KNOWLEDGE AND PRACTICES OF STROKE SURVIVORS REGARDING SECONDARY STROKE PREVENTION, KHOMAS REGION, NAMIBIA

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DECLARATIONS

I, Peter Jachi, declare hereby that this study is a true reflection of my own research, and that this work or part thereof, has not been submitted for a degree at any other institution of higher education.

_____ Date: _____

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ABSTRACT

Secondary stroke occurs in approximately one third of stroke survivors within five years thus it is a major public health concern. Secondary stroke occurrences largely represent failed secondary prevention. There is paucity of study evidence on stroke survivor knowledge and practices regarding secondary stroke prevention in Namibia. The purpose of this study was to determine the knowledge and practices of stroke survivors with regard to secondary stroke prevention in the Khomas Region, in Namibia.

A quantitative, descriptive and explorative design was used. Face-to-face structured interviews were conducted utilising a structured questionnaire to collect data from a sample of (n=60) stroke survivors from a population of discharged stroke survivors fromthe Katutura State Hospital in year 2012. Data were analysed using Epi Info statistical package version 5.3.1. Ethical considerations were observed during all stages of the study.

Knowledge on secondary stroke prevention appears to be very low among stroke survivors with about 40.0% of stroke survivors unaware they are at an increased risk of suffering another stroke. Almost half of stroke survivors were unable to name a single appropriate action to take to prevent secondary stroke. A significant proportion of stroke survivors also continue to smoke and or drink contrary to expectations and recommendations. Only a relatively small percentage of stroke survivors comply with lifestyle changes prescribed to them like diet modification and engaging in physical exercise activities. However, hypertensive and diabetic stroke survivors seem to have satisfactory medication compliance levels.

To improve on secondary stroke prevention it is recommended that health education regarding stroke management and stroke prevention should be strengthened. The immediate implementation of a support and follow-up programme with a monitoring and evaluation guide for stroke survivors after hospital discharge is also recommended.

Follow-up and support of discharged stroke patients also needs to be improved. Further research could be conducted to ascertain stroke awareness among the general population as well as population surveys on stroke predisposing factors and diseases.

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1. INTRODUCTION

1.1 Orientation of study

Stroke is a sudden life-changing event with lifelong implications, often with chronic disability, reduced independence, and increased need for medical, social and caregiver support (Flanagan et al., 2010). Morbidity caused by stroke is considered the leading cause of adult disability in most regions across the world (O'Donnell, 2010). Furthermore, stroke is the second or third most common cause of death worldwide (Avila et al., 2011). Mackay and Mensah (2004) report that annually 15 million people worldwide suffer a stroke; five million of them die and another five million are left permanently disabled. The latter puts an enormous burden on family and community. The human and economic burden of stroke care is huge; more so in the middle and low income countries such as Namibia (Di Carlo, 2009). Furthermore, two thirds of stroke mortality is reported to occur in less developed countries (World Health Organisation, 2006).

After a stroke, one of the greatest risks, to a stroke survivor, is a secondary stroke (Kirshner, 2010). A secondary stroke, also known as a recurrent stroke, is one which

occurs 24 hours or more after a primary stroke (Mant & Walker, 2011).The potential occurrence of a secondary stroke in at risks patients is approximately 10.0% in the first year and 5.0% per year thereafter (Truelsen, Begg, & Mathers, 2006). Secondary stroke is a major public health concern as it occurs in approximately one third of stroke survivors within five years (Castilla-Guerra, Fernández-Moreno, & Álvarez-Suero, 2009). Furthermore, secondary stroke constitutes about one quarter of all stroke prevalence (Hankey, Jamrozik, Broadhurst, & Forbes, 2002).

Diagnosis of a stroke's pathology type is crucial because treatment, prognosis, and secondary prevention, to a greater extent depend on the stroke type (Warlow, et al., 2008).There are two main types of stroke: ischemic and haemorrhagic (Barwell, 2011).

Common factors that can cause a stroke include: thrombosis, a hemorrhage in the brain, embolism, high blood pressure (hypertension), diabetes, high blood cholesterol levels, high salt consumption in diet, severe emotional distress, anxiety, and anger. In addition severe weather change, like a sudden drop in temperature, has also been reported to cause an impediment to the blood flow to the brain; possibly resulting in a stroke (Hou, 2010).

Identification of risk factors in an individual is critically important for stroke prevention. Prevention of a stroke occurs at two levels: primary or secondary. Primary prevention refers to preventing a stroke before it occurs or preventing a first-ever stroke from occurring; secondary prevention refers to prevention of a repeat stroke (Holmes, 2008).

There are two major categories of risk factors: non-modifiable and modifiable risk factors, respectively. With non-modifiable risk factors individuals may not do anything to alter their stroke risk profile while for modifiable risk factors individuals can do something to change their stroke risk profile (Holmes, 2008).

Non-modifiable risk factors of stroke are age, sex (gender), and familial history (Caplan, 2010). Age is the strongest determinant of stroke (Rowland, Pedley, & Merritt, 2009). Stroke incidence is reported to double every decade after the age of 55 years (idem). Stroke incidence is also higher among men compared to women, especially among those with a family history of stroke (idem). Stroke is also more prevalent among certain ethnic groups. For instance, stroke incidence is significantly higher among African-Americans in the United States of America (US) compared to other ethnic groups (idem). Although non-modifiable risk factors of stroke are generally considered uncontrollable, their assessment enables health professionals to identify individuals of high risk (Polikandrioti, 2009).

Known modifiable risk factors of stroke include: hypertension, cardiac disease, diabetes, hypercholesterolemia, physical inactivity, smoking, and alcohol abuse (Rowland, Pedley, & Merritt, 2009). A history of trans-ischemic attack is also usually considered a stroke modifiable risk factor (idem).

Stroke prevention begins with recognition of its risk factors by both patients and clinicians treating them (Romero, Morris, & Pikula, 2008). In primary prevention of stroke the focus is usually modifiable risk factors of stroke (Holmes, 2008). The most

effective way to prevent a first-ever stroke from occurring is to target modifiable risk factors associated with the stroke (idem).

An individual‘s age and hypertension are widely considered to be the most powerful predictors of stroke in terms of risk factors. These two risk factors thus warrant special attention in both primary and secondary prevention of stroke (Rowland, Pedley, & Merritt, 2009).

Regular exercise may reduce stroke risk by improving risk factors for obesity, hypertension, blood glucose control, and serum lipid ratio (Bendok, Naidech, Walker, & Batjer, 2011). Aerobic exercise is known to have more direct effects, such as promoting atherosclerositic plaque stability and improving endothelial functioning (idem). However, some studies show a U-shaped relationship between physical activity and stroke, which implies an increasing risk with very high intensities of physical activity (Hardman & Stensel, 2009).

Morbid obesity is a risk factor for stroke. The effect of obesity related hypertension, diabetes, and hyperlipidemia on stroke has been well documented. However, evidence for an association between obesity alone and the risk of stroke is weak. (Iacobellis, 2009).

The role of alcohol, as a stroke risk factor, depends on the stroke sub-type and degree of alcohol consumption (Rowland, Pedley, & Merritt, 2009). The latter has been shown to be a risk factor for haemorrhagic strokes in a linear fashion whereas the relationship between alcohol and ischaemic stroke is J-shaped (idem). Modest consumption (up to

two drinks daily in men and one daily in women) is significantly protective against ischemic stroke (idem). The proposed mechanism of action for this phenomenon is that alcohol consumption, in modest amounts, is thought to increase high density lipids; it also leads to decreased platelet aggregation and decreased fibrinogen (Bendok, Naidech, Walker, & Batjer, 2011). Excessive intake of alcohol, namely five or more drinks per day, is associated with an increased risk of both ischemic and hemorrhagic stroke (Bendok, Naidech, Walker, & Batjer, 2011; Rowland, Pedley, & Merritt, 2009). The likely causes of the latter are alcohol abuse related diseases, such as hypertension and cardiomyopathy (Bendok, Naidech, Walker, & Batjer, 2011).

Another potentially modifiable stroke risk factor is depression. Depression is increasingly being recognised as a possible contributor to stroke (Silver, 2012). The findings of a prospective ten year study of 9601 Western European middle-aged men showed that baseline depression nearly doubled the risk of stroke during years five to ten years of the study (idem). The risk of coronary artery disease in depressed individuals also increased by 43.0% during the first five years, after adjusting for age, baseline socio-economic factors, traditional vascular risk factors, and antidepressant treatment (idem). The mechanism of how depression increases is thought to be complex and not clearly understood (McGowan, 2010). However, it is believed that depression increases a stroke risk through the involvement of stress hormones and inflammatory mediators thereby reducing blood perfusion in the brain (idem).

When a stroke occurs it should be considered a medical emergency. All patients with suspected a stroke should urgently be referred to stroke health management services with a view to either admitting them to a hospital stroke unit or requesting urgent assessment (Scottish Intercollegiate Guidelines Network, 2010).

Stroke has a broad spectrum of clinical features, pathologies, aetiologies and prognoses (Hankey, 2009). Consequently there is a wide variation in the types of treatment, rehabilitation and prevention strategies (idem).The process of recovery from a stroke on the part of survivors is often long and arduous (Flanagan et al., 2010).

The central aspect of stroke recovery is the provision of a coordinated programme by a specialised, multidisciplinary team of health professionals which offers individual assessment, treatment, regular review, discharge and follow up (National Stroke Foundation, 2010). A multidisciplinary team of stroke management should include appropriate levels of nursing, medical, physiotherapy, occupational therapy, speech and language therapy, and social work staff (Scottish Intercollegiate Guidelines Network, 2010). The multidimensional nature of stroke, and its effects requires a coordinated and combined interdisciplinary care-team: the most appropriate strategy to manage a stroke patient (Cuccurullo, 2004).

A stroke survivor can be discharged from hospital if the neurologic examination indicates the stroke has stabilised or is improving and that arrangements have been made so that outstanding medical issues can be managed on an out-patient basis (Watcher & Hollander, 2005). Furthermore, adequate evaluation of the cause of the stroke must also

have been performed to guide secondary prevention (idem). In view of the high risk of recurrent stroke in stroke survivors, one of the first responsibilities of stroke management teams caring for stroke survivors is initiating and implementing secondary stroke prevention measures (Kirshner, 2010).

Prior to hospital discharge relevant members of the stroke interdisciplinary management team should thus provide specific training for stroke survivors and their caregivers. This training should include, as necessary, personal care techniques, communication strategies, physical handling techniques and on-going secondary stroke prevention (National Stroke Foundation, 2010).

As previously mentioned, a significant proportion of primary stroke survivors are at risk of suffering a secondary stroke. Hospital re-admissions of stroke survivors related to recurrent stroke and infections within six months were found to be as high as 40.0% to 50.0% (Lin, Chang, & Tseng, 2011; Torp, Vinkler, Pedersen, Hansen, & Jorgensen, 2006). Secondary strokes are also generally associated with the worse functional outcomes compared with first-ever strokes (Hankey, Jamrozik, Broadhurst, & Forbes, 2002). In addition, there is also an increased risk of death associated with secondary stroke (idem). A worrisome trend, particularly for the developing world, is that a higher percentage (relative to the developed world) of secondary strokes is from the developing world (Bogousslavsky, 2006).

The phenomenon of secondary strokes has been linked to poor compliance with treatment and inadequate secondary stroke prevention measures (Bogousslavsky, 2006).

Hankey, Jamrozik, Broadhurst and Forbes (2002) support the argument that secondary stroke occurrences largely represent failed secondary stroke prevention. It is also suggested that up to 80.0 % of secondary strokes are preventable through a combination of different lifestyle changes and medical interventions (Hackman & Spence, 2007).

It is recommended that secondary prevention of stroke be regarded as an integral part of stroke rehabilitation given that the majority of strokes are not fatal (Salter, Teasell, Foley, Bhogal, & Speechley, 2011). The knowledge and perception of stroke survivors about their recurrent stroke risk are equally important in secondary stroke prevention (Hiraga, 2011).

Secondary stroke prevention refers to all strategies used to help prevent recurrence of stroke (Edmans, 2011). These strategies are usually a lifelong commitment involving a close relationship between a stroke management team and a stroke survivor (Markus, Pereira, & Cloud, 2010). The lifestyle advice given to address risk factors for stroke in primary prevention should ideally be reinforced in secondary prevention of stroke (idem). The risk factors for both primary and secondary stroke are similar. In comparison to primary stroke prevention the difference in secondary stroke prevention is that the risk of another stroke is considerably higher (idem). In such a scenario there is (i) less time to address risk factor modification, or (ii) less time for risk factor modification to take effect (idem). Risk factor modification in secondary stroke prevention might therefore require medical intervention or at times surgery (idem).

In some circles it has been argued that secondary prevention of stroke should not be ‘Should I lower this stroke survivor’s blood pressure?’ or ‘Should I put this stroke survivor with atrial fibrillation on warfarin?’ but rather ‘How much can I lower this individual‘s blood pressure to minimise their risk without making the patient ill?’ and ‘Why should I not be starting anticoagulation therapy in a person with a stroke episode found to be in atrial fibrillation?’ (Markus, Pereira, & Cloud, 2010).

As a cardinal rule in secondary stroke prevention, all stroke survivors can benefit from lifestyle and risk factor modifications, such as low-fat and low-salt diet, physical exercise, smoking cessation, control of blood pressure, glucose and lipids management in addition to treatment of the causes of the initial stroke (Kirshner, 2010; Brass, 2005). Furthermore, depending on the type of stroke, medication compliance (for example anti-platelets, anticoagulants, statins and antihypertensive medications) should be emphasised to stroke survivors as part of ongoing secondary stroke prevention (Wityk & Llinas, 2007).

Control of blood pressure is considered one of the most powerful secondary stroke prevention strategies (Kirshner, 2010). Normal blood pressure levels have been defined as less than 120/80 mm Hg. (Furie, et al., 2011). An absolute target blood pressure level and reduction in stroke survivors is uncertain and should be individualised (idem). However, benefit has been associated with an average reduction of approximately 10/5 mm Hg (idem). Regular blood pressure screening and, a combination of behavioural

lifestyle modification and drug therapy, are therefore recommended to stroke survivors to achieve these goals (Silver, 2012).

Specific lifestyle changes for hypertensive stroke survivors include:

- weight loss if overweight or obese
- a reduction in salt intake (using herbs, garlic, chilli pepper, and curry to flavour food as an alternative to salt)
- reduction of alcohol intake
- smoking cessation
- a reduction in consumption of coffee and other caffeine-containing beverages
- increasing calcium intake by including two portions of fat-free or low-fat dairy products in the daily diet
- increasing folic acid and vitamins B12 and B6 intake by eating foods such as legumes, whole grain cereals and starches, eggs, fish, and meat
- decreasing saturated fat intake and increasing unsaturated fat consumption increasing fruit and vegetable intake
- daily physical exercise which is mild and not strenuous.

Patients should also be encouraged to consult a registered dietician for individualised dietary counseling (Ministry of Health and Social Services, 2011).

It has been reported that many patients continue smoking even after a stroke (Hashimoto, 2011). Support measures to enforce non-smoking are therefore required in this high-risk population (idem). Active and passive smoking, as well as smokeless

tobacco products, pose a risk to stroke survivors (idem). It is thus recommended that in addition to counseling, medical therapy to reduce nicotine dependency can also be initiated for smoking stroke survivors (idem). In Namibia, the Ministry of Health and Social Services actively encourages the use of acupuncture, nicotine skin patches, and nicotine chewing gum, for stroke survivors to help them quit smoking (Ministry of Health and Social Services, 2011).

Studies reveal that despite an increased risk of a recurrent stroke, many stroke survivors are actually not prescribed preventative therapies such as antiplatelets or anticoagulants (Heart and Stroke Foundation of Ontario, n.d). While withholding treatment might seem illogical, physicians argue that there are special challenges around secondary stroke prevention treatments (Bushnell & Colón-Emeric, 2009). In older patients for instance careful titration of blood-pressure-lowering drugs is needed to avoid hypotension (idem). There is also the need to weigh the risk of haemorrhagic stroke when prescribing statins (idem). Similarly it is important to consider the risk of recurrent ischaemia versus bleeding in patients taking antiplatelet or anticoagulant therapy (idem). Furthermore, the risk of peri-procedural complications appears to be high with both carotid angioplasty and stenting, and carotid endarterectomy in older patients with carotid stenosis (idem).

Moderate exercise for half an hour on most days is encouraged for ischemic stroke/TIA patients who are able to engage in physical activity (Kirshner, 2010). The benefits of exercise to stroke survivors are both remarkable and wide ranging (American Heart Association, American Stroke Association, 2012). Physical activity improves heart

function and lipid profile by lowering total cholesterol while raising high density lipoproteins (idem). Physical exercise also lowers blood pressure and resting heart rate (idem). In addition to these physical and physiological benefits, exercise can also enhance self-confidence and independence and reduce depression and anxiety of stroke survivors (idem). It is however recommended that for stroke survivors whose disability precludes independent exercise, a supervised therapeutic exercise regimen is preferable (Kirshner, 2010).

Arguably the most important aspect for secondary stroke prevention is the education of stroke survivors. At the core of secondary stroke prevention is good stroke survivor education to ensure compliance (Markus, Pereira, & Cloud, 2010). Education of stroke survivors was found to exert the most important effect on the control of established cardiovascular risk factors associated with stroke prevention (Liu, Wang, Guo, Li, Li, & Qian, 2011).

It has been argued that a secondary stroke largely represents failed secondary stroke prevention. A variety of factors, ranging from a lack of information and knowledge among stroke survivors, and poor treatment compliance to stroke co-morbidity, have been identified as some of the challenges facing secondary stroke prevention.

Stroke survivors and their families or caregivers are often not aware of risk factors for stroke, stroke warning signs and their own risk for secondary stroke (Cunningham, 2003). In view of such ignorance stroke survivors often do not take appropriate action by seeking immediate medical attention when such consultations become necessary (idem).

Some stroke survivors and caregivers acknowledge the need to prevent stroke recurrence, but often feel they lack sufficient information and support to do so (idem).

Adherence to therapies is a primary determinant of treatment success (O'Carroll, Dennis, Johnston, & Sudlow, 2010). Yet only 30.0% of stroke patients reported sub-optimal medication adherence (idem). Poor compliance with drug therapy and lifestyle modification for secondary stroke prevention negatively influences the effect of stroke prevention strategies (Ma, et al., 2008).

Stroke survivors today are discharged from the hospital more quickly than in the past because of shifting economic realities. The length of in-patient rehabilitation is decreasing, with a change of focus toward community-based rehabilitation which then leaves a relatively short time for many stroke survivors and their caregivers or families to absorb all of the information they will need when they go home. Since many stroke survivors continue to experience significant impairments after discharge, and may have co-morbidities, such as heart disease and diabetes, their educational needs may be extensive. Quite often stroke survivors and their caregivers or families may be poorly prepared for the full extent of care-giving responsibilities (Otswald, Davis, Hersch, Kelley, & Godwin, 2008).

Accurate information enables stroke survivors to make informed decisions about treatment and treatment options. In addition, the provision of information can aid a positive attitude to recovery. It is however imperative to underline that stroke survivors have specific information needs at different stages of their recovery. Timing of

information for the different stages is therefore crucial in ensuring that stroke survivors understand information fully and remember it (Alaszewski, King, Alaszewski, & Potter, 2008).

Observational surveys have consistently demonstrated that many stroke survivors and their families express both a lack of understanding and a desire for further knowledge about the causes and consequences of stroke and secondary stroke preventative measures. There is also evidence to suggest that the current methods of providing information to stroke survivors and their caregivers or families is inadequate and need to be improved. Stroke management teams should aim to provide information to stroke survivors that is timely and in an appropriate format (Rodgers, Bond, & Curless, 2001).

1.2 Statement of the problem

In Namibia there is no evidence of published studies done on stroke prevention, treatment and rehabilitation. Furthermore, there is no evidence of policy or practice guidelines on secondary stroke prevention. It is also not clear to what extent health workers provide health education to stroke survivors (i) during in-patient treatment, (ii) at hospital discharge, and (iii) subsequent follow-ups, to prevent recurrence of stroke. The Namibian public health sector is experiencing a shortage of healthcare professionals; this shortage could be attributed to causing unnecessary and preventable morbidity and deaths from diseases such as stroke (Shacinda, 2006; Barnad, 2004). To the best of the researcher‘s knowledge there is only one stroke unit and one neurologist in the Namibian public health sector which is arguably not enough to meet demand for

stroke health services. Furthermore, there is also no evidence in Namibia of the existence of stroke support groups or associations where stroke survivors and or their caregivers can obtain information or get peer support regarding stroke prevention.

1.3 Purpose of the study

The purpose of this study is to determine the knowledge and practices of stroke survivors with regard to secondary stroke prevention.

1.4 Objectives of the study

i. To describe the stroke survivor education practices of the Katutura State Hospital stroke management team with regard to secondary stroke prevention.

ii. To determine the type of knowledge stroke survivors have with regard to secondary stroke prevention.

iii. To determine the practices and challenges of stroke survivors with regard to secondary stroke prevention.

iv. To identify information sources for stroke survivors with regard to secondary stroke prevention.

1.5 Significance of the study

The researcher is a physiotherapist and a member of the stroke management team at the Katutura State Hospital. This study is expected to reveal information regarding the depth of knowledge and practices of stroke survivors with respect to secondary stroke prevention. This could help to improve future stroke survivor education practices by

stroke management teams and thus help stroke survivors prevent secondary strokes. Furthermore, the study could also potentially contribute to the development of stroke prevention guidelines in Namibia.

1.6 Definitions of key concepts

- Knowledge

  This is defined as "facts, information, and skills acquired through experience or education or awareness or familiarity gained by experience of a fact or situation" (Oxford Dictionaries, 2011). In this study knowledge of secondary stroke prevention is defined as the ability to identify key secondary stroke prevention strategies such as diet modification, less alcohol consumption, more exercise, smoking cessation, control of pre-existing predisposing disease conditions and medication compliance.

- Practice

  Practice is defined as the actual performance of an activity in a real situation (MacMillan Dictionary, 2012). In this study 'practices' refer to actual implementation by a stroke survivor of any of the secondary stroke prevention measures.

- Stroke

  Stroke is defined by the World Health Organisation (WHO) as rapidly developing clinical signs of focal (or global) disturbance of cerebral function

with symptoms lasting 24 hours or longer or leading to death with no apparent cause other than of vascular origin(Markus, Pereira, & Cloud, 2010, p. 3). In this study a stroke case is any patient ascribed a stroke diagnosis as recorded in his/ her medical file (health records) at the time of discharge by a Katutura State Hospital medical practitioner.

- Stroke survivor

A survivor is a person remaining alive after an event in which others have died (Oxford Dictionaries, 2012). A stroke survivor is therefore a person who remains alive after a stroke/ cerebrovascular accident. In this study a stroke survivor is any patient who at the time of hospital discharge from the Katutura State Hospital had a stroke as part of his /her discharge diagnosis and who was alive at the time of the study. According to the 2000 Health Information System of the Ministry of Health and Social Services, the inpatient discharge and cause of death codes, that pertain to diagnosis variables for stroke, include intracranial haemorrhage, cerebral infarction or cerebrovascular accident.

The 2000 Health Information System of the Ministry of Health and Social Services' inpatient discharge and cause of death codes, diagnosis variables for stroke (as indicated in the stroke patient's medical file) include intracranial haemorrhage, cerebral infarction or cerebrovascular accident.

- Secondary stroke prevention

Secondary stroke prevention refers to all strategies used to help prevent recurrence of stroke (Edmans, 2011). General measures in all stroke survivors include reducing body mass index, adopting a low salt diet, smoking cessation, and taking regular exercise (idem). Overall secondary prevention of stroke entails a reinforcement of controlling modifiable risk factors of stroke and compliance of stroke treatment regimens (Markus, Pereira, & Cloud, 2010). In this study the key secondary stroke prevention strategies are diet modification, less alcohol consumption, more physical exercise, smoking cessation, control of pre-existing predisposing disease conditions and medication compliance.

- Stroke management team

A stroke management team is a formally coordinated and organised variety of treatment disciplines responsible for multidisciplinary evaluation and intervention of post-acute stroke patients (American Heart Association, American Stroke Association, 2005). The organisation and composition of stroke management teams often vary depending on setting; such a team may consist of a physician, nurse, physiotherapist, occupational therapist, speech and language pathologist, psychologist, social worker, dietician, and pharmacist (National Stroke Foundation, 2005). The team may also be expanded to include any other clinicians or rehabilitation specialists as necessary (idem). Stroke survivors and their caregivers are also usually acknowledged as important team members (idem).

A considerable body of evidence, mainly from countries in Western Europe, indicates that better clinical outcomes are usually achieved when patients with acute stroke are treated in a setting that provides coordinated, multidisciplinary stroke-related evaluation and services (American Heart Association, American Stroke Association, 2005). In this study however, the stroke management team refers to health professionals frequently involved in the treatment of stroke patients at the Katutura State Hospital. These professionals are a neurologist, neurology medical officer, stroke unit nurse, pharmacist, social worker, occupational therapist, dietician, and physiotherapist.

- Katutura State Hospital

The Katutura State Hospital is also known as the Intermediate Hospital Katutura. It is one of the two public hospitals in the Khomas region and has a 840 bed capacity. The hospital has multiple functions and serves as (i) a district hospital for the Windhoek District, (ii) a national referral hospital, and (iii) a training hospital. A range of medical and surgical specialist and allied health services are among some of the major services the hospital offers. The stroke unit was established in 2009 and is also part of the specialised clinical units available at the Katutura State Hospital (Katutura State Hospital, 2011)

- Khomas region

The Khomas region is one of 13 Namibian administrative regions. It is the region in which Namibia's capital Windhoek is located (Government of the Republic of

Namibia, 2006). The Khomas region is the most populous Namibian region with a population of about 340 000 (Republic of Namibia, 2012). For health services the majority of the people in the Khomas region use cheaper public health services instead of the more expensive private health services (Regional Network for Equality in Health in Southern Africa, 2005).

1.7 Ethical considerations

Permission to conduct the research was sought from relevant authorities before the study was commenced. The Academic Research Committee of the University of Namibia gave its approval to the research study (Annexure H). Thereafter, consent was obtained from the Research Committee of the Ministry of Health and Social Services to enable access to stroke survivor medical records at the Katutura State Hospital and the subsequent involvement of stroke survivors in the research study (Annexure J).

It was explained to respondents that there was no foreseeable harm to them by participating in the research study. Furthermore, they were informed that participation in the research study was voluntary and that they had the right to withdraw from the study at any stage. Thereafter, written informed consent was then sought from each respondent (Annexures D and E)

Confidentiality and anonymity were guaranteed: raw data would be kept in safe place and no individual respondent would be identified by name in the research report.

1.8 Summary

In this chapter the following were discussed: orientation of the study; statement of the problem; purpose of the study; study objectives; the significance of the study; definitions of key concepts on the knowledge and practices of stroke survivors; and ethical considerations.

In the next chapter a review of literature, on knowledge and practices of stroke survivors regarding secondary stroke prevention is presented.

CHAPTER 2

2. LITERATURE REVIEW AND CONCEPTUALISATION

2.1 Introduction

Chapter 1 provided an introduction and background to the study. This chapter presents a conceptualisation of the literature, review of literature regarding awareness of secondary stroke among stroke survivors, knowledge and practices of stroke survivors regarding secondary stroke risk factor control, educational strategies for stroke survivors to prevent secondary stroke and secondary stroke prevention challenges.

2.2 Conceptual Framework, the Health Belief Model

The Health Belief Model was developed in the 1950's by social psychologists Hochbaum, Rosenstock and others to help predict health behaviours. The model consists of five constructs: individual perceptions to susceptibility, severity, barriers to action, benefits of action and cues to action in response to a threat of illness. These factors all contribute to the likelihood of an individual engaging in behaviour and actions to reduce the threat of an illness (Evers, Jones, Caputi & Iverson, 2011).

In this study behaviour and actions examined is compliance with secondary stroke prevention measures

2.2.1 Variables of the Health Belief Model

Perceived susceptibility to secondary stroke

This dimension refers to one‘s subjective perception of contracting a disease condition (Edberg, 2010). The Health Belief Model infers that a stroke survivor who demonstrates awareness to secondary stroke will more likely take measures to prevent secondary stroke.

Perceived severity of secondary stroke

This construct refers to the beliefs about the seriousness of the condition, or leaving it untreated and its consequences (Rimer, Glanz, & Viswanath, n.d). The belief by a stroke survivor that suffering a secondary stroke is a possibility and that secondary stroke will worsen morbidity should lead to improved compliance with secondary stroke prevention measures.

Perceived barriers to secondary stroke prevention

The potential negative aspects of a particular health action may act as an impediment to undertaking the recommended health behaviour. This is where a stroke survivor weighs the action (of engaging in secondary stroke prevention) ‘s effectiveness against perceptions that it may be expensive, unpleasant, inconvenient or laborious (Edberg, 2010). It is assumed by the Health Belief Model that stroke survivors with a greater perception of barriers are less likely to reveal compliance behaviour to secondary stroke prevention compared to those who believe that the benefits outweigh the barriers.

Perceived benefits of secondary stroke prevention

Perceived benefits help reduce perceived threats about positive health behaviour. Perceived barriers impede health behaviours. Perceived benefits minus perceived barriers support positive health behavioural change (Rimer, Glanz & Viswanath, n.d). The Health Belief Model hypothesises that stroke survivors who perceive benefits from adopting secondary stroke prevention measures are more likely to demonstrate the required health behaviour than those who do not.

Cues to adopt secondary stroke prevention

These are strategies that stimulate action towards the adoption of secondary stroke prevention measures. Cues such as advice from friends or family, seeing somebody suffer a secondary stroke, media adverts on secondary stroke and health promotion material on secondary stroke (Rankin, Stallings & London, 2005). Cues act as a precipitating force that makes stroke survivors adopt secondary stroke prevention. Cues thus play an important role to help stroke survivors comply with secondary stroke prevention.

2.3 Awareness of secondary stroke among stroke survivors

Patients who survive an initial stroke are at a significantly increased risk for future strokes compared to the general population (Hiraga, 2011). Awareness of stroke recurrence among stroke survivors is reported to have a positive influence on the likelihood of a stroke survivor adopting secondary stroke prevention (Samsa, et al., 1997). Respondents who, for instance recognised their own personal future risk, were

more likely to consume less alcohol ($P < .0001$) and salt ($P < .005$) and to eat more fruits and vegetables ($P < .02$) (idem). Approximately three quarters of stroke survivors who recalled being told of their increased stroke risk by a physician acknowledged this risk in comparison to only about a quarter of stroke survivors who did not recall being informed by a physician (idem). Healthcare providers should therefore play a crucial role in communicating information about risk of secondary stroke to stroke survivors.

There are not many published studies that focus specifically on awareness of risk of a future stroke among high risk groups like stroke survivors. One of the few published studies which investigated awareness of risk in high-risk patients showed that only 42.0% of patients with a history of previous stroke are aware of their future stroke risk (Samsa, et al., 1997). A more recent study by Slark et al. (2010) reveal similar findings: 41.0% of stroke survivors showed awareness of risk of a future stroke.

Other studies on awareness of risk of future stroke among stroke survivors reveal that only 20.0% of stroke survivors accurately estimated their risk for stroke secondary stroke, 10.0% underestimated their risk, and 70.0% overestimated the risk. The results also suggest that elderly stroke survivors, ethnic minority groups, and people with lower levels of education, are among the groups with lower awareness levels of secondary stroke. Inaccurate estimation of secondary stroke tends to be associated with attitudes, health belief and self-reported memory problems (Hiraga, 2011).

2.4 Knowledge and practices of stroke survivors regarding secondary stroke risk factor control

The majority of stroke survivors have risk factors that predispose them to secondary stroke (Turanjanin et al., 2011). Many of these risk factors represent conditions that are treatable. Breaking bad habits and adopting a healthy lifestyle is useful. For example, quitting smoking, reducing alcohol consumption, and increasing physical activity, will all have beneficial effects on hypertension, diabetes, obesity and dyslipidemia thereby reducing the risk of another stroke (idem). Stroke survivors who have knowledge on secondary stroke prevention suffer fewer recurrent strokes. There is however also contradictory evidence that awareness and knowledge of secondary stroke risk factors by stroke survivors does not always translate to adoption and implementation of optimal secondary stroke prevention (Bansil, McCall-Brown & Laschiver, 2009; Croquelois & Bogousslavsky, 2006).

Modifiable secondary stroke risk factors, such as blood pressure, physical exercise, smoking, diet, alcohol consumption, and medication compliance, are discussed below to provide some insight into stroke survivors' knowledge and ability to implement relevant lifestyle changes and control these risk factors.

2.4.1 Blood pressure

Hypertension is considered the major modifiable risk factor for stroke. A meta-analysis of seven randomized controlled trials shows that antihypertensive drugs dramatically reduce secondary stroke (RR 0.76; 95% CI 0.63-0.92). These findings imply that blood

pressure should be lowered and monitored almost indefinitely after a cerebrovascular event (Russolillo, Minno, Tufano, Prisco & Minno, 2011).

Hypertension is one of the risk factors stroke survivors can easily identify. Hypertension, hyperlipidemia, and smoking, were identified as risk factors for secondary stroke by 90.0% of stroke survivors compared to other secondary stroke risk factors identified by less than 50.0% of stroke survivors (Sloma, Backlund, Strender & Skånér, 2010).

Control of hypertension seems a significant problem among stroke survivors. A large Swedish population-based cohort study, involving 28,449 participants, revealed an increased hypertension rate of 79.4% among people with a history of previous stroke 7.5 years after enrolment into the study (Joubert, Bustos, Decavel, Chopard, Joubert & Moulin, 2011). A study done by Brenner et al. (2010) reports that stroke survivors were more likely to have unrecognized hypertension (18.7% *v* 13.5%, $p<0.0003$), unrecognized stage 2 hypertension (4.4% *v* 2.2%, $p<0.0006$) compared to control subjects. Stroke survivors were more likely to be treated for hypertension (92.4% *v* 89.0%, $p <0.0001$) compared to control subjects. These results indicate that stroke survivors were more likely to seek treatment for hypertension. Despite this treatment, stroke survivors in the cited study were still more likely to have uncontrolled hypertension (33.3% *v* 30.4%, $p = 0.0074$) and stage 2 hypertension (9.1% *v* 7.6%, $p = 0.017$).

Croquelois and Bogousslavsky (2006) report that an analysis of 109 known hypertensive stroke survivors at the time of stroke showed that blood pressure control was still suboptimal at three months after hospital discharge; an alarming 74 (67.9%) out of 109 still had elevated values. Only 64 (58.7%) of these stroke survivors recollected having been informed that high blood pressure is one of the cerebrovascular risk factors. Only 51 (46.8%) acknowleged high blood pressure as being a cerebrovascular risk factor (idem).

Brenner et al. (2010) argue that hypertensive stroke survivors, with suboptimal blood pressure control, are in such a predicament not necessarily due ignorance but possibly because blood pressure control is difficult to achieve. Some stroke survivors effectively recognise high blood pressure as a secondary stroke risk factor, but unfortunately struggle to manage it. As previously mentioned the findings of a study showed that despite treatment, stroke survivors were still more likely to have hypertension (33.3% vs. 30.4%, p=0.0074) and stage 2 hypertension (9.1 % vs. 7.6%, p=0.017) compared to controls (idem). These findings are supported by Hu (2011).

In a study done by Hu (2011) it was found that 76.7% of the stroke survivors correctly identified hypertension as being a risk factor for cerebrovascular disease. A total 172 hypertensive stroke survivors participated in the study. Only 98 (57.0%) of them took antihypertensive drugs regularly. Despite this 73 (42.4%) of them had hypertension control. The results of this study suggest that knowledge of a risk factor, such as hypertension, does not necessarily imply the ability to control it.

Liu et al. (2011) argue that a stroke survivor ‘s level of education exerts the most important effect on the control of established cardiovascular risk factors. Multivariate analysis showed that education was the strongest associated factor for control of hypertension. Persons with tertiary qualifications had an odds ratio of 2.177 (95.0% confidence interval 1.554–3.048) for control of hypertension. A higher level of education thus appears to have a positive influence on the ability of a stroke survivor to control hypertension. The control rate of hypertension, rate of awareness, and treatment of hypercholesterolemia, also seemed to improve with a higher household income (Liu et al., 2011).

There is paucity of published studies on stroke survivors in Africa. A prospective case control study, involving 80 stroke survivors in Nigeria, revealed that control of hypertension and diabetes mellitus were a significant challenge among this group of stroke survivors. Such challenges exposed them to a higher risk of secondary stroke. Hypertension was found to be more common in the stroke group (82.5%) than in a control group (63.8%) (Amu, Ogunrin, & Danesi, 2005).

2.4.2 Physical activity

Physical activity exerts a beneficial effect on multiple stroke risk factors. A review of studies on physical activity and stroke showed that moderately or highly active persons had a lower risk of stroke incidence or mortality than did persons with a low level of activity. Moderately active men and women had a 20.0% lower risk. Those who were highly active had a 27.0% lower risk. Physical activity also tended to lower blood

pressure and weight. It also enhanced vasodilation, improved glucose tolerance and overall promoted cardiovascular health (American Heart Association, American Stroke Association, 2011).

