SCHOOL OF PUBLIC HEALTH

COLLEGE OF HEALTH SCIENCES

UNIVERSITY OF GHANA

FACTORS INFLUENCING THE QUALITY OF LIFE OF STROKE PATIENTS ATTENDING TEMA GENERAL HOSPITAL

BY

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THIS DISSERTATION IS SUBMITTED TO THE UNIVERSITY OF GHANA, LEGON IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF MASTER OF PUBLIC HEALTH (MPH) DEGREE.

JULY, 2017

DECLARATION

I hereby declare that apart from references to other people's work which have been duly acknowledged, this work is as a result of my own independent work. I further declare that this work has not been submitted for the award of any degree in this institution or other universities elsewhere.

…… ……

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Dr. Genevieve C. Aryeetey **Date**

(SUPERVISOR)

DEDICATION

I dedicate this work to my dear loving husband Mr Ransford Odoom for his care and support shown me throughout this course. To my children, Britney Kekeli Odoom and Jason Elinam Odoom for all their prayers and support which brought me this far.

ACKNOWLEGDEMENTS

I wish to express my profound gratitude to my supervisor, Dr.Genevieve Cecilia Aryeetey for the encouragement, guidance, patience, and supervisory advice throughout the writing of this proposal. I acknowledge and appreciate the support of Dr Justice Nonvignon throughout the study period at the School of Public Health. I am also grateful to the Odoom and Boateng family for their support and guidance. To the Learning to pass study group members, I'm happy I met you people. Finally, my utmost gratitude goes to my friends and loved ones for believing in me and supporting me in every possible way. May God bless you all!!

ABSTRACT

Stroke remains the leading cause of serious, long-term neurologic impairment and functional disability. Stroke affects the quality of life of its survivors. This study seeks to determine factors influencing the quality of life of stroke patients in order to promote maximal health related quality of life (HRQOL) improvements in these patients.

The objective of the study is to determine the factors influencing the quality of life of stroke patients attending Tema General Hospital

This is a facility-based cross-sectional study using a quantitative (SS-QOL) method to determine factors that influences the quality of life of stroke patients attending the Tema General Hospital. The study population was all stroke patients accessing healthcare at the TGH. Simple Random Sampling Without Replacement (SRSWOR) technique was employed to select 135 stroke patients. Stroke Specific Quality of Life (SS-QoL) questionnaire (Appendix 2) was used. Descriptive analysis, univariate and multivariate logistic regression analysis was carried out. A confidence interval of 95% was used to show significant relations between the dependent and the independent variable

Language (2.77 (SD 0.98)), Mood (2.58 (SD 0.73)) and Personality (2.79 (SD 0.86)) and self-care, thinking and vision were related to quality of life of stroke patients. Educational status influences the quality of life of stroke patients ($p=0.0431$). There was no significant association between behavioral characteristics and quality of life of stroke patients ($p>0.05$)

QOL domains such as language, mood, personality and self-care, thinking and vision were significant domains that influenced the quality of life of stroke patients attending TGH. Educational status of patients significantly predicts QoL.

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LIST OF ABBREVIATIONS

DALYs……Disability Adjusted Life Years

DM……...Diabetes Mellitus

GHS……Ghana Health Services

HIV/AIDS……..Human Immune Virus/Acquired Immune Deficiency Syndrome

HPPM……Health Policy, Planning and Management

HRQOL……...Health Related Quality of Life

HRQOLISP……Health-Related Quality of Life in Stroke Patients

QOL……...Quality of life

NEWSQOL……...Newcastle Stroke-Specific Quality of Life 24 Measure

SAH……Subarachnoid Haemorrhage

SD……..Standard Deviation

SPH……School of Public Health

SS-QoL……...Stroke Specific Quality of Life

SRSWOR……Simple Random Sampling without Replacement

TGH……Tema General Hospital

UE……Upper Extremity

W.H.O……..World Health Organization

CHAPTER ONE

INTRODUCTION

1.1 Background to study

Stroke according to Owolabi *et al.,* (2015), is the abrupt death of some brain cells as a result of oxygen deficiency when blood ceases to flow to the brain on the account of an impasse or a breach of an artery to the brain. Clinically, Sacco *et al.,* (2013) cites paralysis, weakness, numbness, severe headache, incoherent speech, mental status change, vision problems, falling and dizziness as signs of stroke. Risk factors of stroke are mainly grouped into two, modifiable and non-modifiable (Lopez, 2006). According to Lopez, hypertension, diabetes mellitus, high blood cholesterol, obesity, cardiovascular diseases, sedentary lifestyle, atrial fibrillation, smoking and alcohol consumption make up the modifiable risk factors whereas age, gender and genetics make up the non-modifiable risk factors.

Stroke, the second major source of disability worldwide (Owolabi *et al,* 2015), is likewise, the second major root of mortality in persons over 60 years of age and the fifth major source of mortality among persons of 15 and 59 years of age (WHO, 2016). Furthermore, the chances of stroke occurring in low-and middle-income countries has more than duplicated during the last forty years and with anticipation of threefold increase in the death rate for the next twenty years (Owolabi *et al,* 2015). Among the causes of death in Ghana, stroke falls within the first three and it's also the major cause of disability in the country (De-Graft, 2007), with a make-up of 9.1% of the total medical adult admissions and 13.2% of all medical adult mortalities (Bosu, 2010).

Stroke affects the quality of life of quality (QOL) of patients due to the physical and cognitive outcome, such as movement restrictions and physical functioning, and

depression that comes with it (Laurent et al, 2011). Salter et al., (2008) defines quality of life (QOL) as how a person views his/her status in life in the cultural context and value systems he/she lives in and in relation to his/her goals, expectations, standards and concerns. Health Related Quality of Life (HRQOL) on the other hand is the disparity between normal functions and functions that arises on the account of the disease (van Straten, 2000). Measures of HRQOL include emotional, physical, social, and subjective feelings of well-being.

Nevertheless, much studies (Sampane-Donkor et al, 2014; Wiredu & Nyame, 2001; Agyemang, Attah-Adjepong, Owusu-Dabo, et al., 2010; Bosu, 2010) have not been done on the risk factors of stroke and the effect associated with Ghana's neglect of the quality of life, though there remains heightening number of stroke survivors with high prevalence (82%) of hypertension, which is the most important stroke risk factor (Sampane-Donkor et al, 2014). Consequently, this research attempted to ascertain factors that affect the quality of life of stroke patients so as to ensure utmost health related quality of life (HRQOL) improvements in these patients.

1.2 Problem statement

Stroke continues to be the major cause of severe, long-term neurologic impairment and functional disability (Tobin, 2008) serious, long-term neurologic impairment and functional disability (Tobin, 2008). This according to World Health Organization (WHO) (2012), explicate the high disability adjusted life years (DALYs) in sub-Saharan Africa, approximately sevenfold as compared to high income countries (WHO, 2012). Moreover, WHO rates it as the second major cause of mortality among persons of over 60 years of age and the fifth major cause of mortality among persons of 15 and 59 years of age (WHO, 2016) recording more than a duplicate of the incidence in low-

and middle-income countries during the last forty years. Furthermore, 84% of patients with stroke in low- and middle-income countries as compared to 16% in high income countries die within three years of diagnosis (Johnston, Mendis & Mathers, 2009).

