 1526

Basic Conditions of Employment Act No. 75 of 1997. Department of Labour: Government Gazette, 11 November 2005. South Africa. [www.labour.gov.za](http://www.labour.gov.za) (Accessed 23 October 2011)

Becker D, Whitley R, Bailey E, Drake R 2007 Long term employment trajectories among participants with severe mental illness in supported employment. *Psychiatric Services* (Washington D.C) 58: 922 - 928

Beckman A, Hakansson A, Rastam L, Lithman T, Merlo J 2006 The role country of birth plays in receiving disability pensions in relation to patterns of health care utilization and socioeconomic differences: A multilevel analysis of Malmo, Sweden. *BMC Public Health* 16:71

Berger JR 2004 AIDS and stroke risk. *Lancet Neurology* 3: 206 - 207

Bergman H, Kurthman M, von Ungern-Sternberg A, Weimann VG 1991 Medical educational and functional determinants of employment after stroke. *J Neural Transm (Suppl)* 33: 157 – 161

Bernspang B, Fisher AG 1995 Differences between persons with right or left cerebral vascular accident on the Assessment of Motor and Process Skills. *Archives of Physical Medicine Rehabilitation* 76: 1144 – 1151

Biggs D 2005 Health promotion needs of stroke patients accessing community health centres in the metropole region of the Western Cape. Unpublished Thesis. University of the Western Cape, South Africa.  
[http://etd.uwc.ac.za/usrfiles/modules/etd/docs/etd\\_init\\_8460\\_1174284729.pdf](http://etd.uwc.ac.za/usrfiles/modules/etd/docs/etd_init_8460_1174284729.pdf)

Bisiker J, Millinchip K 2007 Developing a work rehabilitation project: “Equal pathways to work”. *British Journal of Occupational Therapy* 70: 259 - 263

Black-Schaffer RM & Osberg JS 1990 Return to work after stroke: development of a predictive model. *Archive of Physical Medicine Rehabilitation* 71: 285 - 290

Boden-Albala B, Litwak E, Elkind MSV, Rundek T, Sacco RL 2005 Social isolation and outcomes post stroke. *Neurology* 64: 1888 – 1892

Bowden M, Balasubramanian C, Behrman A, Kautz S 2008 Validation of a speed based classification system using quantitative measures of walking performance post stroke. *Neurorehabilitation Neural Repair* 22: 672 – 675

Braithwaite J, Mont D 2009 Disability and poverty: a survey of World Bank poverty assessments and implications. *European Journal of Disability Research* 3: 219-232.  
doi:10.1016/j.alter.2008.10.002

Breen A, Langworthy J, Baghurst J 2007 Improved early pain management for musculoskeletal disorders: Health and Safety Executive Research Report 399. Health and Safety Executive books, London

Bryer A, Connor M, Haug P, Cheyip B, Staub H, Tipping B, Duim W, Pinkney-Atkinson V 2010 South African guidelines for management of ischaemic stroke and transient ischaemic attack: a guideline from the South African Stroke Society (SASS) and the SASS writing committee. *South African Medical Journal* 10: 750 - 778

Burton AK, Kendall NA, Pearce BG, Birrel LN, Bainbridge LC 2008 Management of upper limb disorders and the biopsychosocial model. Health and Safety Executive Books. London

Busch A, Coshall C, Heuschmann P, McKevitt C, Wolfe C 2009 Sociodemographic differences in return to work after stroke: the South London Stroke Register. *Journal of Neurosurgery Psychiatry* 80: 888 – 893. DOI:10.1136/jnnp.2008.163295

Buurke J, Nene A, Kwakkel G, Erren-Wolters V, Ljzerman M, Hermens H 2008 Recovery of gait after stroke: what changes? *Neurorehabilitation and Neural Repair* 22: 676 - 683

Buys T, van Biljon H 2007 Functional capacity evaluation: An essential component of South African occupational therapy work practices services. *Work* 29: 31-36

Campbell J, Wright C, Moseley A, Chilvers R, Richards S, Stabb L 2007 Avoiding long-term incapacity for work: Developing an early intervention in primary care. A report of scoping work carried out by the Peninsula Medical School, Primary care research group, on behalf of the Department for work and pensions (Health, Work and Wellbeing)

Carr R, Shepherd R, Nordholm L, Lynne D 1985 Investigation of a new motor assessment scale for stroke patients. *Physical Therapy* 65: 175 – 180

Carr R, Shepherd R 2010 *Neurological Rehabilitation: Optimizing Motor Performance*, 2<sup>nd</sup> edn. Page 8. Churchill Livingstone, Elsevier

Carrol C, Rick J, Pilgrim H, Cameron J, Hillage J 2010 Workplace involvement improves return to work rates among employees with back pain on long-term sick leave: a systematic review of the effectiveness and cost-effectiveness of interventions. *Disability and Rehabilitation* 32: 607 – 621

Chau J, Thompson D, Chang A, Woo J, Twinn S, Cheung S, Kwok T 2010 Depression among Chinese stroke survivors six months after discharge from a rehabilitation hospital. *Journal of Clinical Nursing* 19: 3042 – 3050 DOI: 10.1111/j.1365-2702.2010.03317.x

Coetzee Z, Charlyn G, van der Westhuizen R, van Niekerk L 2011 Re-conceptualising vocational rehabilitation services towards an inter-sectoral model. *South African Journal of Occupational therapy* 41: 32 - 37

Collin C, Wade DT, Davies S, Horne V 1988 The Barthel ADL Index: A reliability study. *International Disability Studies* 10: 61 – 63

Commission for Employment Equity Annual report 2007–2008. Department of Labour, Pretoria, South Africa [www.info.gov.za/view/DownloadFileAction?id=90058](http://www.info.gov.za/view/DownloadFileAction?id=90058) (accessed 2 February 2009)

Connor MD, Thorogood M, Casserly B, Dobson C, Warlow MD 2004 Prevalence of stroke survivors in rural South Africa: Results from the Southern Africa stroke prevention initiative (SASPI) Agincourt field site. *Stroke* 35: 627 – 632

Connor M, Walker R, Modi G, Warlow C 2007 Burden of stroke in black populations in sub-Saharan Africa. *Lancet Neurology* 6: 269 – 278. DOI: 10.1016/S1474-4422(07)70002-9

Constitution of the Republic of South Africa 1996: Act 108, Issue No. 32, pg 1247

Convention on the Rights of Persons with Disabilities 2006. New York, United Nations

Cruse B, Cysique LA, Markus R, Brew BJ 2012 Cerebrovascular disease in HIV-infected individuals in the era of highly active antiretroviral therapy. *Journal of Neurovirology* PMID: 22528476 (Epub ahead of print)

Daniel K, Wolfe C, Busch M, McKeivitt C 2009 What are the social consequences of stroke for working-aged adults? A systematic review. *Stroke* 40: 431 – 440

Dearle L 2009 Physical abilities of community-dwelling adults more than six months post stroke: a cross-sectional survey. Unpublished research report. Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, South Africa

de Araujo T, Karasek R 2008 Validity and reliability of the job content questionnaire in formal and informal jobs in Brazil. *Scandinavian Journal of Work, Environment and Health* 6: 52 – 59

de Koker C, de Waal L, Vorster J 2006 A profile of social security beneficiaries in South Africa: Volume 3. Data Desk, Department of Sociology and Social Anthropology: Stellenbosch University

de Villiers L, Kalula S, Burch V 2009 Does multidisciplinary stroke care improve outcome in a secondary-level hospital in South Africa? *International Journal of Stroke* 4: 89 - 93

Dong Y, Sharma VS, Chan BP, Venketasubramanian N, Teoh HL, Seet RC, Tanicala S, Chan YH, Chen C 2010 The Montreal Cognitive Assessment is superior to the Mini-Mental State Examination for the detection of vascular cognitive impairment after acute stroke. *Journal of the Neurological Sciences* 299: 15 - 18

Dunsky A, Dickstein R, Marcovitz E, Levy S, Detsch J 2008 Home based motor imagery training for gait rehabilitation of people with chronic post stroke hemiparesis. *Archives of Physical Medicine and Rehabilitation* 89: 1580 - 1588

Drummond MF, Sculpher M, Torrance G, O'Brien B, Stoddart G 2006 *Methods for the economic evaluation of health care programmes*. Oxford: Oxford University Press

Duff N 2012 Perceived factors that influence return to work after stroke. Unpublished research report. Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, South Africa

Duncan PW, Minhai S 1997 Stroke recovery. Topics in Stroke Rehabilitation 4: 51 – 58

Duncan PW, Horner RD, Reker DM, Samsa GP, Hoenig H, Hamilton B, LaClair BJ, Dudley TK, Kelly-Hayes M 2002 Adherence to Post-acute Rehabilitation Guidelines is Associated with Functional Recovery in Stroke. Stroke 33: 167 – 178

Employment Equity Act No. 55 of 1998 Department of Labour, Pretoria, South Africa: [www.labour.gov.za](http://www.labour.gov.za) (Accessed 23 October 2011)

Encyclopedia [www.en.wikipedia.org/wiki/Blue-collar\\_worker](http://www.en.wikipedia.org/wiki/Blue-collar_worker) (Accessed 20 May 2012)

Escorpizo R, Reneman M, Ekholm J, Fritz J, Krupa T, Marnetofit S, Maroun C, Guzman J, Suzuki Y, Stucki G, Chan C 2011 A conceptual definition of vocational rehabilitation based on the ICF: Building a Shared Global Model. Journal of Occupational Rehabilitation 21: 126 – 133. DOI: 10.1007/s10926-011-9292-6

Fadyl JK, McPherson M 2009 Approaches to Vocational Rehabilitation after Traumatic Brain Injury: A Review of the Evidence. Journal of Head Trauma Rehabilitation 24: 95 – 212

Feuerstein M, Berkowitz SM, Amy J, Haufler MS, Huang GD 2001 Working with low back pain: Workplace and individual psychosocial determinants of limited duty and lost time. American Journal of Industrial Medicine 40: 627 – 638

Fisher K, Jing L 2008 Chinese disability independent living policy. Disability and Society 23: 171 – 185 DOI: 10.1080/09687590701841216

Flegal KM, Carroll MD, Ogden CL Curtin LR 2010 Prevalence and trends in obesity among US adults, 199 – 2008. Journal of the American Medical Association 303: 235 - 241

Foerch C, Misselwitz B, Sitzler M, Berger K, Steinmetz H, Neumann-Haefelin T 2005 Difference in recognition of right and left hemisphere stroke. The Lancet 366: 392 – 393

Folstein M, Folstein S, McHugh P 1975 “Mini Mental State” a practical method for grading the cognitive ability of patients for the clinician. *Journal of Psychiatric Research* 12: 189-198

Franché R, Krause N 2002 Readiness for Return to Work Following Injury or Illness: Conceptualizing the Interpersonal Impact of Health Care, Workplace, and Insurance Factors. *Journal of Occupational Rehabilitation* 12: 233 - 256

Franché RL, Cullen K, Clarke J, MacEachen E, Frank J, Sinclair S, Reardon R 2004 Workplace-based Return to Work Interventions: A Systematic Review of the Quantitative and Qualitative Literature – Summary. Institute for Work and Health, Toronto, Ontario Canada

Frank AO, Thurgood J 2006 Vocational Rehabilitation in the UK: opportunities for health-care professionals. *International Journal of Therapy and Rehabilitation* 13: 126 - 134

Gabriele W, Renate S 2009 Work loss following stroke. *Disability and Rehabilitation* 19: 1-7

Giaquinto S, Ring H 2007 Return to work in selected disabilities. *Disability and Rehabilitation*, 29: 1313 – 1316

Gilworth G, Phil M, Cert A, Sansam K, Kent R 2009 Personal experiences of returning to work following stroke: An exploratory study. *Work* 34: 95 - 103

Grammenos S 2003 Illness, disability and social inclusion. Dublin, European Foundation for the Improvement of Living and Working Conditions  
<http://www.eurofound.europa.eu/pubdocs/2003/35/en/1/ef0335en.pdf> (Accessed 6 August 2010)

Gorman A, Foley J, Ettenhofer M, Hinkin C, Van Gorp W 2009 HIV-associated neuropsychological impairment. *Neuropsychology Review* 19: 186 - 203

Green J, Forster A, Young J 2001 A test-retest reliability of the Barthel Index, the Rivermead Mobility Index, the Nottingham Extended Activities of Daily Living Scale and the Frenchay Activities Index in stroke patients. *Disability and Rehabilitation* 23: 670 – 676

Guccionne A, Felson D, Anderson J, Anthony J, Zhang Y, Wilson P, Kelly-Hayes M, Wolf P, Kreger B, Kannel W 1994 The effects of specific medical conditions on the functional limitations of elders in the Framingham Study. *American Journal of Public Health* 84: 351 - 358

Guise J, McKinlay A, Widdicombe A 2010 The impact of early stroke on identity: a discourse analytic study. *Health* 14: 75 – 90

Hachinski V, Donnan G, Gorelick P, Hacke W, Cramer S, Kaste M, Fisher M, Brainin M, Buchan A, Lo E, Skolnick M, Fisher M 2010 Working Toward a Prioritized World Agenda. *Stroke* 42: 3341 - 3346

Hackett M, Glozier N, Jan S, Lindley R 2012 Returning to Paid Employment after Stroke: The Psychosocial Outcomes In Stroke (POISE) Cohort Study. *PLoS ONE* 7 (7): e41795. DOI: 10.1371/journal.pone.0041795

Hagberg M 2005 Clinical assessment, prognosis and return to work with reference to work related neck and upper limb disorders. *Italian Journal of Occupational Medicine and Ergonomics* 27: 51 – 57

Haig AJ 2007 Developing world rehabilitation strategy II: flex the muscle, train the brain, and adapt to the impairment. *Disability and Rehabilitation* 29: 977 – 979 DOI: 10.1080/09638280701480369 PMID: 17577733

Hale L Eales C 1998 Recovery of walking function in stroke patients after minimal rehabilitation. *Physiotherapy Research International* 3: 194 – 205

Hannerz H, Pedersen B, Poulsen O, Humle F, Andersen L 2011 A nationwide prospective cohort study on return to gainful occupation after stroke in Denmark 1996 – 2006. *British Medical Journal Open* 1: e000180. DOI: 10.1136/bmjopen-2011-000180

Hannerz H, Linnea F, Poulsen O, Pedersen B, Andersen L 2012 Enterprise size and return to work after stroke. *Journal of Occupational Rehabilitation* DOI 10.1007/s10926-012-9367-z

Hanson MA, Burton AK, Kendall NA, Lancaster RJ, Pilkington A 2006 The costs and benefits of active case management and rehabilitation for musculoskeletal disorders (Health and Safety Executive Research Report 493) [www.hse.gov.uk/research/rrpdf/rr493.pdf](http://www.hse.gov.uk/research/rrpdf/rr493.pdf)

Haugli L, Meland S, Magnussen L 2011 What facilitates Return to Work? Patients Experiences 3 years after occupational rehabilitation. Journal of Occupational Rehabilitation DOI: 10.1007/s10926-011-9304-6

Henderson M, Glozier N, Holland EK 2005 Long term sickness absence is caused by common conditions and needs managing. British Medical Journal 330: 802 – 803

Hobart JC, Lamping DL, Freeman JA, Langdon DW, McLellan DL, Greenwood RJ, Thompson AJ 2001 Evidence-based measurement: Which disability scale for neurologic rehabilitation? Neurology 57: 639 - 644

Holmqvist K, Kamwendo K, Ivarsson A 2009 Occupational therapists' descriptions of their work with persons suffering from cognitive impairment following acquired brain injury. Scandinavian Journal of Occupational Therapy 16: 13 – 24

Hommel M, Trabucco-Miguel S, Joray S, Naegele B, Gonnet N, Jaillard A 2009 A Social dysfunctioning after mild to moderate first ever stroke at vocational age. Journal of Neurosurgery Psychiatry 80: 371 – 375

Hsieh CL, Lee MH 1997 Factors influencing vocational outcomes following stroke in Taiwan: a medical centre-based study. Scandinavian Journal of Rehabilitation Medicine 29: 113 – 120

Hsueh I, Wang C, Sheu C, Hsieh C 2003 Comparison of Psychometric Properties of Three Mobility Measures for Patients with Stroke. Stroke 34: 1741 - 1745

Hughes J, Jelsma J, Maclean E, Darder M, Tinise X 2004 The health-related quality of life of people living with HIV/AIDS. Disability and Rehabilitation 18: 371 – 376

International Labour Organization reports 2006-2007 The employment situation of people with disabilities: towards improved statistical information. Geneva

Johnson L, Selfe J 2004 Measurement of mobility following stroke: a comparison of the Modified Rivermead Mobility Index and the Motor Assessment Scale. *Physiotherapy* 90: 132 - 138

Joling C, Janssen P, Groot W 2004 Modelling return-to work intervention strategies: A method to help target interventions. *Journal of Occupational Rehabilitation* 14: 43 – 62

Joling C, Groot W, Janssen P 2006 Duration dependence in sickness absence: how can we optimize disability management intervention strategies? *Journal of Occupational and Environmental Medicine* 48: 803 – 814

Jones MK, Latreille PL, Sloane PJ 2006 Disability, gender and the British Labour market. *Oxford Economic Papers* 58: 407 – 449 DOI: 10.1093/oep/gp1004