Approximately 14.0% of stroke survivors achieve a full recovery in physical function; 25.0% to 50.0% will require at least some assistance with activities of daily living; about 50% will experience severe long-term effects, such as partial paralysis (Gordon, et al., 2004). Physical activity after stroke may help to prevent disability and stroke recurrence. Paradoxically physical impairments suffered as a result of stroke may themselves inhibit post-stroke exercise (Damush, Plue, Bakas, Schmid, & Williams, 2007). Physical activity intolerance is therefore a frequently reported characteristic among stroke survivors, especially in the elderly (Gordon, et al., 2004).

Energy expenditure during gait in hemiplegic stroke survivors varies in terms of the degree of weakness, spasticity, training, and bracing. Generally the debilitating motor effects of a stroke can markedly reduce mechanical efficiency and increase the energy cost of walking up to two times that of able-bodied persons (Roth & Harvey, 2000). After a stroke, common household tasks, such as bed making and vacuuming, become associated with considerably greater energy requirements among stroke survivors than among their healthier counterparts (Gordon, et al., 2004).

Collectively, the sheer difficulty of everyday tasks can create a vicious circle of further decreased activity and greater exercise intolerance, eventually leading to secondary complications, such as reduced cardio-respiratory fitness, muscle atrophy, osteoporosis,

and impaired circulation to the lower extremities in stroke survivors. The latter may result in eventual thrombus formation, decubitus ulcers, or both. Furthermore, a diminished self-efficacy, greater dependence on others for activities of daily living, and reduced ability for normal societal interactions, can have a profound negative psychological impact (Gordon, et al., 2004).

It is reported that a large percentage of stroke survivors who receive advice on post-stroke physical exercise and hence are perceived to have knowledge on the importance of post-stroke physical exercise actually implement that advice. According to studies in the United States of America (USA), it was observed that 75.0% of stroke survivors, who receive advice on post-stroke physical exercise, do report actually doing so compared to only 40.0% of stroke survivors who exercise but without having received such advice (American Heart Association, American Stroke Association, 2011).

Overall, the rate of physical exercise uptake by stroke survivors is not optimum. A study among Nigerian stroke survivors reported that 34 (42.5%) admitted to a sedentary life-style, with little or no physical exercise. They had as a result of their sedentary lifestyles a threefold secondary stroke risk compared to controls (OR 3.2, 95.0% CI 1.6 - 6.6; $X^2 = 10.6$, $p < 0.05$) (Amu, Ogunrin & Danesi, 2005).

2.4.3 Smoking

The risk of a stroke increases with the number of cigarettes smoked. People who smoke more than 40 cigarettes per day are considered heavy smokers. They have twice the risk of a stroke compared to light smokers who smoke less than 10 cigarettes per day.

Smoking cessation lowers the risk of stroke significantly within two years after stopping; the risk is reported to reach the level of a non-smoker at five years after smoking cessation (Simon, 2008).

Simon (2008) argues that it takes strong motivation to stop smoking. For instance, an episode of poor health directly related to smoking such as a stroke can be a vital factor in terms of influencing a decision to stop smoking. Simple advice from a general practitioner about smoking cessation results in only 2.0% of smokers stopping smoking and 5.0% more stopping smoking if the advice is repeated (idem).

Smoking is one of the easily identified risk factors for secondary stroke by stroke survivors. It would therefore appear that stroke survivors have good knowledge that smoking should be avoided to prevent secondary stroke.

Among stroke survivors it was however observed that it is not easy to quit smoking. In a group of 94 smokers with ischemic stroke, self-reported smoking cessation rates of up to 37.8% in the minimal intervention group were recorded, and 42.9% in the intensive intervention group after six months of an intervention program (Frandsen, Sorensen, Hyldahl, Henriksen, & Bak, 2012). However, when smoking cessation rates were verified by exhaled carbon monoxide levels in both the minimal intervention group and the intensive intervention group smoking cessation rates plummeted to much lower rates of 28.9% and 32.7%, respectively (idem). In a similar study in China, Ma et al. (2008) reveal that three months after hospital discharge 27.0% of stroke survivors with

atherosclerotic cerebral infarction had not followed the instructions on quitting tobacco smoking.

Amu et al.(2005) report that cigarette smoking among stroke survivors was 11.3% compared to 1.3% among controls. Turanjanin et al. (2011) reported that it is predominantly younger stroke survivors who smoke more compared to their older counterparts. In two study sample groups (n= 60 stroke survivors aged 15-45 years, and n=60 stroke survivors aged 46-75 years) the results show that the younger age group had a smoking rate of 54.2% compared to 25.0% in the older age group (idem).

Based on these studies it seems that there is generally a high prevalence of smoking among stroke survivors. Smoking as a secondary stroke risk factor is further complicated because the rate of smoking cessation among smoking stroke survivors is significantly low.

2.4.4 Diet

Diet can be an influential factor in secondary stroke prevention, especially considering a diet‘s nutritional influence on lipid profile, cardiovascular disease and obesity (Apostolopoulou, Michalakis, Miras, Hatzitolios, & Savopoulos, 2012). Salt restriction, and a low saturated and high polyunsaturated fats diet, seem to be the most important dietary priorities (idem). The powerful effects of statin drugs in lowering the levels of fasting cholesterol, combined with an unbalanced focus on fasting lipids (as opposed to postprandial fat and oxidative stress), have led many physicians and patients to believe that diet is relatively unimportant (Fisher & Lees, 2006). However, a Cretan

Mediterranean diet, which is high in beneficial oils, whole grains, fruits, and vegetables, and low in cholesterol and animal fat, has been shown to reduce stroke and myocardial infarction by as much as 60.0% in four years (idem). The effect of the Mediterranean diet is twice that of simvastatin according to a Scandinavian Simvastatin Survival Study in which a reduction of myocardial infarction was only achieved by 40.0% after six years (idem).

Patient compliance and acceptance of diet modification are generally known to be poor (Harvey, Macko, Stein, Zorowitz, & Winstein, 2008). The diet component that seems to be most difficult to comply with among stroke survivors is reduction of salt intake. In a study to assess salt-free diet compliance among patients with stroke in three Baghdad hospitals in Iraq, the results revealed that salt-free diet non-compliance was as high as 69.0% (Hasan, Hussein & Haji, 2011).

A study was undertaken to investigate dietary habits and food restriction compliance. The study comprised 265 participants (n=168 elderly stroke survivors and n= 97 young patients with first-ever stroke) who had been admitted to a South Korean hospital. The findings were that the frequency of intake of salted food and cholesterol-containing food actually increased. The frequency of fruits and vegetables intake was decreased in young stroke survivors relative to the elderly stroke survivors. In stroke survivors with high economic status or higher levels of education, the frequency of fruits and vegetables was also elevated. Overall, these findings suggest that dietary intake of salt, meat, cholesterol-containing foods, fruits and vegetables, among stroke survivors varies:

age, sex (gender), economic status and the presence of other stroke risk factors could be attributing factors (Park, Kim, Kim, Kwon, & Kwon, 2001).

2.4.5 Alcohol consumption

A complex relationship is believed to exist between alcohol consumption and stroke occurrence (Patra, et al., 2010). This relationship is thought to be dependent on sex (gender), type of stroke, and quantities of alcohol consumed. It is well accepted that heavy alcohol consumption is linked to an increased risk of both ischemic and hemorrhagic stroke; moderate alcohol consumption is reported to have a protective effect (idem).

A study done in the USA concluded that prevalence of alcohol consumption was significantly lower in stroke survivors than in controls (35.5% vs. 60.3%, $p < 0.001$) (Kohsaka, Jin, Rundek, Homma, Sacco & Tullio, 2011). A different study in the USA reported a significantly high proportion of stroke survivors also suffer substance abuse in the form of continued tobacco smoking, irresponsible alcohol consumption, and illegal drug use (Ríos, et al., 2012).

Stroke survivors who consumed alcohol tended to be younger according to a report by Engstad, Viitanen and Arnesen (2003). This is supported by Ríos et al. (2012) who also reported that alcohol abuse is prevalent among young stroke survivors. Furthermore, Ríos et al. (2012) reported that African American stroke survivors tended to ’substance abuse’ more (61.0% vs 51.0%; $P<0.02$) compared to their white counterparts. Male stroke survivors also tended to frequently entertain ’substance abuse’ compared to

female stroke survivors (61.0% vs 47.0%; P < 0.002). Although alcohol consumption is an established risk for secondary stroke, there seems to be no established trend of alcohol consumption among stroke survivors.

2.4.6 Medication compliance

Medication adherence is one of the most topical issues in secondary stroke prevention (National Stroke Association, 2012). It is argued that compliance of taking prescribed medications is central to both recovery post-stroke and secondary stroke prevention (idem). The findings of a study support the argument that stroke mortality is significantly higher among stroke survivors who are non-compliant with their post-stroke medications compared to those who take their medications as prescribed. A study in Canada reported that medication adherence appears to be the major difference among an observed 429 stroke survivors who died within one year of stroke compared to those who survived the one year (Khan, Yun, Humphries & Kapral, 2010).

Failure to take prescribed medication is a major barrier to optimal outcomes in post-stroke management (National Stroke Foundation, 2005). Surprisingly, many stroke survivors acknowledge they do not take their medications exactly as prescribed (National Stroke Association, 2012). Medication non-compliance factors can be classified as survivor-related, medication-related, and condition-related. Survivor-related factors include forgetfulness, treatment anxiety, misunderstood instructions and fear of becoming dependent on medications (idem). Medication-related factors include length of treatment, complexity of treatment and unwanted side effects (idem). Condition-

related factors include co-morbidity, level of disability and severity of the pathology (idem). Factors such as depression, living alone, socioeconomic status, and a total number of baseline medications have been found to not be significantly associated with medication adherence (Khan, Yun, Humphries & Kapral, 2010).

Various studies seem to suggest that over 50.0% of aging stroke survivors on multiple prescription medications acknowledge that they forget to take their medications at varying degrees; some of them habitually (National Stroke Association, 2012). In a study that investigated medication adherence in the elderly population, it was found that there was only 40.0% medication compliance among elderly patients who had been prescribed statin therapy (Latif & McNicoll, 2009). Possible explanations of such a high rate of non-compliance included the sudden added financial burden of a new prescription and or the appearance of side effects soon after initiation (idem).

Sappok et al. (2001) report a ‘rather good’ compliance with secondary stroke prevention in stroke survivors with ischemic stroke at one year after discharge from a stroke unit in Germany. At the end of the first year of the study the proportion of stroke survivors who were compliant both with antithrombotic treatment and medication for secondary stroke risk factors, such as hypertension, diabetes and hyperlipidemia, was evaluated through structured telephone interviews. The results were that 87.6% of the stroke survivors were still on antithrombotic medication, and 70.2% were still being treated with the same agent prescribed at discharge. In terms of those with hypertension, diabetes, and hyperlipidemia, the results were that 90.8%, 84.9%, and 70.2% were still receiving their

treatment for these respective risk factors. Logistic regression analysis revealed stroke survivor age (OR 1.03, 95.0% CI 1.00 to 1.06), stroke severity on admission (OR 1.09, 95,0% CI 1.00 to 1.20), and cardioembolic cause (OR 4.1, 95.0% CI 1.2 to 13.8) as independent predictors of medication compliance (Sappok, Faulstich, Stuckert, Kruck, Marx, & Koennecke, 2001).

The findings by Sappok et al. (2001) seem to be validated in similar studies in Sweden and Canada, namely that post-stroke patients' medication compliance is satisfactory. In a study in Sweden the proportion of stroke survivors who were persistent users of drugs prescribed at discharge from hospital at two years was 74.2% for antihypertensive drugs, 56.1% for statins, and 63.7% for antiplatelet drugs (Glader, Sjölander, Eriksson & Lundberg, 2010). At one year from the initial prescribing of medication, the Canadian study results ranged from 61.8% to 75.8% for stroke survivors' adherence to antihypertensive drugs (Khan, Yun, Humphries, & Kapral, 2010). The Swedish and Canadian studies provide further evidence that medication compliance, to prevent secondary stroke among stroke survivors, is overall satisfactory. In other words it seems that in typical Western societies stroke survivors are generally adherent to their prescribed medications. However, evidence from other similar studies on medication adherence among strong survivors suggest that medication adherence trends are not uniform. A study undertaken in Italy of 631 consecutive stroke survivors discharged on statin therapy, and then followed up for 12 months after the acute ischemic stroke, revealed that within 12 months from discharge 246 patients (38.9%) had discontinued statin therapy (Colivicchi, Bassi, Santini, & Caltagirone, 2007).

Maningat et al. (2013) reported that adverse drug events are cited as the most common cause of statin discontinuation. Adverse drug events would also seem to explain the high rates of discontinuation of statin therapy reported in some studies (Colivicchi et al., 2007; Latif & McNicoll, 2009). Statin therapy intolerance is an explanation that is however refuted by Jackevicius and Mamdani (2002). They argue that given the known tolerability of statins' non-adherence to statin therapy cannot be explained by this claim. A plausible explanation is that stroke survivors, particularly those without coronary artery disease, may perceive no immediate benefit and thus discontinue statin medication without appreciating the long-term consequences of their actions (idem).

An African study on medication compliance among stroke survivors revealed new challenges pertaining to post-stroke medication compliance. Such challenges were parallel and competing healing practices used by stroke survivors: seeking help from traditional healers and churches, for example. In a study of 103 stroke survivors in rural South Africa it was found that out of the 73 (71.0%) who had hypertension only 8 (8.0%) were taking anti-hypertensive treatment. Despite having been prescribed anti-hypertensive medication after stroke, many of these stroke survivors were reluctant to use the medication partly due to ignorance regarding antihypertensive medication therapy. Other barriers to medication compliance reported by stroke survivors included cost of treatment, difficulties with access to drugs, and lack of equipment to monitor blood pressure. A negative attitude to allopathic care was not a significant factor despite that 42 (40.8%) of the stroke survivors had also sought help from traditional healers (SASPI Project Team, 2004).

Three robust study reviews found only modest effects for interventions to improve adherence with medications in people with chronic illness, although the interventions were not tested specifically in the stroke population. To improve medication compliance the following was found to be beneficial:

- simplification of drug dose regimens
- information provision or education of medication users
- motivation of medication users
- counseling of medication users
- family therapy and improved support
- use of reminders.

Education alone, or informing people about adverse drug effects, was found not to change adherence significantly. The use of multi-compartment medication compliance devices was reported to be useful in promoting adherence among non-adherent diabetic adults living at home: no benefits were noted for those with hypertension (National Stroke Foundation, 2005).

The global effect of stroke on an individual's health should always be considered when proffering solutions. Specific interventions could be required for particular problems after stroke: difficulties in opening medication containers due to loss of hand function or difficulties with cognition and perception, for example. A self-management care plan could also be useful for optimising concordance with medications for secondary stroke prevention (National Stroke Foundation, 2005).

2.4.7 Treatment of other underlying causes for secondary stroke

Certain disease, such as diabetes mellitus, carotid stenosis, and atrial fibrillation, have been proved by research to be precursors of a stroke. In the USA for instance a prevalence of 15.0% to 33.0% of diabetes mellitus was found in patients with ischemic stroke. Diabetes mellitus also appears to be an independent predictor of recurrent stroke: population-based studies indicated that 9.1% of secondary strokes have been estimated to be attributable to diabetes (idem). Diabetes mellitus has been shown to be a reliable predictor of the presence of multiple lacunar infarcts by other stroke studies (American Heart Association, American Stroke Association, 2011).

Atrial fibrillation is a major cause of cardio-embolic stroke: it is responsible for about 15.0% of all strokes in the USA (Russolillo, Minno, Tufano, Prisco, & Minno, 2011). Patients diagnosed with atrial fibrillation have a four to five fold increased risk for a stroke with an overall incidence of 4.5% per year (idem). Carotid endarterectomy and medical treatment among patients with 70.0% stenosis or greater, but without near occlusion, were shown to provide up to 16.0% absolute-risk reduction or 61.0% relative-risk reduction of a stroke over five years (American Heart Association, American Stroke Association, 2011). Treatment of diabetes mellitus, carotid stenosis, and atrial fibrillation, among stroke survivors may therefore help to prevent secondary stroke.

Sloma et al. (2010) reported that stroke survivors who had a family history of cardiovascular disease, and stroke survivors who had diagnoses of carotid stenosis, atrial fibrillation and or diabetes prior to their stroke event showed better awareness that the

diagnoses were stroke/ TIA risk factors compared to stroke survivors without these conditions. Furthermore, atrial fibrillation or, a family history of cardiovascular disease, seems to be associated with a better knowledge about other secondary stroke risk factors (idem).

Although stroke and TIA survivors require optimal treatment of vascular risk factors Brenner et al. (2010) reported that undiagnosed hypertension and diabetes are highly prevalent among stroke survivors. Nearly one-fifth of stroke and TIA survivors had unrecognized hypertension, 4.4% had unrecognized stage 2 hypertension, and 4.2% had unrecognized diabetes (idem). Furthermore, rates of unrecognized risk factors were higher in stroke/TIA survivors versus stroke-free participants: stroke survivors were twice as likely to have unrecognized stage 2 hypertension versus stroke-free control subjects (idem).

Factors found to be associated with increasing rates of unrecognized hypertension are increasing body mass index and lower levels of education (Brenner et al., 2010). Their findings concur with those of Hu (2000) who underscored that school and tertiary education levels play a significant role in a stroke survivor‘s ability to recognise and control secondary stroke risk factors. Evidence also suggests that an association exists between lower income and unrecognized dyslipidemia and lower treatment rates of stroke risk factors overall (Brenner et al., 2010).

Poor awareness of underlying causes of secondary stroke among stroke survivors is often blamed for the subsequent suboptimal control of cerebrovascular risk factors

among them. A report on stroke survivors three months after hospital discharge showed that only one third had visited a specialist or a general practitioner to help them control their risk factors or manage underlying conditions. Only 38 (34.9%) of the 112 cardiac patients visited a cardiologist; eleven (27.5%) of the 40 cigarette smokers attended a smoking cessation programme and seven of the 27 diabetic patients (25.9%) visited a diabetologist following their primary stroke. The mean number of general practitioner visits per month was 0.62 (range, 0– 4.21) with 44 (26.8%) stroke survivors having not visited their general practitioner since their discharge from hospital (Croquelois & Bogousslavsky, 2006).

A clinical trial on known diabetic African American stroke survivors found that 33.0% of the subjects had serum glucose level of ≥200 mg/dL, 48.0% of the subjects had blood pressure of ≥140/90 mm Hg on clinical examination, and only 30.0% of the treated subjects had a blood pressure under 140/90 mm Hg. Despite the reported use of a lipid-lowering agent in 43.0% of the subjects known to be hypercholesterolemic, it was found that 38.0% of them had a cholesterol level of ≥240 mg/dL (Ruland, Raman, Chaturvedi, Leurgans & Gorelick, 2003). The results of this clinical trial provide further evidence that control of cardiovascular disease and secondary stroke risk factors is suboptimal among some stroke survivors.

Most studies allude to a suboptimal management and or control of secondary stroke risk factors, such as hypertension, diabetes and dyslipidemia among stroke survivors. Similarly some stroke survivors continue with their adverse lifestyles such as cigarette

smoking, consuming alcohol, and not physically exercising thereby predisposing themselves to a higher risk of secondary stroke. Knowledge of a risk factor for secondary stroke seems to have some positive effect on a stroke survivor's ability to address that risk factor. This highlights the importance of improving stroke survivors' awareness and knowledge on secondary stroke risk factors.

2.5 Educational strategies for secondary stroke prevention

Educating stroke survivors is an essential component for achieving successful outcomes of rehabilitation and secondary stroke prevention irrespective of where patient care is dispensed: hospital inpatients to outpatients; nursing home to home settings, for example (Pierce, 2010). Stroke management teams are challenged to adequately educate stroke survivors and their families prior to discharge (idem). Stroke health education is becoming increasingly more important as length of hospital stay for patients has shortened over time (idem). Furthermore, a significant proportion of stroke survivors are dependent on informal caregivers, often family members who feel inadequately trained and poorly informed (Kalra, 2004).

When developing educational strategies for stroke survivors and their caregivers, health professionals should consider a wide range of factors. For example,

- general patient status
- readiness of the stroke survivor to learn
- severity of the primary stroke and complications
- level of consciousness and cognitive impairment,

- visual and motor impairment
- speech and language impairment
- memory changes (retention)
- patient and caregiver circumstances (Morill & Pinzon, 2009).

2.5.1 Once-off versus routine education sessions

Information provision and health education of the stroke survivor are both considered critical at all stages of rehabilitation and recovery (National Stroke Foundation, 2005). Effective communication, education and information sharing should be provided in an appropriate and timely manner (idem). This is especially so considering that stroke survivor information needs for secondary stroke prevention are known to change over time (Hanger, Walker, Paterson, McBride, & Sainsbury, 1998).

A meta-analysis study on stroke studies done in the United Kingdom revealed that there is evidence to support routine provision of information to stroke survivors and their families as being an effective way for stroke health education. It was also recommended that strategies which actively involve patients and caregivers should be used in routine practice (Smith, Forster, & Young, 2009).

Secondary stroke prevention health education is meant to change behaviour, empower survivors and thereby prevent illness progression, complications and recurrence. An acute stroke causes multiple stresses, making it difficult for the stroke survivor to retain information provided to them whilst in the acute period. Similarly, during rehabilitation many people are unable to retain and process information due to reduced concentration,

anxiety, depression and tiredness. Single one-off education sessions may therefore inevitably fail in these settings. Learning is an evolving process: sequential sessions that offer 'learn-practise-learn' opportunities are considered more effective than single sessions (Hanger & Wilkinson, 2001).

It is however rather ironic that many stroke health educational programmes are hospital-based, yet this is the time when stroke survivors are least able to retain information. Secondary stroke prevention health education should ideally start during the acute phase and must then continue well beyond a stroke survivor's return to the community (Hanger & Wilkinson, 2001).

2.5.2 Stroke education packets

Health institutions (hospitals) are encouraged to use a standardized discharge education packet, together with other stroke-related information, to educate stroke survivors and caregivers on secondary stroke prevention (Virginia Department of Health, 2012). In the stroke education packets, secondary stroke risk factors and interventions should be highlighted. Stroke survivors and their caregivers should be made aware of the following information.

- smoking cessation through nicotine replacement therapy and behavioural therapy
- improved diet, specifically diet that is low in fat and sodium, but high in fruit and vegetables should be consumed, potassium supplements may be used
- increase regular physical exercise

- avoidance of excessive alcohol
- medications concordance follow-up details after hospital discharge (Virginia Department of Health, 2012).

Stroke health education packets can also be in the form of flyers on selected topics: "What to teach your stroke survivor/family", for example. The flyers should be available in stroke units or placed on brochure racks in hospital family waiting areas (Morill & Pinzon, 2009).

Stroke education packets are known to improve accessibility of stroke health information. In addition to addressing common barriers to patients and caregivers, health education stroke education packets can serve to address several issues: lack of time on the part of health professionals due to increased functions of health professionals and increased patient loads of sicker patients, inter alia (Morill & Pinzon, 2009).

A common pitfall however with stroke health education packets is that often general information may be provided at the expense of specific information which could be of more importance to the stroke survivors or caregivers (Tooth & Hoffmann, 2004). Alaszewski et al, (2008) report that some stroke survivors complain that the stroke health education information they receive is too generic and not tailored to their individual situations. For example, general advice to do exercise in a stroke health education packet does not clearly indicate how that would relate to the stroke survivors' particular circumstances and how strenuously they should do the exercise (idem). For

this reason there should be an attempt to individualise interventions proffered to stroke survivors in stroke health education packets (National Stroke Foundation, 2005).

There are mixed study findings on which method is more effective: personalised versus generic stroke health education packets. In some of the studies no significant differences were observed in behavioural change by stroke survivors relative to the contained individualised information about symptoms, rehabilitation aims, and activities of daily living. In other studies half of the stroke survivors felt that an individualised stroke health education packet was useful. One shortcoming noted by those who felt they were not useful was that there could have been a change in the stroke survivor's condition since receiving the health education packet thus the packet lost relevance (Rodgers, Bond & Curless, 2001).

2.5.3 Oral education versus written materials

Health professionals frequently rely on oral education to teach stroke survivors and their caregivers important components of care and other basic information about stroke (Pierce, 2010). Reports, however, suggest that stroke survivors retain only about 20.0% of what they hear (Mansoor & Dowse, 2003). Written materials strengthen or augment these verbal directives and have the potential to improve both the stroke survivors and caregivers' knowledge and confidence as well as increase their participation in healthcare decisions, and ultimately encourage adherence to the treatment plan (Pierce, 2010). Written materials also offer message consistency, aid information recall, and further clarify information or instructions provided verbally (idem). Written education

materials should be used as an adjunct rather than a substitute for verbal education since the former can be subsequently referred to when reinforcement is needed (idem).

A point to consider is that stroke survivors and caregivers must be able to read and understand the content of written materials (Pierce, 2010). Stroke survivors should be health literate to understand any kind of health education. Health literacy is the ability to obtain, process, and understand basic health information and services needed to make appropriate health decisions and follow instructions for treatment. Many factors can contribute to an individual's health literacy; the most obvious being the person's general literacy, the ability to read, write, and understand written words and numbers. However, other factors can also impact health literacy, such as the person's experience in the health care system, the complexity of the information being presented and how the material is communicated. Furthermore, cultural factors may also influence decision-making (Delta States Stroke Network, n.d).

Most written materials are on the eleventh grade level (Morill & Pinzon, 2009). The average reading level of the public is rated around the seventh to the eighth grade level (idem). In the USA in particular, surveys have shown that nearly half of American adults read at basic levels, and that 20.0% of USA adults actually read below a fifth grade level (Delta States Stroke Network, n.d). The cohort of the population that read below a fifth grade level generally find it hard to read pamphlets or booklets, directions on a bottles of medicine, or the explanations for a food exchange list or other nutritional guidelines (idem).

A study done in Australia to ascertain the suitability of stroke health education materials revealed that written education materials for stroke survivors and their caregivers had a mean readability level of a grade 9 level, higher than recipients' mean reading ability of grade 7 - 8 (Eames, McKenna, Worrall, & Read, 2003).

Adding further to the reading level conundrum is that individuals have a preference for learning styles: fifty-five percent of people are visual learners (pictures, written, video), 30.0% are kinaesthetic (demonstration, "hands-on") and 15.0% auditory (rely on verbal narrations to learn). Given the aforementioned learning-styles distribution, it raises doubt whether stroke survivors and their caregivers even understand the written materials they receive from stroke management teams. Healthcare providers should therefore strive to communicate in a broad range of formats of stroke awareness messages to suit the wide variety of stroke survivor audiences (Delta States Stroke Network, n.d).

2.5.4 Access to stroke health information for stroke survivors

Accessibility to stroke health information in the context of this study refers to how easy it is for stroke survivors get and understand stroke health education information. The World Health Organization advocates that all patients should have a right to receive information about their health condition that is factual, easy to understand, accurate, and appropriate to their needs (Knight, Worrall & Rose, 2006). Stroke survivors and their caregivers have three needs: to be informed about all aspects of care; to be involved in

decisions; and to be provided with all the information they require about stroke care-giving (Rodgers, Bond & Curless, 2001).

Inadequate information sharing and poor communication in some hospitals, and post discharge settings for stroke survivors have been identified as major areas of dissatisfaction by stroke survivors and their caregivers (Pierce, 2010). As a result stroke survivors tend to repeatedly ask the same question as a way of probing for the information they desire to get and grasp. This persistent quest for information at a later stage could be a symptom suggestive of stroke health education offered to stroke survivors possibly at the wrong time for these individuals (Hanger & Wilkinson, 2001).

Various sources of information for stroke survivors have been identified by way of interviewing stroke survivors themselves. Stroke survivors report that stroke management teams, peers, family, and community members constitute common sources of stroke-related information. Community organisations, written information, and mass media were also identified as important sources of information. Self-search information, personal and shared experiences also contribute to stroke survivors' body of knowledge regarding stroke (Cunningham, 2003).

Stroke management teams are arguably stroke survivors' most significant source of information (Moore, Maiocco, Schmidt, Guo & Estes, 2002). Stroke survivors report that when health education information is provided face-to-face in an understandable way, with supporting materials and in an open manner, they appreciate it better and

often this results in a better experience for both stroke the survivor and caregiver (Eastern Health & Social Services Council, 2007)**.**

Although various stroke management team members are referred to as a source of information: nurses appear to play a key role in information provision issues (Moore, Maiocco, Schmidt, Guo & Estes, 2002). It has also been reported that expanding a specialist nursing role to provide outreach education and support to stroke survivors and caregivers after discharge from hospital can be effective in promoting stroke recovery and rehabilitation (Burton & Gibbon, 2005).

Most people tend to view doctors as a natural source of health information: some individuals however question whether health education should still remain part of a doctor's role. Some stroke survivors believe that doctors lack time to address their concerns. Many stroke survivors indicate that they did not want to 'bother' their doctor with their questions (Moore, Maiocco, Schmidt, Guo & Estes, 2002).

Other stroke management team members are also often perceived as too busy or not available to answer the questions of stroke survivors and their caregivers. Often the explanations they give are deemed too complicated by the stroke survivors or simply do not address their personal concerns. Stroke management team members do not realise that stroke survivors often feel reluctant to ask questions partly due to these cited concerns (Rodgers, Bond & Curless, 2001).

There are certain steps that can be used by stroke management teams as a guide in information provision. Firstly, information should be provided promptly and in an

ongoing manner to reinforce what has been communicated and to update as circumstances change. The need for ‘check-points’ and to recap information should be considered important throughout. Secondly, when possible, information should be given on a one-to-one basis in a private area and not in the middle of an open ward. Some health professionals unfortunately talk to patients in front of them but not ‘to’ them: when talking to a patient, health professionals should directly address that particular patient (stroke survivors and caregivers). Thirdly, health professionals (stroke management team members) should avoid the use of medical jargon and should ensure that information is kept simple and in layperson terms. Equally important is that it is best to try to give a balanced view of both the worst and best case scenarios on recurrence of stroke (Eastern Health & Social Services Council, 2007).

The following are examples of key areas where information to stroke survivors and or their caregivers should be provided as a minimum:

- to explain clearly what a stroke is and what the diagnosis actually means
- what caused the stroke and what the prognosis is
- to explain what could be potentially wrong with a patient in circumstances where it is not possible to give a definite diagnosis
- to explain why things were or were not happening (for instance not being given a drink)

- to explain why certain tests are being carried out, for example scans and blood tests
- how to prevent further strokes
- what community services are available to stroke survivors
- to offer advice about financial support and benefits (Eastern Health & Social Services Council, 2007).

Individual facilities caring for stroke survivors tend to develop their own health education materials. As in other areas of healthcare, stroke health education information is often based upon what health professionals think stroke survivors and their caregivers want to know. This approach to patient health education is predominantly passive in nature and does not engage stroke survivors and or their caregivers in active learning and problem solving. It is also debatable whether this approach to health education addresses those issues that are important to stroke survivors and caregivers. Furthermore, the acceptability and readability of health education materials is often not evaluated (Rodgers, Bond & Curless, 2001)

Occupational therapists are encouraged to assess and address stroke survivors' informational health needs and identify their preferred formats for receiving their health education material. Readability assessments of stroke health education material should be done if written information is provided (Tooth & Hoffmann, 2004).

Using a range of different education and information resources in various formats (video, audio, written, picture) should be considered to improve the effectiveness of information delivery to stroke survivors and their caregivers (Cunningham, 2003). The use of props, scans, drawings and charts by the stroke management team to explain information about stroke is also well appreciated by stroke survivors (Alaszewski et al., 2008). An assessment of such information provision preferences should however be made and relevant information delivery techniques then used (idem).

Hux et al, (2000) urge public health authorities to consider the use of newspapers, radio, and television as a means of delivering stroke health education and awareness messages. Findings from a systematic review on mass media interventions however warn that although such campaigns aimed at the public may raise awareness of symptoms/ signs of stroke they generally have a limited impact on behavioral change (Lecouturier, Rodgers, Murtagh, White, Ford & Thomson, 2010). Public awareness of stroke warning signs tended to decline during advertising black-outs making short campaigns less effective (Hodgson, Lindsay & Rubini, 2009). Long, intermittent mass media campaigns were preferable and recommended (idem).

The internet is a valuable source of information for stroke survivors and caregivers. When stroke survivors fail to get the information they want from stroke management teams they often access the internet for information. The biggest letdown though with the internet is the variability in the quality of information. A survey of stroke survivors on their usage of internet-based information indicated that their selectivity of internet-

sourced information related partially to their perceived quality of that information and also to its acceptability (Alaszewski, King, Alaszewski & Potter, 2008).

Access to a telephone hotline is a popular stroke health information delivery style favoured by stroke survivors (Eames, McKenna, Worrall & Read, 2003). Stroke survivors indicated that they preferred to receive notices of community services or programmes related to stroke via the telephone (Cunningham, 2003).

A study designed to explore preferences for information delivery style on four topic categories showed that both stroke survivors and their caregivers seem to prefer delivery styles that are a mix of active and passive delivery of information across all topics. The specific health education format preferences shown were a combination of face-to-face, written and telephone for both stroke survivors and caregivers prior to discharge. At three months post-discharge the preference combination for stroke survivors changed to face-to-face, written and alternative formats of online and audiovisual information. On the other hand there was no change in the caregivers' format preference combination at three months after hospital discharge. From this evidence it can be argued that an assessment of stroke survivors' information provision format preferences should be done routinely (Eames, McKenna, Worrall & Read, 2003).

It is estimated that one third of stroke survivors acquire aphasia as a result of their stroke. Aphasia is a language impairment that may interfere with a person's ability to express and understand language as well as the ability to read and write. Unfortunately these are the very skills that enable stroke survivors to participate effectively in

receiving and requesting health information. Researchers have tried to provide some insight into the lives of people with aphasia. At various stages of recovery it was found that 'blocked' access to health information is a major issue for people with aphasia; this makes them feel that 'everything seemed a secret'(Knight, Worrall & Rose, 2006).

The health information needs of people with aphasia are not considerably different from those of stroke survivors without aphasia. It is also important to appreciate that the health information needs of the former can differ from patient to patient. Health information provision practices for stroke survivors with aphasia should therefore take into account individual needs. This implies accounting for language difficulties that may be interfering with a person with aphasia's ability to access health information. Lack of patient inquiry should not necessarily be interpreted as an indication of lack of interest or need. It is also important for the stroke management team to check stroke survivors' understanding of information instead of waiting for them to indicate a need for more information (Knight, Worrall & Rose, 2006).

Studies indicate that, significantly less time is actually spent on information provision when communication occurs between health professionals and stroke survivors. One study documented that as little as 17.5% of 'communication' time was spent providing health information. For stroke survivors with aphasia even less information was received; far less time was spent explaining the information and fewer topics on secondary stroke prevention were covered (Knight, Worrall & Rose, 2006).

2.6 Secondary stroke prevention challenges

Evidence that secondary stroke prevention among some stroke survivors is suboptimal is illustrated by the fact that approximately 25.0% of people who recover from their first stroke will have another stroke within five years (Schoenstadt, 2006). Secondary stroke prevention is beset by numerous challenges; most are related to both the stroke survivors and the stroke management teams.

2.6.1 Stroke survivor related challenges

Secondary stroke can be the result of poor treatment adherence by stroke survivors. The ability to control risk factors for secondary stroke by a significant proportion of stroke survivors is less than satisfactory as revealed by some study findings (Ma et al., 2008; Warner et al., 2010).

Blood pressure lowering is an indisputable effective means to prevent a first-ever stroke. It has regrettably taken longer to prove that blood pressure lowering is equally effective for the prevention of secondary stroke. Despite this knowledge, blood pressure levels are controlled in less than 25.0% of the hypertensive stroke survivors worldwide. The real challenge therefore is to implement novel and effective strategies for the control of blood pressure and other cardiovascular risk factors. These strategies should ideally encompass behavioural lifestyle measure changes: stopping smoking, increasing physical exercise, and reducing body weight, for example. Other new strategies to lower overall cardiovascular risk could include the development of single-pill combinations of drugs of known efficacy. The non-availability of single-pill combinations for

hypertension currently could possibly be contributing to challenges in secondary stroke prevention (Chalmers & Chapman, 2001).

Patients diagnosed with a stroke often present with multiple co-morbidities. This presents a challenge regarding optimal management and controlling of predisposing factors of secondary stroke. The results of a study of 224 stroke survivors, who presented with ischaemic stroke and transient ischaemic attack, revealed that as much as one-third of them had concurrent abnormal glycaemia, hypertension and dyslipidemia. Abnormal glycaemia was in fact present in almost half of those with ischemic stroke. What was of concern was that the majority of these co-morbidities were undiagnosed thus were not being actively treated (Scott, et al., 2010).