Nonetheless, regardless of stroke's ginormous effect on countries' socio-economic development, lesser attention had been given to this rising to date situation (Johnson 2016). Deeping the situation is the challenges associated with managing patients, conflated with scanty rehabilitation services, deficiency of preventive measures, in addition to poor understanding of the likely unique risk factors connected to stroke (Sampane-Donkor et al, 2014) coupling with lack of readily accessible comparative quality of life data to help make the case for the development of national stroke strategies.

The Tema General Hospital is the largest Public Health Institution in Tema Metropolis with high stroke patient turnout and admissions throughout the year (TGH, Annual report, 2014). The hospital focuses on provision of medical care and physiotherapy services to patients which in the long run has an impact on their quality of life. Given that stroke is a long-term and probably a life-time condition, it has implications on the quality of life of the people it affects. Their health, perceptions, attitude to life among others are affected after the onset of the condition. Studies on the quality of life of stroke patients in our Ghanaian setting is limited and this study seeks to assess the quality of life of stroke patients and the factors influencing this quality of life.

1.3 General Objective

The general objective of the study is to determine the factors influencing the quality of life of stroke patients attending Tema General Hospital

1.4 Specific Objectives

The specific objectives are:

1. To estimate the quality of life (QOL) of stroke patients attending the Tema General Hospital.

2. To assess factors influencing the quality of life (QOL) of stroke patients attending the Tema General Hospital.

1.5. Conceptual Framework

The research was guided by the above conceptual framework developed by the Mohammad (2014) (Figure 1). The modified conceptual framework showed the various factors that influence the quality of life of stroke patients.

The socio-demographic and health profile characteristics of the patients that influence the QoL of the stroke survivors included: age, sex, marital status, religion, educational level, occupation, income level, health insurance status, family history of stroke, history of alcohol and history of smoking. The functional status which corresponds to the activities or function of the quality of care domains influence the QOL of the stroke survivors included: energy, family roles, language, mobility, mood, personality, self-care, social roles, thinking, upper extremity (UE) function, vision, and work/productivity.

1.5. Conceptual Framework

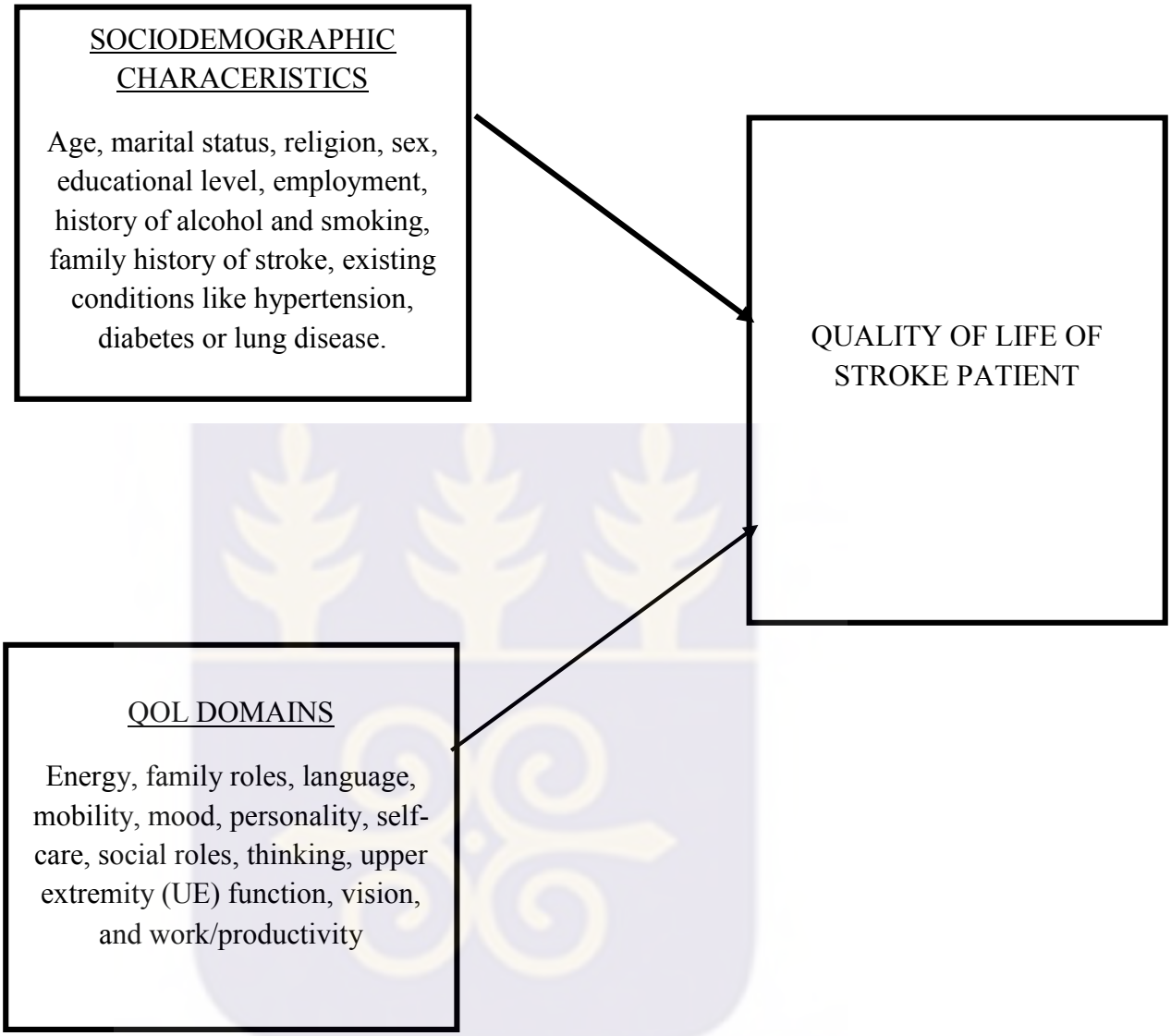

Figure 1: Conceptual Framework of factors influencing the QoL of stroke patients (Modified from Mohammad, 2014).

1.6 Significance of the study

Evaluation of the quality of life of stroke patients at the TGH revealed the state of stroke survivors. This aided both in the recognition of areas a patient is highly affected by the disease and in planning effective therapeutic and rehabilitative interventions. Moreover, the evaluation of the QOL of these patients provided meaningful way to evaluate the efficacy of stroke rehabilitation.

Additionally, the assessment of the determinants of QOL enabled the evaluation of cost effectiveness, and other factors that influence the health of stroke patients. It facilitated a broader description of stroke and a range of problems that affected the patients that are equally important to patients.

Lastly, lessons learnt could be extended to other hospitals and quasi facilities. The findings of this study could contribute to existing literature of stroke.