Jorgensen HS, Ruth J, Nakayama H, Kammergaard LP, Raaschou H, Olsen TS 1999 What determines good recover in patients with the most severe strokes? The Copenhagen stroke study. *Stroke* 30: 2008 - 2012

Kahonde CK, Mlenzana N, Rhoda A 2010 Persons with physical disabilities' experiences of rehabilitation services at community health centres in Cape Town. *South African Journal of Physiotherapy* 66: 2 - 7

Karasek R, Brisson C, Kawakami N, Houtman I, Bongers P, Amick B 1998 The Job Content Questionnaire: An Instrument for Internationally Comparative Assessments of Psychosocial Job Characteristics. *Journal of Occupational Health Psychology* 3: 322 – 355

Kauhanen M, Korpelainen J, Hitunen P, Nieminen P, Sotaniemi K, Myllyla V 2000 Domains and Determinants of Quality of Life after Stroke caused by Brain Infarct. *Archives of Physical Medicine Rehabilitation* 81: 1541 - 1546

Kaye H, Jans L, Jones E 2011 Why Don't Employers Hire and Retain Workers with Disabilities? *Journal of Occupational Rehabilitation*. 21: 526 – 536 DOI: 10.1007/s10926-011-9302-8

Kelly-Hayes M, Beiser A, Kase CS, Scaramucci A, D'Agostino RB, Wolf PA 2003 The Influence of Gender and Age on Disability following Ischemic Stroke: the Framingham study. *Journal of Stroke and Cerebrovascular Diseases* 12: 119 – 126

Kendall E, Muenchberger H, Gee T 2006 Vocational rehabilitation following traumatic brain injury: a quantitative synthesis of outcome studies. *Journal of Vocational Rehabilitation*. 25: 141 - 160

Keyser-Marcus L, Bricout J, Wehman P, Campbell L, Cifu D, Englander J, High W, Zafonte RD 2002 Acute predictors of return to employment after traumatic brain injury: A longitudinal follow-up. *Archives of Physical Medicine Rehabilitation* 83: 635 – 641

Kiessling A, Henriksson P 2005 Perceived cognitive function in coronary disease: an unrecognized predictor of unemployment. *Quality of Life Research* 14: 1481 - 1488

Kirkevold M, Bronken B, Martinsen R, Kvigne K 2011 Promoting psychosocial well-being following a stroke: Developing a theoretically and empirically sound complex intervention. *International Journal of Nursing Studies*. DOI:10.1016/j.ijnurstu.2011.10.006

Kissela BM, Khoury J, Kleindorfer D 2005 Epidemiology of ischemic stroke in patients with diabetes: the greater Cincinnati/Northern Kentucky Stroke Study. *Diabetes Care* 28: 355 - 359

Koch L, Egbert N, Coeling H, Ayers D 2005 Work after the onset of illness: experiences of right hemisphere stroke survivors. *Rehabilitation Counseling Bulletin* 48: 209 – 218

Kosny A, Franche R, Pole J, Krause N, Cote P, Mustard C 2006 Early health care provider communication with patients and their workplace following a lost-time claim for an occupational musculoskeletal injury. *Journal of Occupational Rehabilitation* 16: 25 - 37

Kouwenhoven S, Kirkevold M, Engedal K, Kim S 2011 Depression in acute stroke: prevalence, dominant symptoms and associated factors. A systematic literature review. *Disability and Rehabilitation* 33: 539 – 556

Kranciukaite D, Rastenyte D 2006 Measurement of quality of life in stroke patients. *Medicina (Kaunas)* 42: 710 – 716

Kuddo A 2009 Labour Laws in Eastern European and Central Asian Countries: minimum norms and practices (Discussion paper 0920). Washington, World Bank

Kuzel A 1992 Sampling in qualitative inquiry. In B Crabtree and W Miller (eds), *Doing qualitative research. Research Methods for Primary Care Volume 3*. Pages 31 – 44. Newbury Park, CA: Sage

Kwakkel G, Kollen BJ, van der Grond J, Prevo AJ 2003 Probability of regaining dexterity in the flaccid upper limb: impact of severity of paresis and time since onset in acute stroke. *Stroke* 34: 2181 – 2186

Landsbergis PA, Schnall PL, Pickering TG, Schwartz JE 2002 Validity and reliability of a work history questionnaire derived from the Job Content Questionnaire. *Journal of Occupational and Environmental Medicine* 44: 1037 - 1047

Lee S, Shafe A, Cowie M 2011 UK stroke incidence, mortality and cardiovascular risk management 1999 – 2008: time-trend analysis from the General Practice Research Database. *British Medical Journal* 2: e000269. DOI: 10.1136/bmjopen

Lemieux P, Durand M, Hong Q 2011 Supervisors' Perceptions of the Factors Influencing the Return to Work of Workers with Common Mental Disorders. *Journal of Occupational Rehabilitation* 21: 293 – 303. DOI 10.1007/s10926-011-9316-2

Leng CM 2008 Description of a return-to-work occupational therapy programme for stroke rehabilitation in Singapore. *Occupational Therapy International* 15: 87 – 99

Lennon SM, Hastings M 1996 Key physiotherapy indicators for quality of stroke care. *Physiotherapy* 82: 655 - 664

Lennon S, Johnsson L 2000 The modified rivermead mobility index: validity and reliability. *Disability and Rehabilitation* 22: 833 – 839

Liv H, Silje M, Liv HM 2011 What facilitates return to work? Patients experiences 3 years after occupational rehabilitation. *Journal of Occupational Rehabilitation* DOI 10.1007/s10926-011-9304-6

Lock S, Jordan L, Bryan K, Maxim J 2005 Work after stroke: focusing on barriers and enablers. *Disability and Society* 20: 33 – 47

Loeb ME, Eide AH 2004 Living conditions among people with activity limitations in Malawi: a national representative study. Oslo. SINTEF

Lord S, Rochester L 2005 Measurement of community ambulation after stroke: Current status and future developments. *Stroke* 36: 1457 – 1461

MacEachen E, Clarke J, Franche RL, Irvin E 2006 Systematic review of the qualitative literature on return to work after injury. *Scandinavian Journal of Work and Environmental Health* 32: 257 - 269

Malm J, Kristensen B, Karlsson T, Carlberg B, Fagerlund M, Olsson T 1998 Cognitive impairment in young adults with infratentorial infarcts. *Neurology* 51: 433 – 440

Malouin F, Pichare L, Bonneau C, Durand A, Corriveau D 1994 Evaluating motor recovery early after stroke: Comparison of Fugl-Meyer Assessment and the Motor Assessment Scale. *Archives of Physical Medicine and Rehabilitation* 75: 1206 - 1212

Mamabolo MV 2005 Discharge and post discharge functional level of patients with stroke. Research report, Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, South Africa

Mamabolo MV, Mudzi W, Stewart A, Olorunju S, Singh A 2009 A study to determine post discharge functional improvement of patients with stroke. *South African Journal of Occupational Therapy* 39: 15 – 18

Mars M 2004 HIV: Implications for exercise on treatment and rehabilitation. *The South African Journal of Physiotherapy* 60: 9 - 14

McCullagh E, Brigstocke G, Donaldson N, Kalra L 2005 Determinants of care giving burden and quality of life in caregivers of stroke patients. *Stroke* 36: 2181 – 2186

McDowd J, Filion D, Pohl P, Richards L, Stiers W 2003 Attentional Abilities and Functional Outcomes Following Stroke. *The Journals of Gerontology* 58: 45 - 53

McLean R 2007 Employment Status Six Months after Discharge from Inpatient Rehabilitation for a Mild-to-moderate Physical Disability. *Annals Academy of Medicine Singapore* 36: 18 - 21

Medin J, Barajas J, Ekberg K 2006 Stroke patients' experiences of return to work. *Disability and Rehabilitation* 28: 1051 – 1060

Mensah GA 2008 Epidemiology of stroke and high blood pressure in Africa. *Heart* 94: 697 – 705. DOI: 10.1136/hrt.2007.127753

Michael K, Allen J, Macko K 2005 Reduced ambulatory activity after stroke: The role of balance, gait, and cardiovascular fitness. *Archives of Physical Medicine and Rehabilitation* 86: 1552 - 1556

Minelli C, Fen LF, Minelli DPC 2007 Stroke incidence, prognosis, 30-day, and 1-year case fatality rates in Matao, Brazil: a population-based prospective study. *Stroke* 38: 2906 – 2911

Mital A, Desai A, Mital A 2004 Return to work after a coronary event. *Journal of Cardiopulmonary Rehabilitation* 24: 365 - 373

Mitchell AJ, Kemp S, Benito-Leon J, Reuber M 2010 The influence of cognitive impairment on health related quality of life in neurological disease. *Acta Neuropsychiatrica* 22: 2–13 DOI: 10.1111/j.1601 – 5215.2009.00439.x

Mitra S 2008 The recent decline in the employment of persons with disabilities in South Africa, 1998 – 2006. *South African Journal of Economics* 76: 480 – 492 DOI: 10.1111/j.1813-6982.2008.00196.x

Modi G 2006 Stroke and HIV: causal or coincidental co-occurrence? South African Medical Journal 96: 1247 – 1248

Mont D 2004 Disability employment policy (Discussion paper 0413). Washington, World Bank

Mudzi W, Stewart A, Musenge E 2012 Effect of carer education on functional abilities of patients with stroke. International Journal of Therapy and Rehabilitation 19: 380 - 385

Muijzer A, Geertzen J, de Boer W, Groothoff J, Brouwer S 2012 Identifying factors relevant in the assessment of return to work efforts in employees on long term sickness absence due to chronic low back pain: a focus group study. Public Health 12: 77  
<http://www.biomedicalcentral.com/1471-2458/12/77>

Murphy R, Sackley CM, Miller P, Harwood RH 2001 Effect of experiences of severe stroke on subjective valuations of quality of life after stroke. Journal of Neurology Neurosurgery Psychiatry 70: 679 - 681

Nasreddine Z, Phillips NA, Bedirian V, Charbonneau S, Whitehead V, Collin I, Cummings J, Chertkow H 2005 The Montreal Cognitive Assessment, MoCA: A Brief Screening Tool For mild Cognitive Impairment. Journal of the American Geriatrics Society 53: 695 – 699

National Rehabilitation Policy 2000 Rehabilitation for all, Department of Health, Pretoria, South African Government Printers

Neau JP, Ingrand P, Mouille-Bracket C, Rosier MP, Couderq C, Alvarez A, Gil R 1998 Functional recovery and social outcome after cerebral infarction in young adults. Cerebrovascular Disorders 8: 296 - 302

Niemi ML, Laaksonen R, Kotila M, Waltimo O 1988 Quality of life 4 years after stroke. Stroke 19: 1101 – 1107

Nigerian National Bureau of Statistics 2011 Annual Socioeconomic Report: Unemployment  
[www.nigerianstat.gov](http://www.nigerianstat.gov)

Noreau L, Escorpizo R, von Elm E, Miller WC, Tawashy A 2010 Work and Employment. In Eng JJ, Teasell RW, Miller WC, Wolfe DL, Townson AF, Hsieh JTC, Connolly SJ, Mehta S, Sakakibara BM, editors. Spinal Cord Injury Rehabilitation Evidence. Volume 3.0 Vancouver: pages 1 - 14

Ntsiea MV, Van Aswegen H, Lord S, Olorunju S 2012 Return to work services rendered for patients at stroke rehabilitation facilities in Gauteng Province, South Africa. International Journal of Therapy and Rehabilitation 19: 130 - 135

Nunnally JC 1978 Psychometric theory, 2<sup>nd</sup> edn. Pages 230 – 245. McGraw-Hill, New York

O'Connor M, Meuller L, Van Ormer A, Drake R, Penk W, Rosenheck R, Semiatin A, Drebing C 2011 Cognitive impairment as barrier to engagement in vocational services among veterans with severe mental illness. Journal of Rehabilitation Research and Development 48: 597 – 608

Ostelo RW, van Tulder MW, Vlaeyen JW, Linton SJ, Morley SJ, Assendelft WJ 2005 Behavioural treatment for chronic low back pain (Cochrane Review). In Cochrane Database of Systematic Reviews, Issue 1 John Wiley and Sons, Limited, Chichester

Ostry AS, Marion SA, Demers PA, Hershler R, Kelly S, Teschke K, Hertzman C 2001 Measuring psychosocial job strain with the Job Content Questionnaire using experienced job evaluators. American Journal of Industrial Medicine 39: 397 – 401

Ottenbacher KJ, Graham JE 2007 The state of the science: access to postacute care rehabilitation services. A review. Archives of Physical Medicine and Rehabilitation 88: 1513 – 1521 DOI: 10.1016/j.apmr.2007.06.761 PMID: 17964898

Oxley P 2007 Improving access to taxis. Geneva, International Road Transport Union [www.internationaltransportforum.org/europe/ecmt/pubpdf/07TaxisE.pdf](http://www.internationaltransportforum.org/europe/ecmt/pubpdf/07TaxisE.pdf) (Accessed 20 August 2012)

Paolucci S, Antonucci G, Pratesi, L, Trallesi M, Grasso M, Lubich S 1999 Post stroke depression and its role in rehabilitation of inpatients. Archives of Physical Medicine Rehabilitation 80: 985-989

Paris Organisation for Economic Co-operation and Development (OECD) report 2010 Sickness, disability and work: breaking the barriers. A synthesis of findings across OECD countries

Patel S, Greasley K, Watson P 2007 Barriers to rehabilitation and return to work for unemployed chronic pain patients: A qualitative study. *European Journal of Pain* 11: 831 – 840

Pendlebury ST, Cuthbertson FC, Welch SJ, Mehta Z, Rothwell PM 2010 Underestimation of cognitive impairment by Mini-Mental State Examination versus the Montreal Cognitive Assessment in patients with transient ischemic attack and stroke: a population-based study. *Stroke* 41: 1290 - 1293

Peters G, Buni S, Oyeyemi A, Hamzat T 2012 Determinants of return to work among Nigerian stroke survivors. *Disability and Rehabilitation Early Online* 1-5 DOI: 10.3109/09638288.2012.697251

Petre R, Beiser A, Seshadri S, Kelly-Hayes M, Kase C, Wolf P 2009 Stroke in women – Gender Differences in Stroke Incidence and Post-stroke Disability in the Framingham Heart Study. *Stroke*: 40: 1032 - 1037

Phillips H, Noumbissi A 2004 Disability in South Africa. *African Population Studies* 19: 115 – 138

Pohjansvaara T, Erkinjuntti T, Vataja R, Kaste M 1997 Comparison of stroke Features and Disability in Daily Life in Patients with Ischaemic Stroke Aged 55 to 70 and 71 to 85 years. *Stroke* 28: 729 - 735

Possl J, Jurgensmeyer S, Karlbauer F, Wenz C, Goldenberg G 2001 Stability of employment after brain injury: a 7 year follow up study. *Brain Injury* 15: 5 – 27

Rexroth P, Fisher AG, Merritt BK, Gliner J 2005 ADL differences in individuals with unilateral hemispheric stroke. *Canadian Journal of Occupational Therapy* 72: 212 - 221

Rhoda A, Mpofu R, De Weerd W 2009 The rehabilitation of stroke patients at community health centres in the Western Cape. *South African Journal of Physiotherapy* 65: 3 – 8

Rhoda A, Mpofu R, DeWeerd W 2011 Activity limitations of patients with stroke attending out-patient facilities in the Western Cape, South Africa. South African Journal of Physiotherapy 67: 16 – 22

Roberts S, Heaver K, Hill J, Rennison B, Stafford N, Howat G, Kelly S, Krishnan P, Thomas A 2004 Disability in the Workplace: Employers' and Service Providers' Responses to the Disability Discrimination Act in 2003 and Preparation for 2004 Change. Research Report 202. London: Department for Work and Pensions.