Aging is another characteristic feature of stroke survivor cohorts. Advanced age predisposes stroke survivors to a higher risk of experiencing secondary stroke. Another inherent characteristic of an older population is that they also have multiple co-morbidities. Special considerations almost always have to be made between secondary stroke prevention treatments and the impending possibility of causing another stroke secondary to such treatments. Neurologists are often faced with paradoxical decisions: weighing the risk of recurrent ischemia versus bleeding in patients taking antiplatelet or anticoagulant therapy. Peri-procedural complications also appear to be high in carotid angioplasty and stenting, and carotid endarterectomy in older patients with carotid stenosis. Other common medical challenges in managing aging stroke survivors include adverse drug events, recognizing the risk of dementia, depression, osteoporosis, and

ultimately deciding when to discontinue secondary stroke prevention (Bushnell & Colón-Emeric, 2009).

2.6.2 Stroke management team related challenges

Challenges with secondary stroke prevention often arise at the transition points of patient care (Heart and Stroke Foundation of Ontario, n.d). Secondary stroke prevention appears to be not well integrated and coordinated across the continuum of care (idem). It is reported that communication gaps between neurologists and principal care physicians are common (Ewer, 2012). There is also a tendency of lack of ownership in patient management directives and, at times, conflicting preferences as to the specific management of the stroke survivor between these specialties (Ewer, 2012; Swarztrauber & Vickrey, 2004). Understanding the respective mutual roles and responsibilities of physicians who manage a stroke survivor is important to assure good patient care (Swarztrauber & Vickrey, 2004).

Even though study results reveal that effective long-term risk factor management can reduce the risk of recurrent stroke by around 70.0-80.0% through the implementation of simple best practice guidelines, secondary stroke prevention measures remain frequently sub-optimally implemented in stroke survivors (Joubert, Bustos, Decavel, Chopard, Joubert & Moulin, 2011). It is alleged that a significant proportion of physicians caring for stroke survivors fail to implement guidelines on secondary stroke prevention (Ma, et al., 2008). A study in the USA revealed that 67.0% (n= 53,829) of nursing home stroke survivors were not receiving therapy (defined as antiplatelet or anticoagulant) for

secondary stroke prevention despite qualifying for such treatment (Quilliam & Lapane, 2001). According to Ma et al. (2008) the findings of a similar study in China, on secondary stroke risk factor management were: despite qualifying for certain drug therapy after 90 days post-hospital discharge, 26.9% of stroke survivors had not been prescribed anti-platelet agents; 52.6% had not been prescribed statins; and 59.4% had not been prescribed antihypertensive medications.

A combination of factors could explain doctors under-prescribing cardiovascular medications and sub-optimally managing risk factors for secondary stroke prevention. Such factors could be lack of awareness or familiarity with guidelines, low motivation and low outcome expectancy and inability to reconcile guideline recommendations with patient preferences. Other notable factors include physician inertia, insufficient time and resources. Physicians also tend to frequently underestimate a patient's actual cardiovascular risk (Gorelick & Testai, 2009; Tyson & Turner, 1999).

Lack of tools and resources have also been identified as a potential impediment to the successful prevention of secondary stroke (Ewer, 2012). Shortage of health professionals can exacerbate the situation because often there is not sufficient time to devote to secondary stroke prevention activities (Tyson & Turner, 1999).

The large numbers of stroke survivors alone as well as the overall burden of stroke at times simply overwhelm healthcare systems: secondary stroke prevention is as a result compromised. The annual stroke incidence in England is cases well above 100 000; three-quarters are over the age of 65 years. These stroke survivors return to the

community and every medical practice in the United Kingdom has a median prevalence of 14.7 patients who have had a stroke or transient ischaemic attack per 1000 patients registered. This figure is set to rise further as the population ages and people survive in a disabled state for longer (Simon, 2008).

2.7 Summary

A review of literature on awareness of stroke recurrence among stroke survivors, knowledge and practices of stroke survivors regarding secondary stroke prevention, strategies for educating stroke survivors and challenges around secondary stroke prevention, were discussed. There is evidence that awareness of stroke recurrence among stroke survivors increases the likelihood of adopting a secondary stroke prevention strategy. Most studies seem to suggest that a significant proportion of stroke survivors do not acknowledge that having a stroke predisposes them to more future strokes. In addition, risk factors for secondary stroke, most of which are either treatable or avoidable, are highly prevalent among stroke survivors. The uptake of secondary stroke prevention strategies among stroke survivors with poor knowledge regarding stroke recurrence is low. The suitability of educational information made available to stroke victims is debatable in terms of content, format, and timing of provision. There also seems to be a number of challenges plaguing secondary stroke prevention; the majority of which are related to either stroke survivors or stroke management teams.

The next chapter describes the research design and methodology used in this study.

CHAPTER 3

3. RESEARCH METHODOLOGY

3.1 Introduction

Chapter 2 provided an overview of the literature review and conceptualisation of the study. The purpose of this study was to determine the knowledge and practices of stroke survivors with regard to secondary stroke prevention. This chapter focuses on the research design and methods used in the study. The following are discussed: quantitative, descriptive and explorative study design; study population, sample and sampling; instruments for data collection; procedures for data collection; and data analysis.

3.2 Research design

"A research design is an act of logical steps taken by the researcher to answer the research question. It forms the 'blueprint' of the study and determines the methodology used by the researcher to obtain sources of information such as subjects, elements and units of analysis, to collect and analyse the data and to interpret the results" (Brink, 2006, p. 96). Yin (2003) as cited by Tappen (2011) argues that a research design is the logical sequence that connects the empirical data to a study's initial research questions

and ultimately its conclusions. An explorative, descriptive design with a quantitative approach was used to conduct the study.

Quantitative research studies aim to quantify attitudes or behaviours, measure variables on which they hinge, compare and point out correlations (Kirch, 2008).The goal of quantitative methods is to determine whether the predictive generalisations of a theory hold true (Child Health and Nutrition Research Initiative, n.d). A quantitative design was chosen for this study because the researcher wanted to determine the stroke survivors' type of knowledge and their practices with regard to secondary stroke prevention. Information sources for stroke survivors, and challenges facing stroke survivors with regard to secondary stroke prevention would also be determined.

A descriptive research design was chosen for this study to allow for measurement, recording, and description of variables accurately from a representative sample (Mitchell & Jolley, 2010). A descriptive design does not necessarily tell whether one variable causes changes in another; it may however suggest cause and effect hypotheses (idem). Descriptive designs are also used in studies where more information is required in a particular field through the provision of a picture of the phenomenon under investigation (Brink, 2006). In this study the stroke survivor education practices of the Katutura State Hospital's stroke management team with regard to secondary stroke prevention are described. In addition, the knowledge, practices and challenges of the stroke survivors with regard to secondary stroke prevention are also described.

Explorative research is necessary when little is known about the topic being investigated (Blaikie, 2009). Explorative research is more like detective work: it involves a search for clues to reveal what is happening or what happened (Clow & Stephens, 2009). Exploratory research is often employed as the first step in a multi-part research project (Macnabb, 2008). Exploratory studies are usually small-sample designs used primarily for gaining insights and ideas about research problems and variables associated with such problems (idem). In this study knowledge, practices, and challenges of stroke survivors with regard to secondary stroke prevention are explored with the use of a structured closed and open ended questionnaire for face-to-face interviews. A self-administered structured closed and open ended questionnaire was used to obtain data on the stroke survivor health education practices of the Katutura State Hospital's stroke management team.

3.3 Research method

In this section the study population and sample are presented. In addition, the sampling technique is described.

3.3.1 Population

A study population is the "entire group of persons or objects that is of interest to the researcher or the criteria which set the boundaries with regard to the elements or subjects" (Brink, 2006, p.123).There are two separate populations in the study: (i) the stroke management team of the Katutura State Hospital which consisted of one neurologist, one neurology medical officer, nine stroke unit nurses, five social workers,

four physiotherapists, two occupational therapists, one hospital dietician and six pharmacists, and (ii) the population group of stroke survivors resident in the Khomas region who were discharged from the Katutura State Hospital between 1 January 2012 and 31 December 2012. In situations where a stroke survivor could not be interviewed due to their pathology, their caregiver were interviewed in their place.

3.3.2 Sample and sampling

A sample is part or fraction of a whole or a subset of a larger set, selected by a researcher to participate in a research study (Brink, 2006). Sampling is the process of selecting an adequate sample size from a population of interest so that by studying the sample we may fairly generalize our results back to the population from which they were chosen (Glasow, 2005).

For the stroke management team population group, a simple random sampling technique was used to draw a representative participant from each of the eight professional categories referred to in the population description as the stroke management team. Simple random sampling is a type of probability sampling in which the units composing a population are assigned numbers (Babbie, 2010). A set of random numbers is then generated and the units with those numbers are included in the sample (idem). Random sampling can obviously not be done where there is only one incumbent for a professional category. This was the case in this study as the population only comprised one neurologist, one neurology medical officer, and one dietician. They were thus automatically chosen as respondents to represent their respective professional categories.

The population and sampling of the Katutura State Hospital's stroke management team is presented in Table 3.1.

Table 3.1: Population and sampling of the Katutura State Hospital's stroke management team

Stroke management team member	**Population (N)**	**Sample (n)**	**Percentage (%)**
Neurologist	1	1	100.0
Neurology medical officer	1	1	100.0
Stroke unit nurse	9	1	11.1
Social worker	5	1	20.0
Physiotherapist	4	1	25.0
Occupational therapist	2	1	50.0
Hospital dietician	1	1	100.0
Pharmacist	6	1	16.6

For the stroke survivors' population group (N=72) no sampling was done. Identified case files were retrieved from the Katutura State Hospital's Health Information System. Relevant information on the retrieved files was recorded on the medical records data extraction form (Annexure A). Recording such information was done for confirmatory and follow-up purposes, respectively. All 72 stroke survivors met the inclusion criteria in terms of:

(i) their domicile details (Khomas region) in their retrieved medical records (case files), and

(ii) their discharge dates from Katutura State Hospital, i.e between 1 January 2012 and 31 December 2012. They were all followed up for recruitment and participation in the study.

Only 60 of the 72 identified study population were traced and interviewed. The stroke survivor sample was therefore n=60 (83.3% of the population of N=72). The other 12 stoke survivors could not be traced: their addresses or phone contacts provided at the time of their hospitalisation were invalid; they had either relocated from the Khomas region or were deceased at the time of the study.

3.4 Data collection instruments

Three instruments were developed to derive data variables of interest from the Katutura State Hospital's stroke management team and the stroke survivors, namely

(i) a medical records data extraction form (Annexure A)

(ii) a stroke management team questionnaire (Annexure B)

(iii) an English language stroke survivor questionnaire interview schedule (Annexure C).

To cater for both cultural and linguistic diversity of the Khomas region, Annexure C was translated into Oshiwambo and Afrikaans (Annexures F and G). Back translation by professional translators was done to ensure interpretation of questions and meaning did not differ across the three stroke survivor questionnaire interview schedules. The said

translation is a quality control approach advocated by the World Health Organisation which is meant to achieve precise and comparable transfer of meanings across languages in health studies (Ozolins, 2009).

The medical records data extraction form (Annexure A) was developed to extract relevant data from the stroke survivors' respective medical notes that were filed and retained by the Katutura State Hospital's Health Information System department. The use of existing records is an acceptable source of research data especially existing medical records for researchers in health (Polit & Beck, 2004).

Variables of interest of the stroke survivors were:

- date of hospital discharge or time period after hospital discharge
- confirmed diagnosis or diagnoses at time of hospital discharge (especially that of stroke)
- name
- residential address of the patient (stroke survivor)
- and telephone contacts if available.

The patient's name, residential address and telephone contacts were important to enable follow-up of each stroke survivor for recruitment and participation in the study.

A mixed type (close-ended and open-ended questions) self-administered questionnaire was developed to gather data from the Katutura State Hospital's stroke management team. A questionnaire is any written instrument that presents respondents with a series

of questions or statements to which they are to react either by writing out their answers or selecting from among existing answers (Dornyei & Taguchi, 2010). The following were included as questions in Annexure A.

- respondent's designation and specific role in the prevention of secondary stroke
- availability and use thereof of guidelines or protocols for health education of stroke survivors
- documentation of stroke health education
- frequency of stroke health education
- extent of third party involvement in stroke health education
- preferred approaches for stroke health education
- availability of information, education, and communication (IEC) material for secondary stroke prevention
- adequacy of stroke health education
- challenges encountered during secondary stroke prevention.

Face-to-face interviews were utilised to collect data from the stroke survivors. A face-to-face interview (also known as a standardised interview) is a data collection technique normally used in quantitative research. It involves asking the same set of questions in the same way to every research participant (Bowling & Ebrahim, 2005). Both close-ended and open-ended questions were used to develop the interview schedule. The stroke survivor questionnaire interview schedule (Annexure C) comprised five components, namely

- questions pertaining to socio-demographic factors
- questions pertaining to stroke survivors' practices regarding secondary stroke prevention
- questions pertaining to stroke survivors' knowledge on secondary stroke prevention
- questions on stroke survivors' stroke information sources
- questions on stroke survivors' challenges regarding secondary stroke prevention.

3.5 Pilot study of the data collection instruments

A pilot study refers to feasibility or small-scale versions of studies conducted in preparation for the main study. Pilot studies pre-test research instruments. They warn of possible research failures, deviations from protocols or problems with proposed methods or instruments. Overall, good pilot studies increase the likelihood of success in the main study (Lewis-Beck, Bryman & Liao, 2004).

Following the development of the research instruments, the stroke management team questionnaire (Annexure B), and the stroke survivor questionnaire interview schedule, (Annexures C, F and G) were piloted at the Windhoek Central Hospital. For Annexure B the following professional designations were chosen to participate in the pilot study: principal medical officer (Internal Medicine Department), principal pharmacist, principal social worker, hospital dietician, and principal physiotherapist. Six stroke survivors attending the medical out-patients department (MOPD) follow-up reviews were chosen to participate in the pilot study. Two stroke survivors were chosen for each

stroke survivor questionnaire in the three languages: English (Annexure C), Oshiwambo (Annexure F) and Afrikaans (Annexure G).

The participants of the pilot study were approached again after one week and were asked to complete the same questionnaires for the stroke management team members; and to undergo the same interview in the case for the stroke survivors. Repeating the pilot tests with the same participants was done to check the reliability of the data collection instruments. No significant problems of the data collection instruments (Annexures A, C, F and G) were uncovered or reported during the pilot study. These data collection instruments were then adopted for the main study.

3.6 Validity and reliability of data collection instruments

For a measure to be of any value in research, it must be sufficiently reliable and valid (Goodwin, 2009). Validity and reliability determine the precision of the research instrument in providing results that can be generalised to a population (Hopkins, 2000). Both validity and reliability are related, with a continuum relationship (Trochim, 2000). It is suggested that reliability is a necessary but insufficient condition for validity in research; reliability is a necessary precondition of validity; validity maybe a sufficient but not a necessary condition for reliability (Cohen, Manion & Morrison, 2007). It is therefore necessary for a researcher to consider both qualities of validity and reliability when selecting a research instrument (Brink, 2006).

3.6.1 Validity

The validity of a measurement can be defined as the degree with which the measured value reflects the construct it is intended to measure (Buelow & Hinkle, 2008). To ensure validity the research data collecting instruments, namely the stroke management team questionnaire, and the stroke survivor questionnaire interview schedule in English, Oshiwambo, and Afrikaans, were assessed for both face and content validity.

Face validity is the degree with which a test or questionnaire appears to be appropriate for its intended purpose, based on a simple inspection of the test or questionnaire itself (Jackson, 2011). Although such an inspection is the weakest form of validity, some may argue it is useful when little or nothing is known about the variable being measured (Wood & Ross-Kerr, 2010). Extensive literature search by the researcher showed that no published research of the exact nature to the subject under investigation had been carried out in Namibia or elsewhere around the world. The research instruments were therefore neither fully nor partially adopted from another study. They had to be designed for the specific use of this study. Face validity was thus the first assessment of validity of the data collection instruments. An inspection of the research instruments by experts in quantitative research showed that the instruments had face validity.

Content validity refers to the degree with which the content of a test or questionnaire covers the extent and depth of the topics it is intended to cover (Wood & Ross-Kerr, 2010). It involves comparing the content of the measurement techniques to known literature on the topic and validating the fact that the tool does represent the literature

accurately (idem). Content validity is thus frequently estimated from review of the topic's literature, or through consultation with experts in the field (idem). To ensure content validity relevant literature was therefore utilised to develop the data collection instruments: stroke management team questionnaire, and the stroke survivor questionnaire interview schedule. The researcher's three academic supervisors further assessed the research instruments, and contributed with expert comments. They subsequently validated the data collection instruments for content validity.

3.6.2 Reliability

Reliability refers to the degree with which repeated measurements, or measurements taken under identical circumstances, will yield the same results (Buelow & Hinkle, 2008). To ensure reliability of the aforementioned data collection instruments the following was done.

- Due consideration was given to the wording of questions to ensure they were clear and not ambiguous.
- In addition a covering letter was provided, or read, to each respondent. The letter provided detailed instructions on how to respond to the questions.
- Even though two interviewers (the principal researcher and a research assistant) were used in this study, inter-rater reliability was maximised as the research assistant was trained on how to maintain consistency in the data collection process. Furthermore, the research assistant was a final year University of Namibia nursing student and was already familiar with health related terms and

phrases used in the wording of the stroke survivor questionnaire interview schedule.

- The interviews with the stroke survivors in the study were conducted in a standardised environment, in a quiet familiar place. The stroke survivors' respective homes were preferred as an interview venue to minimise distractions or interruptions and anxiety.
- The data collection instruments were piloted at the Windhoek Central Hospital to prove reliability or stability of the data collection instruments. Stability is measured by giving the same individuals an instrument on two occasions within a relatively short period of time and examining their responses for similarities (idem). This method is also termed the test-retest (idem). The results of the test-retest proved that there was consistency or stability of both the data collection instruments. The respective correlation coefficients for the stroke management team questionnaire, and the stroke survivor questionnaire interview schedule were: r = 0.90 and r = 0.78. Generally a test-retest reliability coefficient (r) above 0.80 is an acceptable indicator of good stability of a data collection instrument (Kirk, 2007).

3.7 Data collection

Data collection refers to the procedures used in primary source information gathering, from or about the study subjects in a study (Garrad, 2010). In this study three data collection instruments were used, namely

- the medical records data extraction form (Annexure A)
- the stroke management team questionnaire (Annexure B)
- the stroke survivor questionnaire interview schedule (Annexure C, F, G).

Annexure A was not used in the data analysis because the information captured by this instrument was for following-up study respondents. For the stroke management team, self-administered structured open-ended/ close ended questionnaires (Annexure B) were hand delivered to the randomly selected Katutura State Hospital's stroke management team members: the neurologist, the neurology medical officer, the stroke unit nurse, the social worker, the physiotherapist, the occupational therapist, the hospital dietician, and the pharmacist. A covering letter accompanied the questionnaires. The letter provided instructions on how to complete the questions. Furthermore, the letter sought informed consent from the respondents. Completion and return of the questionnaire also indicated, and implied, a willingness on the part of the respondent to participate in the study. Respondents were given a day to complete the questionnaires. A day after the questionnaires were hand delivered the respondents were followed up to return their completed questionnaires.

Interview dates and times were arranged with the stroke survivors who had been successfully traced based on the information on their medical records. Interviews were subsequently carried out at each respondent's home. The purpose of the research was explained to each one. The respondents were informed of the approximate duration of the interview. They were all individually informed that the interview would be recorded

and that notes of the interview would also be used to ensure accuracy of the information gathered from the interview. They were assured that anonymity and confidentiality would maintained as their names would not be used in the research write up. They were also made aware of their right to participate voluntarily or to decline participation and of their right to decline to answer any question(s) or to end the interview if they felt uncomfortable. To signal their consent to participate in the study the respondents were then given the informed consent form to sign (consent for participation in interview research - Annexure E) which was then counter-signed by the researcher. The principal researcher and or the research assistant used the stroke survivor questionnaire interview schedule (Annexures C, F and G, where applicable) as a guide to conduct the interviews. Each stroke survivor's responses were recorded on the relevant interview schedule (Annexures C, F and G) and audio-taped. The interview schedules and audio-taped data were coded and numbered for future cross-referencing during data entry on Epi Info 5.3.1.

In circumstances where stroke survivors were not conversant in English, the research assistant, who is fluent in some of Namibia's major vernacular languages, conducted the interviews in Oshiwambo or Afrikaans depending on their language preferences. Annexure F or G was used to guide these interviews. If a stroke survivor was in a vegetative state, or mentally incapacitated, and therefore not able to provide consent to participate in the study, proxy consent was then sought from the caregiver. The caregiver was also interviewed in the stroke survivor's place.

3.8 Data processing

Data analysis is the systematic method of examining gathered data for a research investigation to support interpretations and conclusions about the data and inferences about the population (Fitzpatric & Kazer, 2010). It is also a process of cleaning, transforming, and modeling data with the goal of highlighting useful information (Ardagna & Zhang, 2010). In this study data was analysed using a statistics software package Epi Info version 5.3.1. Epi Info is public domain statistical software developed by Centers for Disease Control and Prevention (CDC) which allows for electronic data base creation, data entry, checking of survey data for outliers and inconsistent data, and also conducting a descriptive analysis of survey data (World Health Organisation, n.d). Two Epi Info electronic databases were created: one for the stroke management team data, and the other for stroke survivors' data. Data quality assurance measures, such as data cleaning, were instituted before analysis of data. Data quality assurance refers to the process of profiling the data to discover inconsistencies, and other anomalies, in the data and performing data cleansing activities (for instance removing outliers, missing data interpolation) to improve the data quality (Lucey, 2005). Data cleaning is an integral part of data quality assurance: it is a process of detecting and correcting (or removing) corrupt or inaccurate records from the database (Juran & Godfrey, 1999). Data cleaning was performed by the researcher when all questionnaires' data and interview data had been entered into Epi Info database and before the process of data analysis commenced.

In this study, narrative strategies and descriptive statistics, in conjunction with graphic presentations, were used to analyse the research data. Triangulation was also utilised as

an analysis strategy. Triangulation is defined as mixing of data or methods so that diverse viewpoints cast light upon a topic (Olsen, 2004). It is often useful in validating the claims that might arise from different data sources (idem). Individual interviews, open-ended questions, and written comments on questionnaires, often may generate single words, brief phrases or paragraphs of text which are primarily forms of narrative data that require analysis (Taylor-Powell & Renner, 2003). Descriptive statistics convert and condense a collection of data into an organised, visual representation or picture in a variety of ways so that the data have some meaning for the readers of the research report (Brink, 2006). A descriptive approach also employs measures, such as frequency distributions, measures of dispersion, and measures of relationships, to help summarise and analyse research data (idem).

3.9 Summary

The research methodology used in this study to achieve the research aim was discussed. Population, sample and sampling, compilation of the data extraction form, piloting, validity and reliability were described. Data collection and processing was also discussed. Chapter 4 presents the results of the study and discussion thereof.

CHAPTER 4

4. ANALYSIS OF DATA

4.1 Introduction

Chapter 3 focused on the research design and methodology of this study. In this chapter the results of the study are presented. Analysis of all items of the stroke management team's self-administered questionnaire (Annexure B), and stroke survivor interview (Annexure C), are illustrated individually. Items are presented individually to highlight specific components of secondary stroke prevention health education, knowledge, and practices of stroke survivors, using descriptive statistics, narrative strategies, and triangulation strategies. Some of the wording used for items in Annexures B and C differ from the wording in the presentation of the results to reflect a description in the write up. For instance in Item C1, *age* is changed to *age distribution of stroke survivors.*

4.2 Analysis of responses to questionnaires

An analysis of both research instruments (the stroke management team self-administered questionnaire and the stroke survivor interview schedule) was done utilising a statistics analytical software package, Epi Info version 5.3.1. The results of the analysis are presented in narrative format, frequency tables, pie charts, and bar graphs.

4.2.1 Stroke management team

Information in this section describes the Katutura State Hospital's stroke management team's secondary stroke prevention health education practices.

Item B1: Stroke management team members designation (n=8)

All eight (100.0%) stroke management team members, as shown in Table 4.1, completed the self-administered structured questionnaires. The team comprised a neurologist, a neurology medical officer, a stroke unit nurse, a social worker, a physiotherapist, an occupational therapist, a dietician, and a pharmacist.

Table 4.1: Stroke management team members' participation in the research study

Stroke management team member	**Number handed a questionnaire**	**Number responded**	**% responded**
Neurologist	1	1	100.0
Neurology medical officer	1	1	100.0
Stroke unit nurse	1	1	100.0
Social worker	1	1	100.0
Physiotherapist	1	1	100.0
Occupational therapist	1	1	100.0
Dietician	1	1	100.0
Pharmacist	1	1	100.0

Item B2: Involvement in the management of stroke patients (n=8)

All eight (100.0%) stroke management team members, as shown in Table 4.2, confirmed that they played a part in the management of stroke survivors in their various capacities. This result indicates and, it can also be inferred, that stroke survivors at the Katutura State Hospital received multidisciplinary stroke healthcare, namely: neurology, nursing, social work, physiotherapy, occupational therapy, dietetics, and pharmaceutical services.

Table 4.2: Stroke management team members' involvement in the management of stroke patients

Stroke management team member	**Involvement in management of stroke patients**	
	Yes	**No**
Neurologist	1	0
Neurology medical officer	1	0
Stroke unit nurse	1	0
Social worker	1	0
Physiotherapist	1	0
Occupational therapist	1	0
Dietician	1	0
Pharmacist	1	0

Item B3: Participation in health education of stroke patients (n=8)

All of the eight (100.0%) stroke management team members, as shown in Table 4.3, indicated that they did play some role in the health education of stroke survivors regarding secondary stroke prevention. This result indirectly implies that stroke survivors were imparted with the necessary knowledge to prevent secondary stroke.

Table 4.3: Stroke management team participation in the health education of stroke patients

Stroke management team member	**Participation in health education of stroke patients**	
	Yes	**No**
Neurologist	1	0
Neurology medical officer	1	0
Stroke unit nurse	1	0
Social worker	1	0
Physiotherapist	1	0
Occupational therapist	1	0
Dietician	1	0
Pharmacist	1	0

Item B4: Stroke management team roles in the health education of stroke survivors (n=8)

This item was included to find out the specific roles played by individual stroke management team members in the health education of stroke survivors on secondary stroke prevention. The results are illustrated in Table 4.4.

Table 4.4: Stroke management team roles in the health education of stroke survivors (n=8)

Health education role	**Number of stroke management members executing role**	
	Frequency	**Percentage**
Diet modification	7	87.5
Body weight management	7	87.5
Alcohol consumption reduction/ cessation	6	75.0
Exercise prescription (encourage active lifestyles)	7	87.5
Smoking cessation	7	87.5
Control of stroke predisposing diseases like diabetes	7	87.5
Medication compliance	6	75.0
Other	0	0.0

From Table 4.4 it is evident that most stroke management team members do provide health education to stroke survivors on all of the seven key factors that are identified in this study as being central to secondary stroke prevention. Health education on diet modification, body weight management, physical exercise, smoking cessation, and control of stroke predisposing diseases was provided to stroke survivors by seven (87.5%) of the stroke management team members. Health education on alcohol consumption reduction, and medication compliance, was done by six (75.0%) of the stroke management team members. No other roles regarding health education of stroke survivors were specified by the stroke management team members.

Item B5: Use of guidelines/ checklists when conducting health education to stroke survivors (n=8)

This item explored the use of guidelines, checklists and/ or protocols when conducting stroke health education amongst stroke management team members. As evident in Figure 4.1 only two (25.0%) of the stroke management team used guidelines or a checklist when conducting health education on secondary stroke prevention; six (75.0%) members did not make use of these options.

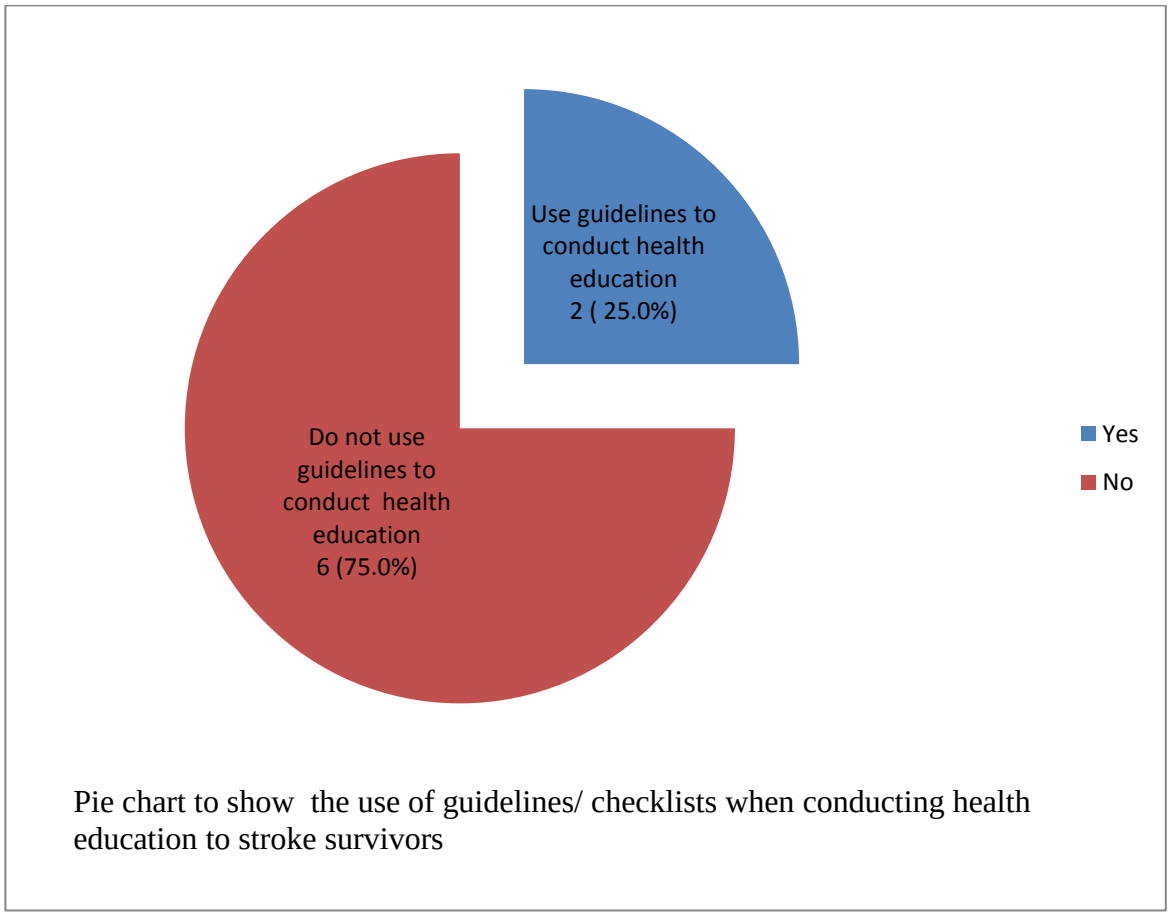


Figure 4.1: Pie chart to show the use of guidelines/ checklists when conducting health education (n=8).

Item B6: Documentation of health education by the stroke management team (n=8)

Results in Figure 4.2 reveal that four (50.0%) of the stroke management team members did not document their health education presented to stroke survivors; four (50.0%) team members did document provision of health education.

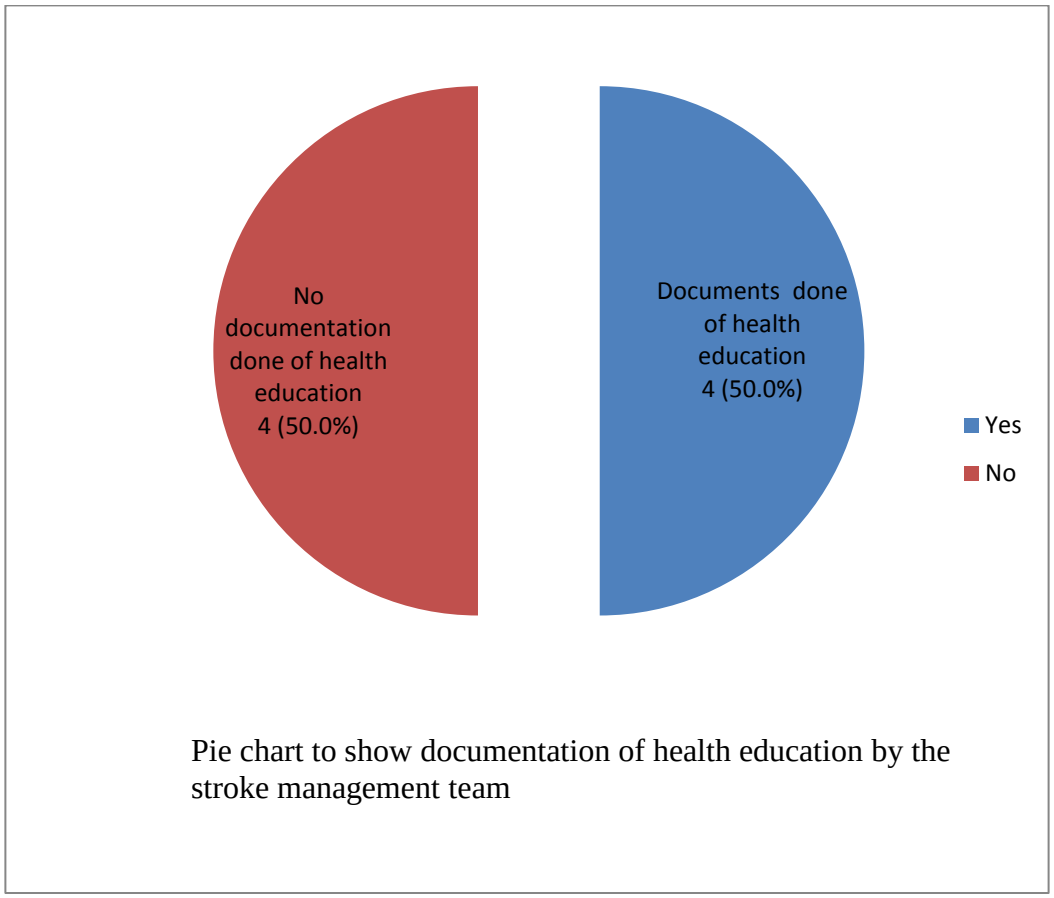


Figure 4.2: Pie chart to show documentation of health education by the stroke management team (n=8).

Item B7: Frequency of health education (n=8)

The frequency with which health education of stroke survivors by the stroke management was done is presented in Figure 4.3. Four (50.0%) of the stroke management team members provided health education only once. Two (25.0%) of rest of the stroke management team provided health education routinely, and the other two (25.0%) did so occasionally.

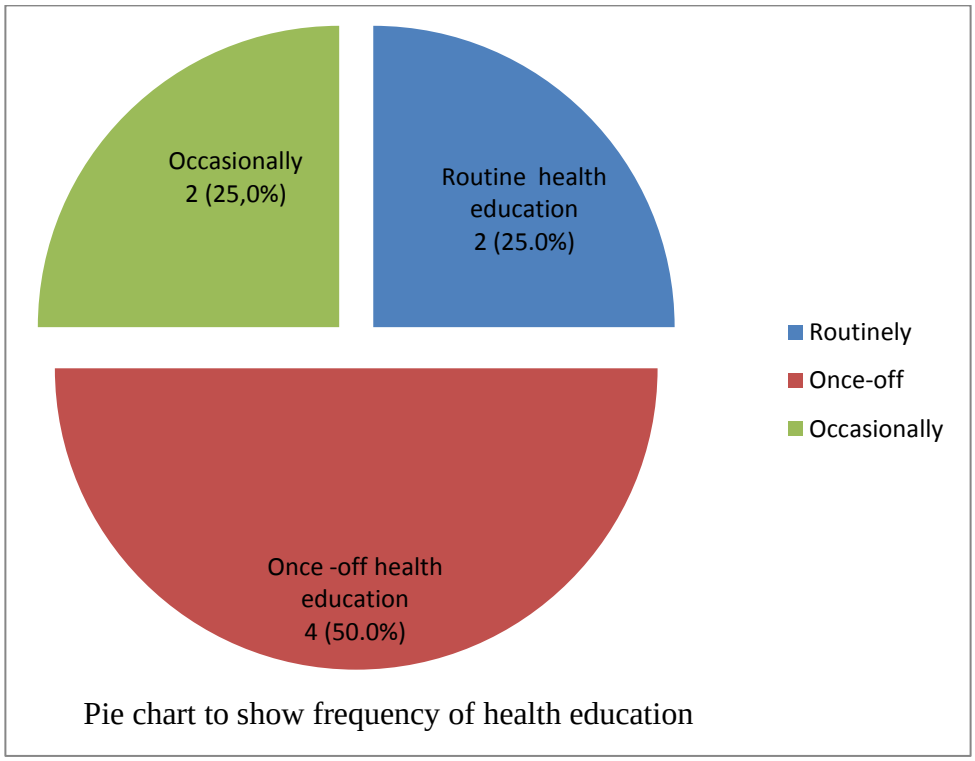


Figure 4.3: Pie chart to show frequency of health education (n=8).