1.7. Outline of the thesis

The thesis is presented under six chapters. Chapter one presents the introduction to the study. Background, problem statement, justification, general objective, specific objectives and research questions were presented. Chapter two presents the literature in relation to the study. Chapter three presents the methods used for the study. Chapter four comprise results and its interpretation. Chapter five presents the discussion of the results and its interpretation. Chapter six provides conclusion and recommendations.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter reviews literature on published studies by other researchers relevant to this study. The literature reviewed was structured around the objectives of this study and research process and presented as follows:

2.1 Global burden of stroke

Stroke lingers as the second major source of disability across the world (Owolabi et al, 2015). Furthermore, stroke is the second major cause of mortality among persons of over 60 years of age and the fifth major cause of mortality among the age group 15 to 59 years (WHO, 2016). Additionally, it is the principal cause of severe, long-term neurologic impairment and functional disability (Tobin, 2008). This accounts for disability adjusted life years (DALYs) of approximately sevenfold higher as compared to high income countries (WHO, 2012). Compounding this is the fact that likelihood of stroke occurring in low- and middle-income countries has more than duplicated over the last four decades and with its mortality expected to triple in the next two decades (Owolabi et al, 2015). For example, cases of stroke that arose between 1990 and 2010 decreased by approximately 10% in the developed countries and increased by 10% in the developing world (Feigin, 2014). Detailed proportions of stroke relapse have varied extensively from 3% to 22% at 1 year to 10% to 53% at 5 years in diverse researchers (Stroke in perspective, 2006). Ischemic strokes including embolic and thrombotic strokes account for 80% of all strokes while hemorrhagic strokes such as primary intracerebral hemorrhage and subarachnoid hemorrhage account for 20% (Zumo, 2006).

Gillum (1999) asserts that the rate of death among Africans living in Western countries is higher as compared to the Whites at ages below 70 years. Gillum continued that a higher prevalence of hypertension, diabetes mellitus (DM), obesity, smoking and low socioeconomic status are likely causes of the high occurrence of stroke and the death associated with it observed among Africans as compared to the Whites (Gillum, 1999). Prevalent health problems in developed countries are those lifestyle illnesses related to increased wealth. Occurrence of diseases in the developing countries, on the other hand, are greatly attributed to poverty, poor healthcare infrastructure and limited access to healthcare (Koju, 2004). However, lots of developing countries have grown economically and demographically in recent years; the result is a shift from poverty related diseases to chronic non-communicable diseases (Connor, Walker, Modi, & Warlow 2007; Koju, 2004). According to Cappuccio (2004), death in the world currently are commonly associated with ischemic heart disease and stroke and that 70% of these deaths occur in developing countries, besides the effect of the HIV/AIDS epidemic. Cappuccio continues to argue that ischemic heart disease and stroke will continue to be the most common causes of morbidity, disability, and death in developing countries in 2020. The world has a moral duty to react to the global alterations in health problems (Breithardt & Eckardt 1999). In Nigeria, stroke case fatalities of 9% in the first 24 hours, 28% at 7 days, 40% at 30 days, and 46% at 6 months and 17% of medical deaths were found in hospital based studies, whereas stroke accounted for 0.5% to 45% among neurological admissions (Ogun, Ojini, Ogungbo, Kolapo, Danesi, 2005).

The burden of stroke results in catastrophic expenditure. For instance, the United State alone spends approximately $ 34 billion on stroke every year (Mozaffarian et al., 2015). Limited studies have been done on the charge of stroke care in Africa. A study however

conducted in Togo revealed that the direct charge of stroke care of an individual is approximately £ 936 in only 17 days; exceeding the average annual spending of Togo – approximately 170 times (Guinhouya et al, 2012). Ghana is however not an exception in the share of this stroke burdens.

2.1.2 Public health burden of stroke

Globally, stroke is rated the second principal cause of mortality with a yearly death proportion of 5.5 million (Lopez, Mathers, Ezzati, Jamison & Murray, 2006). Stroke burdens are not only connected with high death but with high ill health as well; about 50% of stroke survivors are persistently incapacitated (Lopez, Mathers, Ezzati, Jamison & Murray, 2006, Marsh & Keyrouz, 2006). As a result, stroke is of high public health importance with fiscal and societal impacts. The burden of stroke differ greatly per geographical location with the highest burden occurring in Eastern Europe, north Asia, central Africa, and the south Pacific (Howard Cushman, Pulley, et al. 2005). Stroke in time past was a disease of the developed world. However, through the use of pragmatic control measures, stroke burdens in many developed countries have declined greatly. Stroke related deaths in many Western European countries has reduced by 30 – 50% since 1975 and this is very well seen in countries like Iceland, Italy, Austria and Germany (Lopez, Mathers, Ezzati, Jamison & Murray, 2006; Marsh & Keyrouz, 2006). The burden of stroke appears to be moving towards the developing countries; currently two-thirds of stroke mortality cases occurr in sub-Saharan Africa (Lopez, Mathers, Ezzati, Jamison & Murray, 2006; Bravata, Wells, Gulanski, et al., 2005), where poverty, malnutrition and communicable diseases such as HIV/AIDS also exert their greatest toll (Marsh & Keyrouz, 2006). Stroke data on sub-Saharan Africa indicates an annual stroke incidence rate of up to 316 per 100, 000, a prevalence rate of 315 per 100, 000 and a fatality rate of 84% (Truelsen, Heuschmann, Bonita, et al., 2007). The

disability adjusted life years (DALYs) associated with stroke in sub-Saharan Africa is approximately sevenfold higher as compared to high income countries (Lopez, Mathers, Ezzati, Jamison & Murray, 2006). In some years to come, there will be a possibility of a significant rise in the stroke burden in sub-Saharan Africa due to the epidemiological transition in the region from infectious diseases to non-communicable diseases (Agyemang, Attah-Adjepong, Owusu-Dabo, 2010).

The high burden of stroke is partially the result of knowledge deficiency on risk factors and warning signs stroke. This is backed by proofs that increased awareness of stroke risk factors leads to improved compliance with stroke prevention practices while lack of recognition of stroke warning signs is an important causal factor of delay in hospital reporting of stroke (Kreuter & Strecher 1995; Cossi, Preux, Chabriat et al., 2012). Studies done in developed and developing countries reveals that respondents' knowledge of any of the established stroke risk factors or warning signs are generally less than 50% (Wahab, Okokhere, Ugheoke et al 2008; Ayanniyi, Akande, Mustapha 2006; Hickey, O'Hanlon, McGee et al., 2009; Sug Yoon, Heller, Levi, Wiggers 2001; Aly, Abbas, Kazim, et al., 2009; Reeves, Hogan & Rafferty 2002; Obembe, Olaogun, Bamikole et al., 2013). A study conducted in Benin, a sub-Saharan African country, revealed hypertension (34.5%) as the most commonly stroke risk factor while paralysis and hemiplegia (34.4%) appeared as the frequently cited warning signs of stroke. Lack of knowledge of the risk factors and warning signs of stroke have also been reported in Nigerian (Ayanniyi, Akande, Mustapha 2006; Hickey, O'Hanlon, McGee et al., 2009;), though one study showed good knowledge of stroke risk factors among university staff with 91.7% recognizing hypertension (Doyle, Simon, Stenzel-Poore, 2008).

2.2. Stroke burden in Ghana

Stroke is one of three causes of death and the principal root of ill health in Ghana (De-Graft, 2007). This makes up 9.1% of the entire health adult admissions and 13.2% of all medical adult deaths (Bosu, 2010). However, the quality of life of these stroke patients continue to be neglected notwithstanding the ever-increasing number of stroke survivors. Compounding this is the increasing changes in lifestyle and the emerging ageing population. In Ghana, chronic diseases including stroke are seen as spiritual illness which calls for a spiritual treatment rather than treatment in a hospital (De-Graft, 2007).