Roding J, Lindstrom B, Malm J, Ohman A 2003 Frustrated and invisible-younger stroke patients' experiences of the rehabilitation process. Disability and Rehabilitation 25: 867 – 874

Roding J, Glader E, Malm J, Eriksson M, Lindstrom B 2009 Perceived impaired physical and cognitive functions after stroke on men and women between 18 to 55 years of age – a national survey. Disability and Rehabilitation 31: 1092 – 1099

Rollnik J, Allman J 2011 Occupational Rehabilitation of neurological patients – long term outcome data. Rehabilitation (Stuttg) 50: 37 – 43

Rosman KD 1986 The Epidemiology of Stroke In An Urban Black Population. Stroke 17: 667 - 669

Saeki S, Ogata H, Okubo T, Takahashi K, Hoshuyama T 1993 Factors influencing return to work after stroke in Japan. Stroke 24: 1182 - 1185

Saeki S, Ogata H, Okubo T, Takahashi K, Hoshuyama T 1995 Return to Work After Stroke: A Follow-up Study. Stroke 26: 399 - 401

Saeki S 2000 Disability management after stroke: its medical aspects for workplace accommodation. Disability and Rehabilitation 22: 578 – 582

Saeki S, Toyonaga T 2010 Determinants of early return to work after stroke in Japan Journal of Rehabilitation Medicine 42: 254 – 258

Salter KL, Moses MB, Foley NC, Teasell RW 2008 Health-related quality of life after stroke: what are we measuring? *International journal of Rehabilitation Research* 31: 111 – 117

Sangha H, Lipson D, Foley N, Salter K, Bhogal S, Pohani G, Teasell RW 2005 A comparison of the Barthel Index and the Functional Independence Measure as outcome measures in stroke rehabilitation: patterns of disability scale usage in clinical trials. *International Journal of Rehabilitation Research* 28: 135 – 139

Schepers V, Visser-Meily A, Ketelaar M, Lindeman E 2005 Prediction of Social Activity 1 Year Post stroke. *Archives of Physical Medicine and Rehabilitation* 86: 1472 - 1476

Schlote A, Kruger J, Topp H, Wallesch CW 2004 Inter-rater reliability of the Barthel Index, the Activity Index, and the Nottingham Extended Activities of Daily Living: The use of ADL instruments in stroke rehabilitation by medical and non medical personnel. *Rehabilitation (Stuttg)* 43: 75 – 82

Schulz KF, Chalmers I, Hayers RG, Altman DG 1995 Empirical evidence of bias: Dimensions of methodological quality associated with estimates of treatment effects in controlled trials. *The Journal of the American Medical Association* 273: 408 - 412

Schweizer T, Al-Khindi T, Macdonald R 2012 Mini-Mental State Examination versus Montreal Cognitive Assessment: Rapid assessment tools for cognitive and functional outcome after aneurismal subarachnoid hemorrhage. *Journal of the Neurological Sciences*. DOI: 10.016/j.jns.2012.01.003

Shain M 2001 Returning to work after illness or injury: The role of fairness. *Bulletin of Science Technology and Society* 21: 361 DOI 10.1177/027046760102100505

Shah S, Vanclay F, Cooper B 1989 Improving the Sensitivity of the Barthel Index for Stroke Rehabilitation. *Journal of Clinical Epidemiology* 42: 703 - 709

Shah PB 2011 Intention to treat and per-protocol analysis. *Canadian Medical Association Journal* 183: 696

Smith T, Gildeh N, Holmes C 2007 The Montreal Cognitive Assessment: validity and utility in a memory clinic setting. *Canadian Journal of Psychiatry* 52: 329 - 332

South African Department of Health national Guidelines on Stroke and Transient Ischemic Attack of 2001. Directorate: Chronic Diseases, Disabilities and Geriatrics

Spring 2007 EHS M270 Work and Health. [www.workhealth.org/UCI](http://www.workhealth.org/UCI) (Accessed 15 July 2012)

Sturm JW, Donnan GA, Dewey HM, MacDonnell RA, Gilligan AK, Srinanth V, Thrift AG 2004 Quality of life after stroke: the North East Melbourne Stroke Incidence Study. *Stroke* 35: 2340 - 2345

Statistics South Africa 2010 Mid-year population estimates  
[www.statssa.gov.za/publications/P0302/P03022010.pdf](http://www.statssa.gov.za/publications/P0302/P03022010.pdf) (Accessed 31 January 2012)

Statistics South Africa 2011 Population estimates  
[www.statssa.gov.za/publications/P0302/P03022011.pdf](http://www.statssa.gov.za/publications/P0302/P03022011.pdf) (Accessed 23 October 2011)

Stergiou-Kita M, Rappolt S, Kirsh B, Shaw L 2009 Evaluating work readiness following acquired brain injury: Building a shared understanding. *Canadian Journal of Occupational Therapy* 76: 276 – 284

Stergiou-Kita M, Yantzi A, Wan J 2010 The personal and workplace factors relevant to work readiness evaluation following acquired brain injury: Occupational therapists' perceptions. *Brain Injury* 24: 948 - 958

Stineman M, Maislin G, Fielder RC, Granger CV 1997 A prediction model of functional recovery in stroke. *Stroke* 28: 550 – 556

Strong K, Mathers C, Bonita R 2007 Preventing stroke: saving lives around the world. *Lancet Neurology* 6: 182 – 187

Sulter G, Steen C, de Keyser J 1999 Use of the Barthel Index and Modified Rankin Scale in acute stroke trials. *Stroke* 30: 1538 – 1541

Taylor committee reports into a social security system for South Africa 2008 Committee Report Number 9: Social security for people with disabilities. Southern African Regional Poverty Network – South Africa

Tengland P 2011 The concept of work Ability. *Journal of Occupational Rehabilitation* 21: 275 – 285 DOI 10.1007/s10926-010-9269-x

Teasell R, McRae M, Finestone H 2000 Social issues in the rehabilitation of younger stroke patients. *Archives of Physical Medicine Rehabilitation* 81: 205 – 209

Thornton P, Zietzer I, Bruyere SM, Golden T, Houtenville A 2003 What works and looking ahead: a comparative study of UK and US policies and practices facilitating return to work for people with disabilities. Cornell University, New York  
[http://works.bepress.com/susanne\\_bruyere/92](http://works.bepress.com/susanne_bruyere/92) (Accessed 20 August 2012)

Tipping B, de Villiers L, Wainwright H, Candy S, Bryer A 2007 Stroke in patients with human immunodeficiency virus infection. *Journal of Neurology Neurosurgery Psychiatry* 78: 1320 – 1324. DOI: 10.1136/jnnp.2007.116103

Toglia J, Fitzgerald KA, O'Dell MW, Mastrogiovanni AR, Lin CD 2011 The Mini-Mental State Examination and Montreal Cognitive Assessment in persons with sub-acute stroke: relationship to functional outcome. *Archives of Physical Medicine Rehabilitation* 57: 792 - 798

Toschke A, Tilling K, Cox A, Rudd A, Heuschmann P, Wolfe C 2010 Patient-specific recovery patterns over time measured by dependence in activities of daily living after stroke and post stroke care: The South London Stroke Register. *European Journal of Neurology* 17: 219 – 225

Trani J, Loeb M 2010 Poverty and disability: a vicious circle? Evidence from Afghanistan and Zambia. *Journal of International Development* DOI: 10.1002/jid.1709

Treger I, Shames J, Giaquinto S, Ring H 2007 Return to work in stroke patients. *Disability and Rehabilitation* 29: 1397 – 1403

Trygged S, Ahacic K, Kareholt I 2011 Income and education as predictors of return to working life among younger stroke patients. BMC Public Health 11: 742.  
<http://www.biomedcentral.com/1471-2458/11/742>

Trygged S, Hedlund E, Kareholt I 2011 Education and post-stroke separation among couples with mutual children. Journal of Divorce and Remarriage 52: 401 – 414

Trygged S: Commentary in Ntsiea MV, van Aswegen H, Lord S, Olorunju S 2012 Return to work services rendered for patients at stroke rehabilitation facilities in Gauteng Province, South Africa. International Journal of Therapy and Rehabilitation 19: 134

Turner-Stokes L, Disler PB, Nair A, Wade DT 2005 Multidisciplinary rehabilitation for acquired brain injury in adults of working age. Cochrane database of systematic reviews, Issue 3. Art No: CD004170.DOI:10.1002/14651858.CD004170.pub2.

UNAIDS 2010 Report on the global AIDS epidemic [www.unaids.org](http://www.unaids.org) (Accessed 23 October 2011)

United Nations Convention on the rights of people with disabilities 2006 New York [www.un.org/disabilities/documents/convention/convoptprot-e.pdf](http://www.un.org/disabilities/documents/convention/convoptprot-e.pdf) (Accessed 20 March 2012)

Uyttenboogaart M, Stewart RE, Vroomen PC, de Keyser J 2005 Optimizing cut off scores for Barthel index and Modified Rankin Scale for defining outcome in acute stroke trial. Stroke 36: 1984 - 1987

Valpar International Cooperation 1992. Tuscon, Arizona, USA

Van de Port I, van den Bos GA, Voorendt M, Kwakkel G, Lindeman E 2007 Identification of risk factors related to perceived unmet demands in patients with chronic stroke. Disability and Rehabilitation 29: 1841 - 1846

van Oostrom SH, Anema JR, Terluin B, de Vet HC, Knol DL, van Mechelen W 2008 Cost-effectiveness of a workplace intervention for sick-listed employees with common mental disorders: design of a randomized controlled trial. *BioMed Central Public Health* 8: 12 DOI: 10.1186/1471-2458-8-12

van Straten A, de Haan RJ, Limburg M, Schuling J, Bossuyt PM, van den Bos GA 1997 A stroke-adapted 30-item version of the Sickness Impact Profile to assess quality of life. *Stroke* 28: 2155 - 2161

Van Velzen J, Bennekom C, van Dormolen M, Frings-Dresen M 2011 Factors influencing return to work experienced by people with acquired brain injury: a qualitative research study. *Disability and Rehabilitation* 33: 2237 – 2246. Epub 2011 March 29

Vestling M, Tufvesson B, Iwarsson S 2003 Indicators for return to work after stroke and the importance of work for subjective well-being and life satisfaction. *Journal of Rehabilitation Medicine* 35:127 – 131

Waddell G, Burton A 2004 Concepts of rehabilitation for the management of common health problems. The Stationery Office, London

Waddell G, Aylward M 2005 The scientific and conceptual basis of incapacity benefits. The Stationery, Office London.

Waddell G, Burton A, Kendall N 2008 Vocational Rehabilitation: What works, for whom, and when? London: The Stationery Office

Williams LS, Weinberger M, Harris LE, Clark DO, Biller J 1999a Development of a Stroke-specific Quality of Life scale. *Stroke* 30: 1362 – 1369

Williams LS, Weinberger M, Harris LE, Biller J 1999b Measuring Quality of Life in a way that is meaningful to stroke patients. *Neurology* 53: 1839 – 1843

Williams LS, Bakas T, Brizendine E, Plue L, Tu W, Hendrie H, Kroenke K 2006 How valid are the family proxy assessments of stroke patients' health-related quality of life? *Stroke* 37: 2081 - 2085

Wolf T, Baum C, Connor L 2009 Changing face of stroke: Implications for occupational therapy practice. *American Journal of Occupational therapy* 63: 621 - 625

Wolfe C, Critchton S, Heuschmann P, McKeivitt C, Toschke A, Grieve A, Rudd A 2011 Estimates of Outcomes Up to Ten Years after Stroke: Analysis from the Prospective South London Stroke Register. *PLoS Medicine* 8: e 1001033. DOI: 10.1371/journal.pmed.1001033

Wolfenden B, Grace M 2009 Returning to work after stroke: a review. *International Journal of Rehabilitation Research* 32: 93 – 97

World Confederation for Physical Therapy. Guidelines for physical therapist professional entry level education. Revised and published as a WCPT guideline at the 17<sup>th</sup> General meeting of WCPT June 2011. [www.wcpt.org/guidelines/entry-level-education](http://www.wcpt.org/guidelines/entry-level-education) (Accessed May 2012)

World Confederation for Physical Therapy. Policy statement: Education. Revised and re-approved at the 17<sup>th</sup> WCPT General Meeting, June 2011. [www.wcpt.org/policy/ps-education](http://www.wcpt.org/policy/ps-education) (Accessed May 2012)

World Health Organisation MONICA Project 1988 Monitoring trends and determinants in cardiovascular disease: a major international collaboration. *Journal of Clinical Epidemiology* 41: 105 – 114

World Health Survey 2002 - 2004 Geneva. World Health Organisation  
[www.who.int/healthinfo/survey/en](http://www.who.int/healthinfo/survey/en) (accessed 15 July 2012)

World Health Organisation Report on Disability 2011.  
[whqlibdoc.who.int/publications/2011/9789240685215\\_eng.pdf](http://whqlibdoc.who.int/publications/2011/9789240685215_eng.pdf) (Accessed 15 July 2012)

Wozniak MA, Kittner SJ, Price TR, Hebel JR, Slaon MA, Gardner SCM 1999 Stroke Location Is Not Associated With Return to Work After First Ischemic Stroke. *Stroke* 30: 2568 - 2573

Wright J, Cross J, Lamb S 1998 Physiotherapy outcome measures for rehabilitation of elderly people: responsiveness to change of the Rivermead Mobility Index. *Physiotherapy* 84: 216 - 221

Zaidi A, Burchardt T 2005 Comparing incomes when needs differ: equivalisation for the extra costs of disability in the UK. *Review of Income and Wealth* 51: 89-114 DOI:10.1111/j.1475-4991.2005.00146.x

## APPENDIX A

### CURRENT PRACTICE IN RETURN TO WORK INTERVENTION PROGRAMMES FOR PATIENTS WITH STROKE IN THE GAUTENG PROVINCE OF SOUTH AFRICA

#### Consent:

I have read the information letter and agree to participate in this study.      **Yes**      ☐

#### Instructions:

Please complete one questionnaire per department

Please answer all questions in this questionnaire

#### SECTION A: Basic Information

##### 1. What is your clinical setting? (Tick in one box)

Government hospital physiotherapy department ☐

Government hospital occupational therapy department ☐

Private physiotherapy rehabilitation setting ☐

Private occupational therapy rehabilitation setting ☐

Combined private occupational and physiotherapy setting ☐

Combined government hospital physiotherapy and occupational therapy setting ☐

Primary health care clinic ☐

Other: Specify \_\_\_\_\_

## SECTION B: Patient services

***Please note that return to work referred to in this questionnaire, is about return to work that they were doing before stroke***

2. Approximately how many new cases of stroke do you see every month?

3. Approximately how many of these patients require return to work intervention?

4. Do you routinely do return to work intervention?      **Yes** ☐      **No** ☐

4.1. If yes to question 4, which assessment tools do you use with return to work? ***(N.B. If No to question 4, proceed to question 4.7)***

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4.2. Do you usually visit the patient's place of work before they get discharged from hospital?      **Yes** ☐      **No** ☐

4.3. Do you communicate with the patient's employer?      **Yes** ☐      **No** ☐

4.3.1. If yes to 4.3, please specify:

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4.4. Do you provide return to work rehabilitation services at the following places:

The hospital only      **Yes** ☐      **No** ☐

The patient's workplace

Yes ☐ No ☐

Both in hospital and at place of work

Yes ☐ No ☐

4.5. What are the common barriers/obstacles of return to work for your patients who have suffered a stroke?

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4.6. What are the common facilitators/enablers of return to work for your patients who have suffered a stroke?

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4.7. If No to question 4,

Do you refer your patients to another professional to do this? Yes ☐ No ☐

4.8. Any other comment/s:

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**Thank you.**

## **APPENDIX B (Stage one and two pilot studies)**

### **1. STAGE ONE PILOT STUDY:**

#### **1.1 Introduction**

Stage one pilot study was done at two physiotherapy and two occupational therapy departments within the Gauteng province. The departments were randomly selected from a list of all physiotherapy and occupational therapy departments within the study area by a process of simple random sampling.

The purpose of this pilot study was to enable the researcher to establish the following:

- a) clarity of the current practice questionnaire and to check if what is being asked can be captured on a statistical spread sheet, for analysis,
- b) any unforeseen problems that may arise during the data collection process,
- c) internal consistency of the test scores

#### **1.2 Methodology**

The questionnaire was hand delivered to all these departments mentioned above and an allowance of two weeks was given for them to respond. All questionnaires were returned within the first two days via hand delivery. The same questionnaire was sent to the same departments after five days of completing the first one to establish stability of the test scores. Two of the questionnaires were returned within the first week. The other two questionnaires were not returned and the therapists were phoned once and visited once to remind them of the questionnaires. They reported that they had lost the questionnaire and thus the questionnaire had to be resent to them by hand mail. These questionnaires were eventually received within two weeks of delivery. – This was within four weeks of completing the first questionnaire. An excel spread sheet template was created with the help of the statistician to capture this data. Open ended questions were categorised into themes based on responses.

#### **1.3 Data analysis**

STATA 10 software version 10.2 was used to establish the level of agreement of the questionnaire items using kappa values and to establish the scale reliability coefficients of phase one, two and a combination of these two phases of questionnaire administration.

## 1.4 Results

### Level of agreement between items on the questionnaire:

Altman (1991)'s kappa interpretation was used to comment on the kappa values. The interpretation is as follows: poor agreement = less than 0.20; fair agreement = 0.20 – 0.40; moderate agreement = 0.40 – 0.60; good agreement = 0.60 - 0.80 and very good agreement = 0.80 – 1.00.

There was very good agreement (1.0) between all items on the questionnaire except the following three items:

- Approximate number of new cases of stroke seen every month and approximate number of patients who require return to work intervention – these items had good agreement with kappa value of 0.7.
- Common barriers/obstacles of return to work for patients who have suffered a stroke – this item had a moderate agreement with kappa value of 0.5.

### Reliability coefficient of the questionnaire:

Phase one and two of the questionnaire yielded a reliability coefficient of 0.97 and 0.96 respectively. Analysis of combined scales (phase one and two) yielded a reliability coefficient of 0.98.

The result was 0.98: this is a high reliability coefficient according to Nunnally (1978) who established that a reliability coefficient of 0.80 is considered high. No unforeseen problems arose during the data collection process and thus the questionnaire was considered ready for main study data collection.