Item B8: Third party involvement in health education (n=8)

All eight (100.0%) of the stroke management team members, who provided health education to stroke survivors on secondary stroke prevention, indicated they involved family members and or caregivers of the stroke survivor in their health education. This result suggests that the stroke management team attempts to reinforce stroke health education by involving the stroke survivors' family and or caregivers in stroke health education.

Item B9: Information provision formats and/ or information sources recommended for secondary stroke health education

As shown in Table 4.5 all eight (100.0%) stroke management team members make use of a verbal approach: it is the most preferred method of delivery for health education to stroke survivors according to this study. Written material, such as flyers and booklets, were used by three (37.5%) of the stroke management team members. Only two (25.0%) of the stroke management team members recommended the internet as an information source to stroke survivors. The results reveal that videos are not used by the stroke management team members as a health education delivery format. No other information formats or information sources were used or recommended by the stroke management team.

Table 4.5: Information provision formats and information sources recommended for secondary stroke health education (n=8)

Health education format or information source recommended	**Number of stroke management team members using format/ technique**	
	Frequency	**Percentage (%)**
Verbal	8	100.0
Flyers / booklets	3	37.5
Videos	0	0.0
Internet	2	25.0
Other	0	0.0

Item B10: Availability of IEC material for secondary stroke health education

All eight (100.0%) stroke management team members, as shown in Table 4.6, revealed that they did not have IEC material specific for secondary stroke prevention health education. This indicates that it was unlikely that stroke survivors were offered any IEC material for secondary stroke health education by the Katutura State Hospital's stroke management team.

Table 4.6: Availability of IEC material for secondary stroke health education

Availability of IEC material for secondary stroke health education	
Yes	**No**
0	8

Item B11: Content of health education (n=8)

This item pertains to the stroke management team members' health education content preferences which are depicted in Figure 4.4.

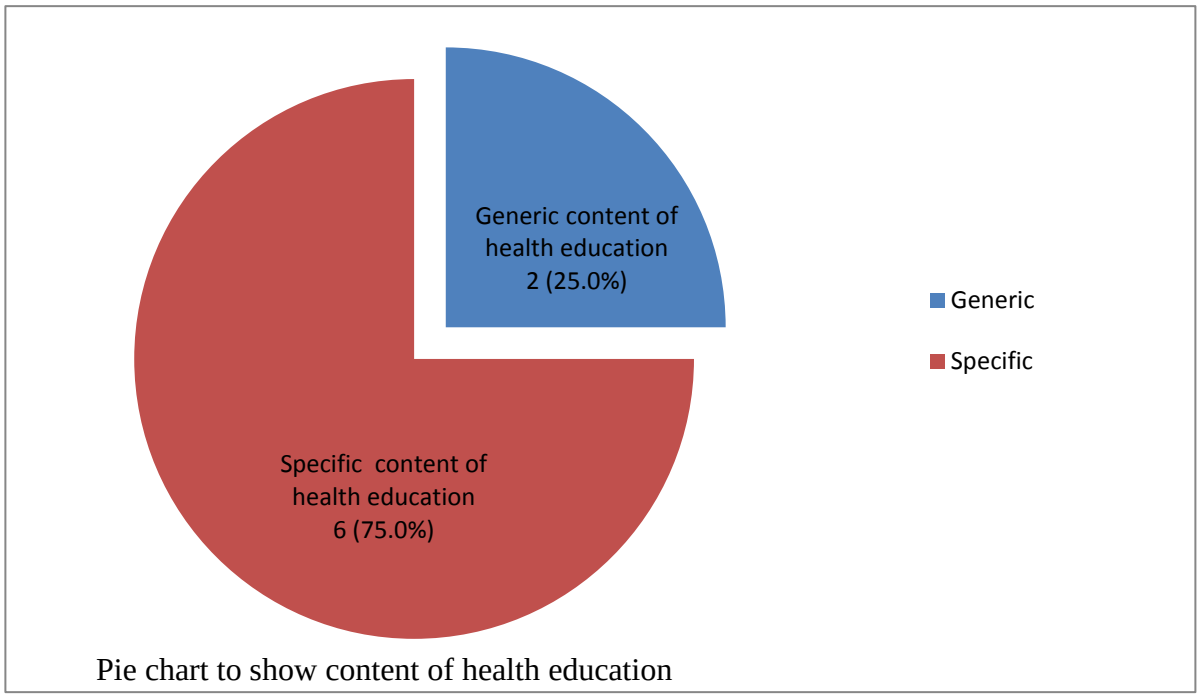


Figure 4.4: Pie chart to show content of health education (n=8).

The majority (n=6: 75.0%) of the stroke management team members do provide health education to stroke survivors on issues or factors specific to a patient's situation as compared to providing generic information on secondary stroke prevention. The other team members (n=2: 25.0%) provide health education on topics covering general information on secondary stroke prevention.

Item B12: Special arrangements for health education to stroke patients with "special needs"

All eight (100.0%) stroke management team members stated that that they either use family members or caregivers in the health education of stroke survivors with special needs. In addition other health education techniques, for example, pictures, written notes, and demonstrations to accommodate and maximise comprehension of health education by stroke patients with cognitive or language impairments, are used by seven (87.5%) of the stroke management team members. Special IEC material was however not used by any of the stroke management team members for health education of stroke survivors with special needs, as indicated in Figure 4.5.

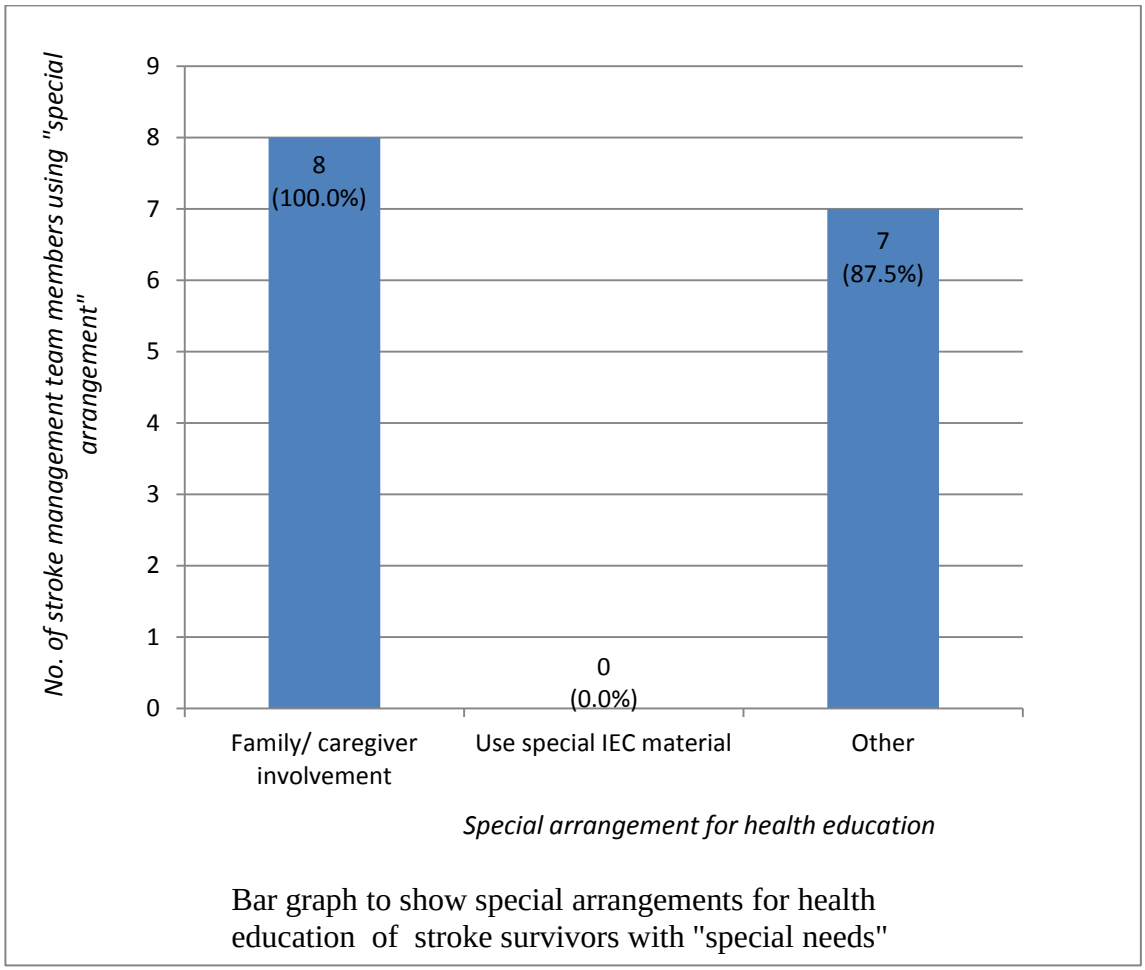


Figure 4.5: Bar graph to show special arrangements for health education of stroke survivors with "special needs".

Item B13: Adequacy of secondary stroke prevention health education (n=8)

The results, as shown in Figure 4.6, reveal that 75.0% (n=6) of the stroke management team members were of the opinion that the health education they provided to stroke survivors was inadequate. On other hand, 25.0% (n=2) were of the opinion such health education was adequate.

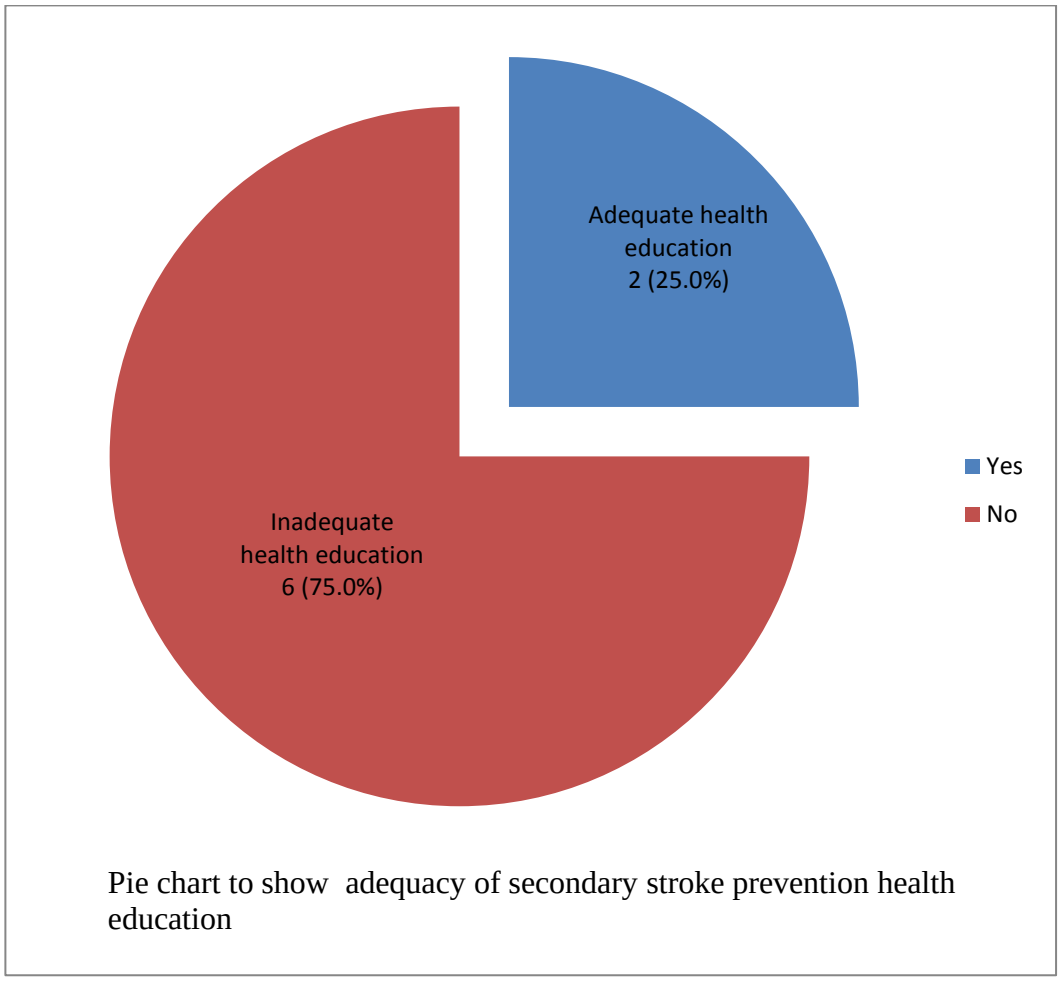


Figure 4.6: Pie chart to show adequacy of secondary stroke prevention health education (n=8).

Item B14: How to improve health education

Suggestions proffered by the stroke management team to improve health education to minimise secondary stroke prevention are shown in Table 4.7.

Table 4.7: What could be done to improve secondary stroke prevention health education

Suggestion to improve health education	**Stroke management team members (n=8)**	
	Frequency	**Percentage (%)**
Improved follow-up of stroke survivors after hospital discharge	4	50.0
Establishment of a stroke assistance organization	2	25.0
Mass media campaigns	3	37.5
Secondary stroke prevention IEC material provision	2	50.0
Increasing staff for stroke healthcare	1	12.5

Item B15: Challenges experienced when providing health education to stroke patients on secondary stroke prevention

This item covered challenges encountered by the stroke management team during the provision of secondary stroke prevention health education. Table 4.8 presents the range of challenges encountered by the stroke management team.

Table 4.8: Challenges experienced by the stroke management team when providing health education

Challenge	**Frequency of stroke management team members experiencing challenge (n=8)**	
	Frequency	**Percentage (%)**
Poor comprehension of stroke health education by stroke survivors	4	50.0
Language and communication barriers	5	62.5
Lack of IEC material.	6	75.0
Poverty	2	25.0
Neglect and poor follow-up of stroke patients	3	37.5
Stroke co- morbidity	2	25.0
Healthcare facilities and staff shortages	3	37.5

A general lack of IEC materials was the most reported challenge to secondary stroke education by 75.0% (n=6) of stroke management team members. According to the respondents, when such materials were available they were often not very specific to secondary stroke prevention. The language and presentation formats of the IEC materials were also not easily comprehensible to a range of stroke survivors given the different lingual backgrounds and cognitive abilities of its intended recipients.

The second commonest challenge to secondary stroke prevention health education was language and communication barriers with stroke survivors. Five (62.5%) of the stroke management team members felt the ability to communicate with stroke survivors was often a challenge owing to significant language barriers. The multilingual nature of stroke survivors often necessitated the frequent use of untrained translators. This meant that there was a risk of loss of key messages in the translation process. The communication problem was further compounded by the fact that stroke, as a disease, frequently impairs cognitive and speech functions.

Poor comprehension of stroke health education by stroke survivors was another significant challenge to secondary stroke health education as reported by four (50.0%) of the stroke management team members. Poor literacy levels of some stroke survivors was partly blamed for this challenge.

Poverty was another reported challenge according to two (25.0%) of the stroke management team members; it affects secondary stroke prevention health education and ultimately secondary stroke prevention viability. One stroke management team member remarked that it seemed the medical condition of stroke was probably less of a problem

relative to the plethora of social problems most stroke survivors were often faced with. Another stroke management team member suggested that the socio-economic environment some stroke survivors lived in made it difficult for them to comply meaningfully with prevention of secondary stroke protocols.

Neglect is probably related to poverty in terms of the poor follow-up some stroke survivors reported to be experiencing. Three (37.5%) stroke management team members stated that, amongst other social and financial challenges, stroke survivors often suffer neglect from their families and frequently missed follow-up appointments because of lack of transportation to the hospital.

According to two (25.0%) stroke management team members, stroke co-morbidity is another impediment that works against a successful implementation of a secondary stroke prevention strategy. HIV/ AIDS in particular was noted as a significant challenge facing a significant proportion of stroke survivors.

Another challenge to secondary stroke prevention that was highlighted is healthcare facilities and staff shortages. Three (37.5%) stroke management team members felt a shortage of health staff in the public health sector negatively impacts on effective provision of stroke health services. The current lack/ shortage of community health extension workers, and a barely functional community based rehabilitation system, for example, worsened the predicament of secondary stroke prevention. Lack of certain essential stroke rehabilitation specialised services, such as speech therapy, physiotherapy, and occupational therapy, in most regions (health directorates) deprived many stroke survivors of these crucial services. The result of such services not being

available means the stroke survivors cannot attain their full rehabilitation; they are also not afforded opportunities of preventing a possible secondary stroke. Furthermore, the geographical vastness of the country makes it logistically difficult to render an effective supportive network. This is particularly relevant with regards to follow up of discharged stroke patients.

4.2.2 Stroke survivors

This section presents information on knowledge and practices of stroke survivors regarding secondary stroke prevention.

Item C1: Age distribution of stroke survivors (n=60)

This item was included to give the researcher an indication of the distribution of the age of stroke survivors. There was a wide age range of stroke survivors in the study: 21 years to 97 years. The average age was 52 years. The distribution of stroke survivors by age is shown in Figure 4.7.

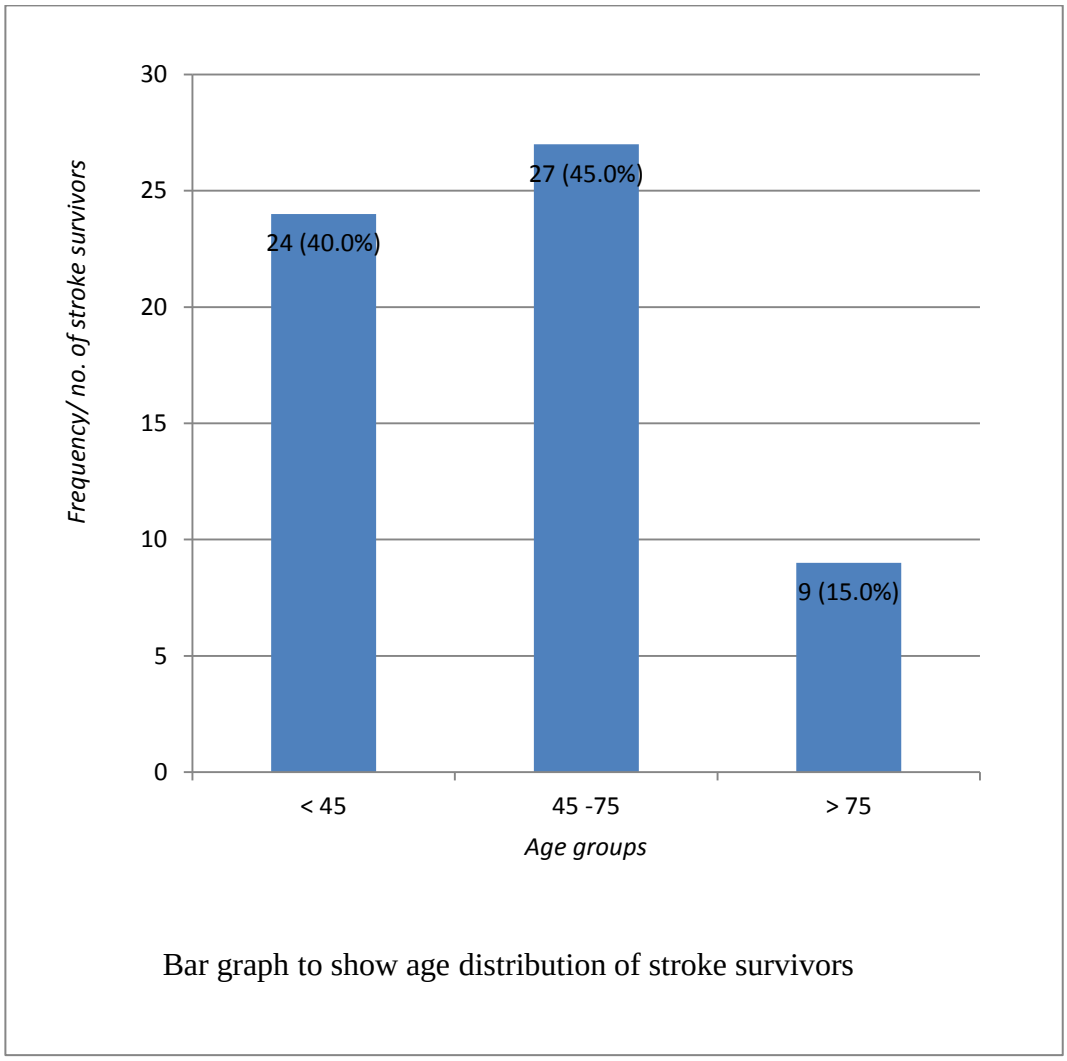


Figure 4.7: Bar graph to show age distribution of stroke survivors (n=60).

As depicted in Figure 4.7 there were 24 (40.0%) 'young stroke' survivors, 27(45.0%) 'middle- aged' stroke survivors, and nine (15.0%) 'elderly' stroke survivors.

Item C2: Gender distribution of stroke survivors (n=60)

As evident in Figure 4.8 there were 24 females (40.0%) and 36 males (60.0%) who participated in the study.

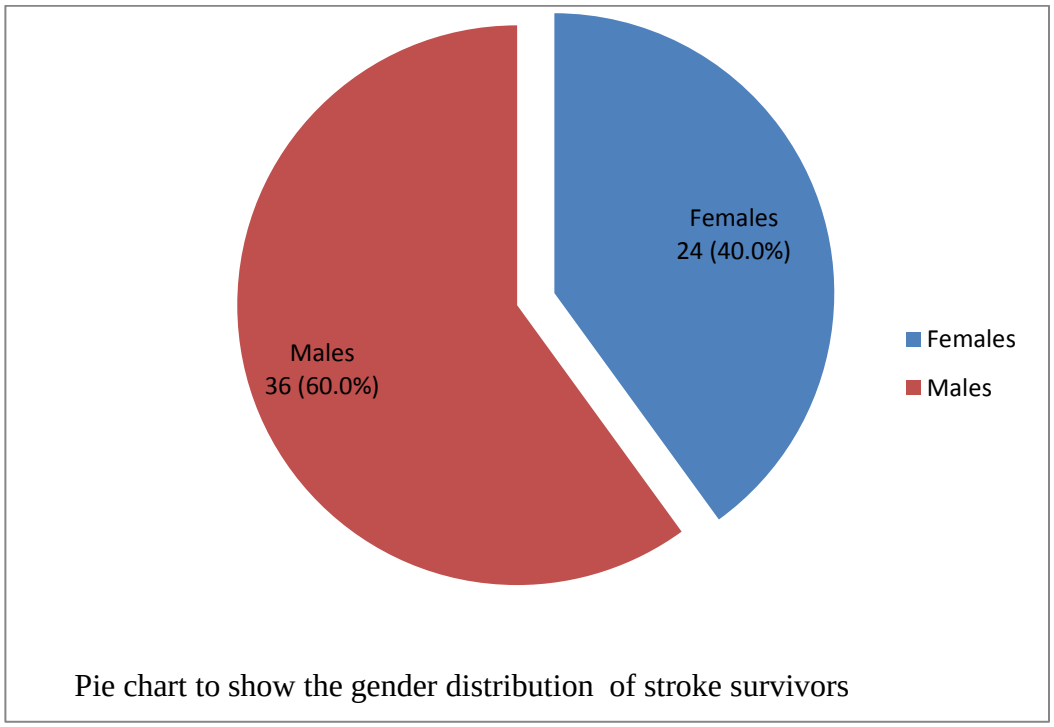


Figure 4.8: Pie chart to show the gender distribution of stroke survivors (n=60).

Item C3: Highest level of education attained (n=60)

This item provided the researcher with some perspective on the stroke survivors' respective level of education. As shown in Figure 4.9, ten (16.7%) stroke survivors had no formal education; 13 (21.7%) had primary school education as their highest educational qualifications; 29 (48.3%) had secondary school as their highest level of education; and eight (13.3%) had tertiary qualifications.

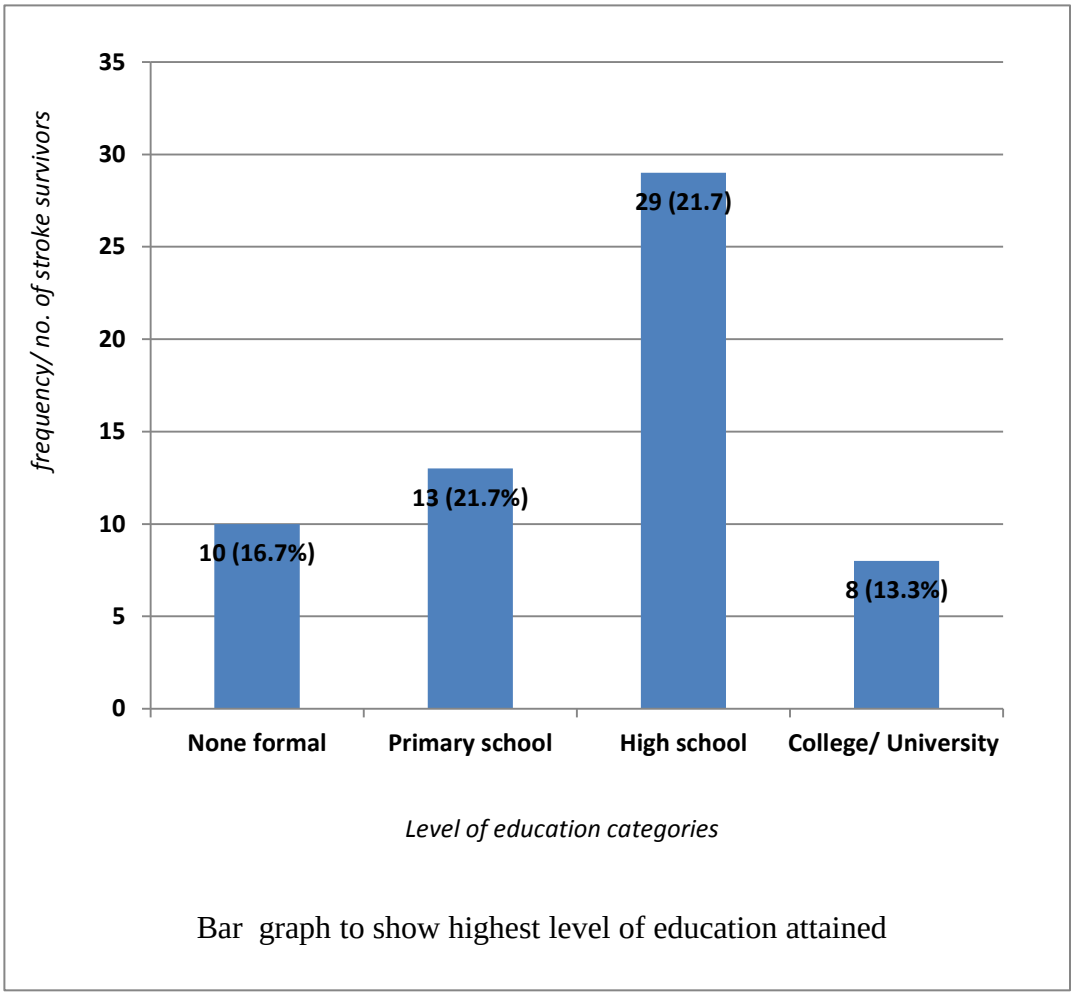


Figure 4.9: Bar graph to show highest level of education attained (n=60).

Item C4: Disability level/ status of stroke survivors (n=60)

This item provided information on the disability profile of stroke survivors in the study. Figure 4.10 shows that 18 (30.0%) respondents had minimal or no residual disability; 33 (55.0%) had moderate disability; and nine (15.0%) had severe (vegetative) disability secondary to stroke. Fourteen (23.3%) of the stroke survivors had aphasia or could not communicate verbally

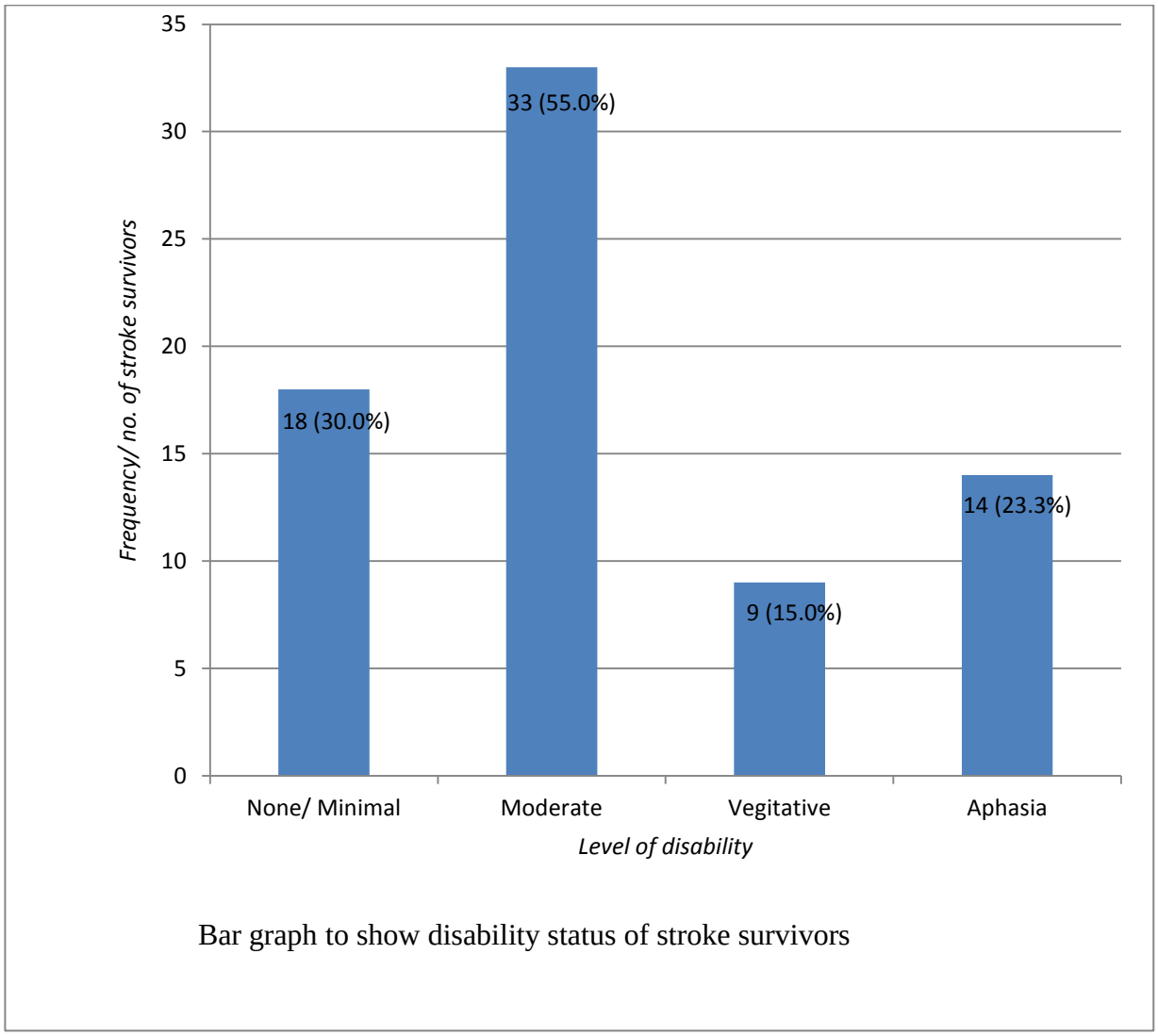


Figure 4.10: Bar graph to show disability status of stroke survivors (n=60).

Item C5: Smoking habits among stroke survivors (n=60)

The results, as shown in Figure 4.11, reveal that 15 (25.0%) of the stroke survivors continued to smoke after suffering a stroke. The remaining 45 (75.0%) were non-smokers.

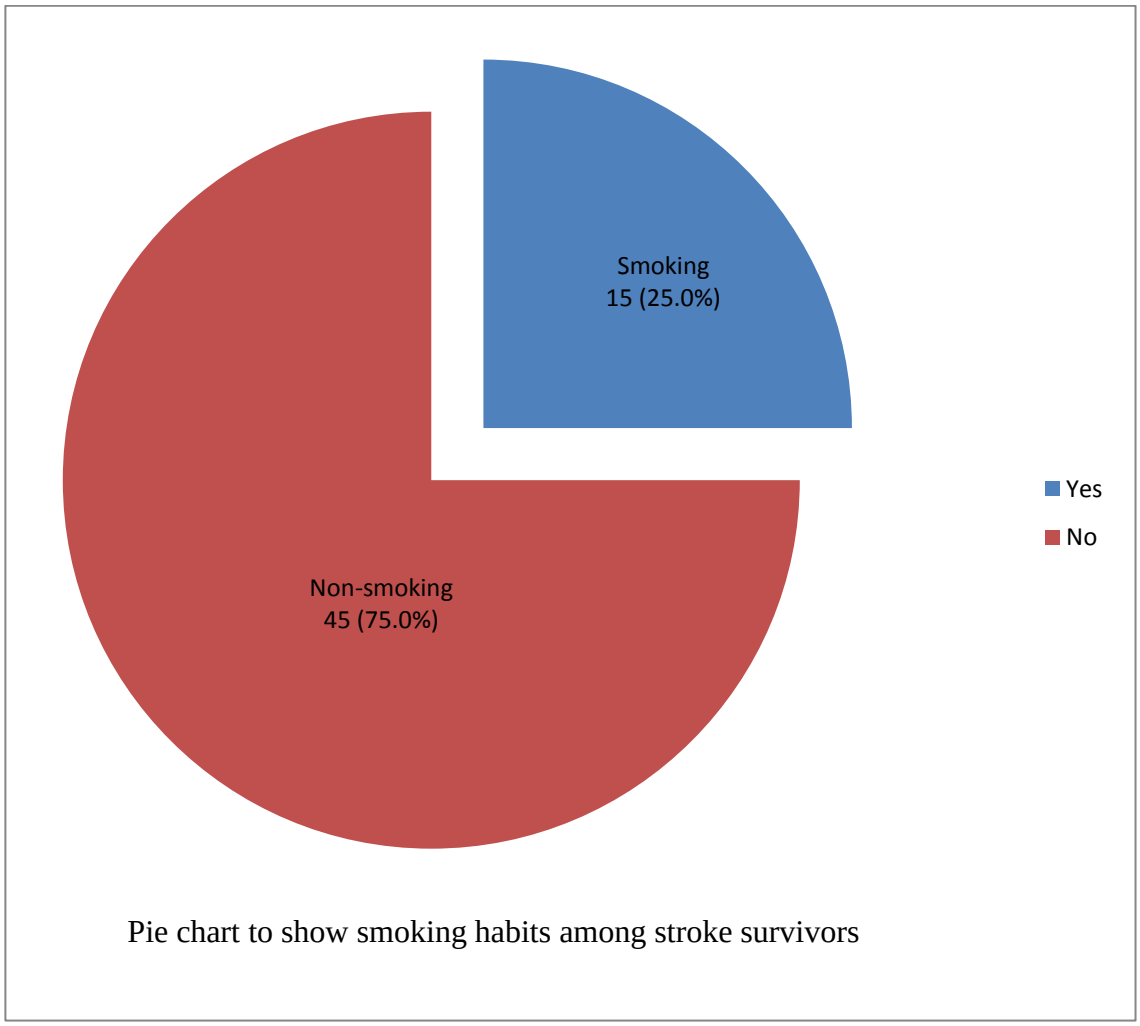


Figure 4.11: Pie chart to show smoking habits among stroke survivors (n=60).

Item C6: Extent of smoking among smoking stroke survivors (n=15)

This item sought to establish the degree of tobacco smoking among the 15 stroke survivors in the study who smoked. The results are presented in Figure 4.12. Two (13.3%) stroke survivors stated they smoked on average one cigarette a day; six (40.0%) stated they smoked on average two cigarettes a day; five (33.3%) stated they smoked three cigarettes a day; and two (13.3%) stated they smoked four or more cigarettes a day. Based on these results it can be inferred that the degree of smoking is moderate amongst smoking stroke survivors.