According to Wiredu & Nyame (2001), stroke is one of the top three causes of death and is likely the principal cause of disability in Ghana. In 2001, Wiredu and Nyame undertook a five-year research at the Korle-Bu Teaching Hospital in Ghana on autopsy cases which revealed that death as a result of stroke accounted for 11% of autopsies and 61% haemorrhagic stroke cases which was common in males than females. A study conducted at the Komfo Anokye Teaching Hospital by Pole, Ikeme, Pobee, et al., (1979) on in-patients admitted at the hospital showed that stroke made up 9.1% of the total medical adult admissions and 13.2% of all medical adult deaths. Hypertension is gradually becoming prevalent in Ghana. In other words, the burden of stroke in Ghana may upsurge until immediate measures are instituted to correct the insurgency of hypertension in the country (Bosu 2010; Taylor, Davis, Torner et al., 1996). In the United States of America, the general fiscal lifespan charge of each stroke was calculated to be an average of $103,576 in the 1990s (Samsa, Cohen, Goldstein et al., 1997).

It has been estimated that an average stroke patient spends about two hundred and twenty Ghana Cedis (GHS 220.00) which is equivalent to sixty- four dollars eight-eight

cents (USD 64.88) per week on treatment (Stroke Unit, Korle-Bu Teaching, 2014). However, this data could be underreported since people have attributed the incidence of stroke to spiritual causes and hence rely on spiritualists and herbalists for treatment thereby neglecting biomedical management (Stroke Unit, Korle-Bu Records, 2014). Stroke has an influence on cognitive functioning and moreover affects quality of life of patients.

2.2.1 Risk factors of stroke

The strongest determining factor of stroke is age and the peril of stroke duplicates every ten years for persons above 55 years old. Age can be an accepted marker for duration of exposure to other risk factors of stroke (Caplan, 2000; Lopez, Mathers, Ezzati, Jamison & Murray, 2006). Unlike developed countries where stroke usually affects much older individuals (70-75 years), stroke in sub-Saharan Africa affects individuals less than 60 years old (Owolabi, Ugoya, & Platz, 2009; Bravata, Wells, Gulanski, et al., 2005). The next major risk factor after age is hypertension and individuals with hypertension have high chances of experiencing stroke (Chobanian, Bakris, Black, 2003). The robust relation flanked by hypertension and stroke has been ascribed to the potent effects of hypertension on the cerebral circulation (Iadecola & Gorelick, 2004). In cerebral blood vessels, hypertension is acknowledged to yield hypertrophy which causes a fall in the exterior width of the vessels. Also, the endothelial cells' ability to release vasoactive factors increases the constrictor tone of systemic and cerebral arteries which is altered by hypertension (Iadecola & Gorelick, 2004). Sickle cell (very common in sub-Saharan Africa) patients stand a higher risk of experiencing stroke; as high as 200-400folds (Ohene-Frempong, Weiner & Sleeper, 1998; Merkel, Ginsberg, Parker & Post, 1979). Sickle patients' standing higher chance of experiencing stroke may be due to increased haemolysis and changes in rheological properties of red blood

cells (Ohene-Frempong, Weiner & Sleeper, 1998; Merkel, Ginsberg, Parker & Post, 1979). The chances of a person experiencing stroke again after a previous stroke is very high; thus a recurrence rate of 5 – 25% in 1 year and 20 – 40% in 5 years (Caplan, 2000).

INTERSTROKE study conducted recently revealed hypertension, current smoking, obesity, lack of physical activity and diet as the causes of more than 80% of all strokes (O'Donnell, Xavier, Zhang, Chin, 2010). Since all these risk factors can be altered, stroke can very much be prevented. Studies have revealed that stroke risk factors are different among different races and populations (Owolabi, Ugoya, & Platz, 2009; Ohene-Frempong, Weiner & Sleeper, 1998; Merkel, Ginsberg, Parker & Post, 1979). A study comparing stroke risk factors among individuals who have survived stroke in Nigeria and Germany revealed that smoking, hyperlipidemia, atrial fibrillation, congestive cardiac failure, ischemic heart disease, and atherosclerosis of the carotids and vertebral arteries are mostly associated with German stroke survivors (Owolabi, Ugoya, & Platz, 2009). Nigerian stroke survivors on the contrary, mostly had hypertension associated with them (Owolabi, Ugoya, & Platz, 2009). A study done in UK between the white populations and the black populations commonly found cardioembolic and large vessel atherosclerotic stroke among the whites than the blacks (Merkel, Ginsberg, Parker & Post, 1979). The cultural variances in stroke risk factors has been ascribed to interacting genetic, environmental, dietary, and socio-economic variables, and has implications for the distribution of stroke subtypes (Ohene-Frempong, Weiner & Sleeper, 1998; Merkel, Ginsberg, Parker & Post, 1979; Kim, Nam, Jee, Suh, 2005). Haemorrhagic stroke commonly has hypertension as a risk factor while ischemic stroke is mostly associated with factors such as smoking, hyperlipidemia, cardiac disease and atherosclerosis (Kim, Nam, Jee, Suh, 2005;

Ebrahim, Sung, Song et al., 2006; Owolabi & Agunloye, 2013). Relatively, the latter group of risk factors is common among the whites; thus, making ischemic stroke the most common stroke in the western world (Owolabi, Ugoya, & Platz, 2009; Ohene-Frempong, Weiner & Sleeper, 1998; Merkel, Ginsberg, Parker & Post, 1979). Presently, most African countries have adopted 'Western lifestyle' and as such the distribution of stroke risk factors and subtypes in Africa is anticipated to be like what is seen in the Western world.

Hypertension as a predictable risk factor has not been able to explicate all stroke risk and evidence arising shows possible pathophysiological role of genes in stroke (Sacco, Ellenberg, & Mohr, 1989; Manolio, Collins & Cox, 2009). Genome wide association studies have identified a wide range of genes associated with stroke (Ikram, Seshadri & Bis, 2009). These comprise, Apolioprotein E (APOE), Methylenetetrahydrofolate reductase (MTHFR), Endothelial Nitric Oxide Synthase (ENOS), Factor V Leiden (F5), Cytochrome P450 4F2 (CYP4F2), beta-fibrinogen and Phosphodiesterase 4D (PDE4D). Surprisingly, some of the discovered stroke related genes has association with the conventional risk factors of stroke. For instance, a study conducted among an Icelandic population revealed that a genome wide relationship research found that risk deviations for atrial fibrillation of ch4q25 were likewise risk factors for ischemic stroke (Gretarsdottir, Thorleifsson & Manolescu, 2008). In the same study site, the genotypes of 1,661 participants was recorded as cases of ischemic stroke with 10,815 control subjects. The utmost significant indicators were separated in two divergent European populations with 2224 cases and 2583 controls (Gretarsdottir, Thorleifsson & Manolescu, 2008; Schunkert, Gotz, Braund, McGinnis et al., 2008). The robust link occurred with SNP (single nucleotide polymorphism), with cardioembolic stroke (Gretarsdottir, Thorleifsson & Manolescu, 2008). "Furthermore, a ch9 alternate linked

to myocardial infarction and coronary artery disease was linked with ischemic stroke in the different populations (Schunkert, Gotz, Braund, McGinnis et al., 2008)."