## 1.5 Discussion

The questionnaire was answered appropriately with no indication of misunderstanding of any of the questions. The questions about appropriate number of patients with stroke and patients who require return to work intervention yielded a good agreement. A decision was made to leave these questions unchanged as the therapists did not have the exact number of patients at hand. This is a possible explanation of the discrepancy between the first and second phase of the questionnaire administration. The question on common barriers and obstacles had moderate agreement. Some of the therapists wrote enablers of return to work under barriers, but in a

reverse format when they completed the questionnaire the second time (e.g. if employer support was considered to be an enabler of return to work during phase one of questionnaire administration, the same person would say that “not having employer support” is a barrier of return to work in phase two of the questionnaire administration). This question was left unchanged for the main study as it did not alter the required data.

## **1.6 Conclusion**

The current practice in return to work questionnaire was considered ready for the main study data collection process.

## **2. STAGE TWO PILOT STUDY:**

### **2.1 Introduction**

This pilot study was done at the New Kensington Life clinic which is one of the rehabilitation units that offer stroke rehabilitation services within the Johannesburg area. This rehabilitation unit was randomly selected from a list of all stroke rehabilitation units and hospitals that offer stroke rehabilitation services within the study area by a process of simple random sampling. The purpose of this pilot study was to:

- a) establish understanding of the patient demographic questionnaire, Barthel Index (BI), Modified Rivermead mobility index (MRMI), Montreal cognitive assessment (MoCA), Stroke specific quality of life scale (SSQoL), and the Job content questionnaire (JCQ) to this study group and to the researcher and research assistant,
- b) establish if there is agreement between the two sets of data (researcher's and research assistant's data of items listed in (a) above),
- c) summarise the continuous and categorical data from the questionnaires listed in (a) above, to establish if it would be possible to get patients who meet the main study inclusion criteria at by six weeks post stroke.
- d) enable the research assistant to familiarise himself with the therapist portable assessment lab (TPAL),
- e) establish the amount of time it would take to administer the questionnaires,
- f) identify any unexpected problems that may arise during the data collection process

### **2.2 Methodology**

Seven consecutive patients (10% of the minimum study group) who have had stroke for less than six weeks were included in the pilot study. The patients were visited twice (five days apart) and at each visit the researcher and research assistant sat in and each independently filled in their questionnaires while only one person was interviewing the patient. Both the researcher and the research assistant had an opportunity to interview all patients by the end of the pilot study. The following were interviewer administered: the patient profile questionnaire; MRMI; BI; SSQoL; JCQ, and MoCA. The research assistant (Occupational therapist) administered TPAL on one patient to familiarise themselves with this assessment tool.

## 2.3 Data analysis

STATA 10 software version 10.2 and STATISTICA version 8 were used to analyse descriptive data from questionnaires listed in (a) above. Continuous data was summarised using median. Categorical data was summarised using frequencies and percentages. Below is a summary of results of the seven patients assessed in this pilot study:

## 2.4 Results

### Demographic information

The median age of the patients was 41 (33-48) years. Five (71.4%) of the patients were male and two (28.6%) were female. Six (85.7%) were married and one (14.3%) was single.

### Stroke related information

Four (57.1%) had the right sided hemiplegia while three (42.9%) had left sided hemiplegia. The median stroke duration was two (2-4) weeks. All patients received physiotherapy, occupational therapy and speech therapy services. Results of illnesses that they had besides stroke are shown in Table 1.

**Table 1: Other illnesses besides stroke (n = 7)**

|                            | n (%)    |
|----------------------------|----------|
| Epilepsy                   | 1 (14.3) |
| Arthritis                  | 1 (14.3) |
| Hypertension               | 3 (42.9) |
| HIV/AIDS related illnesses | 2 (28.6) |
| Raised cholesterol         | 1 (14.3) |

A patient could select more than one illness. The most common illness besides stroke was hypertension (42.9%) followed by HIV/AIDS related illnesses (28.6%). None of the patients had the following illnesses which were included in the questionnaire: diabetes, asthma, and cardiac diseases.

### Economic situation

All of the patients (100%) were breadwinners at the time of having a stroke. None of them had applied for private disability insurance or a government disability grant and six (85.7%) of them

will stay within the Johannesburg area (i.e. their usual residence) when they are sick. The number of dependents, years in current job, total number of years working and sick leave duration are shown in Table 2.

**Table 2: Descriptive summary for other items of interest (n = 7)**

| Items                                                    | Median | Min- Max |
|----------------------------------------------------------|--------|----------|
| <b>Number of dependents</b>                              | 3      | 2-5      |
| <b>Number of years in current job</b>                    | 5      | 2-16     |
| <b>Number of years working altogether</b>                | 8      | 5-23     |
| <b>Sick leave duration (weeks) in a three year cycle</b> | 6      | 6-23     |

The median sick leave duration in a three year cycle was six weeks.

The type of occupation at the time of suffering a stroke is shown in Table 3.

**Table 3: Type of occupation at the time of suffering a stroke (n = 7)**

| <b>Occupation</b> | <b>n (%)</b> |
|-------------------|--------------|
| Engineer          | 1 (14.3)     |
| Miner             | 1 (14.3)     |
| Administrator     | 1 (14.3)     |
| Driver            | 1 (14.3)     |
| Police officer    | 2 (28.5)     |
| Accountant        | 1 (14.3)     |

The highest category of occupational group is the police officers (28.5%) and there is only one person for each of the other occupational groups. Two (29%) people are in blue collar occupation (miner and driver).

The numbers of patients per key job responsibility area are shown in Table 4.

**Table 4: The numbers of patients per key job responsibility area (n = 7)**

| Key job responsibility                          | n (%)    |
|-------------------------------------------------|----------|
| Sitting – administration including computer use | 3 (42.9) |
| Standing – labour intensive                     | 3 (42.9) |
| Driving                                         | 1 (14.2) |

There was an equal number (42.9%) of those who did administrative work in sitting and labour intensive work in standing. The following key responsibility areas were also included on the questionnaire, but none of the patients had this as their key job responsibility: sitting (labour intensive); standing (administration); walking; and lifting.

### **Activities of daily living functional ability and mobility**

A Barthel index (BI) was used to establish the patient's activities of daily living functional ability and a Modified Rivermead mobility index (MRMI) was used to establish the patient mobility. The results are shown in Table 5.

**Table 5: BI and MRMI scores (n = 7)**

|                                 | n (%)    |
|---------------------------------|----------|
| <u>BI score/20 (12 = 60%)</u>   |          |
| <12                             | 3 (42.9) |
| ≥12                             | 4 (57.1) |
| <u>MRMI score/40 (24 = 60%)</u> |          |
| <24                             | 4 (57.1) |
| ≥24                             | 3 (42.9) |

A score of more than 60% was attained by more patients on the BI 4 (57.1) than on the MRMI 3 (42.9).

### **Cognitive level**

The Montreal cognitive assessment (MoCA) was used to establish the cognitive level. The MoCA scores are shown in table 6.

**Table 6: MoCA scores per patient (n = 7)**

|                  | Score |
|------------------|-------|
| <b>Patient 1</b> | 9     |
| <b>Patient 2</b> | 13    |
| <b>Patient 3</b> | 16    |
| <b>Patient 4</b> | 20    |
| <b>Patient 5</b> | 24    |
| <b>Patient 6</b> | 25    |
| <b>Patient 7</b> | 27    |

The highest score was 27. Four (57%) of the patients had a score above 19.

### **Perceived health related quality of life**

The stroke specific quality of life scale (SSQoL) was used to measure the patient's perceived quality of life. One of the patients had difficulty completing this due to expressive aphasia and thus it was administered on six patients. The median SSQoL score was 120 (100 – 187). The lowest scores were in work/productivity, social roles and family roles (all had a median score of zero).

### **The job content**

The Job content questionnaire was used to measure the patient's pre-morbid job content. The median total JCQ score was 72 (64-82).

- a) A research assistant who will do the vocational assessment of all intervention group patients assessed one patient using TPAL to familiarise himself with this tool and to check logistics of booking and collecting this tool from the Occupational therapy department at the university of the Witwatersrand.

The research assistant found the TPAL easy to administer and the space within the clinical facility was enough for the patient, research assistant and the TPAL. The test is very practical and thus understanding by the patient was generally good. The patient had a score of less than 10% (rating 5) on all items assessed and this was an indication that he still needed improvement in functional ability or may need adaptation of his work environment to

accommodate him in his workplace. According to Valpar International Corporation (1992) a patient has to have a score of 87 – 112.5% for normal working capacity.

The booking and collection process of the TPAL was found to be difficult as it was used for undergraduate teaching and thus was not always available when needed. After doing this pilot study the departmental research coordinator offered to buy TPAL exclusively for research purposes and this was purchased and delivered just after completion of the pilot and will be used for the main study.

- b) The amount of time taken to administer the TPAL was two hours. This was anticipated amount of time and the patient was told at the beginning that the test is likely to be minimum two hours and thus they did not become impatient throughout the test. The assessment is practical, thus the patient did not get bored or lose concentration during the assessment.

The average amount of time in minutes spent administering other measures was as follows: demographic questionnaire (10); BI (4); MRMI (3); MoCA (20); SSQoL (18); JCQ (10). Thus the total amount of time for baseline assessment was 65 minutes. Most of the patients became tired and started losing concentration after about 55 minutes. Too much time was also spent reading the patient's medical records during the interview for information on stroke and other illnesses.

A decision was then made to do the JCQ with TPAL in order to reduce assessment time to 55 minutes. The researcher/research assistant will also have to read the patient's medical records before interviewing and assessing the patient to minimise the time the patient will have to spend in an assessment session.

- c) The following unexpected problems were identified during the pilot study:

- The demographic questionnaire did not have the patient, patient's next of kin and employer contact numbers and physical address – these were included in the questionnaire for the main study data collection.
- No provision was made for documentation of patient's speech problems – provision was made for this to be entered in the stroke related information section.

- The MoCA was difficult for most of the patients especially for one patient with speech problems who had a total score of nine. Only one patient had a score greater than 26 which was initially set as the minimum score for inclusion in this study.
- Questions 7 and 8 of the JCQ (decision authority section) were similar but had an opposite effect on the score. A decision was made to use only one of these questions (question 8).

## **2.5 Discussion**

### **Patient assessment forms and questionnaire**

The total number of items on the questionnaires and assessment forms was 64 and a kappa score of 80% and above was attained for 48 (75%) of these items. Ten (15.6%) of the items had moderate agreement and six (9%) of the items had poor agreement. A meeting was held with the research assistant to discuss items which had poor and moderate agreement in order to have the same understanding of what is expected of the patient. Some of the discrepancies occurred when the patient was independent in doing activities either alone or using an assistive device or had a partial score on the BI and MRMI. This matter was clarified between the researcher and research assistant. The item on other illnesses on the demographic questionnaire was corrected by writing additional five illnesses on the questionnaire so that the researcher or research assistant can just tick it off the list.

Most of the discrepancies occurred in the SSQoL scoring as there was poor interpretation of the patient's responses to the five point Likert scale. A separate paper with the scale will be used so that the researcher/research assistant can refer to it at all times when scoring each item. It was interesting to note that all items on the JCQ had a very good agreement. The JCQ is relatively shorter and patients understood the four point Likert scale used to score it better than the SSQoL.

### **Stroke related information**

The age range of 33-48 indicates that it will be possible to find enough patients below the age of 55 for the main study. This finding is similar to that of Wolf, Baum, and Connor (2009) in their study about the changing face of stroke in Washington which established that a large percentage of people who have stroke are less than 55 years old. The median stroke duration of this pilot group was two (2-4) weeks. This is an indication that patients who meet the inclusion

criteria of this research can be found before the six weeks which is a time by when the baseline assessment has to be done.

The second most common illness besides stroke was HIV/AIDS related illnesses (28.6). This is an indication that there is likely to be more patients with HIV/AIDS related illnesses in this study and thus this should be taken into consideration when analysing data. “ Patients with HIV infection who do not have full blown AIDS or pulmonary infection have reduced work capacity, lower aerobic threshold, and poorer aerobic capacity than age matched controls” Johnston et al. (1990) in Mars (2004). Quality of life in the domain of mobility, usual activities, pain/discomfort and anxiety/depression was also found to be compromised in people living with HIV, especially those in stages (World Health Organisation classification) 3 and 4 (Hughes et al., 2004). Thus the quality of life of patients who have HIV in conjunction with stroke is likely to be more compromised than in patients who have stroke only. This may affect the patient’s ability to go back to work after stroke and hence the need to factor it into the analysis.

### **Economic situation**

None of the patients had applied for private disability insurance or a government disability grant at the time of assessment. This is a good indication that the timing of the assessments within six weeks post stroke is appropriate as it is advisable for a return to work programme to commence before the insurance claim or early retirement application is lodged. This early intervention is important because people who have suffered a stroke are sometimes forced into early retirement because of the perception of the employer or healthcare provider that the person is unable to do the job (Alaszewski et al., 2007), thus employers need to be involved before they fully perceive stroke to be a barrier to return to work.

The median sick leave duration in a three year cycle was six (6-23) weeks. This is in line with the South African basic Conditions of Employment Act: No. 75 (1997). The intervention programme in this study starts by six weeks post stroke, and this will be at the end of the leave cycle for most of the patients, and thus they may have started thinking of the possibility of return to work which will help in increasing the number of patients/employers who may have interest in participating in this study.

The occupational groups in this pilot study are wide and three (42.9%) of the patients did sitting (administration) and three (42.9%) did standing (labour intensive) jobs, however five (71%) of

them were white collar workers. This can be explained by the fact that the rehabilitation unit where the pilot study was conducted is a private unit, and thus most blue collar workers who don't have medical aid usually get admitted in government rehabilitation facilities. Thus, the main study research sites would have to include a government rehabilitation site. The wide variety of jobs also indicates a need for the workplace intervention programme to be designed to cover as many occupational groups. One of the patients was a driver. The researcher will have to contact the South African disabled driver's assessors before drawing an intervention programme for drivers in order to align the treatment goals with the traffic department's requirements.

### **Activities of daily living functional ability and mobility**

Four (57.1%) of the patients had a score of more than 60% on the BI by four weeks post stroke. This is an indication that it is possible to find enough patients who meet the inclusion criteria with the set six weeks post stroke. More patients had a higher score on the BI than the MRMI. Ability to cope with activities of daily living and functional mobility have been identified as factors that increase the probability of return to work (Saeki et al 1995; Saeki et al 2000). We thus need patients to have good scores in both the BI and MRMI. The scores improved per patient during the second assessment session which was by four weeks post stroke and thus the BI and MRMI scores are likely to improve by six weeks post stroke when the intervention begins. Patients for the main study will have to be assessed after four weeks of having stroke in order to get a better reflection of their functional ability and avoid excluding them unnecessarily.

### **Cognitive level**

Most of the patients found the MoCA difficult and only one of the patients scored more than 26 which was a minimum score required for inclusion in the study. The researcher had to revise this inclusion criterion and found that the suggested cut off score of 26 was recommended for normal controls in a study by Nasreddine et al (2005) and they recommend a cut off score less than 26 for patients who have mild cognitive impairment (MCI) as may be the case with patients who have had stroke. The score ranges for patients with MCI in their study was 19.0 – 25.2. The inclusion criterion for patients in this study was thus changed to a minimum MCoA score of 19 instead of 26.

### **Perceived health related quality of life**

The lowest scores on the SSQoL scale were in the area of work/productivity, social roles and family roles (all with a median of zero). The reason for these low scores is that all these patients were still within the hospital and some of them had not been of a home pass out yet. It would thus be better to only compare the SSQoL scores of the three months and six months follow up assessment when the patient is out of the hospital. The scores at baseline will still be recorded to compare as the mean scores of the bigger main study sample study group may give a different picture from this pilot study median.

### **The job content**

The highest score was in the area of supervisor and co-worker support. This gives the researcher an indication that the patients come from a supportive environment and that the employer or supervisor is more likely to cooperate with any attempt to help the patient, in this case with a return to work intervention programme. This is supported by the fact that successful return to work is enhanced by employer flexibility (Medin, Barajas, and Ekberg, 2006; Koch et al, 2005; Aleszewski et al, 2007). The norms for each domain of the JCQ will only be received from the JCQ centre after the main study – thus challenges that may arise from interpretation can only be dealt with at the end of the main study data collection.

There was no need to pilot the return to work questionnaire as one of our Master of Physiotherapy degree students is using it for her research project and has piloted this questionnaire in a study group similar to the one in this study. She has given the researcher permission to use this piloted return to work questionnaire. This questionnaire will be administered during the three and six month follow up sessions to establish the rate of return to work and the factors that are predictive of return to work in this study group.

## **2.6 Conclusion**

The researcher and the research assistants were well prepared to do all patient assessments and there was generally a good agreement between the scores. Items with poor agreement have been clarified between the assessors and adjustments have been made to the questionnaires. It was realistic to expect to find patients with a stroke duration of less than six weeks who also had the following characteristics: age range of 18 – 55 years; employed at the time of having stroke; independent in activities of daily living as indicated by a BI score of at

least 60% and have cognitive ability of at least 19 out of 30 (63%) on the Montreal cognitive assessment.

Possible challenges which may arise from JCQ analysis will be dealt with at the end of the main study data collection.