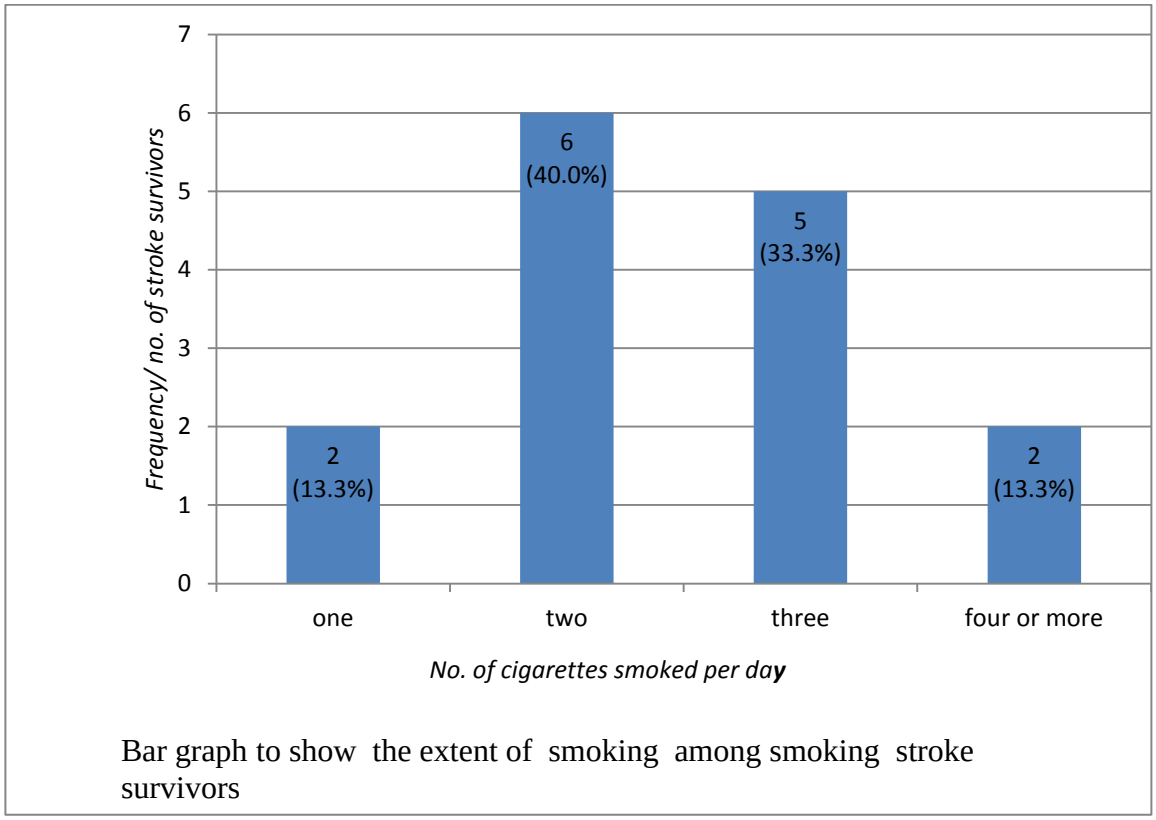


Figure 4.12: Bar graph to show the extent of smoking among smoking stroke survivors (n=15).

Item C7: Alcohol consumption among stroke survivors (n=60)

This item pertains to the alcohol consumption pattern of stroke survivors. The results depicted in Figure 4.13 are as follows: 18 (30.0%) stroke survivors stated they continued to consume alcohol post their stroke, and 42 (70.0%) indicated they did not consume alcohol.

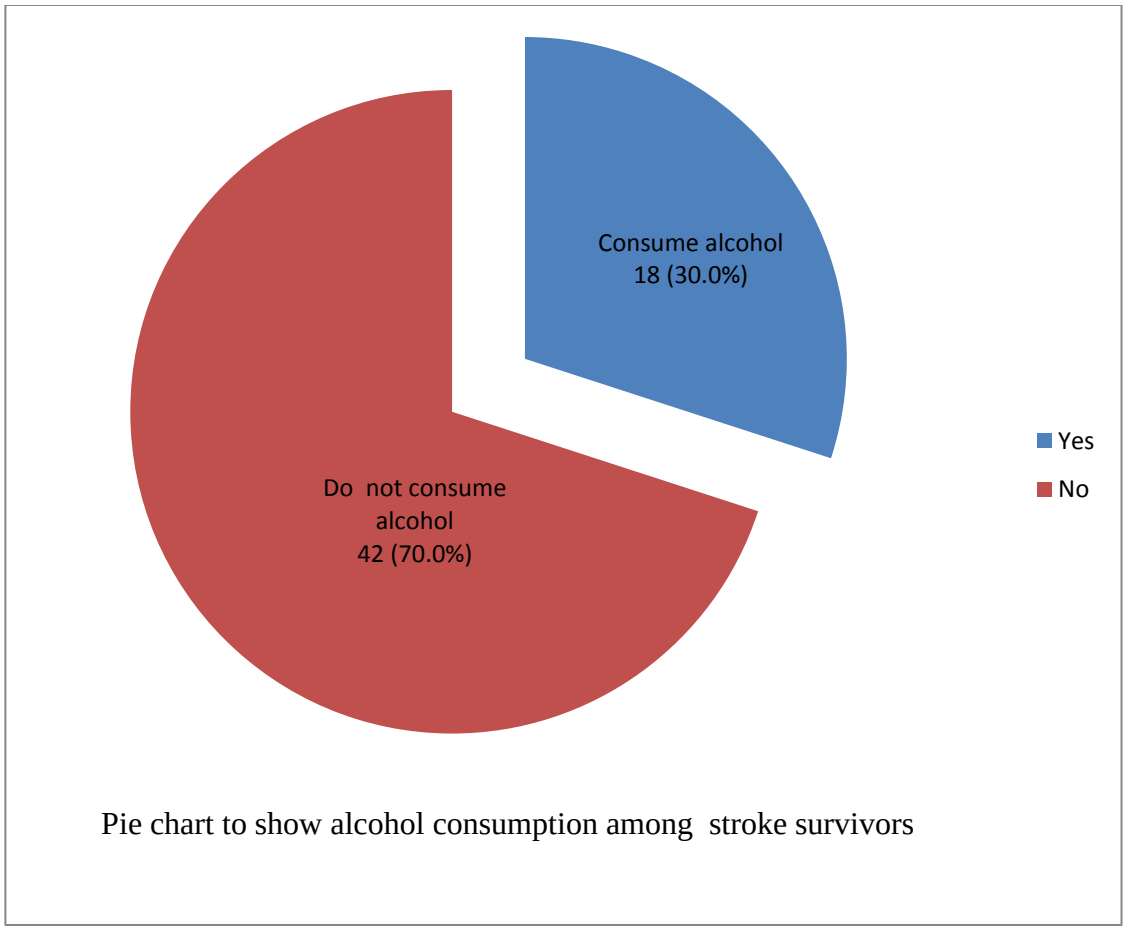


Figure 4.13: Pie chart to show alcohol consumption among stroke survivors (n=60).

Item C8: Extent of alcohol consumption among drinking stroke survivors (n=18)

The results in Figure 4.14 reveal that 13 (72.2%) of the stroke survivors who consumed alcohol indicated that they consumed on average between one and three beers a day; five (27.8%) stroke survivors who consumed alcohol could not quantify their daily alcohol consumption. These results suggest that the majority of stroke survivors who consume alcohol are mostly 'light drinkers'.

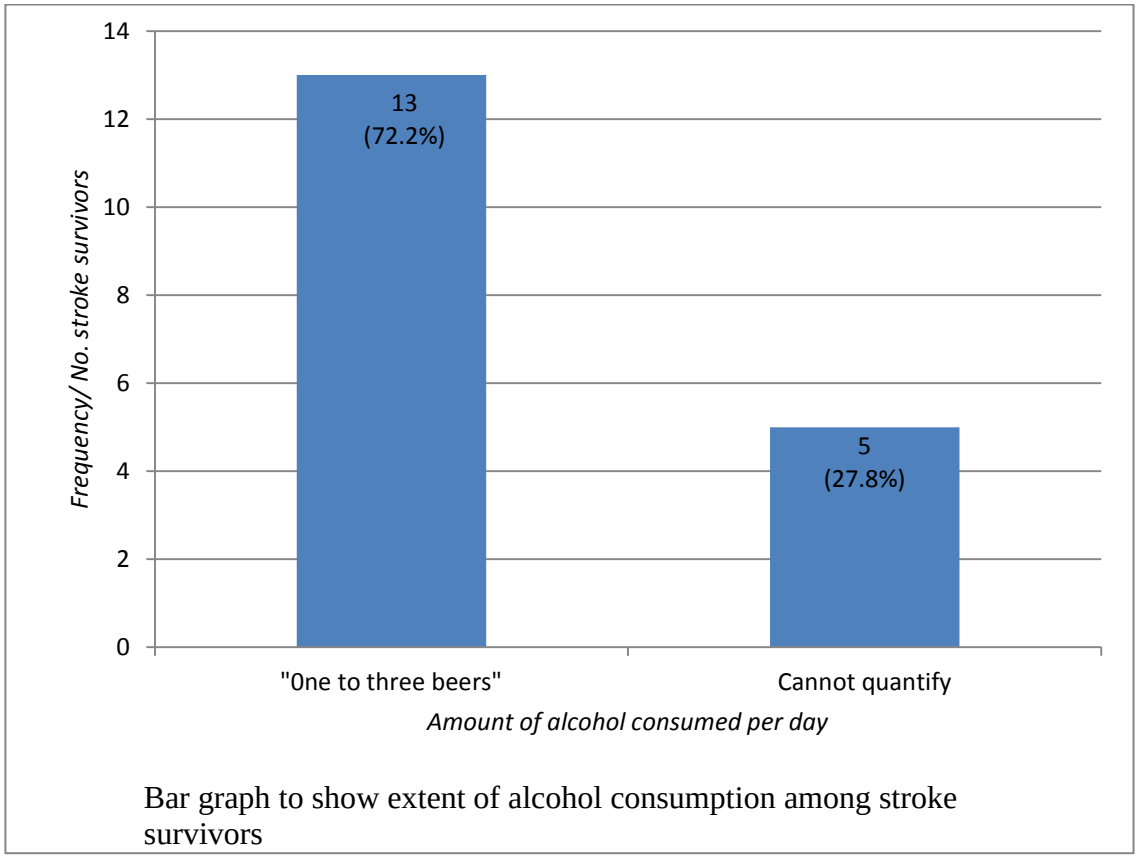


Figure 4.14: Bar graph show extent of alcohol consumption among stroke survivors.

Item C9: Exercise by stroke survivors (n=60)

This item explored exercise habits of stroke survivors in general; and not necessarily physical exercise trends vital for secondary stroke prevention. Fifty percent (n=30) of stroke survivors stated they did some exercises as part of their rehabilitation and or secondary stroke prevention. The other 30 respondents (50.0%) indicated they did not do any exercises as evident in Figure 4.15.

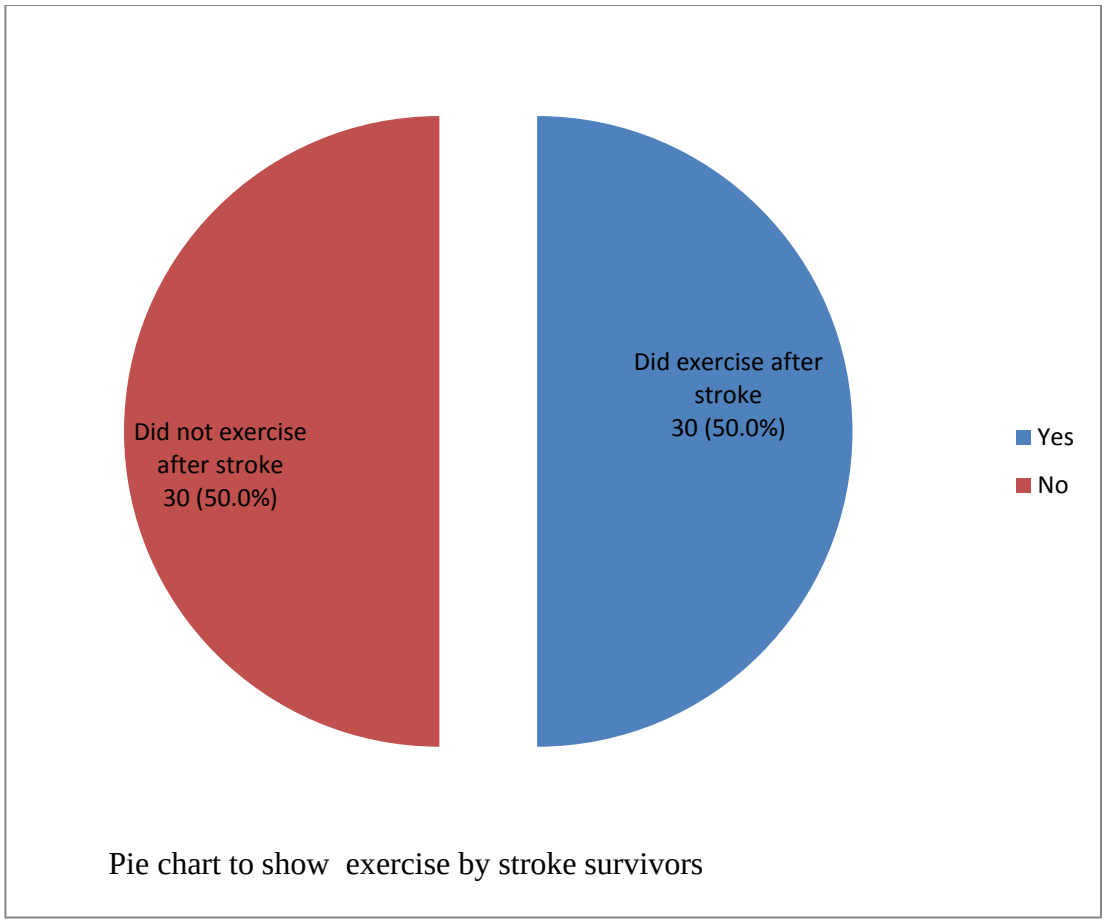


Figure 4.15: Pie chart to show exercise by stroke survivors (n=60).

Item C10: Type of exercise among 'exercising' stroke survivors (n=30)

This item sought to ascertain the specific exercise(s) done by those stroke survivors who had indicated that they did some exercise as part of their rehabilitation. Figure 4.16 depicts the results: eight (26.7%) of these respondents reported doing physical exercises that could be classified as directly beneficial to secondary stroke prevention; the remainder (n=22: 73.3%) did exercises not considered beneficial to secondary stroke prevention.

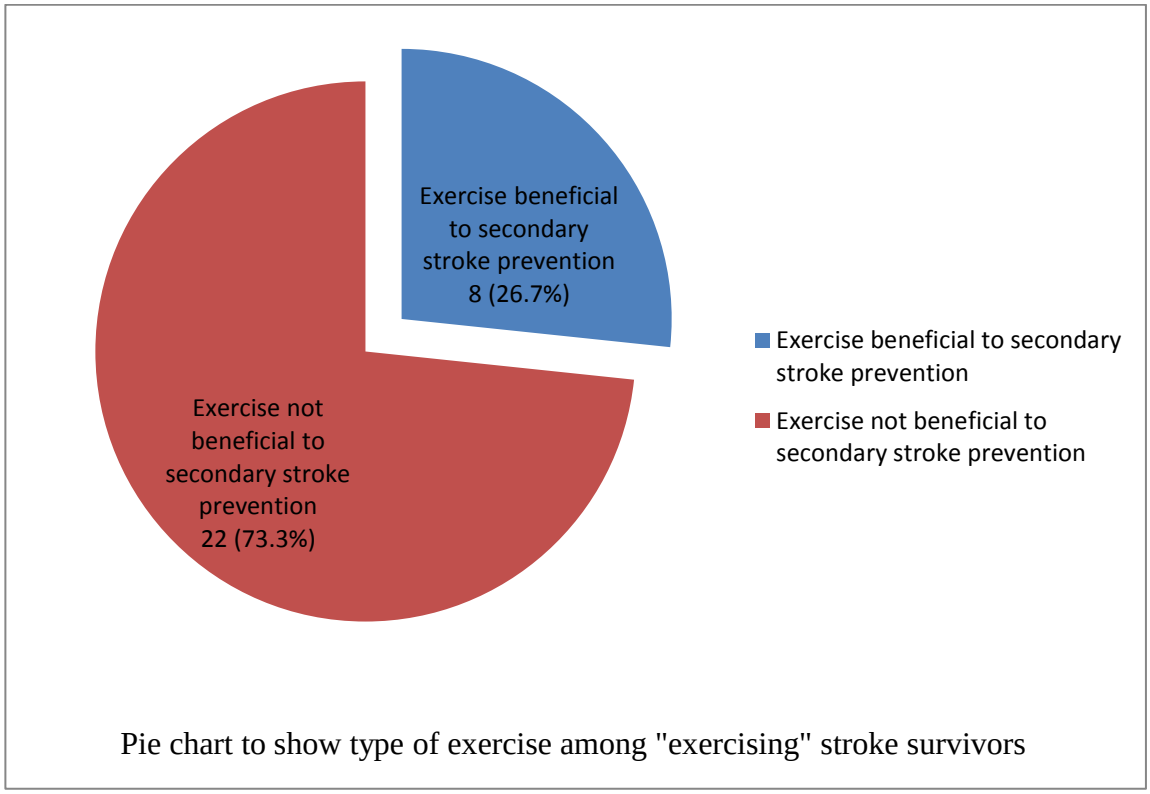


Figure 4.16: Pie chart to show type of exercise among 'exercising' stroke survivors.

Based on the findings in figure 4.16 it can be assumed that the majority, 86.7% (n=52) of stroke survivors lead a largely sedentary lifestyle.

Item C11: Stroke survivors on diet (n=60)

This item determined the stroke survivors who changed their diet following a first-ever stroke; not necessarily a diet change as a measure to prevent secondary stroke. As evident in Figure 4.17, nineteen (31.7%) of the stroke survivors did change to a 'special diet' after suffering a stroke. No change in diet was reported by 41 (68.3%) respondents.

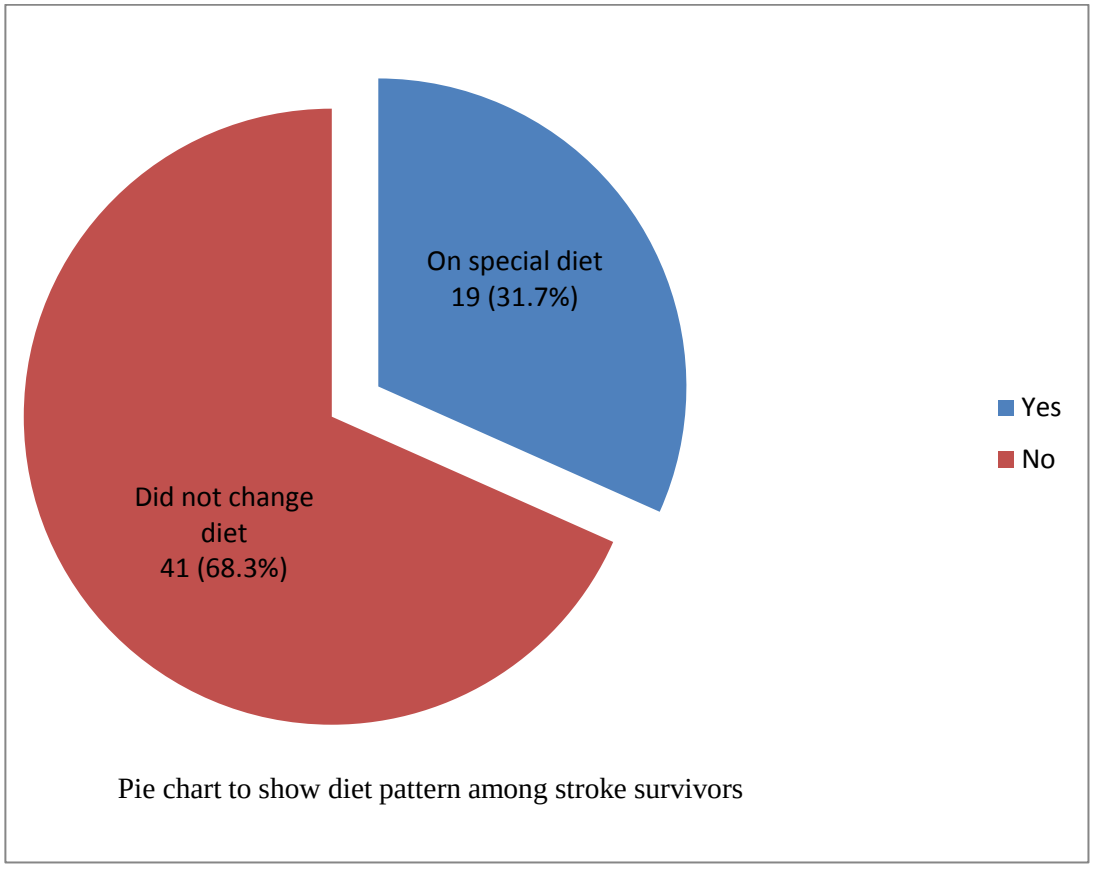


Figure 4.17: Pie chart to show diet pattern among stroke survivors.

Item C12: Type of diet change after stroke (n=60)

The findings for this item are presented in Figure 4.18. Following a stroke 12 (20.0%) respondents stated they changed to a soft diet; eight (13.3%) reduced their salt intake; and sugar intake was reduced by 11 (18.3%). Those who reduced salt and or sugar in their diet can be regarded as the only ones who had a diet change beneficial to secondary stroke prevention.

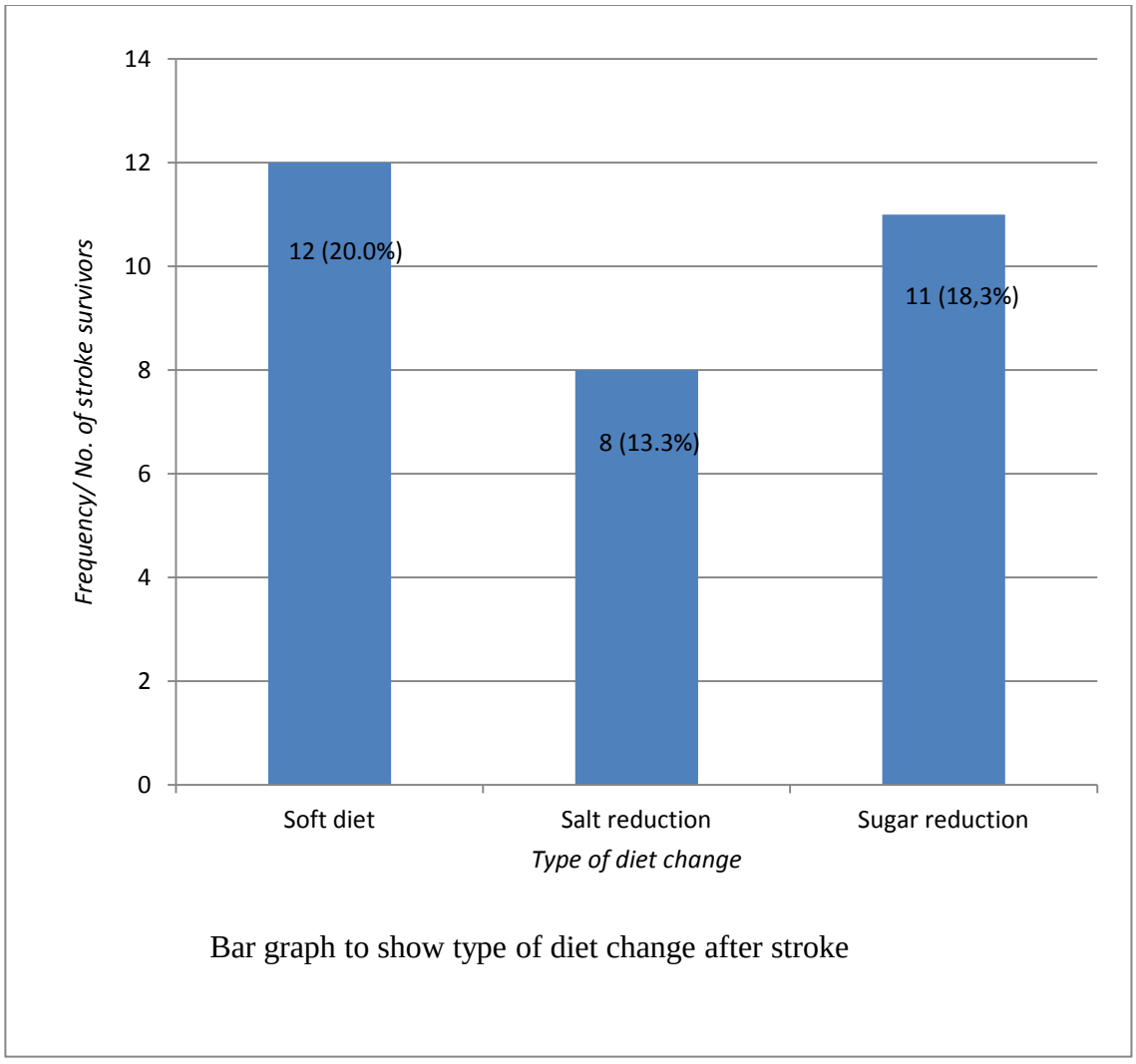


Figure 4.18: Bar graph to show type of diet change after stroke.

Item C13: Hypertension among stroke survivors (n=60)

This item determined stroke survivors suffering from hypertension as it is an established secondary stroke predisposing factor. As evident in Figure 4.19 there were 37 (61.7%) hypertensive stroke survivors. There were 23 (38.3%) stroke survivors who did not have hypertension. Put differently, a significantly high proportion of the respondents had an established secondary stroke predisposing factor: hypertension.

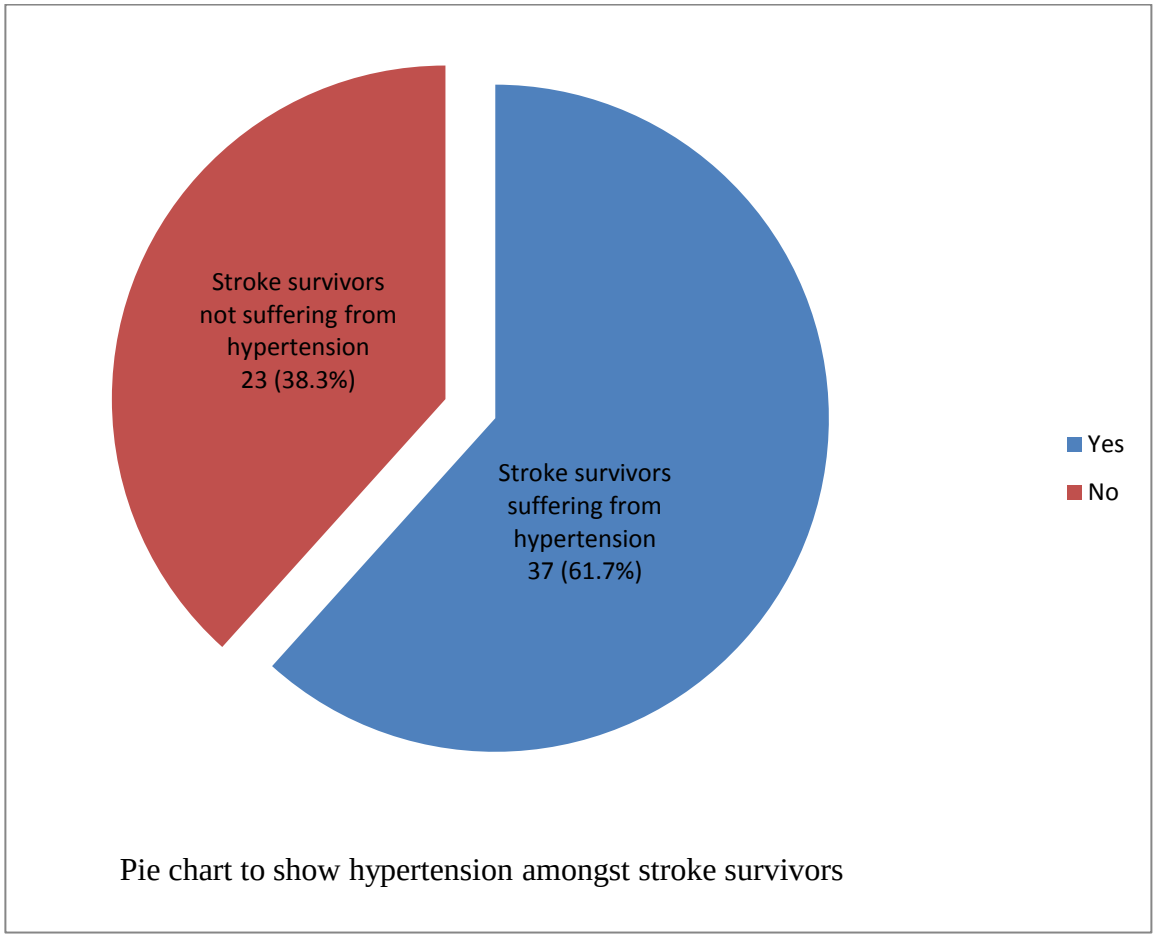


Figure 4.19: Pie chart to show hypertension amongst stroke survivors.

Item C14: Treatment of hypertension among stroke survivors suffering from hypertension (n=37)

Amongst the stroke survivors suffering from hypertension, 29 (78.4%) indicated that they were on treatment for this condition; the remaining 21.6% (n=8) were not on treatment at the time of the study as indicated in Figure 4.20.

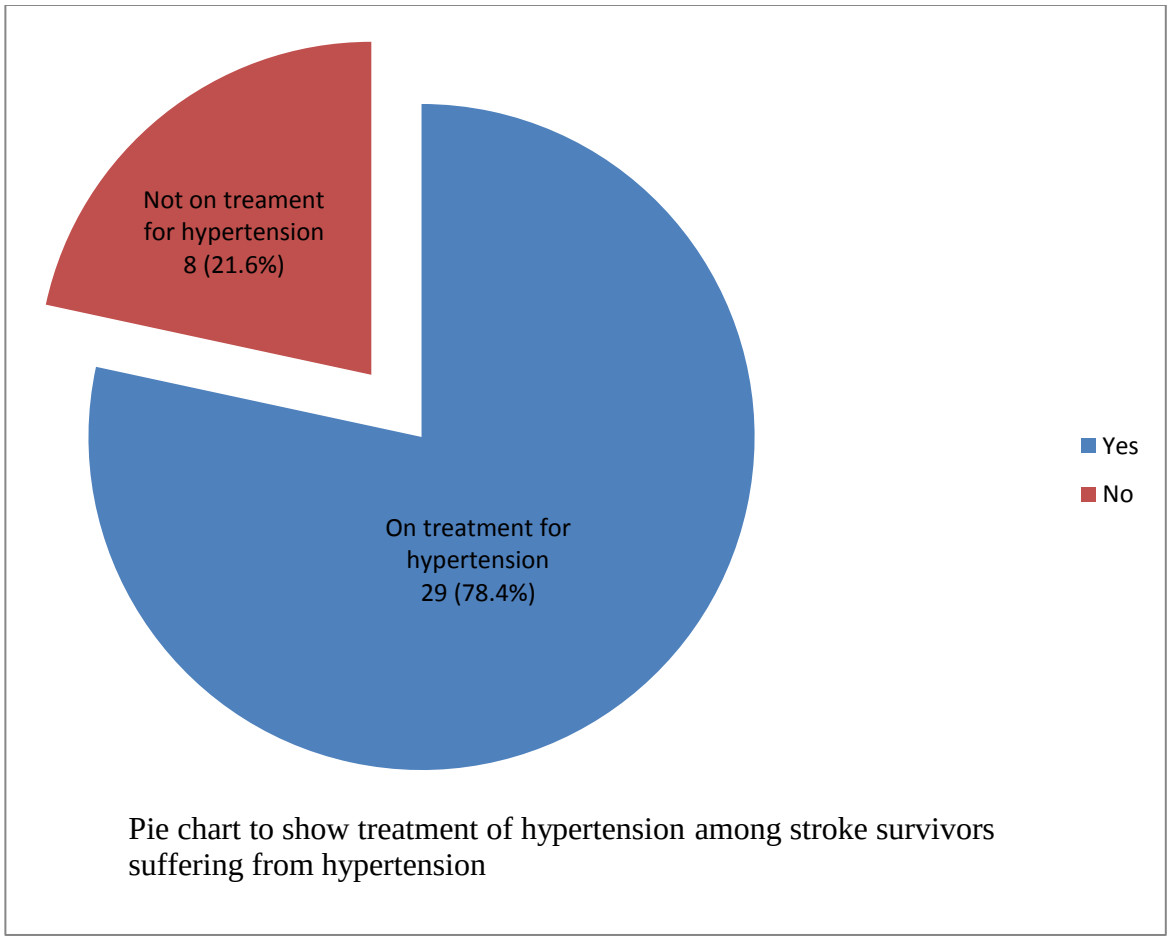


Figure 4.20: Pie chart to show treatment of hypertension among stroke survivors suffering from hypertension.

Item C15: Diabetes among stroke survivors (n=60)

This item determined the number of stroke survivors suffering from diabetes: it is a known secondary stroke predisposing factor. As evident in Figure 4.21 at the time of the study there were eight (13.3%) diabetic respondents. The vast majority, namely 52 out of 60 stroke survivors did not have diabetes.

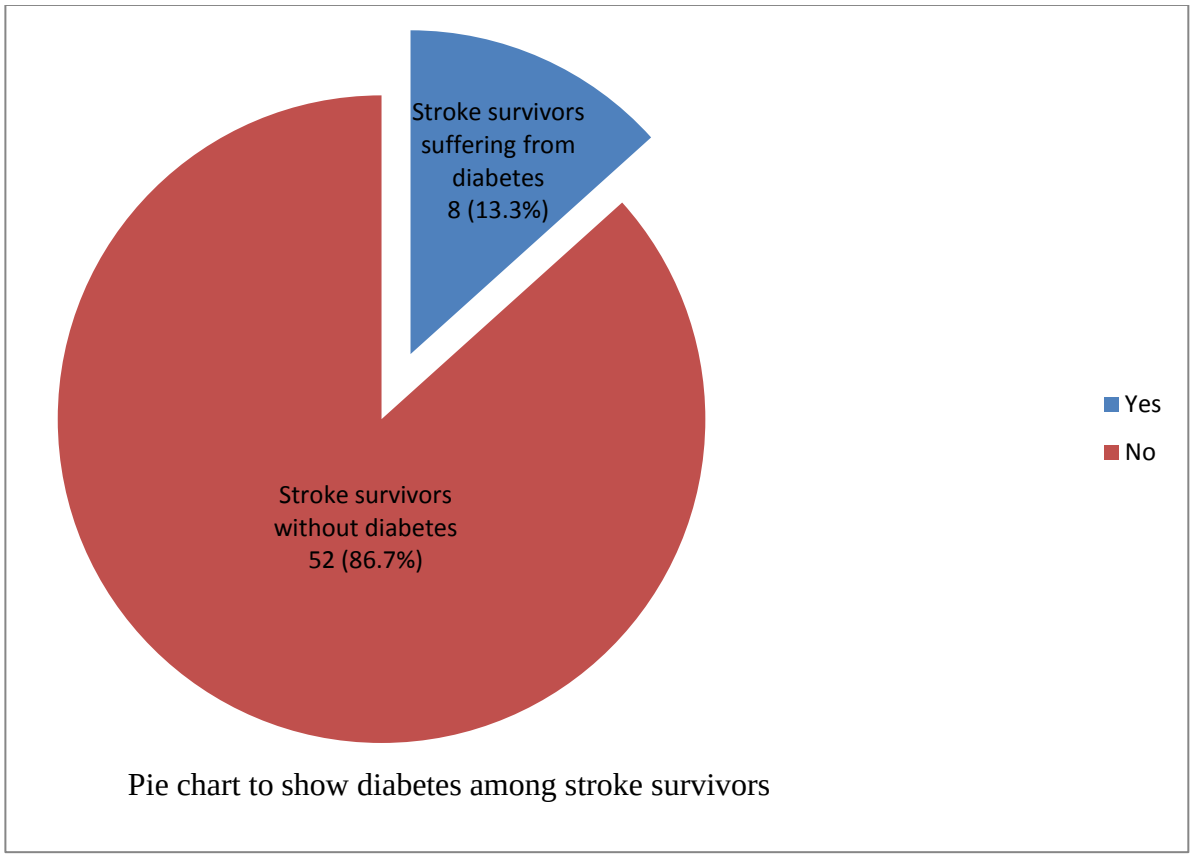


Figure 4.21: Pie chart to show diabetes among stroke survivors.

Given the above findings of diabetes and hypertension this study thus highlights the high prevalence of co-morbidity among stroke survivors.