"Numerous supplementary risk factors of stroke have been recommended but not acknowledged. Some of which consist of oral contraceptive use, vasculitides, inflammatory processes, migraine, sleep apnea syndrome, prothrombin activator inhibitor complex deficiency, hypotension, high C-reactive protein, neurocysticercosis, Chlamydia pneumoniae, Helicobacter pylori, Legionella pneumophilia, chronic bronchitis, periodontal disease, and hyperuricemia (Caplan, 2000; Lopez, Mathers, Ezzati, Jamison & Murray, 2006; Palm, Urbane & Grau, 2009; Nagel & Gilden, 2014)".

2.3 Stroke and quality of life

The strongest determining factor of stroke is age and the peril of stroke duplicates every ten years for persons above 55 years old. Age can be an accepted marker for duration of exposure to other risk factors of stroke (Caplan, 2000; Lopez, Mathers, Ezzati, Jamison & Murray, 2006). Unlike developed countries where stroke usually affects much older individuals (70-75 years), stroke in sub-Saharan Africa affects individuals less than 60 years old (Owolabi, Ugoya, & Platz, 2009; Bravata, Wells, Gulanski, et al., 2005). The next major risk factor after age is hypertension and individuals with hypertension have high chances of experiencing stroke (Chobanian, Bakris, Black, 2003). The robust relation flanked by hypertension and stroke has been ascribed to the potent effects of hypertension on the cerebral circulation (Iadecola & Gorelick, 2004). In cerebral blood vessels, hypertension is acknowledged to yield hypertrophy which causes a fall in the exterior width of the vessels. Also, the endothelial cells' ability to release vasoactive factors increases the constrictor tone of systemic and cerebral arteries which is altered by hypertension (Iadecola & Gorelick, 2004). Sickle cell (very common in sub-Saharan Africa) patients stand a higher risk of experiencing stroke; as

high as 200-400folds (Ohene-Frempong, Weiner & Sleeper, 1998; Merkel, Ginsberg, Parker & Post, 1979). Sickle patients' standing higher chance of experiencing stroke may be due to increased haemolysis and changes in rheological properties of red blood cells (Ohene-Frempong, Weiner & Sleeper, 1998; Merkel, Ginsberg, Parker & Post, 1979). The chances of a person experiencing stroke again after a previous stroke is very high; thus a recurrence rate of 5 – 25% in 1 year and 20 – 40% in 5 years (Caplan, 2000).

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Manolescu, 2008; Schunkert, Gotz, Braund, McGinnis et al., 2008). The robust link occurred with SNP (single nucleotide polymorphism), with cardioembolic stroke (Gretarsdottir, Thorleifsson & Manolescu, 2008). Furthermore, a ch9 alternate linked to myocardial infarction and coronary artery disease was linked with ischemic stroke in the different populations (Schunkert, Gotz, Braund, McGinnis et al., 2008).

Numerous supplementary risk factors of stroke have been recommended but not acknowledged. Some of which consist of oral contraceptive use, vasculitides, inflammatory processes, migraine, sleep apnea syndrome, prothrombin activator inhibitor complex deficiency, hypotension, high C-reactive protein, neurocysticercosis, Chlamydia pneumoniae, Helicobacter pylori, Legionella pneumophilia, chronic bronchitis, periodontal disease, and hyperuricemia (Caplan, 2000; Lopez, Mathers, Ezzati, Jamison & Murray, 2006; Palm, Urbane & Grau, 2009; Nagel & Gilden, 2014).

These measures call for more studies to be sure of their psychometric appropriateness mainly in heterogeneous situations, though they have been preliminarily assessed in stroke patients. Up to now, only the HRQOLISP instrument has been substantiated in sub-Saharan Africa, and was found to establish good content, construct, and discriminant validity and internal consistency reliability (Owolabi, 2011; Owolabi & Ogunniyi, 2009).

Assessing health-related quality of life is important both for measuring the burden of a disease and for assessing the effect of treatments (Rand et al, 2010). There are domains that constitute HRQOL. This study employs the Stroke Specific Quality of Life (SS QOL) scale. For the purpose of this study the domains of quality of life was discussed based on the SS QOL.

2.4 Domains of quality of life

"The Stroke-Specific Quality of Life Scale (SS-QOL) consists of twelve domains. These include: Mobility, Energy, Upper extremity function, Work/productivity, Mood, Self-care, Social roles, Family roles, Vision, Language, Thinking, and Personality. According to the SSQOL, the specific domains most affected in the study, which are those that could be triggered in the presence of the disease or its consequences, were: mobility, work, upper limb function, behavior, family and social relationships, and energy" (Rangel, et al, 2013).

A Nigerian study which evaluated the quality of life among individuals with stroke showed good scores in the vision, thinking, mood and language domains while scores in most of the other domains were just about average (Akosile et al, 2013). However, the authors explicate the lower scores in the role functioning domains (family roles and social role domains) as participants judging themselves more poorly when it comes to activities involving interaction with significant others. Moreover, the mobility, upper extremity function, work/productivity and self-care (Physical functioning) domains were also remarkably affected (Lai, 2005; Gargano, 2007).

Many other studies have revealed a decrease in physical function as the most significantly affected aspect of QOL (Akinpelu & Gbiri 2009; Owolabi & Ogunniyi, 2009). Moreover, the energy (vitality) domain was reported in a similar study has not been significantly different from that of the general population (Kong, 2006).

Low scores in the family relationship probably shows aspects of the disease that caused caregiver role strain and patient dissatisfaction in relation to the care received from the family. Another researcher showed that good social support and quality family assistance maintained, and in some cases even improved, of the patients (Teixeira-

Salmela et al, 2009; Lee et al 2008). In related studies, cognitive dysfunctions accounted for one third of general deficits and affect nearly half of stroke survivors (Pendlebury, 2009). Physical disability is usually related with stroke, but cognitive changes and other non-motor consequences are quite common among stroke survivors (Pendlebury, 2009). Post-stroke cognitive dysfunction comes up with a multi-domain impairment of attention and concentration, executive function, language, memory and visuospatial function with executive dysfunction being the earliest the domain mostly affected (Hachinski et al 2006).

"Several studies identified social and family roles (Akosile et al, 2013), physical functioning (Owolabi, 2011; Akosile et al, 2013) and work (Gbiri & Akinpelu, 2012), feeling (Enato et al, 2011), and emotion domains (Hamza et al 2014) as severely affected. In addition, language (Gbiri & Akinpelu, 2012; Akosile et al, 2013), vision (Enato et al, 2011), thinking and mood domains (Akosile et al, 2013) have been reported as the least affected".

2.5. Factors Influencing quality of life (QoL)

Assessing health-related quality of life is crucial for assessing the effect of therapies as well as for measuring the burden of a disease. However, the quality of life can be affected by several factors. "For instance, studies conducted in Nigeria on the QOL of stroke survivors reported that QOL in influenced by the following factors: stroke severity (Owolabi & Ogunniyi, 2009; Gbiri, Akinpelu & Odole, 2010), motor impairment, (Fatoye et al 2007), disability (Abubakar & Isezuo, 2012; Owolabi, 2011) and depression (Gbiri, Akinpelu & Odole, 2010). Additional determining factors of QOL post stroke comprise: severity of the disorder (Fatoye et al 2007), extent of social support (Owolabi & Ogunniyi, 2009), emotional responses (Owolabi, 2011), mental health and prior mental disorder (Fatoye et al 2007) extent of academic-attainment

(Fatoye et al 2007; Gbiri, Akinpelu & Odole, 2010; Gbiri & Akinpelu, 2012), marital status and spousal support (Gbiri, Akinpelu & Odole, 2010; Gbiri & Akinpelu, 2012) and employment status (Gbiri & Akinpelu, 2012). Socioeconomic class (Owolabi & Ogunniyi, 2009; Owolabi, 2011) was not related with quality of life whereas contradictory outcomes were found on the effect of stroke type on quality of life. Gbiri et al, (2010) found that haemorrhagic stroke survivors had significantly higher QOL at post-stroke periods but Owolabi, (2011) and Owolabi and Ogunniyi, (2009) found no significant association between stroke type and QOL".