## APPENDIX C

### THE EFFECT OF A WORKPLACE INTERVENTION PROGRAMME ON THE RATE OF RETURN TO WORK AFTER STROKE

#### DEMOGRAPHIC QUESTIONNAIRE

Please answer all questions in this questionnaire

Please note that this information is highly confidential

Patient number (e.g 1 or 2...):

Patient's name: \_\_\_\_\_

Patient's ID number: \_\_\_\_\_

Home address: \_\_\_\_\_

\_\_\_\_\_

Home telephone: \_\_\_\_\_

Cell phone: \_\_\_\_\_

Next of Kin name and telephone: \_\_\_\_\_

\_\_\_\_\_

Work telephone: \_\_\_\_\_

Work address: \_\_\_\_\_

\_\_\_\_\_

Work supervisor/line manager/employer's name:

\_\_\_\_\_

### SECTION A: Demography

1.1 Age ☐

1.2. Date of birth: \_\_\_\_\_

*For the following, please tick the relevant block*

#### 2. Gender

☐ Male ☐ Female

#### 3. Marital status

☐ Single ☐ Divorcee ☐ Live-in Partner

☐ Married ☐ Widow

#### 4. Highest educational level completed/achieved

- ☐ University degree
- ☐ Grade 12 + 3 years
- ☐ Grade 12 or equivalent
- ☐ Up to grade 11
- ☐ Up to grade 7

#### SECTION B: Stroke

5.1 When did you have the stroke? \_\_\_\_\_

5.2 Which side of the body is the weakness on?

- ☐ Left      ☐ Right

5.3 Do you have any speech problems?

- ☐ No    ☐ Yes

5.4 If yes to question 5.3, tick appropriate speech problem.

*(NB! Patients with global aphasia and receptive aphasia are excluded in this study)*

- ☐ Dysphasic (expressive)      ☐ Aphasic (expressive)
- ☐ Dysarthria

**6. What other illnesses do you have besides stroke?**

☐ Diabetes

☐ Epilepsy

☐ Asthma

☐ Arthritis

☐ Hypertension

☐ HIV related illnesses

☐ High Cholesterol

☐ Cardiac disease

**Other: (please specify):** \_\_\_\_\_

**7. Which rehabilitation services did you receive after stroke?**

☐ Physiotherapy

☐ Occupational therapy

☐ Speech therapy

☐ Social work/Psychology

**Other: (please specify):** \_\_\_\_\_

## **SECTION C: Economic situation**

### **8. What financial role did you play in the family before the stroke?**

☐ Breadwinner

☐ Dependent

☐ Contributing to the family income

☐ Not contributing to the family income

### **9. What is the monthly income of your household (all sources)?**

☐ R0 – R800

☐ R801 – R2000

☐ R2001 – R5000

☐ More than R5000

### **10. Do you get a disability insurance payment?**

☐ Yes

☐ No

☐ Application in progress

**10.1 If yes/application in progress in 10. Above – give name of insurance company.**

---

### **11. Do you get a state disability grant?**

☐ Yes

☐ No

☐ Application in progress

### **12. How many dependents do you support financially? ☐**

**13. Will you have someone to help you at home?** ☐ Yes ☐ No

**14. If yes to question 13, what is your relationship with the helper?**

**Spouse** ☐ Yes ☐ No      **Daughter** ☐ Yes ☐ No

**Son** ☐ Yes ☐ No      **Neighbour** ☐ Yes ☐ No

**Friend** ☐ Yes ☐ No

**Other: (please specify):** \_\_\_\_\_

**15. Do you have to pay the person helping you at home?**

☐ Yes ☐ No

#### **SECTIOND E: Job related issues**

**16. What was your occupation at the time of suffering a stroke?**

---

**17. Give a brief description of your key responsibilities at work (e.g. sitting, walking, lifting...)**

---

---

---

**18. How many years have you been in the occupation mentioned in No. 16?**

---

**19. How many years have you been working altogether?**

---

**20. What is your sick leave duration?**

---

**21. When you are sick, where do you reside?**

---

**Thank you.**

## **APPENDIX D (Barthel Index: BI)**

|                   |                                                                                                                                                                                    |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Bowels</b>     | 0 = incontinent (or needs to be given enema)<br>1 = occasional accident (once a week)<br>2 = continent                                                                             |
| <b>Bladder</b>    | 0 = incontinent, or catheterised and unable to manage alone<br>1 = occasional accident (maximum once per 24 hours)<br>2 = continent                                                |
| <b>Grooming</b>   | 0 = needs help with personal care<br>1 = independent face/ hair/ teeth/ shaving (implements provided)                                                                              |
| <b>Toilet use</b> | 0 = dependent<br>1 = needs some help, but can do something alone<br>2 = independent (on and off, dressing, wiping)                                                                 |
| <b>Feeding</b>    | 0 = unable<br>1 = needs help cutting, spreading butter, etc.<br>2 = independent                                                                                                    |
| <b>Transfer</b>   | <b>(bed to chair and back)</b><br>0 = unable, no sitting balance<br>1 = major help (one or two people, physical)<br>2 = minor help (verbal or physical)<br>3 = independent         |
| <b>Mobility</b>   | 0 = immobile<br>1 = wheelchair dependent, including corners<br>2 = walks with help of one person (verbal or physical)<br>3 = independent (but may use any aid; for example, stick) |
| <b>Dressing</b>   | 0 = dependent<br>1 = needs help but can do about half unaided<br>2 = independent (including buttons, zips, laces, etc.)                                                            |
| <b>Stairs</b>     | 0 = unable<br>1 = needs help (verbal, physical, carrying aid)<br>2 = independent                                                                                                   |
| <b>Bathing</b>    | 0 = dependent<br>1 = independent (or in shower)                                                                                                                                    |

**Total**

**/20**

## APPENDIX E (Modified Rivermead Mobility Index: MRMI)

Date

Score

### Turning over

Please turn from your unaffected  
side on to your back

### Lying to Sitting

Please sit up on the edge of the bed  
from your unaffected side

### Sitting balance

Please sit on the edge of the bed for 10 seconds

### Sitting to Standing

Please stand up from your chair  
(*should take less than 15 seconds*)

### Standing

Please remain standing for 10 seconds

### Transfers

Please go from bed to the chair and back again  
towards your unaffected side

### Walking Indoors

Walk 10metres in your usual way

### Stairs

Please climb up one flight of stairs in your usual way

**Total Score**

**/40**

MRMI - Scoring System: **0** - Unable; **1** - Assistance of 2; **2** - Assistance of 1;  
**3** - Supervision or verbal cueing; **4** - Requires an aid or appliance; **5** – Independent

## APPENDIX F (Stroke Specific Quality of Life Scale: SSQoL)

**Scoring: each item shall be scored with the following key**

|                                                        |   |
|--------------------------------------------------------|---|
| Total help - Couldn't do it at all - Strongly agree    | 1 |
| A lot of help - A lot of trouble - Moderately agree    | 2 |
| Some help - Some trouble - Neither agree nor disagree  | 3 |
| A little help - A little trouble - Moderately disagree | 4 |
| No help needed - No trouble at all - Strongly disagree | 5 |

| ITEM | SCORE |
|------|-------|
|------|-------|

### Energy

- |                                               |       |
|-----------------------------------------------|-------|
| 1. I felt tired most of the time.             | _____ |
| 2. I had to stop and rest during the day.     | _____ |
| 3. I was too tired to do what I wanted to do. | _____ |

### Family Roles

- |                                                             |       |
|-------------------------------------------------------------|-------|
| 1. I didn't join in activities just for fun with my family. | _____ |
| 2. I felt I was a burden to my family.                      | _____ |
| 3. My physical condition interfered with my personal life.  | _____ |

### Language

- |                                                                                                 |       |
|-------------------------------------------------------------------------------------------------|-------|
| 1. Did you have trouble speaking? For example, get stuck, stutter, stammer, or slur your words? | _____ |
| 2. Did you have trouble speaking clearly enough to use the telephone?                           | _____ |
| 3. Did other people have trouble in understanding what you said?                                | _____ |
| 4. Did you have trouble finding the word you wanted to say?                                     | _____ |
| 5. Did you have to repeat yourself so others could understand you?                              | _____ |

### Mobility

- |                                                                                     |       |
|-------------------------------------------------------------------------------------|-------|
| 1. Did you have trouble walking? (If patient can't walk, go to question 4 and score | _____ |
|-------------------------------------------------------------------------------------|-------|

questions 2-3 as 1.)

2. Did you lose your balance when bending over to or reaching for something? \_\_\_\_\_

3. Did you have trouble climbing stairs? \_\_\_\_\_

4. Did you have to stop and rest more than you would like when walking or using a wheelchair? \_\_\_\_\_

5. Did you have trouble with standing? \_\_\_\_\_

6. Did you have trouble getting out of a chair? \_\_\_\_\_

### **Mood**

1. I was discouraged about my future. \_\_\_\_\_

2. I wasn't interested in other people or activities. \_\_\_\_\_

3. I felt withdrawn from other people. \_\_\_\_\_

4. I had little confidence in myself. \_\_\_\_\_

5. I was not interested in food. \_\_\_\_\_

### **Personality**

1. I was irritable. \_\_\_\_\_

2. I was impatient with others. \_\_\_\_\_

3. My personality has changed. \_\_\_\_\_

### **Self Care**

1. Did you need help preparing food? \_\_\_\_\_

2. Did you need help eating? For example, cutting food or preparing food? \_\_\_\_\_

3. Did you need help getting dressed? For example, putting on socks or shoes, buttoning buttons, or zipping? \_\_\_\_\_

4. Did you need help taking a bath or a shower? \_\_\_\_\_

5. Did you need help to use the toilet? \_\_\_\_\_

### **Social Roles**

1. I didn't go out as often as I would like. \_\_\_\_\_

2. I did my hobbies and recreation for shorter periods of time than I would like. \_\_\_\_\_

3. I didn't see as many of my friends as I would like. \_\_\_\_\_
4. I had sex less often than I would like. \_\_\_\_\_
5. My physical condition interfered with my social life. \_\_\_\_\_

### **Thinking**

1. It was hard for me to concentrate. \_\_\_\_\_
2. I had trouble remembering things. \_\_\_\_\_
3. I had to write things down to remember them. \_\_\_\_\_

### **Upper Extremity Function**

1. Did you have trouble writing or typing? \_\_\_\_\_
2. Did you have trouble putting on socks? \_\_\_\_\_
3. Did you have trouble buttoning buttons? \_\_\_\_\_
4. Did you have trouble zipping a zipper? \_\_\_\_\_
5. Did you have trouble opening a jar? \_\_\_\_\_

### **Vision**

1. Did you have trouble seeing the television well enough to enjoy a show? \_\_\_\_\_
2. Did you have trouble reaching things because of poor eyesight? \_\_\_\_\_
3. Did you have trouble seeing things off to one side? \_\_\_\_\_

### **Work / Productivity**

1. Did you have trouble doing daily work around the house? \_\_\_\_\_
2. Did you have trouble finishing jobs that you started? \_\_\_\_\_
3. Did you have trouble doing the work you used to do? \_\_\_\_\_

**TOTAL SCORE:** \_\_\_\_\_

## APPENDIX G

### JOB CONTENT QUESTIONNAIRE

**Instructions:** Please answer each question by ticking the one answer that best fits your job situation. Sometimes none of the answers fit exactly. Please choose the answer that comes closest.

#### SECTION A: Skill discretion

**1. My job requires that I learn new things.**

☐ Strongly Disagree      ☐ Disagree      ☐ Agree      ☐ Strongly Agree

**2. My job involves a lot of repetitive work.**

☐ Strongly Disagree      ☐ Disagree      ☐ Agree      ☐ Strongly Agree

**3. My job requires me to be creative.**

☐ Strongly Disagree      ☐ Disagree      ☐ Agree      ☐ Strongly Agree

**4. My job requires a high level of skill.**

☐ Strongly Disagree      ☐ Disagree      ☐ Agree      ☐ Strongly Agree

**5. I get to do a variety of different things on my job.**

☐ Strongly Disagree      ☐ Disagree      ☐ Agree      ☐ Strongly Agree

**6. I have an opportunity to develop my own special abilities.**

☐ Strongly Disagree      ☐ Disagree      ☐ Agree      ☐ Strongly Agree

**SECTION B: Decision authority**

**7. I have a lot to say about what happens on my job.**

☐ Strongly Disagree      ☐ Disagree      ☐ Agree      ☐ Strongly Agree

**SECTION C: Psychological job demands**

**8. My job requires working very fast.**

☐ Strongly Disagree      ☐ Disagree      ☐ Agree      ☐ Strongly Agree

**9. My job requires working very hard.**

☐ Strongly Disagree      ☐ Disagree      ☐ Agree      ☐ Strongly Agree

**10. I am not asked to do an excessive amount of work.**

☐ Strongly Disagree      ☐ Disagree      ☐ Agree      ☐ Strongly Agree

**11. I have enough time to get the job done.**

☐ Strongly Disagree      ☐ Disagree      ☐ Agree      ☐ Strongly Agree

**12. I am free from unrealistic demands that others make.**

☐ Strongly Disagree      ☐ Disagree      ☐ Agree      ☐ Strongly Agree

**SECTION D: Physical job demands**

**13. My job requires lots of physical effort.**

☐ Strongly Disagree      ☐ Disagree      ☐ Agree      ☐ Strongly Agree

**14. I am often required to move or lift very heavy loads on my job.**

☐ Strongly Disagree      ☐ Disagree      ☐ Agree      ☐ Strongly Agree

**15. My work requires rapid and continuous physical activity.**

☐ Strongly Disagree      ☐ Disagree      ☐ Agree      ☐ Strongly Agree

**16. I am often required to work for long periods of time with my body in physically strenuous positions.**

☐ Strongly Disagree      ☐ Disagree      ☐ Agree      ☐ Strongly Agree

**17. I am often required to work for long periods of time with my arms in physically strenuous positions.**

☐ Strongly Disagree      ☐ Disagree      ☐ Agree      ☐ Strongly Agree

**SECTION E: Job insecurity**

**18. My job security is good**

☐ Strongly Disagree      ☐ Disagree      ☐ Agree      ☐ Strongly Agree

**19. During the past year, how often were you in a situation where you faced job loss?**

☐ Never      ☐ Faced the possibility once      ☐ Faced the possibility more than once

☐ Constantly      ☐ Actually lost a job

**20. Sometimes people permanently lose jobs they want to keep. How likely is it that during the next couple of years you will lose your present job with your employer?**

☐ Not at all likely      ☐ Not too likely

☐ Somewhat likely      ☐ Very likely

**21. My prospects for career development and promotions are good.**

☐ Strongly Disagree      ☐ Disagree      ☐ Agree      ☐ Strongly Agree

**22. In five years, my skills will still be valuable.**

☐ Strongly Disagree      ☐ Disagree      ☐ Agree      ☐ Strongly Agree

**SECTION F: Supervisor and coworker support**

**23. My supervisor is helpful in getting the job done.**

☐ Strongly Disagree      ☐ Disagree      ☐ Agree      ☐ Strongly Agree

**24. People I work with are helpful in getting the job done.**

☐ Strongly Disagree      ☐ Disagree      ☐ Agree      ☐ Strongly Agree

*Questions extracted from: Job Content Questionnaire and User's Guide. Revision of scale formula 6/86-R-1-11. Developed by the Job/Heart Project at Columbia University. Contributions include Carl Pieper and Joe Schwartz*

# APPENDIX H (Montreal Cognitive Assessment: MoCA)

## MONTREAL COGNITIVE ASSESSMENT (MOCA)

NAME :

Education :

Sex :

Date of birth :