Item C16: Treatment of diabetes among stroke survivors with diabetes (n=8)

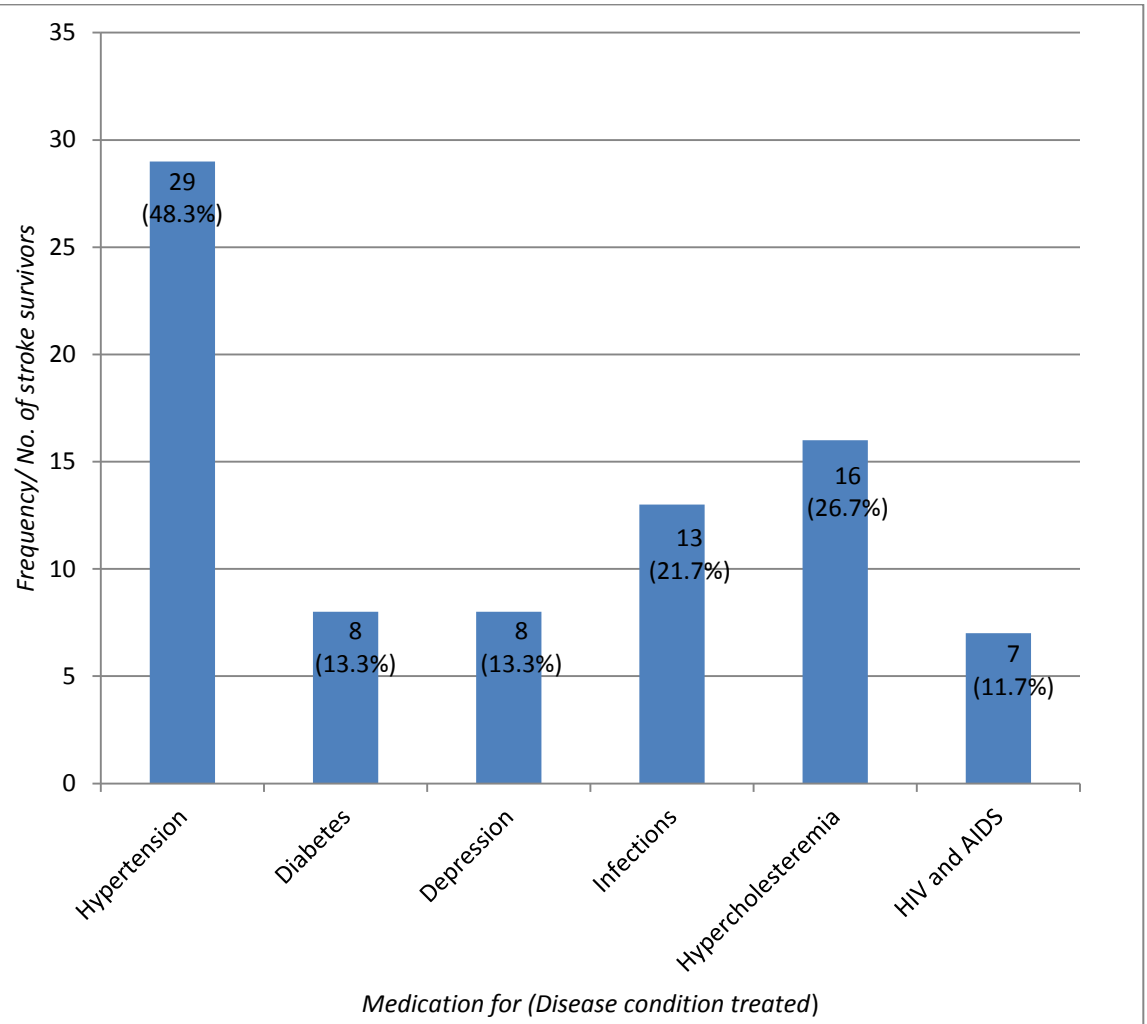
In terms of being on treatment for diabetes all eight (100.0%) stroke survivors gave an affirmative answer. This finding suggests there is a high compliance level of diabetes medication treatment among stroke survivors suffering from this disease.

Item C17: Medication use among stroke survivors (n=60)

This item sought to establish the different treatments the stroke survivors were undergoing at the time of the study. Thirty-four (56.7%) of them were on various medications at the time of the study; the remaining 26 (43.3%) were not on any medication. This finding indicates that within one year of discharge from hospital a relatively high percentage of stroke survivors continued to be on some form of medical treatment. The treatments were however not necessarily for secondary stroke prevention.

Item C18: Type of medications used by stroke survivors (n=60)

This item provided an overview of the different types of treatments stroke survivors were undergoing at the time of the study. It also further provided evidence on co-morbidity among stroke survivors. Figure 4.22 presents the type of medications used by stroke survivors by disease condition or ailment: n= 29 for hypertension (48.3%); n=8 for diabetes (13.3%); n=8 for depression (13.3%); infections n=13 (21.7%); n=16 for hypercholesteremia (26.7%); and n= 7 for HIV and AIDS (11.7%).



Bar graph to show type of medication used by stroke survivors

Figure 4.22: Bar graph to show type of medication used by stroke survivors.

Item C19: Awareness of stroke event (n=57)

This item determined the stroke survivors' awareness of their stroke condition. Figure 4.23 reveals that 57 (95.0%) of the stroke survivors in this study were aware they had

suffered a stroke. In other words out of the sixty respondents there were three (5.0%) who were unaware they had suffered a stroke.

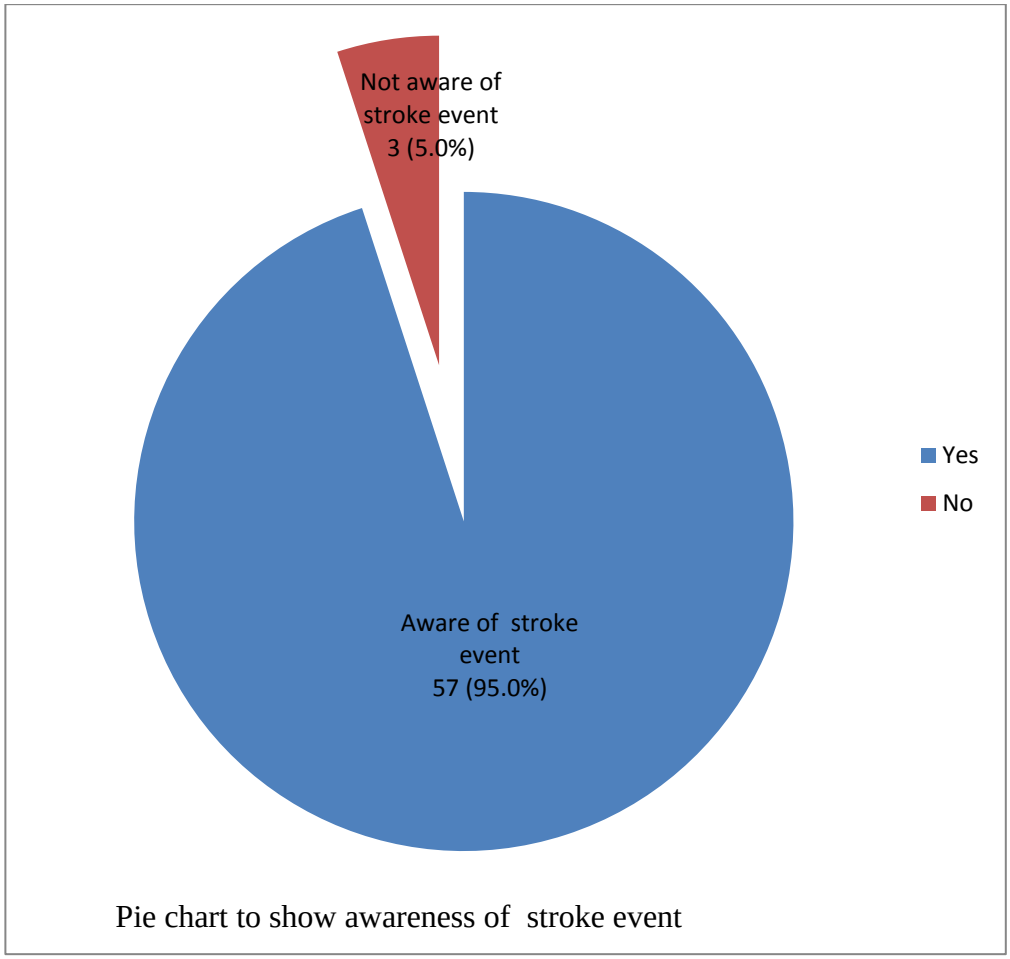


Figure 4.23: Pie chart to show awareness of stroke event (n=60).

C20: When did stroke survivor become aware of stroke event? (n=57)

This item investigated when the 57 stroke survivors in Figure 4.23 became aware of their stroke condition. Their responses showed that all 57 of them (100.0%) became aware of their stroke diagnosis during the time of their hospitalisation.

Item C21: Awareness of cause of stroke (n=60)

This item investigated the stroke survivors' awareness and knowledge on causes of stroke. Figure 4.24 shows identified acceptable and appropriate causes of stroke by the stroke survivors. The most easily identified cause of stroke is high blood pressure. Twenty (33.3%) stroke survivors reported contributed significantly as a cause of their stroke. Four stroke survivors reported old age was a contributory cause of their stroke. Three (5.0%) stroke survivors indicated alcohol abuse as a cause of their stroke. One (1.7%) stroke survivor thought smoking was a cause of his stroke.

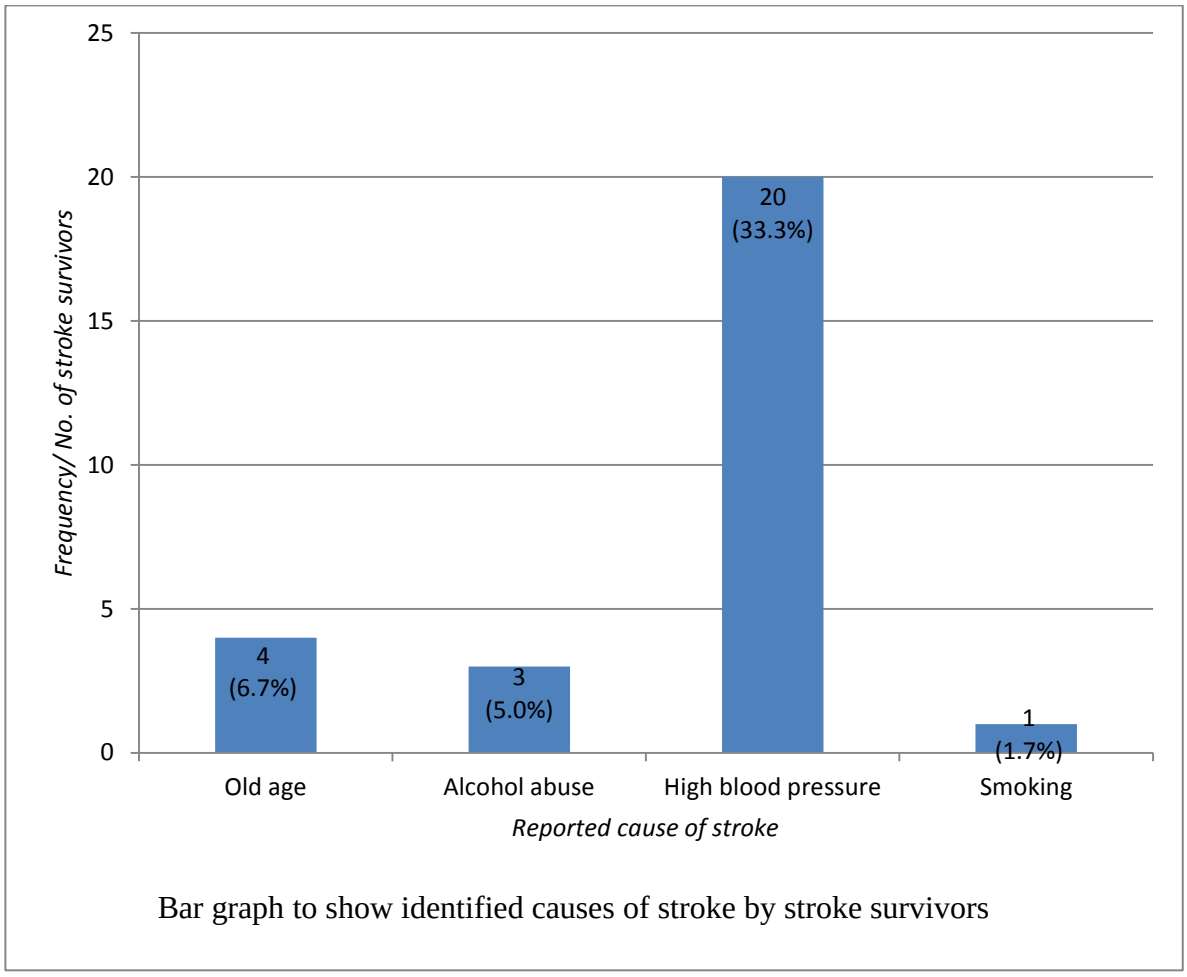


Figure 4.24: Bar graph to show identified causes of stroke by stroke survivors.

A few of the stroke survivors managed to identify multiple causes of their stroke condition. Overall, only 23 (38.3%) stroke survivors could provide an acceptable or appropriate cause of stroke. This result implies that the majority of stroke survivors, namely 61.7% (n=37) were not aware of the cause of stroke.

Item C22: Acknowledgement of secondary stroke risk (n=60)

The results for this item are presented in Figure 4.25. Twenty-four (40.0%) of the stroke survivors were unaware they were at risk of another stroke episode (secondary stroke). Thirty-six (60.0%) of the stroke survivors were able to correctly acknowledge the risk of secondary stroke.

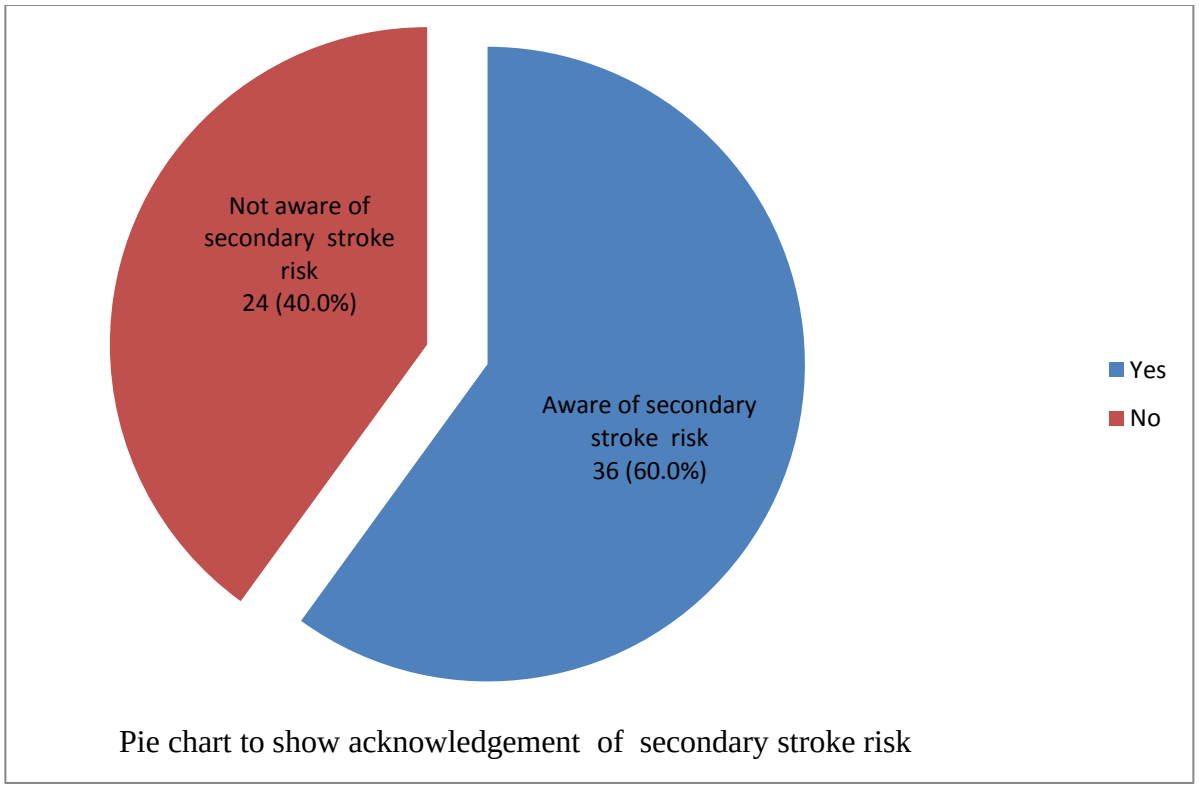


Figure 4.25: Pie chart to show acknowledgement of secondary stroke risk (n=60).

Item C23: Stroke survivor knowledge on secondary stroke prevention

In order to evaluate their knowledge on secondary stroke prevention, an open-ended question was posed to the stroke survivors or their caregivers. The results of this question are presented in Table 4.9.

Table 4.9: Stroke survivor knowledge on secondary stroke prevention (n=60)

Type of knowledge to prevent secondary stroke **(Action to take to prevent secondary stroke)**	**No. of stroke survivors able to identify action (n=60)**	
	Frequency	**Percentage (%)**
Continue treatment of pre-existing risk factors	16	26.7
Reduce alcohol consumption	9	15.0
Diet modification	5	8.3
Lead an active lifestyle (physical exercise)	6	10.0
Curb/ Quit smoking	3	5.0

In terms of the data in Table 4.9 there were 16 (26.7%) stroke survivors who acknowledged that treatment of pre-existing stroke risk factors helps to prevent a

secondary stroke. Reduction of alcohol consumption as a secondary stroke prevention strategy was reported by nine (15.0%) stroke survivors. Diet modification as a way to prevent secondary stroke was identified by five (8.3%) stroke survivors. Six (10.0%) indicated physical exercise as a way to prevent a secondary stroke. Quitting smoking was identified as a secondary stroke measure by only three (5.0%) stroke survivors.

A further analysis of stroke survivors' knowledge, as presented in Table 4.10, revealed that 29 (48.3%) stroke survivors could not identify a single secondary stroke prevention strategy. Only one (1.7%) stroke survivor was able to identify five key secondary stroke prevention strategies. Twenty-two (36.7%) stroke survivors could only correctly identify one secondary stroke prevention strategy. Five (8.3%) stroke survivors managed to identify two secondary stroke prevention strategies. There were only three (5.0%) stroke survivors who managed to identify three secondary stroke prevention strategies. None of them could identify four secondary stroke prevention strategies.

Table 4.10: Stroke survivors'/caregivers' ability to identify secondary stroke prevention strategies (n=60)

Number of secondary stroke prevention strategies identified	**Frequency (n=60)**	
	Frequency	**Percentage (%)**
Zero (No strategies identified)	29	48.3
One strategy identified	22	36.7
Two strategies identified	5	8.3
Three strategies identified	3	5.0
Four strategies identified	0	0.0
Five strategies identified	1	1.7
Total	60	

Item C24: General information sources for stroke survivors for secondary stroke prevention

This item identified information sources on secondary stroke prevention for stroke survivors. The results are presented in Table 4.11.

Table 4.11: General information sources for stroke survivors on secondary stroke prevention (n=60)

Source of information	**Frequency/ No of stroke survivors identifying source (n=60)**	
	Frequency	**Percentage (%)**
Hospital/ Clinic	33	55.0
Friends/ Family	16	26.7
News/ Magazines/ Books	1	1.7
Radio/ TV	0	0.0
Internet	4	6.7
Other	0	0.0

As evident in Table 4.11 the majority of stroke survivors 33 (55.0%) relied on the hospital (the stroke management team) as a source of secondary stroke prevention information. Friends and family accounted for 16 (26.7%) of secondary stroke prevention information sources. News/ magazines/ books do not seem to be a significant source of information: only one (1.7%) stroke survivor mentioned them as a source of secondary stroke prevention information. The internet is also a relatively insignificant source of information: only four (6.7%) stroke survivors stated they used it as a source

of information. Radio and or television were not mentioned as sources of information for secondary stroke prevention. No other sources of secondary stroke prevention were mentioned by the respondents.

Item C25: Hospital sources of information for secondary stroke prevention

The findings of this item are presented in Figure 4.26. Thirty-three (55.0%) of the stroke survivors cited the doctors in the stoke management team as providing them with information for secondary stroke prevention. Nurses, as such an information source, were cited by 22 (36.7%) of the respondents. Only two (3.3%) stroke survivors indicated the dietician was their source of secondary stroke prevention information. The rest of the stroke management team members were not acknowledged by stroke survivors as sources of secondary stroke health education information.

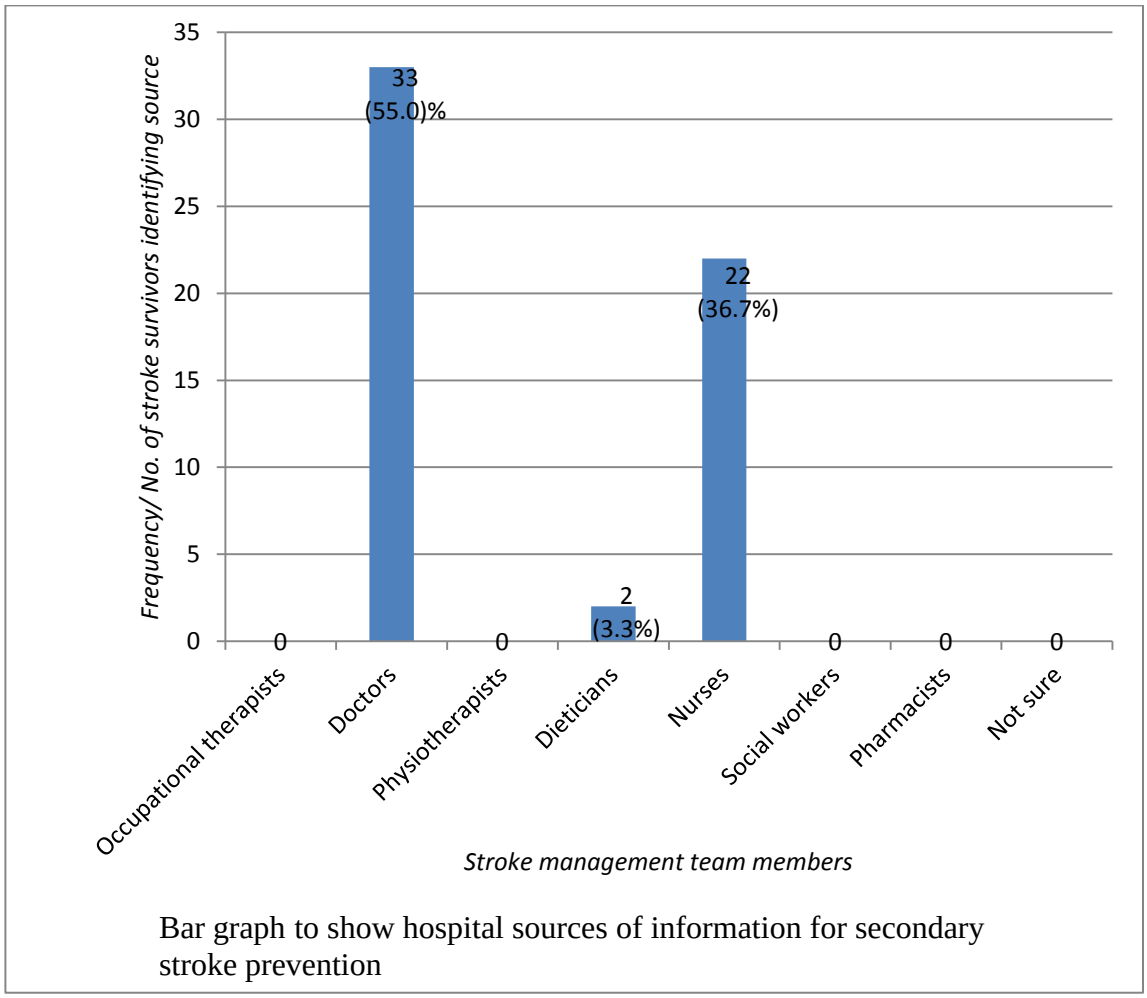


Figure 4.26: Bar graph to show hospital sources of information for secondary stroke prevention (n=60).

Item C26: Satisfaction with information for secondary stroke prevention (n=60)

This item measured the stroke survivors' satisfaction with secondary stroke prevention information. It is clear from Figure 4.27 that 60.0% (n=36) of stroke survivors were not satisfied with secondary stroke prevention information. The remaining 40.0% (n=24) were satisfied with secondary stroke prevention information.

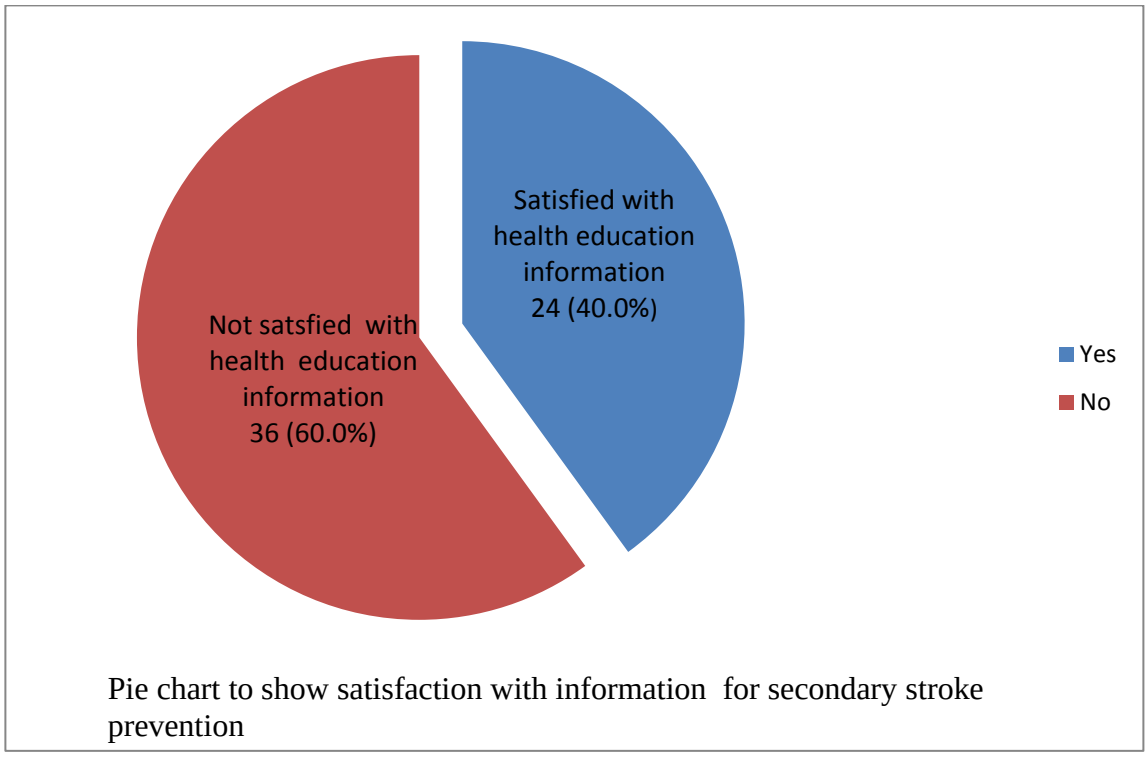


Figure 4.27: Pie chart to show satisfaction with information for secondary stroke prevention (n=60).

Item C27: Recommendation for information provision improvement

Fourteen (23.3%) stroke survivors suggested that the stroke management team should provide more information regarding prevention of secondary stroke. Nine (15.0%) stroke survivors also wanted stroke health education content to be simplified and made more understandable.

Item C28: Challenges experienced by stroke survivors implementing secondary stroke prevention (n=60)

An array of challenges was raised by the stroke survivors and/ or their caregivers pertaining to their experiences with regards to secondary stroke prevention. Table 4.12 shows that the challenges ranged from a basic lack of information about stroke to compliance with treatment and resource availability factors.

Table 4.12: Challenges experienced by stroke survivors implementing secondary stroke prevention

Challenge(s) experienced by stroke survivors	**Frequency**	**Percentage (%)**
Lack of knowledge to prevent secondary stroke	10	16.7
Difficulties complying with secondary stroke prevention measures	8	13.3
Lack of material resources, financial resources and caregiver support to implement secondary stroke prevention measures	13	21.7
Personal challenges	5	8.3

A lack of resources was reported by 13 (21.7%) stroke survivors. This seems to be a major challenge experienced by stroke survivors when implementing secondary stroke

prevention. Material and financial resources limited some stroke survivors' ability to implement certain secondary stroke prevention activities. For instance, foods specified as ideal for these stroke survivors was either too expensive or simply difficult to find. In addition, some stroke survivors mentioned lack of support, in the form of caregivers (human resources), as a limiting factor to secondary stroke prevention implementation.

Lack of knowledge to prevent secondary stroke was the second most cited challenge with 10 (16.7%) stroke survivors reporting on it. These stroke survivors blamed a lack of knowledge on how to prevent a secondary stroke as the reason for them not engaging in any secondary stroke prevention actions.

Difficulties in complying with secondary stroke prevention was reported as a secondary stroke prevention challenge by eight (13.3%) stroke survivors. Some survivors reported that it was generally difficult to stop consuming alcohol or smoking, for example. Some hypertensive stroke survivors were of the opinion that having to go to the clinic/ hospital frequently for blood pressure checks, and to take blood pressure medications on a daily basis, were not very easy things to adhere to consistently. Consequently they at times skipped taking their medicines and follow-up clinic appointments. Initiating and maintaining a physical fitness exercise regimen, and losing excess body weight, were also amongst other secondary stroke prevention activities reported as being generally difficult to comply with.

Five (8.3%) of the stroke survivors cited personal challenges in their efforts to prevent secondary stroke. Some pointed out that they felt some secondary stroke predisposing factors were familial. According to them, familial obesity, for example, meant there was

very little chance of them controlling such factors. One hypertensive stroke survivor remarked that his blood pressure was simply not stabilising despite his best efforts to comply with treatment regimens and advice. A caregiver for a stroke survivor also reported that her ’patient’ was too stubborn to listen to her advice. The unfortunate outcome was that this stroke survivor was generally not compliant to treatment.

4.3 Summary

The results of the study were presented and discussed in this chapter. There were two sections as per the data collection instruments: stroke management team, and stroke survivors. Descriptive statistics, narrative strategies, and triangulation were used to analyse and present findings. Based on these findings the next chapter covers conclusions, recommendations, and limitations of the study.

CHAPTER 5

5. CONCLUSIONS AND DISCUSSION, RECOMMENDATIONS AND LIMITATIONS OF THE STUDY

5.1 Introduction

In chapter 4 the results of the study were presented and discussed in comparison with identified local, regional and international literature. This chapter provides the conclusions drawn from the study. Based on the conclusions drawn, recommendations are formulated and presented within the local context. Limitations of this study, with regards to data sources and literature, are also highlighted. Recommendations for further research are also presented.

5.2 Conclusions from the study

The aim of this study was to determine the knowledge and practices of stroke survivors with regard to secondary stroke prevention. In terms of the aim of the study four objectives were formulated, namely

i. To describe stroke survivor education practices of the Katutura State Hospital's stroke management team with regard to secondary stroke prevention.

ii. To determine the type of knowledge stroke survivors have with regard to secondary stroke prevention.

iii. To determine the practices and challenges of stroke survivors regarding secondary stroke prevention.

iv. To identify information sources for stroke survivors regarding secondary stroke prevention.

Conclusions pertaining to these four objectives are presented below.

5.2.1 Conclusions with regard to the first objective

Quantitative research methods were used to meet the first objective: to describe stroke survivor education practices of the Katutura State Hospital's stroke management team with regard to secondary stroke prevention. Structured self-administered questionnaires were distributed tothe Katutura State Hospital's stroke management team members: the neurologist, a neurology medical officer, a stroke unit nurse, a medical social worker, a physiotherapist, a occupational therapist, a hospital dietician, and a pharmacist. Collected data were then analysed using Epi Info 5.3.1 statistical package. Narrative strategies and descriptive statistics were employed to describe the patient education practices of the stroke management team.

The conclusions for this objective are as follows.

- The results suggest that health education regarding secondary stroke education is offered to stroke survivors and or their caregivers by the Katutura State Hospital's stroke management team. As revealed in section 4.2.1 all of the eight stroke management team members indicated that they did play some role in the health education of stroke survivors regarding secondary stroke prevention. This

is in keeping with many stroke management guidelines which recommend that health education should be offered to stroke survivors on several stroke aspects including secondary stroke prevention (National Stroke Foundation, 2010; The Heart and Stroke Foundation of Canada, 2006; Scottish Intercollegiate Guidelines Network, 2010).

- The frequency with which health education of stroke survivors was done seemed to vary across stroke management team members. The majority of stroke management team members did not routinely provide health education to stroke survivors. Half of the stroke management team members (Figure 4.3) did provide health education only once to stroke survivors. Literature review on stroke health education however widely recommends that information should be made available to stroke survivors and or their caregivers routinely (Scottish Intercollegiate Guidelines Network, 2010).
- The majority of stroke management team members (75.0%) tailor their health education information to meet individual stroke survivor's needs in comparison to providing generic information about secondary stroke prevention. The former practice is supported by literature which recommends that stroke survivors and their families/ caregivers should be offered information that is tailored to meet their needs (National Stroke Foundation, 2010).
- The most used mode of delivery for stroke health education by the stroke management team is verbal instructions followed by written materials as revealed in Table 4.5. The dominant use of verbal communication and written

materials in stroke health education is consistent with study findings by Hoffmann and Cochrane, (2009) who also report that these two health education formats are generally the most frequently used methods of information provision for stroke survivors. However, the ability to communicate with stroke survivors was often cited as a challenge by most stroke management members in this study owing to significant language barriers. Namibia is a multilingual country with as many as 13 recognised national languages for a relatively small national population of just over two million (Tötemeyer, 2010; Frydman, 2011). The difficulty in communication with some stroke survivors often necessitated the frequent use of untrained translators which meant risking losing key messages in the translation process. This communication problem was further compounded by the fact that stroke as a disease frequently impairs cognitive and speech functions.

- There was also a widespread lack of information, education and communication (IEC) for secondary stroke prevention. Furthermore, use of guidelines for secondary stroke prevention health education was lacking; documentation of health education was also not frequently or routinely done.

- Regarding adequacy of stroke health education the majority of stroke survivors expressed dissatisfaction with the information they had or knowledge to prevent secondary stroke (Section 4.2.2: Item C26). Stroke survivors' dissatisfaction with health information provided to them by the stroke management team is a conclusion supported by Knight, Worrall and Rose (2006).

5.2.2 Conclusions with regard to the second objective

Quantitative research methods were used to achieve the second objective: to determine the type of knowledge stroke survivors have with regard to secondary stroke prevention. Stroke survivors, or their caregivers, residing in the Khomas region, discharged from the Katutura State Hospital's stroke unit between 1 January 2012 and 31 December 2012, participated in the study. A structured face-to-face interview was used to interview these respondents regarding their knowledge on secondary stroke prevention. Collected data were analysed using Epi Info 5.3.1 statistical package. Descriptive statistics and narrative strategies were used to present stroke survivors' knowledge regarding secondary stroke prevention.

The conclusions for this objective are as follows.

- From the study findings it can be concluded that stroke survivors' knowledge on secondary stroke prevention is less than satisfactory with as much as 40.0% (27.6% to 52.4% at 95.0% confidence interval) of stroke survivors failing to acknowledge their own risk for secondary stroke (Figure 4.25). Additionally,

almost half of stroke survivors were unable to identify a single secondary stroke prevention strategy (Table 4.10).

- Although the study sample was relatively small (n=60) to confidently make any inferences it should be highlighted that the proportion of stroke survivors who correctly identified their risk for secondary stroke at 60.0% is relatively comparable to other similar studies by Samsa et al. (1997), and Slark, Bentley, Majeed and Sharma (2010): they reported that only 55.0% of stroke survivors acknowledge increased risk of future stroke attacks.

5.2.3 Conclusions with regard to the third objective

Quantitative research methods were used to achieve the third objective: to determine the practices and challenges of stroke survivors regarding secondary stroke prevention. Stroke survivors, or their caregivers, residing in the Khomas region, discharged from the Katutura State Hospital's stroke unit between 1 January 2012 and 31 December 2012, participated in the study. A structured face-to-face interview was used to interview these respondents regarding their practices and challenges regarding secondary stroke prevention. In addition, the Katutura State Hospital's stroke management team, utilising a self-administered structured questionnaire, was requested to provide their opinion on what they felt were challenges regarding secondary stroke prevention. Collected data were analysed using Epi Info 5.3.1 statistical package and triangulation strategies. Descriptive statistics and narrative strategies were then used to present stroke survivors' practices regarding stroke secondary prevention and challenges around secondary stroke prevention.

The conclusions for this objective are as follows.