"In Spain, a study was developed by Poissant, Mayo, Wood-Dauphinee and Clarke (2003) as the first stroke-specific health index, the Preference-based Stroke Index (PBSI). The PBSI included 10 items; walking, climbing stairs, physical activities/sports, recreational activities, work, driving, speech, memory, coping and self-esteem. Physical function ($r = 0.78$), vitality ($r = 0.67$), social functioning ($r = 0.64$) were weakly associated with scales of the SF-36 and the PBSI. The role emotional scale ($r = 0.32$) recorded the weakest correlation. The findings showed that the PBSI can distinguish patients by severity of stroke ($p < 0.05$) and level of functional independence ($p < 0.0001$). Thus, the PBSI is a good indicator for Health-related quality of life'.

"Similarly, the Quality of Life among stroke survivors was assessed 1 year after stroke experience by Carod-Artal, Egido, et al, (2000). A cohort of 118 patients were consecutively followed up for 1 year and recruited into the study. A cross-sectional, descriptive design was developed and a questionnaire was used to collect the information. An ANOVA model was developed and used for the statistical analysis. Mean total SIP (24.3), SIP psychosocial dimension (27.5), and SIP physical dimension (21.2) were correlated with disability, female sex, motor impairment, and depression

(P, 0.0001). Functional status and depression were identified as predictors of quality of life".

"Jaracz and Kozubski, (2003) conducted a study to define universal and domain-specific quality of life (QOL) after stroke. A hospital-based sample of 72 stroke patients was followed up for 6 months after stroke onset. QOL was assessed using the Polish version of the Quality of Life Index. Regression analysis was performed to identify the variables that best predicted QOL. The highest QOL was found in the 'Family' domain, and the lowest in the 'Health and functioning' domain. Strengthening of family support, treatment of depression and reduction of physical dependence could be the decisive factors in improving post-stroke QOL".

"Williams, Morris, Lisa and José (1999) conducted a study that measured the quality of life in a way that is meaningful to stroke patients. A total of 71 patients were evaluated 1 month post-ischemic stroke with a new stroke-specific HRQOL measure-the SS-QOL-and the SF-36, a generic HRQOL measure. Stroke severity, impairments, and functional limitations were also measured. Demographic variables and outcome measure scores were compared between patients rating their overall HRQOL the same as pre-stroke versus those with overall HRQOL worse than pre-stroke. Independent predictors of overall HRQOL were identified using multivariable modeling. Variables associated with better overall HRQOL were higher (better) SS-QOL and Barthel Index scores, and lower (better) NIH Stroke Scale and Beck Depression Inventory scores. Independent predictors of good overall HRQOL were the SS-QOL score (odds ratio [OR], 2.97; 95% CI, 1.3, 7.1; p = 0.01) and NIH Stroke Scale score (OR, 0.69; 95% CI, 0.47, 0.99; p = 0.05). Demographic factors and SF-36 scores were not associated with overall HRQOL ratings. It could be inferred that stroke-specific quality of life score and patient impairments predict patient-reported overall health-related quality of life

(HRQOL) post-stroke. SF-36 scores were not associated with overall HRQOL ratings. Disease-specific HRQOL measures are more sensitive to meaningful changes in post-stroke HRQOL and may thus aid in identifying specific aspects of post-stroke function that clinicians and "trialists" can target to improve patients' HRQOL after stroke".

2.6. Measurement of QoL

"There several tools developed to measure HRQoL which could be generic or disease-specific (Owolabi & Ogunniyi, (2009). Generic measures assess and compare HRQOL across populations or different diseases, while disease-specific measures are more valid, patient-centered, responsive and sensitive in assessing HRQOL in specific diseases and/or populations (Williams et al, 1999). Examples of generic HRQOL measures are SF-36 and EuroQoL (Williams et al, 1999). Stroke-specific measures include the Niemi QOL scale Stroke Impact Scale (SIS), Stroke and Aphasia Quality of Life Scale -39 (SAQOL-39), Newcastle Stroke-Specific Quality of Life 24 Measure (NEWSQOL), Stroke-Specific Quality of Life Scale (SSQOL) and the Health-Related Quality of Life in Stroke Patients (HRQOLISP) (Ewert, 2007; Owolabi, 2011)."

However, for the purpose of this study, the SS-QOL was used. This is because of all the stroke-specific scales, the Stroke-Specific Quality of Life Scale (SS-QOL) (Williams et al, 1999) is the most comprehensive and frequently used patient-reported outcome measure (Chou et al 2009). The SS-QOL provides domain scores and a summary score, with higher scores indicating better function.

The SS-QOL is a self-report questionnaire consisting of 49 items in the 12 domains of energy, family roles, language, mobility, mood, personality, self-care, social roles, thinking, upper extremity (UE) function, vision, and work/productivity. The domains are scored separately, and a total score is also provided. The SS-QOL items also have

acceptable agreement with the categories of the International Classification of Functioning, Disability, and Health, (Teixeira-Salmela et al, 2009). Test-retest reliability, internal consistency, construct, and convergent validity of the SS-QOL have also been ascertained in patients with stroke (Muus, Williams & Ringsberg, 2007).

"A short version of the SS-QoL was developed and tested in Netherlands by Post, Boosman et al., (2017). The short version was developed using data from 141 patients with aneurysmal subarachnoid haemorrhage (SAH) and tested on data from independent samples of 97 patients with SAH and 105 patients with ischaemic stroke or intracerebral haemorrhage. The SS-Qol-12 scores predicted 88-95% of the variance of the original SS-QoL. Mean differences between the SS-QoL-12 and SS-QoL and their 95% CI were generally within 0.1 points on a 1-5 scale. The SS-QoL-12 has good criterion validity for all subsets of stroke. Because it consists of only 12 questions, this short form will be easy to use in research and clinical settings".

2.7 Chapter Summary and Conclusion

Most of the studies reviewed indicated that varied factors affect the quality of life of stroke patients. Stroke is a public health concern because it is one of three causes of mortalities in Ghana. Several quality of life domains have been developed to measure the quality of life of stroke patients. This study used the 12-domain quality of life to assess the quality of life of stroke patients in TGH.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter presents the methods employed to undertake the study. It discusses the research design, study area, population, sample size, sample and sampling procedure. Others were data collection method, data analysis and ethical considerations.

3.1 Research Design

The study employed a cross-sectional study design using quantitative method to determine the factors that influence the quality of life of stroke patients attending the Tema General Hospital.