DATE :

| VISUOSPATIAL / EXECUTIVE      |                                                                                                                                    | Copy cube        |                                                                                             | Draw CLOCK (Ten past eleven)<br>(3 points)                                                                                                        |           | POINTS                     |                              |           |
|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------|------------------|---------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|-----------|----------------------------|------------------------------|-----------|
|                               |                                                                                                                                    |                  |                                                                                             | <div style="display: flex; justify-content: space-around;"> <div>[ ]<br/>Contour</div> <div>[ ]<br/>Numbers</div> <div>[ ]<br/>Hands</div> </div> |           | ___/5                      |                              |           |
| NAMING                        |                                                                                                                                    |                  |                                                                                             |                                                                                                                                                   |           |                            |                              | ___/3     |
| MEMORY                        | Read list of words, subject must repeat them. Do 2 trials. Do a recall after 5 minutes.                                            |                  | FACE                                                                                        | VELVET                                                                                                                                            | CHURCH    | DAISY                      | RED                          | No points |
|                               | 1st trial                                                                                                                          |                  |                                                                                             |                                                                                                                                                   |           |                            |                              |           |
|                               | 2nd trial                                                                                                                          |                  |                                                                                             |                                                                                                                                                   |           |                            |                              |           |
| ATTENTION                     | Read list of digits (1 digit/ sec.). Subject has to repeat them in the forward order                                               |                  | [ ] 2 1 8 5 4                                                                               |                                                                                                                                                   |           |                            | ___/2                        |           |
|                               | Subject has to repeat them in the backward order                                                                                   |                  | [ ] 7 4 2                                                                                   |                                                                                                                                                   |           |                            |                              |           |
|                               | Read list of letters. The subject must tap with his hand at each letter A. No points if ≥ 2 errors                                 |                  | [ ] FBACMNAAJKLBAFAKDEAAAJAMOF AAB                                                          |                                                                                                                                                   |           |                            | ___/1                        |           |
|                               | Serial 7 subtraction starting at 100                                                                                               |                  | [ ] 93                                                                                      | [ ] 86                                                                                                                                            | [ ] 79    | [ ] 72                     | [ ] 65                       | ___/3     |
|                               |                                                                                                                                    |                  | 4 or 5 correct subtractions: 3 pts, 2 or 3 correct: 2 pts, 1 correct: 1 pt, 0 correct: 0 pt |                                                                                                                                                   |           |                            |                              |           |
| LANGUAGE                      | Repeat : I only know that John is the one to help today. [ ]<br>The cat always hid under the couch when dogs were in the room. [ ] |                  |                                                                                             |                                                                                                                                                   |           |                            | ___/2                        |           |
|                               | Fluency / Name maximum number of words in one minute that begin with the letter F                                                  |                  | [ ] _____ (N ≥ 11 words)                                                                    |                                                                                                                                                   |           |                            | ___/1                        |           |
| ABSTRACTION                   | Similarity between e.g. banana - orange = fruit                                                                                    |                  | [ ] train - bicycle                                                                         | [ ] watch - ruler                                                                                                                                 |           |                            | ___/2                        |           |
| DELAYED RECALL                | Has to recall words WITH NO CUE                                                                                                    | FACE             | VELVET                                                                                      | CHURCH                                                                                                                                            | DAISY     | RED                        | Points for UNCUE recall only | ___/5     |
|                               | Category cue                                                                                                                       |                  |                                                                                             |                                                                                                                                                   |           |                            |                              |           |
|                               | Multiple choice cue                                                                                                                |                  |                                                                                             |                                                                                                                                                   |           |                            |                              |           |
| ORIENTATION                   | [ ] Date                                                                                                                           | [ ] Month        | [ ] Year                                                                                    | [ ] Day                                                                                                                                           | [ ] Place | [ ] City                   | ___/6                        |           |
| © Z.Nasreddine MD Version 7.0 |                                                                                                                                    | www.mocatest.org |                                                                                             | Normal ≥ 26 / 30                                                                                                                                  |           | TOTAL ___/30               |                              |           |
| Administered by: _____        |                                                                                                                                    |                  |                                                                                             |                                                                                                                                                   |           | Add 1 point if ≤ 12 yr edu |                              |           |

APPENDIX I (TPAL MTM score conversion table)

**TABLE B**  
**MTM RATE OF WORK PERCENT**

| MTM RATE<br>OF<br>WORK    | MAIL<br>SORT           |                                | ALPHA-<br>BETIZING     |                                | VISUAL<br>MAZE         |                                | PAYROLL                |                                | W.Q.P.<br>RANGE         |                      |
|---------------------------|------------------------|--------------------------------|------------------------|--------------------------------|------------------------|--------------------------------|------------------------|--------------------------------|-------------------------|----------------------|
|                           | MAXIMUM<br>ERRORS      |                                | MAXIMUM<br>ERRORS      |                                | MAXIMUM<br>ERRORS      |                                | MAXIMUM<br>ERRORS      |                                |                         |                      |
|                           | 1 <sup>st</sup> Trial  | After<br>1 <sup>st</sup> Trial | 1 <sup>st</sup> Trial  | After<br>1 <sup>st</sup> Trial | 1 <sup>st</sup> Trial  | After<br>1 <sup>st</sup> Trial | 1 <sup>st</sup> Trial  | After<br>1 <sup>st</sup> Trial |                         |                      |
|                           | 1                      | 0                              | 1                      | 0                              | 2                      | 1                              | 1                      | 0                              |                         |                      |
|                           | SECONDS                |                                | SECONDS                |                                | SECONDS                |                                | SECONDS                |                                |                         |                      |
| 150.0%                    | 238                    |                                | 108                    |                                | 78                     |                                | 135                    |                                | MEETS.<br>MAY<br>EXCEED |                      |
| 145.0%                    | 246                    |                                | 112                    |                                | 80                     |                                | 140                    |                                |                         |                      |
| 140.0%                    | 255                    |                                | 116                    |                                | 83                     |                                | 145                    |                                |                         |                      |
| 135.0%                    | 264                    |                                | 120                    |                                | 86                     |                                | 150                    |                                |                         |                      |
| 130.0%                    | 274                    |                                | 125                    |                                | 90                     |                                | 156                    |                                |                         |                      |
| 125.0%                    | 285                    |                                | 130                    |                                | 93                     |                                | 162                    |                                |                         |                      |
| 120.0%                    | 297                    |                                | 135                    |                                | 97                     |                                | 169                    |                                |                         |                      |
| 115.0%                    | 310                    |                                | 141                    |                                | 101                    |                                | 176                    |                                |                         |                      |
| 112.5%                    | 317                    |                                | 144                    |                                | 104                    |                                | 180                    |                                | MEETS                   |                      |
| 110.0%                    | 324                    |                                | 148                    |                                | 106                    |                                | 184                    |                                |                         |                      |
| 105.0%                    | 340                    |                                | 155                    |                                | 111                    |                                | 193                    |                                |                         |                      |
| 100.0%                    | 357                    |                                | 163                    |                                | 117                    |                                | 203                    |                                |                         |                      |
| 95.0%                     | 375                    |                                | 171                    |                                | 123                    |                                | 213                    |                                |                         |                      |
| 90.0%                     | 396                    |                                | 181                    |                                | 130                    |                                | 225                    |                                |                         |                      |
| 87.5%                     | 408                    |                                | 186                    |                                | 133                    |                                | 232                    |                                |                         |                      |
| 85.0%                     | 420                    |                                | 191                    |                                | 137                    |                                | 238                    |                                |                         | DOES NOT<br>MEET (A) |
| 80.0%                     | 446                    |                                | 203                    |                                | 146                    |                                | 253                    |                                |                         |                      |
| 75.0%                     | 476                    |                                | 217                    |                                | 156                    |                                | 270                    |                                |                         |                      |
| 70.0%                     | 510                    |                                | 232                    |                                | 167                    |                                | 290                    |                                |                         |                      |
| 65.0%                     | 549                    |                                | 250                    |                                | 180                    |                                | 312                    |                                |                         |                      |
| 62.5%                     | 571                    |                                | 260                    |                                | 187                    |                                | 324                    |                                |                         |                      |
| 60.0%                     | 595                    |                                | 271                    |                                | 195                    |                                | 338                    |                                | DOES NOT<br>MEET (B)    |                      |
| 55.0%                     | 649                    |                                | 296                    |                                | 212                    |                                | 369                    |                                |                         |                      |
| 50.0%                     | 714                    |                                | 326                    |                                | 234                    |                                | 406                    |                                |                         |                      |
| 45.0%                     | 793                    |                                | 362                    |                                | 260                    |                                | 451                    |                                |                         |                      |
| 40.0%                     | 892                    |                                | 407                    |                                | 292                    |                                | 507                    |                                |                         |                      |
| 35.0%                     | 1020                   |                                | 465                    |                                | 334                    |                                | 580                    |                                |                         |                      |
| 30.0%                     | 1190                   |                                | 543                    |                                | 390                    |                                | 676                    |                                |                         |                      |
| 25.0%                     | 1428                   |                                | 652                    |                                | 468                    |                                | 812                    |                                |                         |                      |
| 20.0%                     | 1785                   |                                | 815                    |                                | 585                    |                                | 1015                   |                                |                         |                      |
| 15.0%                     | 2380                   |                                | 1086                   |                                | 780                    |                                | 1353                   |                                |                         |                      |
| 10.0%                     | 3570                   |                                | 1630                   |                                | 1170                   |                                | 2030                   |                                |                         |                      |
| 5.0%                      | 7140                   |                                | 3260                   |                                | 2340                   |                                | 4060                   |                                |                         |                      |
| SEM =                     | 75                     |                                | 43                     |                                | 10                     |                                | 34                     |                                |                         |                      |
| Rate of Work<br>Percent = | 35700<br>Seconds Score |                                | 16300<br>Seconds Score |                                | 11700<br>Seconds Score |                                | 20300<br>Seconds Score |                                |                         |                      |

**TABLE B (Cont'd)**  
**MTM RATE OF WORK PERCENT**

| MTM RATE<br>OF<br>WORK    | SMALL<br>PARTS A                     |                                | SMALL<br>PARTS B                     |                                | RULER<br>READING                    |                                | PIPE<br>ASSEMBLY                     |                                | W.Q.P.<br>RANGE         |
|---------------------------|--------------------------------------|--------------------------------|--------------------------------------|--------------------------------|-------------------------------------|--------------------------------|--------------------------------------|--------------------------------|-------------------------|
|                           | MAXIMUM<br>ERRORS                    |                                | MAXIMUM<br>ERRORS                    |                                | MAXIMUM<br>ERRORS                   |                                | MAXIMUM<br>ERRORS                    |                                |                         |
|                           | 1 <sup>st</sup> Trial                | After<br>1 <sup>st</sup> Trial | 1 <sup>st</sup> Trial                | After<br>1 <sup>st</sup> Trial | 1 <sup>st</sup> Trial               | After<br>1 <sup>st</sup> Trial | 1 <sup>st</sup> Trial                | After<br>1 <sup>st</sup> Trial |                         |
|                           | N/A                                  | N/A                            | N/A                                  | N/A                            | 0                                   | 0                              | 0                                    | 0                              |                         |
|                           | SECONDS                              |                                | SECONDS                              |                                | SECONDS                             |                                | SECONDS                              |                                |                         |
| 150.0%                    | 71                                   |                                | 214                                  |                                | 50                                  |                                | 81                                   |                                | MEETS.<br>MAY<br>EXCEED |
| 145.0%                    | 73                                   |                                | 221                                  |                                | 51                                  |                                | 84                                   |                                |                         |
| 140.0%                    | 76                                   |                                | 229                                  |                                | 53                                  |                                | 87                                   |                                |                         |
| 135.0%                    | 79                                   |                                | 237                                  |                                | 55                                  |                                | 90                                   |                                |                         |
| 130.0%                    | 82                                   |                                | 246                                  |                                | 57                                  |                                | 93                                   |                                |                         |
| 125.0%                    | 85                                   |                                | 256                                  |                                | 60                                  |                                | 97                                   |                                |                         |
| 120.0%                    | 89                                   |                                | 267                                  |                                | 62                                  |                                | 101                                  |                                |                         |
| 115.0%                    | 93                                   |                                | 279                                  |                                | 65                                  |                                | 106                                  |                                |                         |
| 112.5%                    | 95                                   |                                | 285                                  |                                | 66                                  |                                | 108                                  |                                | MEETS                   |
| 110.0%                    | 97                                   |                                | 291                                  |                                | 68                                  |                                | 110                                  |                                |                         |
| 105.0%                    | 101                                  |                                | 305                                  |                                | 71                                  |                                | 116                                  |                                |                         |
| 100.0%                    | 107                                  |                                | 321                                  |                                | 75                                  |                                | 122                                  |                                |                         |
| 95.0%                     | 112                                  |                                | 337                                  |                                | 78                                  |                                | 128                                  |                                |                         |
| 90.0%                     | 118                                  |                                | 356                                  |                                | 83                                  |                                | 135                                  |                                |                         |
| 87.5%                     | 122                                  |                                | 366                                  |                                | 85                                  |                                | 139                                  |                                |                         |
| 85.0%                     | 125                                  |                                | 377                                  |                                | 88                                  |                                | 143                                  |                                |                         |
| 80.0%                     | 133                                  |                                | 401                                  |                                | 93                                  |                                | 152                                  |                                |                         |
| 75.0%                     | 142                                  |                                | 428                                  |                                | 100                                 |                                | 162                                  |                                |                         |
| 70.0%                     | 152                                  |                                | 458                                  |                                | 107                                 |                                | 174                                  |                                |                         |
| 65.0%                     | 164                                  |                                | 493                                  |                                | 115                                 |                                | 187                                  |                                |                         |
| 62.5%                     | 171                                  |                                | 513                                  |                                | 120                                 |                                | 195                                  |                                |                         |
| 60.0%                     | 178                                  |                                | 535                                  |                                | 125                                 |                                | 203                                  |                                |                         |
| 55.0%                     | 194                                  |                                | 583                                  |                                | 136                                 |                                | 221                                  |                                | DOES NOT<br>MEET (B)    |
| 50.0%                     | 214                                  |                                | 642                                  |                                | 150                                 |                                | 244                                  |                                |                         |
| 45.0%                     | 237                                  |                                | 713                                  |                                | 166                                 |                                | 271                                  |                                |                         |
| 40.0%                     | 267                                  |                                | 802                                  |                                | 187                                 |                                | 305                                  |                                |                         |
| 35.0%                     | 305                                  |                                | 917                                  |                                | 214                                 |                                | 348                                  |                                |                         |
| 30.0%                     | 356                                  |                                | 1070                                 |                                | 250                                 |                                | 406                                  |                                |                         |
| 25.0%                     | 428                                  |                                | 1284                                 |                                | 300                                 |                                | 488                                  |                                |                         |
| 20.0%                     | 535                                  |                                | 1605                                 |                                | 375                                 |                                | 610                                  |                                |                         |
| 15.0%                     | 713                                  |                                | 2140                                 |                                | 500                                 |                                | 813                                  |                                |                         |
| 10.0%                     | 1070                                 |                                | 3210                                 |                                | 750                                 |                                | 1220                                 |                                |                         |
| 5.0%                      | 2140                                 |                                | 6420                                 |                                | 1500                                |                                | 2440                                 |                                |                         |
| SEM =                     | 41                                   |                                | N/A                                  |                                | 46                                  |                                | 33                                   |                                |                         |
| Rate of Work<br>Percent = | $\frac{10700}{\text{Seconds Score}}$ |                                | $\frac{32100}{\text{Seconds Score}}$ |                                | $\frac{7500}{\text{Seconds Score}}$ |                                | $\frac{12200}{\text{Seconds Score}}$ |                                |                         |

**TABLE B (Cont'd)**  
**MTM RATE OF WORK PERCENT**

| MTM RATE<br>OF<br>WORK    | O-RINGS                |                                | BLOCK<br>DESIGN       |                                | COLOR<br>SORTING      |                                | CIRCUIT<br>BOARD      |                                | W.Q.P.<br>RANGE         |
|---------------------------|------------------------|--------------------------------|-----------------------|--------------------------------|-----------------------|--------------------------------|-----------------------|--------------------------------|-------------------------|
|                           | MAXIMUM<br>ERRORS      |                                | MAXIMUM<br>ERRORS     |                                | MAXIMUM<br>ERRORS     |                                | MAXIMUM<br>ERRORS     |                                |                         |
|                           | 1 <sup>st</sup> Trial  | After<br>1 <sup>st</sup> Trial | 1 <sup>st</sup> Trial | After<br>1 <sup>st</sup> Trial | 1 <sup>st</sup> Trial | After<br>1 <sup>st</sup> Trial | 1 <sup>st</sup> Trial | After<br>1 <sup>st</sup> Trial |                         |
|                           | 1                      | 0                              | 0                     | 0                              | 0                     | 0                              | 0                     | 0                              |                         |
|                           | SECONDS                |                                | SECONDS               |                                | SECONDS               |                                | SECONDS               |                                |                         |
| 150.0%                    | 81                     |                                | 18                    |                                | 23                    |                                | 37                    |                                | MEETS.<br>MAY<br>EXCEED |
| 145.0%                    | 84                     |                                | 18                    |                                | 24                    |                                | 38                    |                                |                         |
| 140.0%                    | 87                     |                                | 19                    |                                | 25                    |                                | 40                    |                                |                         |
| 135.0%                    | 90                     |                                | 20                    |                                | 25                    |                                | 41                    |                                |                         |
| 130.0%                    | 93                     |                                | 20                    |                                | 26                    |                                | 43                    |                                |                         |
| 125.0%                    | 97                     |                                | 21                    |                                | 28                    |                                | 44                    |                                |                         |
| 120.0%                    | 101                    |                                | 22                    |                                | 29                    |                                | 46                    |                                |                         |
| 115.0%                    | 106                    |                                | 23                    |                                | 30                    |                                | 48                    |                                |                         |
| 112.5%                    | 108                    |                                | 24                    |                                | 31                    |                                | 49                    |                                | MEETS                   |
| 110.0%                    | 110                    |                                | 24                    |                                | 31                    |                                | 50                    |                                |                         |
| 105.0%                    | 116                    |                                | 25                    |                                | 33                    |                                | 53                    |                                |                         |
| 100.0%                    | 122                    |                                | 27                    |                                | 35                    |                                | 56                    |                                |                         |
| 95.0%                     | 128                    |                                | 28                    |                                | 36                    |                                | 58                    |                                |                         |
| 90.0%                     | 135                    |                                | 30                    |                                | 38                    |                                | 62                    |                                |                         |
| 87.5%                     | 139                    |                                | 30                    |                                | 40                    |                                | 64                    |                                |                         |
| 85.0%                     | 143                    |                                | 31                    |                                | 41                    |                                | 65                    |                                |                         |
| 80.0%                     | 152                    |                                | 33                    |                                | 43                    |                                | 70                    |                                |                         |
| 75.0%                     | 162                    |                                | 36                    |                                | 46                    |                                | 74                    |                                |                         |
| 70.0%                     | 174                    |                                | 38                    |                                | 50                    |                                | 80                    |                                |                         |
| 65.0%                     | 187                    |                                | 41                    |                                | 53                    |                                | 86                    |                                |                         |
| 62.5%                     | 195                    |                                | 43                    |                                | 56                    |                                | 89                    |                                |                         |
| 60.0%                     | 203                    |                                | 45                    |                                | 58                    |                                | 93                    |                                |                         |
| 55.0%                     | 221                    |                                | 49                    |                                | 63                    |                                | 101                   |                                | DOES NOT<br>MEET (B)    |
| 50.0%                     | 244                    |                                | 54                    |                                | 70                    |                                | 112                   |                                |                         |
| 45.0%                     | 271                    |                                | 60                    |                                | 77                    |                                | 124                   |                                |                         |
| 40.0%                     | 305                    |                                | 67                    |                                | 87                    |                                | 140                   |                                |                         |
| 35.0%                     | 348                    |                                | 77                    |                                | 100                   |                                | 160                   |                                |                         |
| 30.0%                     | 406                    |                                | 90                    |                                | 116                   |                                | 186                   |                                |                         |
| 25.0%                     | 488                    |                                | 108                   |                                | 140                   |                                | 224                   |                                |                         |
| 20.0%                     | 610                    |                                | 135                   |                                | 175                   |                                | 280                   |                                |                         |
| 15.0%                     | 813                    |                                | 180                   |                                | 233                   |                                | 373                   |                                |                         |
| 10.0%                     | 1220                   |                                | 270                   |                                | 350                   |                                | 560                   |                                |                         |
| 5.0%                      | 2440                   |                                | 540                   |                                | 700                   |                                | 1120                  |                                |                         |
| SEM =                     | 16                     |                                | 11                    |                                | N/A                   |                                | 29                    |                                |                         |
| Rate of Work<br>Percent = | 12200<br>Seconds Score |                                | 2700<br>Seconds Score |                                | 3500<br>Seconds Score |                                | 5600<br>Seconds Score |                                |                         |