- Stroke survivors diagnosed with hypertension and diabetes seem to have satisfactory medication compliance levels with all eight (100.0%) stroke survivors suffering from diabetes indicating they were on treatment and 29 (78.4%) of stroke survivors suffering from hypertension also indicating that they were continuing with hypertension treatment (Section 4.2.2: Items C13 to C16). Further analysis of compliance levels of hypertension treatment among stroke survivors indicates treatment compliance levels of between 65.1% and 91.7% at 95.0% confidence interval among stroke survivors suffering from hypertension.
- However, a significant proportion of stroke survivors continue to smoke (25.0%; 14.0% to 36.0% at 95.0% confidence interval) and consume alcohol (30.0%; 18.4% to 41.6 at 95.0% confidence interval) contrary to expectations and recommendations (Section 4.2.2: Items C5 to C8). The proportion of stroke survivors who smoke and or consume alcohol was albeit lower than population averages. In comparison, the Namibian population average of adult alcohol consumers is 55.6% (SIAPAC, 2002). Similar studies on smoking among stroke survivors report a much the same trend ranging from 25.0% to 35.0% of stroke survivors who continue to smoke after a stroke (Ma, et al., 2008; Frandsen, Sorensen, Hyldahl, Henriksen & Bak, 2012).
- Only a relatively small percentage of stroke survivors complied with other lifestyle changes prescribed to them: modifying their diet (26.7%; 15.5% to 37.9% at 95.0% confidence interval) and engaging in physical exercise activities

(13.3%; 4.7% to 21.9% at 95.0% confidence interval), as part of secondary stroke preventative measures (Section 4.2.2: Items C9 to C12). Patient compliance and acceptance of a diet change are generally known to be poor: the reduction of salt intake is known to be the most difficult for stroke survivors (Harvey, Macko, Stein, Zorowitz & Winstein, 2008). Literature also reveals that around 40.0% of stroke survivor participants admit to living sedentary lifestyles (Amu, Ogunrin & Danesi, 2005; American Heart Association, American Stroke Association, 2011). An array of challenges was identified as possible impediments to secondary stroke prevention. These challenges included limited stroke knowledge among stroke survivors, low levels of treatment compliance on some stroke aspects, lack of resources to facilitate secondary stroke prevention, stroke co-morbidity, poverty and poor literacy levels among some stroke survivors. Evidence from 18 studies, spanning eight countries, also concluded that due to limited knowledge, many stroke survivors may not engage in the required preventive behaviors for good health and reducing the risk of secondary stroke (Ellis, Barley & Grubaugh, 2013). A lack of human and material resources is also a challenge frequently reported as an impediment to successful secondary stroke prevention by both stroke management teams and stroke survivors (Ewer, 2012; Tyson & Turner, 1999).

- Regarding stroke co-morbidity, HIV/ AIDS in particular was noted as a significant challenge facing a significant proportion of stroke survivors. HIV/AIDS appears to increase the risk of both ischemic and hemorrhagic stroke.

This increased risk is most apparent in the young HIV-infected population in which other risk factors for stroke are seldom evident. Mechanisms underlying the increased risk for stroke include opportunistic infectious meningitides and vasculitides, primary HIV vasculopathy, altered coagulation and cardioembolic events (Dobbs & Berger, 2009).

- Disability as a result of stroke left some stroke survivors without an income and no means to adjust their lifestyles. It has long been established that disability leads to poverty through a number of exclusion processes especially from paid employment (Eide & Ingstad, 2013). Poverty as a result consumes stroke survivors' abilities to implement a comprehensive secondary stroke prevention programme.

5.2.4 Conclusions with regard to the fourth objective

Quantitative research methods were used to achieve the fourth objective: to identify information sources for stroke survivors regarding secondary stroke prevention. Stroke survivors or their caregivers residing in the Khomas region, discharged from the Katutura State Hospital's stroke unit between 1 January 2012 and 31 December 2012, participated in the study. A structured face-to-face interview was used to interview these respondents regarding their information sources for secondary stroke prevention. Collected data were analysed using Epi Info 5.3.1 statistical package. Descriptive statistics and narrative strategies were then used to present stroke survivors' information sources regarding secondary stroke prevention.

The conclusions for this objective are as follows.

- The findings seem to suggest that the most prominent sources of information for stroke survivors regarding secondary stroke prevention are the hospital, friends, and family (Section 4.2.2: Item C24). Within the hospital context, doctors and nurses appear to be the main providers of stroke health education amongst the stroke management team members (Section 4.2.2: Item C25). The dominance of the hospital as a source of information for stroke survivors conforms with many stroke management guidelines that recommend that stroke management team members should be pro-active in the provision of stroke health education to all stroke survivors, their families and caregivers (Canadian Stroke Network and the Heart and Stroke Foundation of Canada, 2006; Scottish Intercollegiate Guidelines Network, 2010; National Stroke Foundation, 2010). Moore, Maiocco, Schmidt, Guo and Estes, (2002) also support the finding that nurses play a key role in information provision issues. However it is debatable regarding patients' ability to identify correctly their health provider's professional title. A survey in the USA for example found that 26.0% of stroke survivors identified nurse practitioners as medical doctors and a further 5.0% of stroke survivors were unsure of the exact title of their health provider (American Academy of Family Physicians, 2012).
- Other sources of information such as books, magazines, news (radio, television, newspapers) and the internet were found to be not significant sources of health education information for stroke survivors.

5.3 Recommendations

Several recommendations were drawn from the study: they focus on health policy, health standards of practice, support for stroke survivors, and future research. Possible stakeholders to act on these recommendations include the Ministry of Health and Social Services (MOHSS), stroke support groups, and the community.

5.3.1 Recommendations for the Ministry of Health and Social Services (MOHSS)

- A policy that guides the provision of stroke healthcare services could be developed within a year. The policy would give guidance to the organisation of stroke health care services, especially in the public health sector, to cover the preventative, curative and rehabilitative aspects of stroke.
- Standard operating procedures (SOPs) for all stroke management team professions should also be developed and implemented after the development of a guiding policy on stroke healthcare services. The coordination of the development and implementation of SOPs should be done by a neurologist or the overall head of a stroke management team. Standard operating procedures would provide guidance to clinicians and help achieve consistency and uniformity of standards in the provision of stroke healthcare.
- A monitoring and evaluation framework for stroke healthcare services should be developed as part of SOPs. This would be crucial for clinical auditing purposes, quality improvement, and efficient resource allocation.
- Regular monthly in- service training for stroke management team professionals organised by respective heads of departments of stroke management team

professionals would ensure continued health education on stroke healthcare. In addition this should ensure that the stroke management team is kept abreast with latest developments in stroke healthcare.

- Public media campaigns on stroke health education by means of monthly newspaper, radio, and television communications should be started without delay. Long, intermittent mass media stroke health education campaigns can be an effective way of increasing both stroke survivors, their caregivers and the public's knowledge on stroke (Hodgson, Rubini & Lindsay, 2009).
- Patient health education should become an integral part of stroke healthcare. This practice should be implemented promptly. It is suggested that routine provision of information to stroke patients is a more effective way for stroke health education compared to single once off educational sessions (Smith, Forster, & Young, 2009). Patient health education should ideally be done on an individual and weekly basis for all hospitalised stroke survivors and this must be documented. Besides being good clinical practice, documenting health education can also serve as evidence that stroke health education is indeed being offered to stroke survivors. Furthermore the quality assurance department should audit the provision of stroke health education to stroke survivors.
- As an adjunct to the current more common verbal educational approach, the development of IEC materials by the respective heads of departments of the respective stroke management team professions must be expedited and made available for use by the stroke management team. Stroke health education IEC

material must cater for all aspects of the stroke disease phases (preventative, curative and rehabilitative). Relevant translations of written materials for stroke health education should also be done to cover the linguistic and cultural diversity of Namibian citizens.

- A comprehensive community based rehabilitation (CBR) programme for stroke survivors in the Khomas region should be implemented to ensure that stroke survivors discharged from hospital continue to access specialised stroke care in their homes and community environment (Law & MacDermid, 2008). In addition this can also act as a platform for knowledge and skills transfer from the CBR team to stroke survivors and or their caregivers.
- Structured training of caregivers for stroke survivors could be explored by MOHSS as an extension of CBR programmes.

5.3.2 Recommendations for community and stroke support groups

- An establishment of support stroke groups for peers could be expedited. Community leaders and volunteers could take a lead in such support groups. After suffering a stroke there often arise the need for peer support, hope and encouragement for stroke survivors and their families to cope and adjust to their disabilities and changes to their lives. Stroke support groups can offer survivors, their caregivers, and other family members a chance to share these concerns and support each other. Additionally, support groups can provide stroke survivors and their families a place to get answers after stroke. Furthermore, expanded

functions for such support groups could include fundraising for selected needs for its members (American Stroke Association, n.d).

- Non-governmental organisations, faith based organisations and civil organisations could complement stroke public health services through the establishment of stroke support groups, stroke health promotion campaigns, and community based stroke rehabilitation partnerships.

5.3.3 Recommendations for future research

In the next five years various research studies focusing on issues or areas listed below could be commissioned or conducted either by MOHSS, or academic institutions such as the University of Namibia.

i. Stroke awareness among the general population, more specifically knowledge of stroke risk factors, warning symptoms, and treatment could be investigated among the general population in Namibia.
ii. Factors contributing and reasons as to why stroke patients default their treatment could also be explored.
iii. Cultural practices regarding stroke care, myths and beliefs about stroke in Namibia
iv. Population surveys on some stroke predisposing factors and diseases such as obesity, hypercholesterolemia, diabetes and hypertension.
v. Research on the impact of the stroke unit on stroke public health services in Namibia since its establishment at the Katutura State Hospital.

vi. Impact of stroke on its sufferers, their families and society.

5.4 Limitations of the study

Blaikie (2009) refers to limitations of the study as compromises and restrictions in a study that may affect generalisability of study findings.

5.4.1 Limitations with regards to respondents

The position of the researcher, as a senior physiotherapist at the Katutura State Hospital might have influenced the responses of some of the respondents. Work colleagues (stroke management team members) and stroke survivors (patients) may have believed they were compelled to respond positively to some of the questions in order to conform to certain expectations as professionals or patients causing the Hawthorne Effect. To help minimise the Hawthorne Effect respondents in this study were assured that they would not be identified by name in the research write up, their responses would remain anonymous and their data would be kept confidential. However, for stroke management team professionals where there was only one incumbent anonymity of responses could not be achieved.

Another challenge with the study was interviewing caregivers instead of stroke survivors because their disability status made it impossible to interview them directly. Although the respective caregivers could be considered arguably representative of a stroke survivor, some responses could have differed had it been the stroke survivors themselves giving responses to the interview. Further, due to the small number of respondents the reliability of the study could also have been influenced.

5.4.2 Limitations with regards to literature

There was paucity of literature from studies done on stroke locally. Furthermore there is no evidence in the literature of studies undertaken in Namibia on secondary stroke prevention specifically. A few regional studies and a lot more international studies were thus used in the literature review. In addition a few of the cited sources in the literature were also not current.

5.5 Concluding remarks

Knowledge regarding secondary stroke prevention seems to be relatively low among stroke survivors with as much as 40.0% of stroke survivors unaware they are at risk of suffering another stroke. Consequently, only a relatively small percentage of stroke survivors in this study complied with secondary stroke preventative measures. A possible explanation for poor knowledge and low treatment compliance levels could be that although health education is offered to stroke survivors by the stroke management team, the stroke health education is probably not comprehensive enough to be of real benefit and impact. In addition, as mentioned in chapter 2, a significant proportion of stroke survivors are dependent on informal caregivers who are often family members who feel inadequately trained, poorly informed, and dissatisfied with the extent of support available to them after the stroke survivor is discharged from hospital (Kalra, 2004). In addition, there are also other challenges around secondary stroke prevention such as stroke co-morbidity, poverty, poor comprehension of the stroke disease and resource constraints that have to be overcome if secondary stroke prevention is to be successful.

REFERENCES

Alaszewski, H., King, A., Alaszewski, A & Potter, J. (2008).*Communicating information to stroke survivors.* University of Kent.

American Academy of Family Physicians. (2012). *Patients perceptions regarding health care providers.* Retrieved December 13, 2013, from http://www.aafp.org/dam/AAFP/documents/about_us/initiatives/PatientPerceptions.pdf

American Heart Association, American Stroke Association. (2006). Guidelines for prevention of stroke in patients with ischemic stroke or transient ischemic attack. *Stroke, 37*, 577-617.

American Heart Association, American Stroke Association. (2011). Guidelines for the prevention of stroke in patients with stroke or transient ischemic. *Stroke, 42*, 227-276.

American Heart Association, American Stroke Association. (2005). *Management of adult stroke rehabilitation care: a clinical practice guideline.*

American Heart Association, American Stroke Association. (2012). *Physical activity.* Retrieved September 12, 2012, from

ttp://www.strokeassociation.org/STROKEORG/LifeAfterStroke/HealthyLivingAfterStroke/PhysicalActivity/Physical-Activity_UCM_310896_Article.jsp

American Stroke Association. (n.d). *Successful stroke support groups: our guide to organizing successful stroke support groups.*

Amu, E., Ogunrin, O & Danesi, M. (2005). Re - appraisal of risk factors for stroke in Nigerian Africans - a prospective case - control study. *Africa Journal of Neurological Sciences, 24* (2).

Apostolopoulou, M., Michalakis, K., Miras, A., Hatzitolios, A & Savopoulos, C. (2012). Nutrition in the primary and secondary prevention of stroke. *Maturitas, 72* (1), 29-34.

Ardagna, D & Zhang, L. (Eds.). (2010). *Run time models for self managing systems and applications.* Basel: Springer .

Avila, J., Lucas, J. L & Hernandez, F. (2011). .*Animal models for neurodegenerative disease.* Madrid: Royal Society of Chemistry.

Babbie, E. (2010). *The practice of social research.*Wadsworth: Cengage Learning.

Bansil, S., McCall-Brown, A. N & Laschiver, B. (2009). *Assessment of patient*

compliance with secondary stroke prevention measures. Retrieved June 3, 2012, from http://www.thenecc.org/images/McCallBrownPoster2009.pdf

Barnard, M. (2004, August 31). Shortage of doctors takes centre stage. *The Namibian.*

to the national EMS education standards. Burlington: Jones and Bartlett.

Bendok, B., Naidech, A., Walker, M. T &Batjer, H. H. (2011). *Hemorrhagic and*

ischemic stroke: medical, imaging, surgical and interventional approaches. New York: Thieme.

Blaikie, N. (2009). *Designing social research.* Cambridge: Polity Press

Bogousslavsky, J. (2006). *Stroke: selected topics.* New York: Demos Medical

Publishing.

Bowling, A & Ebrahim, S. (2005). *Handbook of health research methods: investigation,*

measurement and analysis. Berkshire: McGraw-Hill International.

Brass, L. M. (2005). Reducing the risk of stroke. *Advanced Studies in Medicine,* 5(10C),

1003-1010.

Brenner, D. A., Zweifler, R. M., Gomez, C. R., Kissela, B. M., Levine, D., Howard, G.,

et al. (2010). Awareness, treatment, and control of vascular risk factors among stroke survivors. *Journal of Stroke Cerebrovascular Disease, 19*(4), 311-320.

Brink, H. (2006). *Fundamentals of research methodology for healthcare professionals.* Cape Town: Juta and Company.

Buelow, J. M & Hinkle, J. L. (2008). Why are reliability and validity important to neuroscience nurses? *Journal of Neuroscience Nursing, 40* (6), 369-372.

Burton, C & Gibbon, B. (2005). Expanding the role of the stroke nurse: a pragmatic clinical trial. *Journal of Advanced Nursing, 52* (6), 640-50.

Bushnell, C. D & Colón-Emeric, C. S. (2009). Secondary stroke prevention strategies for the oldest patients: possibilities and challenges. *Drugs Aging, 26* (3), 209-230.

Canadian Stroke Network and the Heart and Stroke Foundation of Canada. (2006). *Canadian best practice recommendations for stroke care:* Ottawa.

Caplan, L. R. (2010). *Stroke.* Sydney: Accessible Publishing Systems.

Castilla-Guerra, L., Fernández-Moreno, M &Álvarez-Suero, J. (2009). Secondary stroke prevention in the elderly: new evidence in hypertension and hyerlipidemia. *European Journal of Internal Medicine, 20,* 586-590.

Chalmers, J & Chapman, N. (2001). Challenges for the prevention of primary and

secondary stroke: the importance of lowering blood pressure and total cardiovascular risk. *Blood Pressure, 10* (5-6), 344-351.

Child Health and Nutrition Research Initiative. (n.d). *Quantitative and qualitative research*. Retrieved August 6, 2012, from http://www.chnri.org/resources/1.%20Learning%20Resource%20Material/Qualitative%20Research/Guides/Quali%20&%20quantitative%20research.pdf

Clow, K. E & Stephens, R. E. (2009). *Concise encyclopedia of professional services marketing.* New York: Routeledge.

Cohen, L., Manion, L & Morrison, K. (2007). *Research methods education.* New York: Routledge.

Colivicchi, F., Bassi, A., Santini, M & Caltagirone, C. (2007). Discontinuation of statin therapy and clinical outcome after ischemic stroke. *Stroke, 38*, 2652-2657.

Croquelois, A & Bogousslavsky, J. (2006). Risk awareness and knowledge of patients with stroke: results of a questionnaire survey 3 months after stroke. *Journal of Neurology, Neurosurgery and Psychiatry, 77* (6), 726–728.

Cuccurullo, S. (2004). *Physical medicine and rehabilitation board review.* New York: Demos Medical.

Cunningham, J. (2003). *The experience of stroke survivors and caregivers stroke education and awareness themes.* Retrieved June 14, 2012, from http://www.ahprc.dal.ca/projects/ysp/pdfs/reports/experience-strokeSurvivor.pdf

Damush, T. M., Plue, L., Bakas, T., Schmid, A & Williams, L. S. (2007). Barriers and facilitators to exercise among stroke survivors. *Rehabilitation Nursing, 32* (6), 253-60.

Delta States Stroke Network. (n.d). *Stroke awareness and education toolkit for healthcare providers.* Retrieved June 22, 2012, from http://msdh.ms.gov/msdhsite/_static/resources/3904.pdf

Di Carlo, A. (2009). Human and economic burden of stroke. *Age Ageing, 38* (1), 4-5.

Dobbs, M. R & Berger, J. R. (2009). Stroke in HIV infection and AIDS. *Expert Review of Cardiovascular Therapy, 7* (10), 1263-71.

Dornyei, Z & Taguchi, T. (2010). *Questionnaires in second language research: construction, administration, and processing.* New York: Taylor & Francis.

Eames, S., McKenna, K., Worrall, L & Read, S. (2003). The suitability of written education materials for stroke survivors and their carers. *Topics in Stroke Rehabilitation, 10* (3), 70-83.

Eastern Health & Social Services Council. (2007). *Stroke survivors and carers recommendations for improvement of services.* Belfast: EHSSB Stroke Strategy Implementation Project.

Edberg, M. C. (2010). *Essential readings in health behavior: Theory and practice.* Sudbury: Jones and Bartlett.

Edmans, J. (2011). *Occupational therapy and stroke.* San Francisco: Wiley-Blackwell.

Eide, A. H & Ingstad, B. (2013). Disability and poverty: reflections on research experiences in Africa and beyond. *African Journal of Disability, 2* (1).

Ellis, C., Barley, J & Grubaugh, A. (2013). Poststroke knowledge and symptom awareness: a issue for secondary stroke prevention. *Cerebrovascular Diseases, 35* (6), 572-81.

Engstad, T., Viitanen, M & Arnesen, E. (2003). Predictors of death among long-term stroke survivors. *Stroke, 34*, 2876-2880.

Evers, U., Jones, S., Caputi, P.& Iverson, D. (2011). Combining the Health Belief Model and Social Marketing to develop a community level campaign about asthma for older adults. *Emerging researchers in ageing conference* (pp. 117-125). Sydney: ERA.

Ewer, S. (2012). *Secondary stroke prevention*. Alabama Department of Public Health. Montgomery.

Fisher, M & Lees, K. (2006). Nutrition and stroke prevention. *Stroke, 37*, 2430-2435.

Fitzpatric, J. J &Kazer, M. W. (Eds.).(2010). *Encyclopedia of nursing research.* New York: Springer.

Flanagan, S. R., Zaretsky, H & Moroz, A. (2010). *Medical aspects of disability: a handbook for the rehabilitation professional.* New York: Springer.

Frandsen, N. B., Sorensen, M., Hyldahl, T. K., Henriksen, R. M & Bak, S. (2012). Smoking cessation intervention after ischemic stroke or transient ischemic attack: a randomized controlled pilot trial. *Nicotine and Tobacco Research, 14* (4), 443-447.

Frydman, J. (2011). Retrieved December 16, 2013, from *A critical analysis of Namibia's English-only language policy*: http://www.lingref.com/cpp/acal/40/paper2574.pdf

Furie, K. L., Kasner, S. E., Adams, R. J., Albers, G., Bush, R. L., Fagan, S. C., et al. (2011). A guideline for healthcare professionals from the American guidelines

for the prevention of stroke in patients with stroke or transient ischaemic attack. *Stroke, 42*, 227-276.

Garrad, J. (2010). *Health sciences literature review made easy.* Sadbury: Jones & Bartlett Learning.

Glader, E. L., Sjölander, M., Eriksson, M & Lundberg, M. (2010). Persistent use of secondary preventive drugs declines rapidly during the first 2 years after stroke. *Stroke, 41*, 397-401.

Glasow, P. A. (2005). *Fundamentals of survey research methodology.* Virginia: Mitre.

Goodwin, C. J. (2009). *Research in psychology: methods and design.* New Jersey: John Wiley & Sons.

Gordon, N. F., Gulanick, M., Costa, F., Fletcher, G., Franklin, B. A., Roth, E. J. et al. (2004). Physical activity and exercise recommendations for stroke survivors. *Circulation, 109*, 2031-2041.

Gorelick, P. B & Testai, F. D. (2009). *Preventing recurrent stroke: targets for managing risk.* Retrieved July 16, 2012, from http://www.stroke.org/site/DocServer/Preventing_Recurrent_Stroke_Handouts.pdf?docID=7042

Government of the Republic of Namibia. (2006). *Republic of Namibia population projections.* Windhoek: National Planning Commission.

Hackman, D. G & Spence, J. D. (2007). Combining multiple approaches for the secondary prevention of vascular events after stroke: a quantitative modeling study. *Stroke, 38,* 1881-1885.

Hanger, H. C & Wilkinson, T. J. (2001). Stroke education: can we rise to the challenge? *Age and Ageing, 30* (2), 113-114.

Hanger, H. C., Walker, G., Paterson, L. A., McBride, S & Sainsbury, R. (1998).What do patients and their carers want to know about stroke? A two-year follow-up study. *Clinical Rehabilitation, 12* (1), 45-52.

Hankey, G. (2009). *Stroke treatment and prevention: an evidence-based approach.* Cambridge University Press: Cambridge.

Hankey, G., Jamrozik, K., Broadhurst, R. J & Forbes, S. (2002). Long-term disability after first-ever stroke and related prognostic factors in the Perth community stroke study, 1989-1990. *Stroke, 33,* 1034-1040.

Hardman, A. E & Stensel, D. J. (2009). *Physical activity and health: the evidence explained.* New York: Taylor & Francis.

Harvey, R., Macko, R., Stein, J., Zorowitz, R & Winstein, C. (2008). *Stroke recovery and rehabilitation.* New York: Demos Medical Publishing.

Hasan, Z. N., Hussein, M. Q & Haji, G. F. (2011). Hypertension as a risk factor: is it different in ischemic stroke and acute myocardial infarction comparative cross-sectional study? *International Journal of Hypertension*.

Hashimoto, Y. (2011). Smoking and stroke. *Brain Nerve, 63* (5), 483-90.

Heart and Stroke Foundation of Ontario.(n.d). *Coordinated stroke strategy.* Retrieved July 16, 2012, from http://strokenetworkseo.ca/public/pdf_docs/PreventionWorkshopContinuumMar1_04.pdf

Hiraga, A. (2011). Perception of recurrent stroke risk among stroke survivors. *Neuroepidemiology, 37*, 88–89.

Hodgson, C., Lindsay, P & Rubini, F. (2009). Using paid mass media to teach the warning signs of stroke: the long and the short of it. *Health Promotion Journal of Australia, 20* (1), 58-64.

Holmes, L. (2008). *Cph exam quick reference review.* Sudbury: Jones & Bartlett Learning.

Hoffmann, T & Cochrane, T. (2009). What education do stroke patients receive in Australian hospitals? *Patient education and counseling, 77*, 187- 191.

Hopkins, W. G. (2000). Retrieved Novemeber 15, 2012, from *Validity and Reliability - Sportscience*: www.sportsci.org/resource/stats/ValidityAndReliability.ppt

Hu, R. (2011). *Hypertension awareness, treatment, and control status among ischemic stroke survivors in community.* Retrieved July 2, 2012, from Globe Thesis: http://www.globethesis.com/?t=2154360308969983

Hux, K., Rogers, T & Mongar, K. (2000). Common perceptions about strokes. *Journal of Community Health, 25*, 47-65.

Iacobellis, G. (2009). *Obesity and cardiovascular disease.* Oxford: Oxford University Press.

Jackevicius, C. A & Mamdani, M. (2002). Adherence with statin therapy in elderly patients with and without acute coronary syndromes. *The Journal of the American Medical Association, 288* (4), 462-467.

Jackson, S. L. (2011). *Research methods and statistics: a critical thinking approach.* Belmont: Cengage Learning.

Joubert, J., Bustos, E. M., Decavel, P., Chopard, J. L., Joubert, L. B & Moulin, T.

(2011). Telestroke for the long-term management of risk factors in stroke survivors. *Telemedicine Techniques and Applications*.

Juran, J. M & Godfrey, A. B. (1999). *Juran's quality handbook.* New York: McGraw Hill.

Kalra, L. (2004). Training carers of stroke patients: randomised controlled trial. *BMJ, 328* (1099).

Katutura State Hospital. (2011). *Katutura State Hospital profile.* unpublished.

Khan, N. A., Yun, L., Humphries, K & Kapral, M. (2010). Antihypertensive drug use and adherence after stroke. *Stroke., 41*, 1445-1449.

Kirch, W. (2008). *Encyclopedia of public health.* New York: Springer.

Kirk, R. E. (2007). *Statistics: an introduction.* Belmont: Cengage Learning.

Kirshner, H. S. (2010). Update on secondary stroke prevention. *European Neurological Journal*.

Knight, K., Worrall, L & Rose, T. (2006). The provision of health information to stroke patients within an acute hospital setting: what actually happens and how do patients feel about it? *Topics in Stroke Rehabilitation, 13* (1), 78-97.

Kohsaka, S., Jin, Z., Rundek, T., Homma, S., Sacco, R. L & Tullio, M. R. (2011).

Alcohol consumption and atherosclerotic burden in the proximal thoracic aorta. *Atherosclerosis, 219* (2), 794.

Latif, S & McNicoll, L. (2009). Medication and non-adherence in the older adult. *Geriatrics for the Practising Physician, 92* (12).

Law, M. C & MacDermid, J. (2008). *Evidence-based rehabilitation: a guide to practice.* New Jersey: Slack Incooperated.

Lecouturier, J., Rodgers, H., Murtagh, M. J., White, M., Ford, G. A & Thomson, R. G. (2010). Systematic review of mass media interventions designed to improve public recognition of stroke symptoms, emergency response and early treatment. *BMC Public Health, 10* (784).

Lewis-Beck, M. S., Bryman, A & Liao, T. F. (2004). *The SAGE encyclopedia of social science research methods.* California: SAGE.

Lin, H., Chang, W. L & Tseng, M. (2011). Readmission after stroke in a hospital-based registry: risk, etiologies, and risk factors. *Neurology, 76* (5), 438-43.

Liu, Q., Wang, M., Guo, J., Li, J., Li, C & Qian, M. (2011). Effect of socioeconomic status on secondary prevention of stroke. *International Journal for Quality in Health Care, 23* (4), 405-412.

Lucey, T. (2005). *Management information systems.* London: Thomson Learning.

Ma, R., Wang, C., Zhao, X., Xu, M., Lv, Y., Wei, M., et al. (2008). A survey on compliance with secondary stroke prevention guidelines and follow up for the inpatients with atherosclerotic cerebral infarction/transient ischemic attack. *Neurological Research, 30* (4), 383-388.

Mackay, J & Mensah, G. (2004). *The atlas of heart disease and stroke.* Geneva: World Health Organisation in collaboration with Centers for Disease Control and Prevention.

MacMillan Dictionary. (2012). *Practice*. Retrieved April 14, 2012, from http://www.macmillandictionary.com/dictionary/british/practice

Macnabb, D. E. (2008). *Research methods in public administration and non-profit management: quantitative and qualitative approaches.* New York: M E Sharpe Inc.

Maningat, P., Gordon, B. R & Breslow, J. L. (2013). How do we improve patient compliance and adherence to long-term statin therapy? *Current atherosclerosis reports, 15* (1), 291.

Mansoor, L. E & Dowse, R. (2003). Effect of pictograms on readability of patient

information materials. *The Annals of Pharmacotherapy, 37* (8), 1003-1009.

Mant, J & Walker, M. F. (2011). *ABC of stroke.* West Sussex: John Wiley and Sons.

Markus, H., Pereira, A & Cloud, G. (2010). *Stroke medicine.* Oxford: Oxford University Press.

McGowan, H. (2010). *Stroke and depression.* Retrieved May 29, 2012, from http://www.healthnetworks.health.wa.gov.au/docs/Stroke_Depression.pdf

Ministry of Health and Social Services. (2011). *Namibia standard treatment guidelines.* Windhoek: Ministry of Health and Social Services.

Mitchell, M. L & Jolley, J. M. (2010). *Research design explained*. Belmont: Wadworth Cengage Learning

Moore, L., Maiocco, G., Schmidt, S., Guo, L & Estes, J. (2002). Perspectives of caregivers of stroke survivors: Implications for nursing. *Medsurgnursing,11*, 289-295.

Morill, L. A & Pinzon, M. (2009). *Developing effective education strategies for stroke survivors.* Retrieved June 23, 2012, from www.stroke.org/site/DocServer/STARS_Handout.pdf?docID=7142

National Stroke Association.(2012). *Medication adherence and compliance.* Retrieved

July 16, 2012, from http://www.stroke.org/site/DocServer/NSA_Med_AdherenceBooklet.pdf?docID=9121

National Stroke Foundation. (2010). *Clinical guidelines for stroke management.* Melbourne: National Stroke Foundation

National Stroke Foundation. (2005). *Clinical guidelines for stroke rehabilitation and recovery.* Melbourne: National Stroke Foundation.

O'Carroll, R., Dennis, M., Johnston, M & Sudlow, C. (2010). Improving adherence to medication in stroke survivors (IAMSS): a randomised controlled trial: study protocol. *BMC Neurology, 10* (15).

O'Donnell, M. (2010). *Global epidemiology of stroke.* Dublin: National University of Ireland.

Olsen, W. (2004). *Developments in sociology.* (M. Holborn, Ed.) Ormskirk: Causeway Press.

Otswald, S. K., Davis, S., Hersch, G., Kelley, C & Godwin, K. M. (2008). Evidence-based educational guidelines for stroke survivors after discharge home. *Journal of Neuroscience Nursing, 40* (3), 173-191.

Oxford Dictionaries. (2011). *Knowledge*. Retrieved June 15, 2011, from http://oxforddictionaries.com/definition/knowledge?q=knowledge

Oxford Dictionaries. (2012). *Survivor*. Retrieved February 12, 2012, from http://oxforddictionaries.com/definition/survivor?q=survivor

Ozolins, U. (2009). Back translation as a means of giving translators a voice. *The International Journal for Translation & Interpreting Research, 1* (2).

Park, K. A., Kim, H. S., Kim, J. S., Kwon, S. U & Kwon, S. C. (2001). Food intake frequency, and compliance in stroke patients. *Korean Journal of Community Nutrition, 6,* 542-552.

Patra, J., Taylor, B., Irving, H., Roerecke, M., Baliunas, D., Mohapatra, S., et al. (2010). Alcohol consumption and the risk of morbidity and mortality for different stroke types - a systematic review and meta-analysis. *Biomed Central Public Health, 10* (258).

Pierce, L. L. (2010). How to choose and develop written educational materials. *Rehabilitation Nursing, 35* (3), 99-112.

Polikandrioti, M. (2009).Non-modifiable risk factors for ischemic stroke. *Health Science Journal, 3* (1).

Polit, D. F & Beck, A. G. (2004). *Nursing research: principles and methods.* Philadelphia: Lippincott.

Quilliam, B. J & Lapane, K. L. (2001). Clinical correlates and drug treatment of residents with stroke in long-term care. *Stroke, 13*, 1385-1393.

Rankin, S. H., Stallings, K. D & London, F. (2005). *Patient education in health and illness.* Philadelphia: Lippincott Williams and Wilkins.

Regional Network for Equality in Health in Southern Africa. (2005). *Equity in healthcare in Namibia towards needs-based allocation formula.* Windhoek: EQUINET.

Republic of Namibia. (2012). *Namibia 2011 population and housing census main report.*

Rimer, K., Glanz, B. K & Viswanath, K. (n.d). *Health behavior and health education: theory research and practice.* Retrieved March 05, 2015, from http://www.med.upenn.edu/hbhe4/part2-ch3-main-constructs.shtml

Ríos, F. d., Kleindorfer, D. O., Khoury, J., Broderick, J. P., Moomaw, C. J., Adeoye, O., et al. (2012). Trends in substance abuse preceding stroke among young adults: a population-based study. *Stroke, a Cerebral Circulation, 43* (12),3179-83.

Rodgers, H., Bond, S & Curless, R. (2001). Inadequacies in the provision of information

to stroke patients and their families. *Age and Ageing, 30*, 129-133.

Romero, J. R., Morris, J & Pikula, A. (2008). Stroke prevention: modifying risk factors. *Therapeutic Advances in Cardiovascular Disease, 2* (4).

Roth, E. J & Harvey, R. L. (2000). Rehabilitation of stroke syndromes. In R. L. Braddom (Ed.), *Physical medicine and rehabilitation.* Philadelphia: Saunders.

Rowland, L. P., Pedley, T. A & Merritt, H. H. (2009). *Merritt's neurology.* Philadelphia: Lippincott Williams & Wilkins.

Ruland, S., Raman, R., Chaturvedi, S., Leurgans, S & Gorelick, P. B. (2003). Awareness, treatment, and control of vascular risk factors in African Americans with stroke. *Neurology, 60* (1), 64-68.

Russolillo, A., Minno, M. N., Tufano, A., Prisco, D & Minno, G. D. (2011). Filling the gap between science & clinical practice: prevention of stroke recurrence. *Thrombosis Research, 129* (2012), 3-8.

Salter, K., Teasell, R., Foley, N., Bhogal, S & Speechley, M. (2011). *Secondary prevention of stroke.* Evidence-based review of stroke rehabilitation.

Samsa, G. P., Cohen, S. J., Goldstein, L. B., Bonito, A. J., Duncan, P. W., Enarson, C.,

et al. (1997). Knowledge of risk among patients at increased risk for stroke. *Stroke, 28*, 916-921.

Sappok, T., Faulstich, A., Stuckert, E., Kruck, H., Marx, P & Koennecke, H. C. (2001). Compliance with secondary prevention of ischemic stroke: a prospective evaluation. *Stroke, 32*, 1884-1889.

SASPI Project Team. (2004). Secondary prevention of stroke: results from the Southern Africa Stroke Prevention Initiative (SASPI) study. *Bull World Health Organ, 82* (7), 503-508.

Schoenstadt, A. (2006, December 26). *Recurrent stroke*. Retrieved September 12, 2012, from http://stroke.emedtv.com/stroke/recurrent-stroke.html

Scott, D. P., Greenfield, J. R., Bramah, V., Alford, J., Bennett, C., Markus, R., et al. (2010). Challenges in secondary stroke prevention: prevalence of multiple metabolic risk factors, including abnormal glycaemia, in ischaemic stroke and transient ischaemic attack. *Internal Medicine Journal, 40: 275–280, 40*, 275-280.

Scottish Intercollegiate Guidelines Network. (2010). *Management of patients with stroke: rehabilitation, prevention and management of complications, and discharge planning. a national clinical guideline.* Edinburgh.

Shacinda, S. (2006, October 4). Doctor shortage critical in developing world: WHO. *The*

Namibian.

SIAPAC. (2002). *Nationwide KAP baseline survey on alcohol and drug use and abuse in Namibia.* Windhoek: Ministry of Health and Social Services.

Silver, B. (2012). *Stroke prevention.* Retrieved May 29 , 2012, from http://emedicine.medscape.com/article/323662-overview#aw2aab6b3

Simon, C. (2008). Prevention of stroke. *Innovait, 1* (4), 305-313.

Slark, J., Bentley, P., Majeed, A & Sharma, P. (2010). Awareness of stroke symptomatology and cardiovascular risk factors amongst stroke survivors. *Journal of Stroke and Cerebrovascular Diseases. 2012 Jul;21(5):358-62., 21* (5), 358- 362.

Sloma, A., Backlund, L. G., Strender, L. E &Skånér, Y. (2010). Knowledge of stroke risk factors among primary care patients with previous stroke or TIA: a questionnaire study. *BMC Family Practice, 11* (47).

Smith, J., Forster, A & Young, J. (2009). Cochrane review: information provision for stroke patients and their caregivers. *Clinical Rehabilitation, 23* (3), 195-206.

Swarztrauber, K & Vickrey, B. (2004). Do neurologists and primary care physicians

agree on the extent of specialty involvement of patients referred to neurologists? *Journal of General Internal Medicine, 19* (6), 654–663.

Tappen, R. M. (2011). *Advanced nursing research: from theory to practice.*Sadbury: Jones and Bartlett.