3.2 Study Area

The study was conducted at the Tema General Hospital (TGH). The TGH is located in the Tema Metropolis, the most industrialized city in Ghana. Tema metropolis is one of the 10 districts in Greater Accra Region and is a vibrant commercial. The Tema Metropolis has a population of about 403,934 (2010 Population and Housing Census), making it the second largest populated district in the Greater Accra Region. Tema Metropolis is a coastal district situated about 30 kilometers East of Accra, the Capital City of Ghana. It shares boundaries in the northeast with the Dangme West District, south-west by Ledzokuku Krowor Municipal, north-west by Adentan Municipal and Ga East Municipal, north by the Akuapim South District and south by the Gulf of Guinea. The Ashaiman Municipal is an in-lock enclave within the Tema Metropolis. The Metropolis covers an area of about 87.8 km2 with Tema as its capital. The

Greenwich Meridian (i.e. Longitude 0º) passes through the Metropolis, which meets the equator or latitude 0° in the Ghanaian waters of the Gulf of Guinea.

The geographical location of the Hospital is surrounded by road networks, making the Hospital the major referral point for all other clinics/ hospitals, public and private in and around the Metropolis. The catchment area includes the whole of Tema metropolis, its satellite town and villages. The Tema General Hospital has ten (10) wards with 280-bed capacity. It provides 24 hours specialist and general services to both out- patient and in- patient.

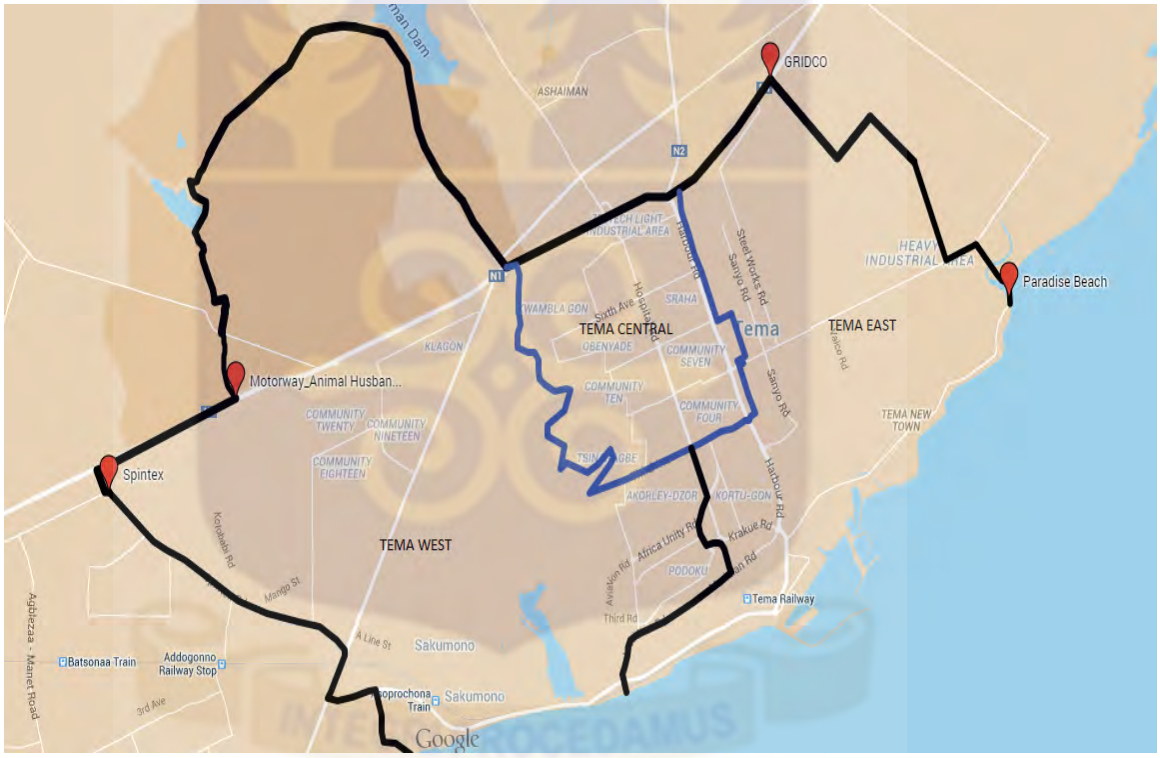

Fig.3.1**:** Map of Tema Municipality

3.3 Study Population

The study population comprised all stroke patients attending the physiotherapy unit of the Tema General Hospital

3.3.1. Inclusion criteria

All stroke patients 18 years of age and above, conscious and had good memory, in good state of mind and were capable of giving voluntary consent and had reported and received services at the Department for the past one month.

3.3.2. Exclusion Criteria

All stroke patients with deafness or significant decrease in hearing, and patients with cognitive disorders that prevented them from understanding the questionnaires. Also, patients below 18 years was excluded

3.4 Variables

Table 3.1 presents the variables measured in the study

Table 3.1: Table of Variables

Variable	**Indicator**
Dependent Variable	
Quality of life of stroke patients	
Independent Variables	
Demographic characteristics	Age, Sex, Marital status, Education, Occupation, Income, Health insurance, Religion, Family History of stroke, Co-morbidities, History of Alcohol and History of Smoking.
Stroke Specific Quality of Life measures	Energy, family roles, language, mobility, mood, personality, self-care, social roles, thinking, upper extremity function, vision, productivity

3.5 Sample Size Determination

Adopted sample size formula by Cochran for cross-sectional study:

$$n = \frac{(Z_{\frac{\partial}{2}})^2 p(1-p)}{d^2} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

where: n: sample size

p: the prevalence of stroke in Ghana p=9.1% (Donkor, 2014)

d: margin of error, 5%

Zα/2=1.96 since α=5% at 95% Confidence Level

Inputting the above into equation (1), the minimum sample size for external clients required for this study was given by

$$n = \frac{(1.96)^2 \times 0.o91(1-0.091)}{(0.05)^2} = 127$$

Using 10% error margin, the final minimum sample size for the patients was 140

From the 140 questionnaires distributed to stroke patients to solicit their responses, 135 patients completely filled and returned the questions. This represents a 96.4% response rate. The analysis was done based on the returned questionnaire.

3.6 Sampling Procedure

Simple Random Sampling without Replacement (SRSWOR) technique was employed to select participants. SRSWOR meant that once a participant is selected, he or she was not be selected again (Ahmed, 2009).This was done by obtaining the register of all the stroke patients and selecting from the attendance register the folders of all stroke patients who access physiotherapy services at the Physiotherapy Department of TGH. Folders of stroke patients who had been on admission for the past four weeks (one month) and patients who come and go on weekly basis for physiotherapy were selected. A total of 400 stroke patients were obtained from the department which served as the sample frame. The selection of patients from the database was done by generating 140 participants from a sample frame of 400 with the help of a random number generator. Patients whose numbers were selected were then identified and subsequently interviewed. A period of one month was used to interview the respondents. Face-to-face interview was conducted for the selected patients from Monday to Friday within the hours of 7am to 4pm each day. Each day, three (3) to eight (8) respondents on average were interviewed.