**FOLLOW UP (Three and six months)**

**Patient number (e.g. 1 or 2...):**

**Patient name:** \_\_\_\_\_

**Follow session: Three months**

☐

**Six months**

☐

**SECTION A: RETURN TO WORK**

**1. Are you currently working?**

Yes

☐

No

☐

**2. For how long have you been working since your stroke?** \_\_\_\_\_

**Did you return to your previous employment?**

Yes

☐

No

☐

**Was your job description changed at all for you?**

Yes

☐

No

☐

**3. Was your physical working environment adapted to accommodate you?**

Yes

☐

No

☐

**Are you working full-time or part time?**

Full-time

☐

Part-time

☐

**4. If no to question 1, have you previously returned to work after your stroke?**

Yes

☐

No

☐

If yes to question 7:

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 B: REASONS FOR RETURNING TO WORK

*(Can tick more than one item)*

Financial ☐

Personal development ☐

Use of knowledge ☐

Boredom ☐

Contact with colleagues ☐

Pressure from family ☐

Motivation from family ☐

Enjoyment of work ☐

Recommended by therapists ☐

Other (Specify).....

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

### **SECTION C: REASONS FOR STOPPING WORK**

***(Can tick more than one item)***

|                               |  |
|-------------------------------|--|
| 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 D: REASONS FOR NOT RETURNING TO WORK**

***(Can tick more than one item)***

|                                 |  |
|---------------------------------|--|
| 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 K (Ethics clearance certificate)

### UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

Division of the Deputy Registrar (Research)

### HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)

R14/49 Mambolo

#### CLEARANCE CERTIFICATE

#### PROTOCOL NUMBER M081132

#### PROJECT

The Effect of a Workplace Intervention  
Programme on the Rate of Return to  
Work After Stroke

#### INVESTIGATORS

Mrs MV Mambolo

#### DEPARTMENT

Physiotherapy Department

#### DATE CONSIDERED

08.11.28

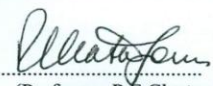
#### DECISION OF THE COMMITTEE\*

Approved unconditionally

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

DATE 09.01.30

CHAIRPERSON .....

  
(Professor P E Cleaton Jones)

\*Guidelines for written 'informed consent' attached where applicable

cc: Supervisor : Dr H Van Aswegen



#### 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...

## **APPENDIX L (Stroke survivor information document)**

Dear Participant

I, Veronica Ntsiea (Mamabolo), am studying towards a doctorate degree (PhD) at the University of the Witwatersrand. Research is a requirement towards attaining this degree. I am currently conducting a study to find out if patients will return to work they were doing at the time of having stroke if their treatment includes doing some of the activities at work and if the employer is also involved in the process of trying to get the employee back to work. We will call this process a workplace intervention programme.

Research is the way that we are able to answer questions that we have, and so as part of my doctorate degree, I have chosen to do this study. At the end of this study we will also look at factors which make people return to work or not return to work after stroke. If the workplace intervention programme is found to increase the rate of return to work after stroke, this will be included as part of the treatment programme in order to improve the quality of life of a person with stroke. Knowledge of the factors which make people return or not return to work after stroke will help us as health professionals, employees/patients and employers to provide a service which is relevant to the needs of the people who have had stroke.

### **You are invited to consider participating in this study:**

Before agreeing to participate, it is important that you read and fully understand what is involved. If you have any questions, do not hesitate to ask me. You may not participate in any other study project that provides a workplace intervention programme during your participation in this study.

Participating in this study requires that you agree to be in either a group that receives the workplace intervention programme or the group that continues with usual stroke rehabilitation. We need to have two groups in order to compare them at the end of the study to see if the workplace intervention made a difference. You do not choose the group that you will belong to – this process is random so that the researcher or participant will not influence/determine the type of people who go to a certain group. This random allocation will improve the quality of the results of this research.

People who are allocated to the group which does not receive a workplace intervention programme (control group), will continue with their rehabilitation programme as usual but will be interviewed and tested for ability to function and return to work at the beginning of the study, after three months and after six months of having stroke to find out if there are any changes in this group.

People who receive a workplace intervention will be interviewed and tested for ability to function and return to work at the beginning of the study, at three months and at six months after having a stroke. In addition to this they will have a six weeks intervention programme from a research assistant starting with an interview to find out what they think will make it difficult or easy for them to go back to work, have a meeting with the researcher and employer to discuss things which may make it difficult or easy to go back to work. A meeting will also be held between researcher and employer to find out what they think will make it easy or difficult to return to work after stroke.

After all the interviews an intervention programme will be started to work on the problems identified (e.g. difficulty to walk, use arm at work). This additional treatment will be given at the place of work while the participant continues with the usual rehabilitation programme that they get from their hospital/clinic.

There is no risk to yourself or your family in taking part in this study and there is no additional cost that will be incurred by you or your family when participating in this study. You will not be paid to participate in this study but your transport costs will be reimbursed adequately if you are required to travel only for the purpose of this study. You won't benefit directly from participating in this study, however by taking part in the study you can help improve the type and quality of rehabilitation that assists people to return to work after suffering a stroke where possible.

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

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 and/or the intervention programme 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 you will still continue with your usual stroke rehabilitation at the hospital/clinic whenever the need arises.

**NB! Participation in this study does not mean that you are obliged to go back to work, or that you are obliged to stop working. You and your employer will still follow the usual process required to make this decision which is not dependent on the results of this study.**

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 researchers.

If you would like any further information or have any questions please feel free to contact me, on details mentioned below. If you have any complaints regarding how the researcher conducted themselves or the interview or their treatment towards you, you may contact the chairperson (Prof. Cleaton-Jones) of the Witwatersrand, Human Research Ethics Committee established to help protect the rights of research participants at 011 717 2301.

**Thank you.**

---

Veronica Ntsiea

Cell: 0832972146

Office: 011 717 2015

Email: Mokgobadibe.Mamabolo@wits.ac.za

## **APPENDIX M (Stroke survivor informed consent)**

I (full name and surname) \_\_\_\_\_ give permission to Veronica Ntsiea OR any of her appointed research assistants (Modise Mogotsi/Mpho Modisane/Rachel Malebana) to interview me and implement a workplace intervention programme for me for their research to find out the effect of a workplace intervention programme on the rate of return to work after stroke.

### **I understand why this research is done and know that:**

- I can leave the research project any time when I want to
- Information that I will give will be treated with confidentiality
- I will have two interviews for a maximum of 30 minutes each
- If I am selected into the intervention group, I will have six sessions of workplace intervention of maximum one hour each
- I will be allocated a code, which will be used in place of my name
- I will not be paid for taking part in this research
- Participation in this study does not mean that I am obliged to go back to work, or that I am obliged to stop working. I and my employer will still follow the usual process required to make this decision which is not dependent on the results of this study.
- This is the work of the researcher and the hospital and employer will not be responsible for any consequences that may arise as a result of the research intervention.

**Name & Signature:** \_\_\_\_\_

**Date:**

**Participant**

**Name & Signature:** \_\_\_\_\_

**Date:**

**Researcher/Research assistant**

## **APPENDIX N (Employer Information Document)**

Dear \_\_\_\_\_'s employer.

I, Veronica Ntsiea (Mamabolo), am studying towards a doctorate degree (PhD) at the University of the Witwatersrand. Research is a requirement towards attaining this degree. I am currently conducting a research project to find out if patients will go back to work after stroke if their treatment includes doing some of the activities at work and if the employer is also involved in the process of trying to get the employee back to work. We will call this process a workplace intervention programme.

Research is the way that we are able to answer questions that we have, and so as part of my doctorate degree, I have chosen to do this research. At the end of this study we will also look at factors which make people return to work or not return to work after stroke. If the workplace intervention programme is found to increase the rate of return to work after stroke, this may be included as part of the treatment programme in order to improve the quality of life of a person with stroke. Knowledge of the factors which make people return or not return to work after stroke will help us as health professionals, employees/patients and employers to provide a service which is relevant to the needs of the people who have had stroke.

**One of your employees is taking part in our research project and the process requires involvement of the employer. You are thus invited to consider participating in this study:**

Participating in this research project requires that you agree to be interviewed for maximum 30 minutes by the research assistant at the beginning and at the end of this study in order to identify things which may make it easy or difficult for \_\_\_\_\_ to cope with his/her normal duties at work. A voice recorder will be used during the interviews but this information will remain confidential. After identification of these, the researcher will need to come to the workplace to assist \_\_\_\_\_ with work activities that he/she may possibly do. The treatment at work will focus on activities like use of the arm or walking depending on the problems identified. \_\_\_\_\_ will continue with the usual stroke rehabilitation at the hospital/clinic. The aim of this additional intervention which requires five visits (maximum one hour per visit) is to establish if it will make a difference in the employees' ability to come back to work.

**NB! Participation in this study does not mean that the employee is obliged to come back to work, or that you are obliged to retain the employee at work. You and your employee will still follow the usual process required to make this decision which is not dependent on the results of this study.**

You may not benefit directly from participating in this study, however by taking part in the study you can help improve the type and quality of rehabilitation that assists people to return to work after suffering a stroke where possible.

Results from the study once it is completed will also be made available to you if you wish to know them. Participation is completely voluntary, there is absolutely no pressure on you to take part in the study, and if during the intervention programme 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.

Every effort will be made to keep all documentation, which shows your name and responses to the interviews confidential. **No answers or personal information will be disclosed to anyone other than the researchers.**

If you would like any further information or have any questions please feel free to contact me, on details mentioned below. If you have any complaints regarding how the researcher conducted themselves or the interview or their treatment towards you may contact the chairperson (Prof Cleaton-Jones) of the Witwatersrand, Human Research Ethics Committee established to help protect the rights of research participants at 011 717 2301.

Would you please let me know if you will be able to participate in this study, by filling and signing the consent form?

Your help with this will be highly appreciated.

**Thank you.**

Veronica Ntsiea

Cell: 0832972146; Office: 011 717 2015; Fax: 011 717 3719; Email: Mokgobadibe.Mamabolo@wits.ac.za

## APPENDIX O (Employer Informed Consent)

I (full name and surname) \_\_\_\_\_ give permission to Veronica Ntsiea (Mamabolo) OR any of her appointed research assistants (Modise Mogotsi/Mpho Modisane/Rachel Malebana) to interview me for their research to find out the effect of a workplace intervention programme on the rate of return to work after stroke.

I understand why this research is done and know that:

- I can leave the research project any time when I want to
- Information that I will give will be treated with confidentiality
- I will be allocated a code, which will be used in place of my name
- The interview will be for a maximum period of 30 minutes
- I will not be paid for taking part in this research
- Participation in this study does not mean that the employee is obliged to come back to work, or that I am obliged to retain the employee at work. I and my employee will still follow the usual process required to make this decision which is not dependent on the results of this study.

Name & Signature: \_\_\_\_\_  
Participant

Date:

Name & Signature: \_\_\_\_\_  
Researcher/Research assistant

Date:

## APPENDIX P (Tape Recording Informed Consent)

I (full name and surname) \_\_\_\_\_ give permission to Veronica Ntsiea (Mamabolo) OR any of her appointed research assistants (Modise Mogotsi/Mpho Modisane/Rachel Malebana) to tape record the interview for their research to find out the effect of a workplace intervention programme on the rate of return to work after stroke.

I understand why this research is done and know that:

- I can terminate the interview at any time
- Information that I will give will be treated with confidentiality
- The interview will be maximum 30 minutes long
- I will not be paid for taking part in this research

Name & Signature: \_\_\_\_\_  
Participant

Date:

Name & Signature: \_\_\_\_\_  
Researcher/Research assistant

Date:

## **APPENDIX Q (Research site permission request letter)**

Dear Hospital/Rehabilitation Centre manager

I, Veronica Ntsiea (Mamabolo), am studying towards a doctorate degree (PhD) at the University of the Witwatersrand. Research is a requirement towards attaining this degree. I am currently conducting a research project to find out if patients will go back to work after stroke if their treatment includes doing some of the activities at work and if the employer is also involved in the process of trying to get the employee back to work. We will call this process a workplace intervention programme.

Research is the way that we are able to answer questions that we have, and so as part of my doctorate degree, I have chosen to do this research. At the end of this study we will also look at factors which make people return to work or not return to work after stroke. If the workplace intervention programme is found to increase the rate of return to work after stroke, this may be included as part of the treatment programme in order to improve the quality of life of a person with stroke. Knowledge of the factors which make people return or not return to work after stroke will help us as health professionals, employees/patients and employers to provide a service which is relevant to the needs of the people who have had stroke.

I need to interview, assess and provide a workplace intervention programme people who have had stroke from your hospital/rehabilitation unit. The interview and assessment will establish the participants' demographic information, assessment will be done to establish the participant's functional ability, and the intervention will be done at the participant's workplace to help them adjust to their workplace after stroke. This will include (but not limited to) activities involving arm or leg function that are job specific for each individual participant. Participants will also be given an information leaflet and a consent form to give us permission to include them in this study.

Participation in this research project is voluntary and information gained from this study will be treated with confidentiality. Participants can leave the research project any time when they want to.

Please find enclosed copies of the consent and information letters that will be given to patients and employers and copies of the questionnaires and assessments that will be used to collect data.

Permission is thus sought from you, to conduct this study in your institution

Your help with this will be highly appreciated.

Regards

---

Veronica Ntsiea

Cell: 0832972146

Office: 011 717 2015

Fax: 011 717 3719

Email: [Mokgobadibe.Mamabolo@wits.ac.za](mailto:Mokgobadibe.Mamabolo@wits.ac.za)

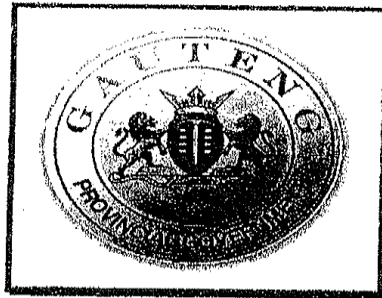
## APPENDIX R (Gauteng department of health permission document)

GO-000-0000(100) 10:15 Health

P. 008/011

### CONDITIONS OF APPROVAL OF RESEARCH TO BE CONDUCTED BY POST GRADUATE STUDENTS IN GAUTENG DEPARTMENT OF HEALTH (GDoH)

For approval by the Director Policy, Planning and Research



**GAUTENG DEPARTMENT OF HEALTH (GDOH)**

**POLICY, PLANNING AND RESEARCH**

Enquiries: Sue le Roux

Tel: +2711 355 3642/3212

Fax: +2711 355 3675/3007

Email: [Sue.LeRoux@gauteng.gov.za](mailto:Sue.LeRoux@gauteng.gov.za)

| CONTACT DETAILS OF THE RESEARCHER       |                                                                                             |
|-----------------------------------------|---------------------------------------------------------------------------------------------|
| Date                                    | 27/07/2009                                                                                  |
| Tel number                              | 083 297 2146                                                                                |
| Fax number                              | 011 717 3719                                                                                |
| Email                                   | Mokgobadi@wits.ac.za                                                                        |
| Researcher /Principal Investigator (PI) | Ms Veronica Mamabolo                                                                        |
| Supervisor                              | Dr. Heleen van Aswegen                                                                      |
| Institution                             | University of the Witwatersrand                                                             |
| Research title                          | The effect of a workplace intervention programme on the rate of return to work after stroke |

Approval is hereby granted by the Gauteng Department of Health for the above research project to be conducted. Approval is limited to compliance with the following terms and conditions:

1. All principles pertaining to ethics of research are observed and adhered to by all involved in the research project. Of key importance are the issues pertaining to research on human subjects as contained in the Declaration of Helsinki (1964, amended in 1983) and the constitution of the Republic of South Africa, respect for:
  - Human dignity;
  - Autonomy;
  - Informed consent;
  - Vulnerable persons;
  - Confidentiality;
  - Lack of harm;
  - Maximum benefit;
  - and justice
2. The GDoH is indemnified from any form of liability arising from or as a consequence of the process or outcomes of this research;
3. Researchers commit to providing the GDoH with periodic progress and a final report; short term projects are expected to submit progress reports on a more frequent basis and all reports must be submitted to the Director: Policy, Planning and Research of the GDoH;

4. The Principal Investigator shall promptly inform the above mentioned office of changes of contact details or physical address of the researching individual, organisation or team;
5. The Principal Investigator shall inform the above office and make arrangements to discuss their findings with GDoH prior to dissemination;
6. The Principal Investigator shall promptly inform the above mentioned office of any adverse situation which may be a health hazard to any of the participants;
7. The Principal Investigator shall request in writing authorization by the Director: Policy, Planning and Research of the GDoH for any intended changes of any form to the original and approved research proposal;
8. If for any reason the research is discontinued, the Principal Investigator must inform the above mentioned office of the reasons for such discontinuation;
9. A formal research report upon completion should be submitted to the Director: Policy, Planning and Research of the GDoH with recommendations and Implications for GDoH.