Taylor-Powell, E & Renner, M. (2003). *Analysing qualitative data.* Retrieved December 20, 2012, from http://learningstore.uwex.edu/assets/pdfs/g3658-12.pdf

The Heart and Stroke Foundation of Canada. (2006). *Canadian best practice recommendations for stroke care.* Ottawa.

Tooth, L & Hoffmann, T. (2004). Patient perceptions of the quality of information provided in a hospital stroke rehabilitation unit. *The British Journal of Occupational Therapy, 67* (3), 111-117.

Torp, C. R., Vinkler, S., Pedersen, K. D., Hansen, F. R & Jorgensen, T. (2006). Model of hospital-supported discharge after stroke. *Stroke, 37,* 1514-1520.

Tötemeyer, A. J. (2010). Multilingualism and the language policy for Namibian schools. *Praesa Occasional Papers, 37.*

Trochim, W. (2000). *The research methods knowledge base* (2nd ed.). Cincinnati: Atomic Dog Publishing.

Truelsen, T., Begg, S & Mathers, C. (2006). Retrieved March 25, 2012, from *The global burden of cerebrovascular disease*: Retrieved from http://www.who.int/healthinfo/statistics/bod_cerebrovasculardiseasestroke.pdf

Turanjanin, N., Jovicevic, M., Brkic, S., Slankamena, P., Divjak, I & Bozic, K. (2011). Prevalence of risk factors in ischemic stroke patients. *HealthMed, 5* (5), 1273-1281.

Tyson, S & Turner, T. (1999). The process of stroke rehabilitation: what happens and why. C*linical Rehabilitation, 13*, 322-332.

Virginia Department of Health. (2012). *Stroke discharge packet guideline.* Retrieved March 2, 2012, from Virginia Stroke Systems: http://virginiastrokesystems.org/assets/files/1/files/vssstrokedischargepacketrecom.pdf

Warlow, C. P., Gijn, J. V., Dennis, M. S., Wardlaw, J. M., Bamford, J. M., Hankey,G. J., et al. (2008). *Stroke: practical management.* Malden: John Wiley & Sons.

Warner, G., Harrold, J., Allen, M & Lyons, R. (2010). Secondary stroke prevention best practice recommendations: exploring barriers for rural family physicians.*Canada Journal of Rural Medicine, 15* (4), 143-152.

Watcher, R. M & Hollander, H. (2005). *Hospital medicine.* Philadelphia: Lippincott Williams & Wilkins.

Wityk, R. J & Llinas, R. H. (2007). *Stroke.* Philadelphia: ACP Press.

Wood, M & Ross-Kerr, J. (2010). *Basic steps in planning nursing research: from question to proposal.* London: Jones & Bartlett Learning.

World Health Organisation. (n.d). *Chronic diseases and health promotion*. Retrieved December 20, 2012, from Epi Info Software: http://www.who.int/chp/steps/resources/EpiInfo/en/index.html

World Health Organisation. (2006). *Neurological disorders: public health challenges.* Geneva: World Health Organisation.

ANNEXURES

ANNEXURE A

MEDICAL RECORDS DATA EXTRACTION FORM

A1) Date of discharge from Intermediate Hospital Katutura

.....

A2) Diagnosis(es) at hospital discharge;

Stroke/ Intracranial haemorrhage/

Cerebral infarction/

Cerebrovascular accident ☐

Hypertension ☐

Diabetes mellitus ☐

Dyslipidemia ☐

Other (specify).....

.....

A3) Patient name:

.....

A4) Patient address:

.....

A5) Phone contacts (if available):

.....

ANNEXURE B

STROKE MANAGEMENT TEAM QUESTIONNAIRE

Instructions:
Please answer all questions as honestly, completely and accurately as possible and return the completed questionnaire to the researcher promptly.

B1) Stroke management team member designation/ cadre e.g. Nurse, Dietician

.....

B2) Are you involved in any way in the management of stroke patients?

Yes ☐

No ☐

B3) If your response is **Yes** to Question 2, do you participate in the health education of stroke patients with regard to prevention of a recurrent (secondary) stroke?

Yes ☐

No ☐

B4) If your response is **Yes** to Question 3, what is your specific role in health education of stroke patients on recurrent (secondary) stroke prevention? Please tick all appropriate.

Diet modification ☐

Body weight management ☐

Alcohol consumption reduction/ cessation ☐

Exercise prescription (encourage active lifestyles) ☐

Smoking cessation ☐

Control of stroke predisposing disease conditions e.g. diabetes ☐

Medication compliance ☐

Other (specify).....

.....

B5) Do you use a guideline/ checklist/ protocol when conducting health education to stroke patients?

Yes ☐

No ☐

B6) Do you document your health education session(s) to stroke patients?

Yes ☐

No ☐

Other (specify).....

B7) During your contact with stroke patients, how frequent do you provide health education to them on recurrent (secondary) stroke prevention?

Once off ☐

At every patient contact ☐

Other (specify).....

B8) Who do you normally involve when conducting health education? Please tick appropriate

Patient ☐

Family/ Caregiver ☐

Other (specify).....

B9) What information provision format(s) do you use (and or recommend to patients) when conducting health education sessions for stroke patients? Please tick appropriate

Verbal ☐

Flier(s)/ Booklet(s) ☐

Videos ☐

Internet as recommendation ☐

Other (specify).....

B10) Do you have any Information, Education, and Communication (IEC) material for recurrent (secondary) stroke prevention?

Yes ☐

No ☐

Which of the following describes more of your health education content to stroke patients with regard to recurrent (secondary) stroke prevention?

Generic (everything about secondary stroke prevention) ☐

Specific to patient‘s needs ☐

It depends (specify).....

.....

B11) Do have any special arrangements to meet the educational needs of stroke patients with special needs for example patients with cognitive or speech or language impairments?

No, Involve family/ caregivers ☐

Use special IEC material ☐

Other (specify).....

.....

B12) In your opinion, is health education or information provision to stroke patients adequate to help stroke patients prevent another stroke?

Yes ☐

No ☐

B13) If your response is **No** to Question 13, what could be done to improve recurrent (secondary) stroke health education?

.....

.....

.....

B14) What challenges (if any) do you experience when providing health education to stroke patients on secondary stroke prevention?

.....
.....
.....THE END

ANNEXURE C

STROKE SURVIVOR QUESTIONNAIRE INTERVIEW SCHEDULE

C1) Age (years): .....

C2) Sex

Male ☐

Female ☐

C3) Highest level of education attained

None Formal ☐

Primary School ☐

High School ☐

College/ University ☐

C4) Disability level/ status (please tick appropriate)

None/ Minimal ☐

Moderate ☐

Vegetative ☐

Aphasia ☐

C5) Do you currently smoke?

Yes ☐

No ☐

C6) If you smoke, how many cigarettes per day? .....

C7) Do you currently drink alcohol?

Yes ☐

No ☐

C8) If you drink alcohol, how much per day? .....

C9) Do you do any exercises?

Yes ☐

No ☐

C10) If you exercise specify the type and frequency of the exercise(s)

.....

.....

.....

C11) Are you on any "special diet"?

Yes ☐

No ☐

C12) If you are on a "special diet" specify the type(s) of diet you are currently on

.....

.....

.....

C13) Do you suffer from high blood pressure?

Yes ☐

No ☐

C14) If you suffer from high blood pressure, are you on treatment for the high blood pressure?

Yes ☐

No ☐

C15) Do you suffer from diabetes?

Yes ☐

No ☐

C16) If you suffer from diabetes, are you on treatment for the diabetes?

Yes ☐

No ☐

C17) Are you currently taking any medicines?

Yes ☐

No ☐

C18) If you are currently taking medicines please specify;

.....

.....

.....

.....

C19) Are you aware that you suffered a disease condition called a stroke?

Yes ☐

No ☐

C20) If you are aware that you suffered a stroke, when did you become aware of this?

.....

C21) Do you know what caused the stroke you suffered?
.....

C22) Are you aware that you can suffer another stroke?

Yes ☐

No ☐

C23) If you are aware of the possibility of suffering another stroke, what could you do to prevent this recurrent stroke from happening?

.....

.....

.....

.....

C24) If you know something about preventing a recurrent stroke, specify where you got this information? Please tick appropriate

Hospital/ Clinic ☐

Friends/ Family ☐

Newspapers/ Magazines/ Books ☐

Radio/ TV ☐

Internet ☐

Other (Specify).....

C25) If you mentioned the hospital as a source of information for prevention of recurrent stroke, specify the health professional(s) who provided you with information on preventing a recurrent stroke. Please all tick appropriate.

Occupational Therapist(s)	☐	Nurse (s)	☐
Doctor(s)	☐	Social Worker(s)	☐
Physiotherapist(s)	☐	Pharmacist(s)	☐
Dietician(s)	☐	Not sure	☐

Other (specify).....

C26) Are you satisfied you have enough information to help you prevent another stroke?

Yes ☐

No ☐

C27) If you are not satisfied with information to help you prevent another stroke, what do you recommend should be done to improve information provision to stroke survivors?

.....

.....

.....

.....

C28) What challenges (if any) are you experiencing in trying to prevent another stroke?

.....
.....
.....
.....

THE END

ANNEXURE D

COVER LETTER/ CONSENT FOR STROKE MANAGEMENT TEAM

University of Namibia
Faculty of Health Sciences
School of Nursing and Public Health
Date.....

Dear Respondent

REF: INVITATION TO PARTICIPATE IN A RESEARCH STUDY

My name is Peter Jachi and I am a Master of Public Health student at the University of Namibia. As part of the requirements for the degree of Master of Public Health, I am carrying out a research study to determine the knowledge and practices of stroke survivors with regard to recurrent (secondary) stroke prevention. Because you are a health care provider, I am inviting you to participate in this research study by completing the attached questionnaire.

The attached questionnaire will require approximately 15 minutes to complete. Participation is strictly voluntary and you may refuse to participate at any time. There is no compensation for responding, nor is there any known risk. In order to ensure that all information will remain confidential, please do not include your name. Research findings will be compiled into a thesis report, individual respondents will however not be identified by name in the report.

If you choose to participate in this research study, please answer all questions as honestly, completely and accurately as possible and return the completed questionnaires to the researcher promptly.

Thank you for taking the time to assist me in my educational endeavours. The data collected will provide useful information regarding prevention of recurrent (secondary) stroke. Completion and return of the questionnaire will indicate your willingness to participate in this study. If you require additional information or have questions, please contact me or my research supervisors at the numbers listed below.

Sincerely,

P. Jachi (contact no. 081 335 6647)

RESEARCH SUPERVISORS;

Dr. A.R.E. Kloppers (contact no. 061 206 3473)

Dr. H. Amukugo (contact no. 061 206 3828)

Ass.Prof. S. D. Yigeremu (contact no. 061 206 3202)

ANNEXURE E

COVER LETTER/ CONSENT FOR PARTICIPATION IN INTERVIEW RESEARCH FOR STROKE SURVIVORS

1. I volunteer to participate in a research study conducted by Peter Jachi, a Master of Public Health student from the University of Namibia. I understand that the aim of the research study is to determine the knowledge and practices of stroke survivors with regard to recurrent (secondary) stroke prevention. I understand that by sharing this information that data collected may help patients who suffer a stroke in the future.

2. I understand that I will not be paid for my participation. I may withdraw and discontinue participation at any time without penalty.

3. Participation involves being interviewed by Mr. Peter Jachi. I understand the interview will take approximately 20 minutes to complete. If however, I feel uncomfortable in any way during the interview session, I have the right to decline to answer any question or to end the interview.

4. To improve the accuracy of data gathering notes will be written during the interview. An audio tape of the interview and subsequent dialogue may also be made.

5. I understand that the researcher will not identify me by name in any reports using information obtained from this interview, and that my confidentiality as a participant in this study will remain secure.

6. For any additional information regarding this research study and my participation in it, I may contact the researcher or his research supervisors at the numbers indicated below.

7. I have read and understood the explanation(s) provided to me. I have had all my questions answered to my satisfaction, and I voluntarily agree to participate in this study.

8. I have been given a copy of this consent form.

_____ _____

My Signature Date

_____ _____

My Printed Name Signature of the Researcher

For further information, please contact;
P. Jachi (contact no. 081 335 6647)
RESEARCH SUPERVISORS;
Dr. A.R.E. Kloppers (contact no. 061 206 3473)
Dr. H. Amukugo (contact no. 061 206 3828)
Ass.Prof. S. D. Yigeremu (contact no. 061 206 32

ANNEXURE F

OSHIWAMBO STROKE SURVIVOR INTERVIEW SCHEDULE/ COVER LETTER/ CONSENT

Epitiko mokugandja uuyelele pakana momapekaapeko

1. Egandjo lyuuyelele ndika otali ningwa pakwiiyamba momapekaapeko taga ningwa kuPeter Jachi, omwiilongi miinima yi na sha nuundjolowele woshigwana moshiputudhilo shopombanda shaNamibia (UNAM). Osha yelela ndje nawa kutya omalalakano gwomapekaapeko ogo okugongela uuyelele okuza kwaamboka ya kwatwa kuuvu wombanda. Uuyelele mboka ye na kombinga yuuvu mbuka oshowo oonkambadhala dhoka haa ningi opo yaa kwatwe we kuuvu mbuka. Uuyelele otawu ka kwathela aanuumvu yombanda monakuyiwa.

2. Egandjo lyuuyelele otali ningwa pakwiiyamba onkene ondi na uuthemba okuhulitha po oonkundathana uuna ndi wete inashi pumbiwa dhi tsikile pwaa na ethiminiko.

3. Momapekaapeko ngaka omwa kwatelwa omapulaapulo gwopakana guule wominute omilongombali lwaampo kutate Peter Jachi. Momapulaapulo ngaka ondi na wo uuthemba okuyamukula owala omapulo ngoka ndi uvite nopwaa na ethiminiko. Uuna ndi uvite itandi vulu okutsila nomapulaapulo ngaka ondi na uuthemba oku shi ninga.

4. Otandi zimine wo omuningi gwomapekaapeko a kwata nenge a shange oonkundathana dhetu naye ngele otashi pumbiwa.

5. Onda kwashilipalekwa wo kutya omuningi gwomapekaapeko ita ka tumbula edhina lyandje moshinyolwa she onkene ondi uvite onda gamenwa mekuthombinga ndika.

6. Kuuyelele wa gwedhwa po kombinga yomapekaapeko ngaka nekuthombinga lyandje. Otandi vulu okuninga omakwatathano nomuningi gwomapekaapeko nenge kaawiliki/kaapukululi ye koongodhi dha gandjwa pevi.

7. Omalombwelo nomafatululo agehe onde ga lesha nonde ga uva ko. Onda yelelwa kwaashihe nda li nda pula onkene otandi iyamba ndi ningi gumwe gwaagandji yuuyelele momapekaapeko ngaka.

8. Onda pewa wo okopi yepitiko ndika ndi kale nayo.

_____ _____ Edhina

(lyomugandji guuyelele lyu udha) Esiku

_____ _____

Edhina (lyomupekaapeki lyu udha) eshainokaha lyomupekaapeki

Kuuyelele wa gwedhwa po monathana naamba, koongodhi tadhi landula;
P. Jachi (konomola: 081 335 6647)

Aawiliki/aapukululi yomuningi gwomapekaapeko;

Dr. A.R.E. Kloppers (konomola: 061 206 3473)
Dr. H. Amukugo (konomola: 061 206 3828)
Ass.Prof. S. D. Yigeremu (konomola: 061 206 3202)

Onomola yomugandji guuyelele**.**.....

OMAPULO KUMBOKA YA LI YA NINGI IIHAKANWA YOMUKITHI GWOMBANDA

C1) Epipi/omimvo: .....

C2) Uukashikekookantu

Omulumentu ☐

Omukiintu ☐

C3) Ondondo yelongo

Inandi enda osikola ☐

Onda hulila moprimasikola ☐

Onda hulila mosekondesikola ☐

Onda li koCollege/ University ☐

C4) Omuthika guulema (ulika nokangombe)

Inandi lemana ☐

Onda lemana kashona ☐

Onda sa ombinga ☐

Ihandi popi we nawa ☐

C5) Oho hili omakaya?

Eeno ☐

Aawe ☐

C6) Ngele oho hili omakaya, oho hili uusekeleta ungapi mesiku? .....

C7) Oho nu iikolitha?

Eeno ☐

Aawe ☐

C8) Ngele oho nu iikolitha, oho nu shi thike peni mesiku?.....

C9) Oho ningi omadhewo gwolutu?

Eeno ☐

Aawe ☐

C10) Ngele oho ningi omadhewo, tumbula oludhi lomadhewo ngoka na uunake ho ga ningi?

.....

.....

.....

C11) Oho li iikulya yowina (mbyoka ngoye wa hogolola/wa lombwelwa wu lye)?

Eeno ☐

Aawe ☐

C12) Ngele osho, tumbula iikulya mbyoka ho li ngashiingeyi.

.....

.....

.....

C13) Owu na elondo lyombinzi?

Eeno ☐

Aawe ☐

C14) Ngele elondo lyombinzi, owu li kepango lyuuvu mbuka?

Eeno ☐

Aawe ☐

C15) Owu na uuvu wosuuka/ehuli?

Eeno ☐

Aawe ☐

C16) Ngele owu na uuvu wosuuka/ehuli, owu li kepango lyuuvu mbuka?

Eeno ☐

Aawe ☐

C17) Ngele osho, oho nu omiti paife?

Eeno ☐

Aawe ☐

C18) Ngele oho nu omiti, oho nu omiti dhini po?

.....

.....

.....

.....

C19) Owu shi shi tuu nawa kutya owa kwatelwe kuuvu hawu ithanwa ombanda?

Aawe ☐

Eeno ☐

C20) Ngele owu shi shi, owe shi tseya uunake/luni?

.....

C21) Owa tseya shoka sha li she eta uuvu mboka?
.....

C22) Owa tseya tuu kutya oto vulu okukwatwa kombanda natango?

Aawe ☐

Eeno ☐

C23) Ngele owa tseya kutya oto vulu okukwatwa kuuvu mbuka natango, oonkambadhala dhini ho ningi opo waa kwatwe we kuuvu mbuka?

.....

.....

.....

.....

.....

C24) Ngele owa tseya omikalo dhokwiikeelela waa kwatwe we kuuvu mbuka, tumbula oonzo mpoka wa pewa uuyelele mbuka. Shi ninga nokutula okangombe mokakololo komondjila.

Koshipangelo/ Kokakilinika ☐

Kokuume/ Kaanegumbo ☐

Miifonkundana/ Miikulanta/Momambo ☐

Moraadio/ koTV ☐

KoIntaneta ☐

Yilwe (tumbula).....

C25) Ngele mepulo lya zi ko owa holola kutya uuyelele okwiikeelela kombanda oshikando oshitiyali owe wu pewa koshipangelo, olye a li e ku pe uuyelele mbuka koshipangelo? Tula okangombe mokakololo komondjila.

Omuthuli/Aathuli ☐ Aapangi ☐

Ondohotola ☐ Aagandji yuuyelele koshipangelo ☐

Omudhewuli gwaanuumwu wombanda ☐ Aaniilonga yomoapoteka ☐

Aagandji yuuyele kombinga yiikulya ☐ Kandi shi wo nawa ☐

Yalwe (tumbula).....

C26) Uuyelele mboka wa pewa owu wete tuu wa gwana oku ku kwathela wu ikelele kuuvu mbuka?

Eeno ☐

Aawe ☐

C27) Ngele owu wete kutya uuyelele mboka inagu gwana, oshike ngiika wu wete tashi vulu okuningwa po ku lundululwe egandjo lyuuyelele mokukwathela mboka ya ningi iihakanwa yuuvu wombanda.

.....

.....

.....

.....

C28) Omawupyakadhi/iiyimbi yini ho tsakaneka moonkambadhala dhoye mokwiikeelela waa kwatwe we kuuvu wombanda?

.....
.....
.....
.....

Tangi

ANNEXURE G

AFRIKAANS STROKE SURVIVOR INTERVIEW SCHEDULE/ COVER LETTER/ CONSENT

Toestemming vir deelname aan onderhoud navorsing

1. Ek verstaan dat deelname aan hierdie studie geheel en al vrywillig is, uitgevoer deur Peter Jachi, ’n magister student van Openbare Gesondheid aan die Universiteit van Namibië. Ek verstaan dat die navorsing mag inligting openbaar wat van potensiële belang mag wees vir die kennis en praktyke van beroerte oorlewendes vas te stel ten opsigte van hernude (sekondêre) beroerte aanval voorkoming. Ek verstaan dat die deel van informasie en die versamelde data pasiënte kan help wat in die toekoms aan beroerte aanvalle ly.
2. Ek verstaan dat ek nie vir my deelname betaal sal word nie. Ek kan enige tyd onttrek en my deelname eindig sonder boete.
3. Deelname beïnhoud ’n onderhoud met Mnr Peter Jachi. Ek verstaan dat die onderhoud rond 20 minute sal vat. As ek gedurende die onderhoud ongemaklik voel het ek die reg om nie te antwoord of die onderhoud te eindig.
4. Om die korrektheid van data te verbeter sal notas gedurende die onderhoud geneem word. ‘N oudioband van die onderhoud en die daaropvolgende dialoog sal ook opgeneem word.
5. Ek verstaan dat die navorser sal my nie in enige berigte met naam noem nie met die informasie verkrygbaar deur die onderhoud en dat my vertroulikheid as ’n deelnemer in die studie verseker sal bly.
6. Vir enige aanvullende informasie in verband met die navors studie en my deelneem, kan ek die navorser of sy studie leier by die aangeduide nommers kontak.
7. Die navorsingstudie, insluitend die bogenoemde inligting is verbaal aan my beskryf. Ek begryp wat my betrokkenheid by die studie beteken en ek stem vrywillig in om deel tneem en ek het’n afskrif van die toestemmingsvorm ontvang.
8. Hiermee verleen ek toestemming on deel te neem aan hierdie studie

_____ _____

My handtekening Datum

_____ _____

My gedrukte naam Handtekening van navorser

Vir verdere informasie kontak asseblief:
P. Jachi (kontak no.: 081 335 6647)

STUDIE LIER
Dr ARE Kloppers (kontak no.: 061 206 3473)
Dr H Amukugo (kontak no.: 061 206 3828)
Ass. Prof S D Yigeremu (kontak no.: 061 206 3202)

Respondent no.:.....

BEROERTE AANVAL OORLEWENDE ONDERHOUD SKEDULE

C1) Ouderdom (jare): .....

C2) Geslag:

Manlik ☐

Vroulik ☐

C3) Hoogste graad bereik (opvoeding)

Geen formele ☐

Primêre skool ☐

Hoër skool ☐

Kollege/universiteit ☐

C4) Ongeskiktheid status (tik passende boks)

Geen/minimaal ☐

Matig ☐

Vegitative staat ☐

Afasie ☐

C5) Rook u op die oomblik?

Ja ☐

Nee ☐

C6) As u rook, hoeveel sigarette per dag? .....

C7) Drink u alkohol?

Ja ☐

Nee ☐

C8) As u alkohol drink, hoeveel per dag? .....

C9) Doen u enige oefeninge?

Ja ☐

Nee ☐

C10) As u oefeninge doen gee aan tipe en gereeldheid aan.

.....

.....

.....

C11) Is u op ’n “spesiale dieet”?

Ja ☐

Nee ☐

C12) As u op in “spesiale dieet” is gee tipe van dieet aan.

.....

.....

.....

C13) Ly u aan hoë bloeddruk?

Ja ☐

Nee ☐

C14) As u aan hoë bloeddruk ly kry u behandeling vir hoë bloeddruk?

Ja ☐

Nee ☐

C15) Ly u aan diabetes?

Ja ☐

Nee ☐

C16) As u aan diabetes ly, kry u behandeling vir diabetes?

Ja ☐

Nee ☐

C17) Neem u enige medikasie?

Ja ☐

Nee ☐

C18) As u op die oomblik medikasie neem, wys asseblief aan.

.....

.....

.....

.....

C19) Is u bewus daarvan dat u aan ’n beroerte ly?

Ja ☐

Nee ☐

C20) As u weet dat u aan ’n beroerte ly, wanneer het u daarvan bewus geword?

.....

C21) Weet u wat die beroerte veroorsaak het?
.....

C22) Is u bewus daarvan dat u aan 'n beroerte kan ly?

Ja ☐

Nee ☐

C23) As u bewus daarvan is dat u ’n beroerte aanval kan kry, wat kan u doen om ’n wederkerende beroerte te vermy?

.....

.....

.....

.....

.....

C24) As u iets weet oor die vermy van ’n wederkerende beroerte, waar het u die informasie opgetel? Tik die passende boks

Hospitaal/kliniek ☐

Vriende/familie ☐

Koerante/tydskrifte/boeke ☐

Radio/TV ☐

Internet ☐

Ander (spesifiseer).....

C25) As u die hospitaal as ’n bron van informasie oor wederkerende beroerte aangegee het, dui asseblief die gesondheidsbeampte(s) se naam wat vir u die informasie gegee het. Tik die passende bokse

Arbeidsterapeut(e)	☐	Verpleegster(s)	☐
Doktor(e)	☐	Maatskaplike werker(s)	☐
Fisioterapeut(e)	☐	Apteker(s)	☐
Dieetkundige(s)	☐	Nie seker nie	☐

Ander (spesifiseer).....

C26) Is u tevrede dat u genoeg informasie het om u te help om ’n verdere beroerte aanval te vermy?

Ja ☐

Nee ☐

C27) As u nie met die informasie tevrede is wat sal help om 'n verdere beroerte aanval te vermy, wat stel u voor moet gedoen word om beroerte oorlewendes beter te informeer?

.....

.....

.....

.....

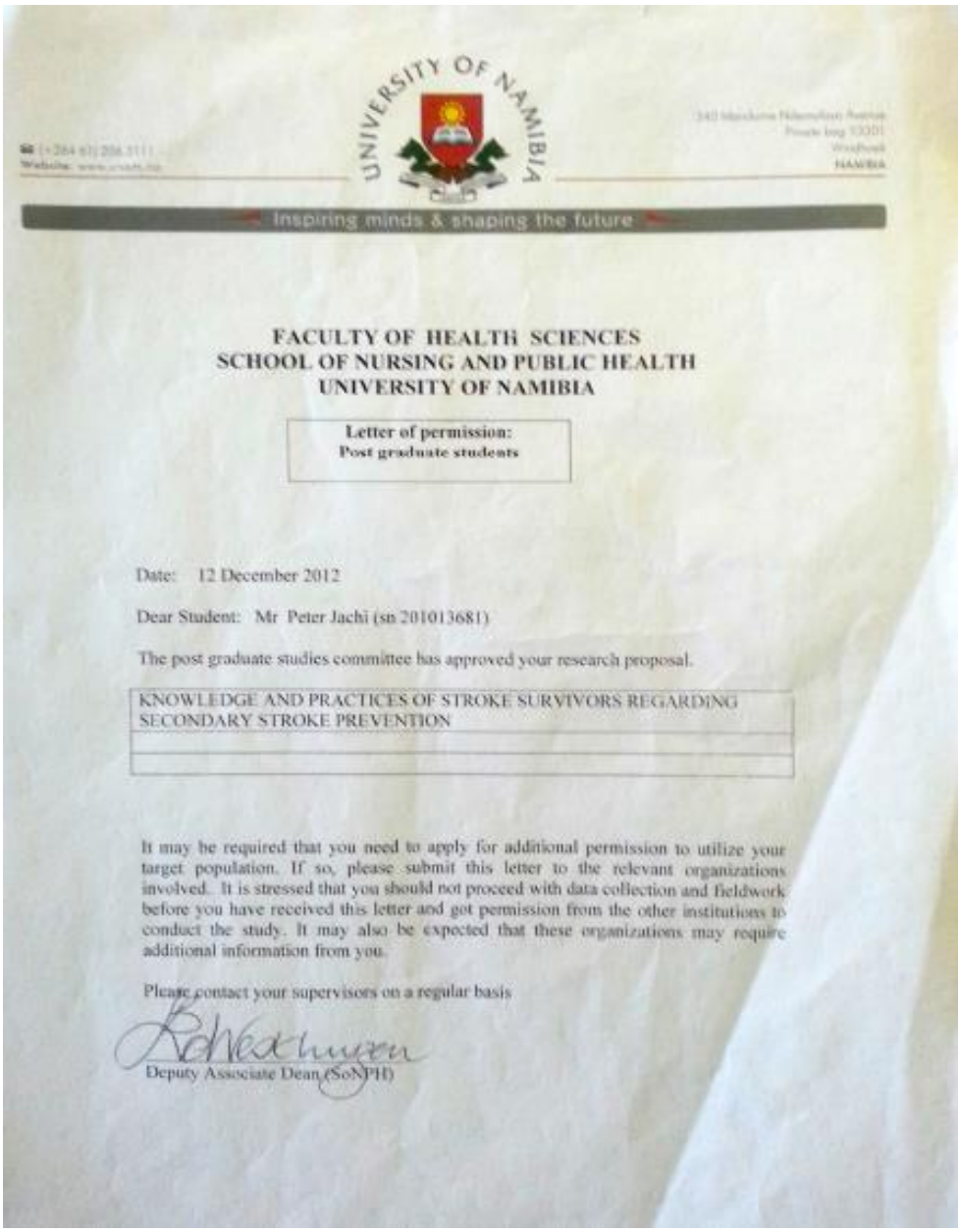
C28) Watter uitdagings (as enige) ondervind u terwyl u probeer ’n verdere beroerte te vermy?

.....
.....
.....
.....

DIE EINDE

ANNEXURE H

UNIVERSITY OF NAMIBIA APPROVAL LETTER



UNIVERSITY OF NAMIBIA

Inspiring minds & shaping the future

FACULTY OF HEALTH SCIENCES
SCHOOL OF NURSING AND PUBLIC HEALTH
UNIVERSITY OF NAMIBIA

Letter of permission:
Post graduate students

Date: 12 December 2012

Dear Student: Mr Peter Jachi (sn 201013681)

The post graduate studies committee has approved your research proposal.

KNOWLEDGE AND PRACTICES OF STROKE SURVIVORS REGARDING SECONDARY STROKE PREVENTION

It may be required that you need to apply for additional permission to utilize your target population. If so, please submit this letter to the relevant organizations involved. It is stressed that you should not proceed with data collection and fieldwork before you have received this letter and got permission from the other institutions to conduct the study. It may also be expected that these organizations may require additional information from you.

Please contact your supervisors on a regular basis

Deputy Associate Dean (SoNPH)

ANNEXURE I

REQUEST TO THE MINISTRY OF HEALTH AND SOCIAL SERVICES FOR PERMISSION TO CONDUCT STUDY

Mr A. Ndishishi
Permanent Secretary
Ministry of Health and Social Services
Private Bag 13198
Windhoek

14 February 2013

Dear Mr. Ndishishi

REF: REQUEST FOR PERMISSION TO ACCESS HOSPITAL RECORDS TO CONDUCT RESEARCH

I am an employee in the Ministry of Health and Social Services at Intermediate Hospital Katutura currently studying for a Master of Public Health Degree with the University of Namibia. As part of the fulfilment of the requirements of the degree program, I have to carry out a research study. My research title is **"KNOWLEDGE AND PRACTICES OF STROKE SURVIVORS REGARDING SECONDARY STROKE PREVENTION"** using quantitative, descriptive and explorative design.

My research proposal was approved by the University of Namibia post-graduate studies committee. I hereby request for permission to use Intermediate Hospital Katutura records for stroke survivors discharged from this hospital between 1 January 2011 and 31 December 2011.

The significance of the study is that study findings can provide useful information regarding prevention of recurrent (secondary) stroke. Furthermore, findings of this study could highlight areas for improvement with regard to treatment guidelines in the management of stroke.

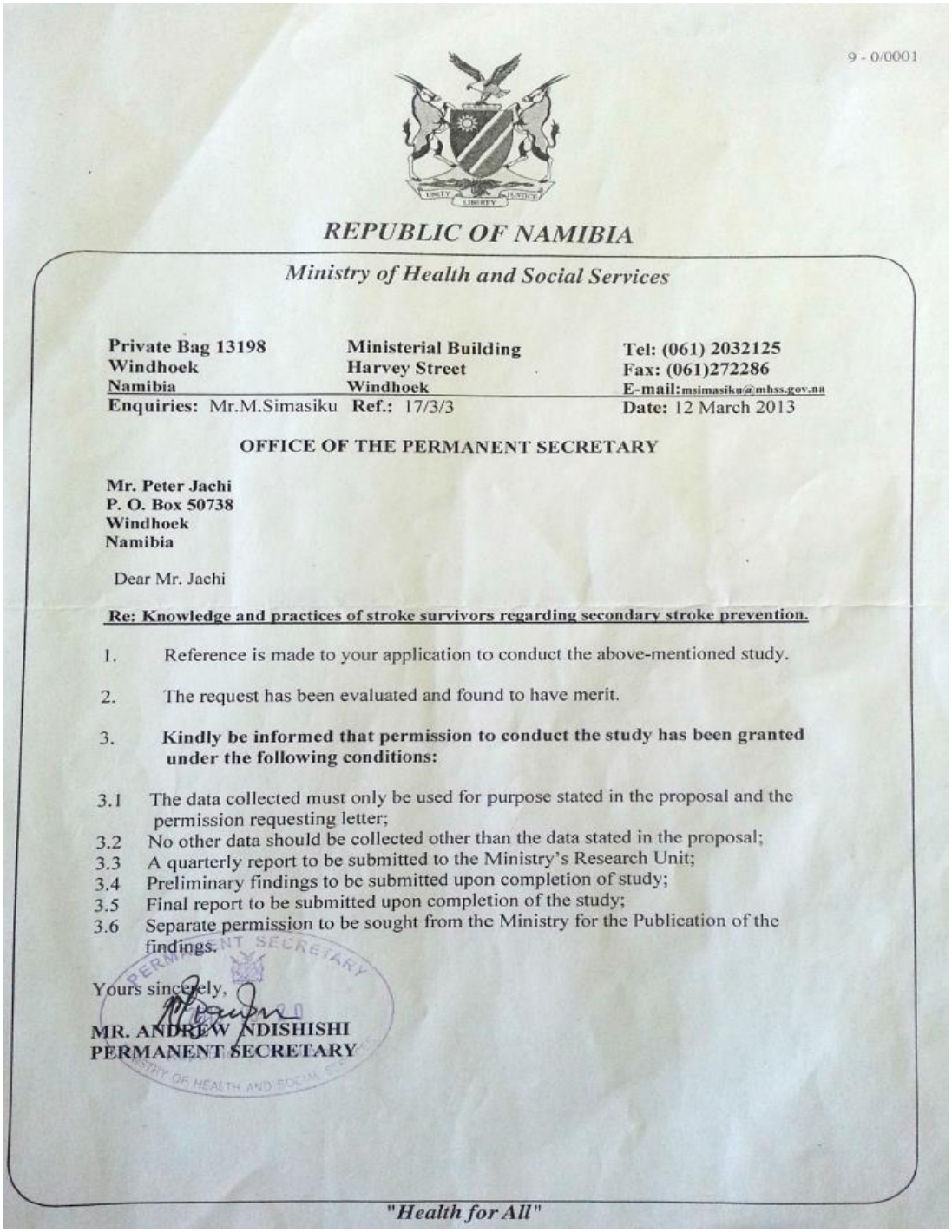
A copy of my full proposal, data extraction tools and letter of approval from the University of Namibia has been attached for your consideration.

Yours sincerely

Peter Jachi
Intermediate Hospital Katutura, Physiotherapy Department; Office Telephone: 061 203 4094, Mobile: 081 335 6647

ANNEXURE J

MINISTRY OF HEALTH AND SOCIAL SERVICES APPROVAL FOR PERMISSION TO CONDUCT STUDY



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REPUBLIC OF NAMIBIA

Ministry of Health and Social Services

Private Bag 13198 **Ministerial Building** **Tel: (061) 2032125**
Windhoek **Harvey Street** **Fax: (061)272286**
Namibia **Windhoek** **E-mail:msimasiku@mhss.gov.na**
Enquiries: Mr.M.Simasiku **Ref.:** 17/3/3 **Date:** 12 March 2013

OFFICE OF THE PERMANENT SECRETARY

Mr. Peter Jachi
P. O. Box 50738
Windhoek
Namibia

Dear Mr. Jachi

Re: Knowledge and practices of stroke survivors regarding secondary stroke prevention.

1. Reference is made to your application to conduct the above-mentioned study.

2. The request has been evaluated and found to have merit.

3. **Kindly be informed that permission to conduct the study has been granted under the following conditions:**

3.1 The data collected must only be used for purpose stated in the proposal and the permission requesting letter;
3.2 No other data should be collected other than the data stated in the proposal;
3.3 A quarterly report to be submitted to the Ministry's Research Unit;
3.4 Preliminary findings to be submitted upon completion of study;
3.5 Final report to be submitted upon completion of the study;
3.6 Separate permission to be sought from the Ministry for the Publication of the findings.

Yours sincerely,

MR. ANDREW NDISHISHI
PERMANENT SECRETARY

"Health for All"