**AGREEMENT BETWEEN THE GAUTENG DEPARTMENT OF HEALTH (GDoH) AND THE  
RESEARCHER**

MM Mamabolo  
**Ms Veronica Mamabolo**

**Principal Researcher**

**Date:**

06/08/2009.

Sue le Roux  
**Sue le Roux**

**Director: Policy, Planning and Research (GDoH)**

**Date:**

29/07/2007

## **APPENDIX S (Participant Information Document: Current practice questionnaire)**

Dear Colleague

I, Veronica Mamabolo, am studying towards a doctorate degree (PhD) at the University of the Witwatersrand. Research is a requirement towards attaining this degree. The title of my study is “The effect of a workplace intervention programme on the rate of return to work after stroke”. The main aim of the study is to find out if patients will return to work they were doing at the time of having stroke if the intervention programme is implemented at their place of work (in addition to usual care within the rehabilitation setting) and if the employer is also involved in the process of trying to get the employee back to work. **The first objective of this study is to identify the current practice in return to work intervention programmes in the Gauteng Province of South Africa.**

Please fill in the attached questionnaire. This will provide baseline information regarding current practice in return to work intervention for patients with stroke and this will guide the process of developing a workplace intervention programme for this study. There is no need to write the name of your institution and thus your responses will be kept confidential. **Participation in this project is optional.**

**Please return the questionnaire in the self- addressed envelope as soon as possible.**

If you would like any further information or have any questions please feel free to contact me, on details mentioned below. If you have any complaints regarding how the research is conducted, you may contact the chairperson (Prof. Cleaton-Jones) of the Witwatersrand, Human Research Ethics Committee established to help protect the rights of research participants at 011 717 2301.

**Thank you for your help. Your cooperation is appreciated.**

---

Veronica Ntsiea

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## Appendix T

### PER PROTOCOL ANALYSIS RESULTS

#### 4.2.9 Return to work after stroke

Results of the rate of RTW at three months and at six months after stroke; how long they worked since stroke; their working conditions after stroke; main reasons for returning to work; and main reasons for not returning to work are presented in this section.

##### 4.2.9.1 The rate of return to work at three months and six months after stroke

Results of the RTW rate for stroke survivors at three months and at six months follow-up are presented in Table 4.27 below. The RTW final outcome for all stroke survivors who participated in the study including those who did not complete the study were included in this analysis. A Fisher's exact test was used to establish the significance of the relationship between RTW and group allocation.

**Table 4.27 The rate of return to work at three months and six months after stroke**

|                           | Three months follow-up   |                     | Six months follow-up     |                     |
|---------------------------|--------------------------|---------------------|--------------------------|---------------------|
|                           | Intervention<br>(n = 36) | Control<br>(n = 37) | Intervention<br>(n = 35) | Control<br>(n = 37) |
|                           | n (%)                    | n (%)               | n (%)                    | n (%)               |
| <b>No return to work</b>  | 26 (72)                  | 32 (86)             | 12 (34)                  | 29 (78)             |
| <b>Returned to work</b>   | 10 (28)                  | 5 (14)              | 23 (66)                  | 8 (22)              |
| <b>Total of those who</b> | n (%)                    |                     | n (%)                    |                     |
| <b>RTW (n = 72)</b>       | 15 (21)                  |                     | 31 (43)                  |                     |

*\*Total of those who RTW = those who RTW in intervention + RTW in control group*

More stroke survivors (28%) in the intervention group returned to work at three months follow-up compared to 14% in the control group. The difference in the rate of RTW between the control and intervention group at three months follow-up was not statistically significant (0.14). At six months follow-up, the majority of stroke survivors (66%) in the intervention group returned to work compared to 22% in the control group. The difference in the rate of RTW between the control and intervention group at six months follow-up was statistically significant ( $p < 0.001$ ).

#### 4.2.10 Factors which are predictive of RTW after stroke

Results for factors which had an influence on RTW on univariate and multivariate analysis are summarised in Table 4.29 and 4.30 respectively. The following were controlled for during the regression analysis: side of stroke, educational level, cognitive function, ADL functional ability and mobility (BI and MRMI). These are variables which have a statistically significant difference between the control and intervention group in this study.

**Table 4.29 Factors that had an influence on RTW after stroke: univariate analysis results**

| Variable                             | OR         | SE         | z          | p> z         | 95% CI            |
|--------------------------------------|------------|------------|------------|--------------|-------------------|
| Sick leave duration                  | 1.2        | 0.2        | 1.3        | 0.01         | 1.9 – 2.5         |
| Female gender                        | 1.7        | 0.4        | -2.3       | 0.02         | 1.1 – 2.6         |
| Left hemiplegia                      | 4.4        | 2.3        | 2.8        | 0.005        | 1.5 – 12.5        |
| Speech problem                       | 0.9        | 0.4        | -1.94      | 0.05         | 0.86 – 0.98       |
| <b>Intervention group allocation</b> | <b>5.5</b> | <b>3.2</b> | <b>2.9</b> | <b>0.003</b> | <b>1.8 – 18.1</b> |
| BI six month score                   | 1.2        | 0.1        | 2.9        | 0.003        | 1.1 – 1.5         |
| MoCA baseline score                  | 1.3        | 0.1        | 3.2        | 0.001        | 1.1 – 1.5         |
| MoCA six month score                 | 1.2        | 0.2        | 2.0        | 0.04         | 1.1 – 1.6         |
| MRMI six month score                 | 4.2        | 2.4        | 1.8        | 0.03         | 1.6 – 14.1        |

Stroke survivors in the intervention group had 5.5 times greater odds of RTW at six months follow-up than those in the control group and those who had left hemiplegia had 4.4 times greater odds of RTW than those with right hemiplegia. Stroke survivors with speech problems were 0.9 times less likely to RTW than those without speech problems. For every unit increase in the six month BI, MRMI and MoCA score, the likelihood of RTW increased by 1.2, 4.2 and 1.2 respectively.

**Table 4.30 Factors that had an influence on RTW after stroke: multivariate analysis**

| Variable             | OR  | SE  | z   | p> z   | 95% CI     |
|----------------------|-----|-----|-----|--------|------------|
| Intervention group   | 6.9 | 3.7 | 3.6 | <0.001 | 2.4 – 19.8 |
| BI six month score   | 1.6 | 0.3 | 2.1 | 0.04   | 1.0 – 2.4  |
| MoCA six month score | 1.3 | 0.1 | 3.2 | 0.001  | 1.1 – 1.5  |
| Left hemiplegia      | 7.7 | 4.3 | 3.7 | <0.001 | 2.6 – 23.2 |

*\*OR = odds ratio; SE = standard error; CI = confidence interval*

Stroke survivors in the intervention group had 6.9 times greater odds of returning to work at six months follow-up than those in the control group and those who had left hemiplegia had 7.7 greater odds of RTW than those with right hemiplegia. For every unit increase in the BI and MoCA score, the likelihood of RTW increased by 1.6 and 1.3 respectively.

An analysis to establish if the influence of side of hemiplegia on RTW could be due to speech problems was done and it has shown that stroke survivors with right hemiplegia were 7.1 times more likely to have speech problems than those with left hemiplegia ( $p < 0.001$ ; CI = 2.4 – 20.7).

## Appendix U

### Summary of strategies used by stroke survivors and employers in this study to overcome barriers of return to work after stroke

Stroke survivors who had memory problems were taught to write their daily tasks on regular basis in order to cope in the workplace: *"I forgot about meetings and other scheduled activities all the time. I got help from therapist with techniques to manage my schedule and setting reminders (P01W). Balance and gait re-education* within the workplace also helped those who experienced this problem when they arrived at work: *"What helped was teaching me and practicing going up and down stairs at work as I struggled with this at first despite having done it at the hospital" (P01W).*

Some of the stroke survivors were allowed to report to work later than they usually do in order to cater for the difficulty in getting to the point where they get public transport: *"It was difficult to get public transport because of long distance from home to taxi. This was handled by allowing me to report for duty slightly later than usual to help me as it was difficult to get transport to work in the morning" (P10B).* One of the stroke survivors got a lift from a colleague on a daily basis: *"The biggest issue is related to transport. I do not have a car currently and even if I had a car it would be difficult for me to drive because my hand is still weak. At the moment my colleague has to fetch me and bring me back home" (P12B).*

Difficulty with working all day due to fatigue was dealt with by some employers, by allowing the stroke survivor to work less hours when they first came back to work: *"He was getting tired most of the time. We let him go home early on certain days. Because he is a hard worker, we knew that he will catch up when the right time comes" (E11W).* One stroke survivor could not cope doing night shifts and the employer allowed her to work day shifts only: *"I also had difficulty with doing late night shifts. I have been allowed to work only in shifts that finish work by 6pm. Morning to late afternoon shifts only" (P52B).*

The following are more examples of accommodations made for some of the stroke survivors: *"It was difficult for me to lift heavy boxes. This has been addressed by allowing me to work such that I no longer lift and move heavy boxes full of clothes. I just open the boxes and unpack them and straighten the clothes" (P52B); "It was difficult for me to iron clothes on ironing board. Now I have a big ironing board and that thing to cover it to make clothes not to fall down when ironing"*

(P61B); *“It was difficult for me to type on the computer when holding the phone at the same time. I got earphones (hands free phone) after the therapist recommended them and now I work better”* (P79W).

### **Summary of stroke survivors’ and employers’ expectations after stroke**

The stroke survivors and their employers were asked what it is that they look for in this situation (after stroke). Table below shows summary and examples of their responses to this question.

#### **Stroke survivors’ and employers’ expectations after stroke**

| <b>Employers’ expectations</b>                                                                                                        | <b>Stroke survivors’ expectations</b>                                                                               |
|---------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|
| Early communication with the stroke survivor (E52B)                                                                                   | An employer to have an understanding of stroke and its consequences (P66B)                                          |
| Full commitment. “They must show that they are interested in their work and that they want to try their best to do their work” (E10B) | An opportunity to work even if it is for less salary (P27W): worried about sitting at home and doing nothing (P30B) |
| “They must not expect that their colleagues are going to do their work for them” (E10B)                                               | An employer to go all out to support stroke survivors who were fully committed to their work (P73B)                 |
| To be able to pay attention to detail (E27W)                                                                                          | To create an opportunity for RTW at stroke survivors’ pace ((P27W)                                                  |
| To be able to do the job they were doing before and do it safely and fast (E30B)                                                      | Continue paying salary during leave (P31W)                                                                          |

### **Aspects of the intervention that worked well and those that did not work well**

Stroke survivors and their employers were asked questions about aspects of the workplace intervention programme that worked well and those that did not work well. A summary of their responses with examples is presented in Table on the next page.

### Aspects of the intervention that worked well and those that did not work well

| Aspects that worked well                                                                                                                 | Aspects that did not work well                                                                                                                                                   |
|------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Increased communication between the employer, stroke survivor and therapist (P03W)                                                       | Full RTW occurred after a long time (P58B)                                                                                                                                       |
| Having an opportunity to practice work skills within the workplace (P10B; E27W)                                                          | It was not always possible for the therapist to convince employer to reasonably accommodate the stroke survivor (P51B), especially when the company had plans to cut jobs (P30B) |
| Having an opportunity to realise own workability limitations and deal with them where possible (P66B)                                    | It was difficult to secure an appointment with the employer as they had busy schedules during working hours (P57W)                                                               |
| Increased employer awareness and understanding of stroke and the stroke survivors' challenges (P29W)                                     | There was no opportunity to be reassessed again at work long after stroke (P27W)                                                                                                 |
| Co-workers got an opportunity to be counselled about stroke consequences to allay their fears when working with a stroke survivor (P70B) | Co-worker counselling was not done in some instances due to the busy company schedule (E53W)                                                                                     |
| It created an opportunity for the employer to retain the employee in the job where possible (E10B)                                       | It was difficult to get transport to go for therapy sessions at the workplace (P73B)                                                                                             |

### What makes people stay long in their job?

The stroke survivors were asked a question about what they think makes people stay long in their job. The following were identified as the main factors that would make them stay in the current job for long:

#### Managerial support

The need for recognition, acknowledgement, and motivation by the employer was expressed by most stroke survivors as factors that would make them stay long in their current job. They indicated that they need to be treated as human beings and need the employer to be honest when communicating with them at all times. The following two quotes indicate how the need to be treated like human beings and be supported was expressed by some of the stroke survivors:

*"Knowing that the employer sees you as a person with needs, not just as a person who should only be used for work and when you are not able to do the work they forget about you. They don't even want to know where you are and how you are doing" (P27W). "...they talk to me and check how I am doing. This shows that they care" (P73B).*

#### Job satisfaction

Job satisfaction was also mentioned as a reason for staying long in the job resulting in job dedication and willingness to come back to work. One example of this is a stroke survivor who said *"I will stay long in my job because I love my job and enjoy it" (P58B).*

#### Good interpersonal working relationships

This was mentioned by most stroke survivors who indicated the need for mutual respect and regular communication. The following is an example of what was expressed: *"I have to have good working relationship with the people I work with including my boss. If we always fight they will not want me at work. Like now, if we were fighting at work imagine what will happen to me. They will be happy and I will not have a job because they will want to get rid of me as quickly as possible" (P58B).*

#### Having specific job skills and ability to do the job

Not being able to do the job will result in company production loss and this will result in employer dissatisfaction. *"You will stay long in the job if able to do the work accurately. The employer does not want people who cannot work right" (P51B).*

#### Unavailability of jobs

*"... big problem is that if the company plans to cut jobs you will always find them looking for a person to send away. They will not help you to come back to work. I think they will be happy because it will make it easy for them to cut you off" (P30B). "...there are very few jobs, so if you leave your current job you are not guaranteed of another job" (P31W)*

When employers were asked the same question about what they think would make people stay long in their current job, their responses were as follows:

### Good team work and job commitment

An employee who works well with co-workers and is committed to their work is more likely to want to continue working. *“People will stay long in their job if they like the job and are committed to working. If they understand the needs of the company and know that if the company is not doing well this will affect everybody” (E52B).*

### Feeling valued by company

An employee who feels valued by the company will want to continue working in that company. *“People stay in their jobs because of the type of manager who looks after the interest of the workers” (E11W).* *“We all have problems, but it is good to know that you have support from people at work” (E79W).* An employer who supports employees who are sick will make them feel valued and acknowledged as human beings by the company. *“If the workers see that a manager supports the employees, like the one who is sick, they will stay in the job. The human element is critical. People are not just interested in the job but need to have the human element being taken care of” (E11W).*

### Good managerial skills

A manager needs to give realistic, relevant solutions to employees when they have problems. *“It also motivates the worker if they see that the management knows what is going on ‘on the ground’ and gives advice based on realities of the situation. When an employee sees that the manager does not know what they are talking about and that they give unrealistic solutions or advice, they will become unhappy with the work situation” (E53W).*

### Work skills and capabilities

An employee needs to have the required specific work skills and capabilities in order to continue working in their job. *“They must have ability to do the job that they are hired for. If they cannot do the job they will not have a reason to continue working in that job” (E27W).* *“When a job needs to be done it has to be done properly. If it is not done properly the company reputation will be affected” (E57W).* *“The whole purpose of being hired is to do a specific job, so if you cannot do that job there is no other choice. The company will try as much as possible to help a person do the job, but if they can’t do that job, they will obviously not be able to stay long in the job. We have to understand that some of the jobs are very difficult if you are not strong even if you love the job and are committed to it, you will have no choice but to stop working” (E70B).*

### Ability to work fast

Employees who work slowly reduce company productivity and also slow down their co-workers.

*“...if you cannot work fast the company will not be happy because the production will slow down. The people you work with will also not be happy because they will not qualify for bonuses when their production is low. You see, when this happens, nobody will want to work with you in their team and no supervisor will want you to work with their teams” (E30B).*