3.6.1. Data Collection

Stroke Specific Quality of Life (SS-QoL) questionnaire (William, 1999) (Appendix 2) was used to determine the factors that influence the QoL of the stroke patients at the TGH. The SS-QoL is a self-reported questionnaire that contains 12 domains with a total of 49 items. The domains included: energy, family roles, language, mobility, mood, personality, self-care, social roles, thinking, upper extremity (UE) function, vision, and work/productivity. The domains were scored separately and total score was also provided. Scoring of the SS-QoL was rated on a 5-point Likert scale. Response options were scored as 5 (“no help

needed/strongly disagree", 4 ("a little help/ moderate disagree") 3 ("some help/ neither agree or disagree"), 2 ("a lot of help/moderately agree") and 1 ("total help/ strongly agree"). Domains scores and summary score was provided by the SS-QoL with higher score indicating better Quality. The scale was tested for reliability, internal consistency, construct, and convergent validity (Muus, 2007; Owolabi, 2013).

Data on the other independent variables including demography, family history of stroke, History of Alcohol and smoking, socioeconomic status such as income and Health insurance were also collected for further analysis. The questionnaires were interviewer administer to participants.

The questionnaire had two sections. Section one encompassed the demographic characteristics (age, marital status, religion, educational level, Sex, Income, Occupation, Health insurance, History of Alcohol and Smoking, co-morbiditiesies conditions like Hypertension, Diabetes Lung cancers etc). Section two consisted of the Stroke Specific QoL domains. Each questionnaire took 15-30 minutes on the average to be completed.

3.7 Quality Control

- Study materials were explained to participants prior to interview.
- Research assistants were trained to carry out survey accurately.
- Questionnaires were cross checked by principal researcher.

3.8 Data Processing and Analysis

The data collected were screened or validated and coded where necessary before the entry. After data entry using Epi info 7, the data set was cross-checked with hard copies to ensure

there were no errors. The data set from the questionnaires was then exported to STATA software 14.0 for cleaning, merging and analysis. Cleaning of the data was done by running frequencies of the variables. This checked inconsistently coded data. Inconsistently coded data was double checked with raw data from the questionnaire. Simple proportions and means were used to describe categorical and numerical data, respectively.

The analysis of the Likert scale responses are as follows. Firstly, the answers were coded on a scale from 1 (strongly agree) to 5 (strongly disagree) and analysed numerically. Sum scores for each domain range between 15 and 25 while total maximum score is 245. Mean overall and domain scores were presented as percentages of the maximum possible score overall or for individual domains. The domains were scored separately and total score provided. Higher score indicated better function of quality of life. The relations between the domains and quality of life was analyzed initially using the univariate logistic regression analysis. Multivariate logistic regression analyses were done to exclude high intercorrelated independent variables. The results were presented as frequencies, mean, proportions, and percentages. A confidence interval of 95% was used to show significant relations between the dependent and the independent variables.

3.9 Pretesting

The questionnaire was designed to reflect objectives of the study. Pretesting of data collections tools was done at Tema Polyclinic with 10 participants to validate survey tools. The purpose was to establish if the tool is clearly worded and devoid of major biases and can sought the type of information intended. Pretesting was also carried out with the aim of eliminating irrelevant questions so as to make it reliable.

3.10 Ethical Consideration

Introductory letter was obtained from the Department of Health Policy, Planning and Management (HPPM) of the School of Public Health (SPH) to Greater Accra Regional Health Directorate and was introduced to the head of the facility for permission from hospital authorities prior to the study. Letter of support from Tema Municipal Health Directorate was then be obtained and attached to the proposal. The proposal was then submitted to the HPPM Department of the School of Public Health who then forwarded it for ethical clearance from Ghana Health Services (GHS) Review Committee. Clearance was obtained from Ghana Health Service ethical board prior to data collection.

Participation in this study was entirely voluntary and participants had the option not to participate or to discontinue their participation without any adverse consequence. Participants were given sufficient information about the study to enable them decide whether to take part or not.

Written informed consent forms was given to participants to sign. All informed consent was in English. However, consents form was read out to patients who could not read and write to obtain their consent by thumb printing to participate in the study.

Participants were assured of the fact that this work is purposely academic and as such information they provide will be protected with strict confidentiality. Participants were assured of animosity by not asking for their names and that no harm was intended.

The study did not enquire any major cost for participants except the participants' time that was spent in answering the questionnaire and interviews. Participants were at liberty to withdraw from the study at will.

No risk or discomfort concerning participation in this research was anticipated apart from the time that will be spent on answering the questionnaire. No direct benefit to participant, however the outcome of this study will be used to inform policy on stroke management. There was no conflict of interest.

3.11 Chapter Summary and Conclusion

The study discussed the research design, study area, population, sample size, sample and sampling procedure. Also, data collection method, data analysis and ethical considerations were reviewed. A facility-based cross-sectional research design was used to select 127 respondents in TGH. Consent was sought before administering questionnaire to respondents. Respondents were at liberty not to participate in the study. There was no conflict of interest.

CHAPTER FOUR

RESULTS

4.0 Introduction

This chapter presents the results of the survey data gathered from 135 stroke patients receiving physiotherapy treatment for stroke at TGH with a response rate of 96.4%. Essentially, the chapter presents results on the socio demographic characteristics of the stroke patients; economic status of the adult stroke patients; behavioral status of stroke patients; association between Quality of life (QOL) using stroke specific quality of care tool (SS-QoL) and factors that influences the Quality of life (QOL) of stroke patients as well as the differences in the quality of life by the socio-economic status; and the reasons for the differences.

4.1 Socio-demographic characteristics

The characteristics of quality of life of stroke patients is presented in Table 4.1

Majority of the respondents were in the age category of 60-69 years with frequency of 53 (39.3%), then followed by 70 years and above 38 (28.2%), then 50-59 32 (23.7%) and <50 12 (8.9%) followed respectively. About 69 (51.1%) of the respondents were females, while 60 (44.5%) were married and 8 (5.9%) were widowed. About 16 (29%) of the respondents had primary and JHS/middle school while 78 (58.2%) were unemployed. Majority of the respondent were Christians 110 (83.3) whiles 22 (16%) were Moslems. Also 74 (54.8%) of the respondents earned < GHC 500 while 31 (23.0%) earned GHC 500-999, with 25 (18.5%) earning GHC1000 +

Table 2.1: Socio-demographic characteristics of stroke patients (n=135)

Characteristics	N	%
Age (years)		
<50	12	8.9
50 – 59	32	23.7
60 – 69	53	39.3
70+	38	28.2
Sex		
Male	65	48.2
Female	69	51.1
Marital Status		
Single	51	37.8
Married	60	44.5
Divorced	16	11.9
widowed	8	5.9
Education		
No education	24	18.1
Primary	38	28.6
JHS/middle/vocation	39	29.3
Secondary	16	12.0
tertiary	16	12.0
Employment		
Unemployed	78	58.2
Employed	56	41.8
Religion		
Christian	110	83.3
Muslim	22	16.7
Income		
<500	74	54.8
500-999	31	23.0
1000+	25	18.5
Total	135	100.0

Source: Field data (2017)

4.2 Behavioral characteristics of stroke patients

For co-morbidities, majority of the respondents were hypertensive (94.8%) as against the (5.2%) diabetics. More (61.5%) of the respondents had no history of ever taking alcoholic beverages with the remaining (38.5%) currently consuming alcoholic beverages. Majority of respondents' family history of stroke, 97% of the patients indicated they have no history of the disease in their family in contrast to the 45.2% that have family history of stroke. Most of the patients (88.2%) have active health insurance as compared with the 11.8% who have none or either renewed their health insurance.

Table 4.2: Behavioral characteristics of stroke patients

Characteristics	**N**	**%**
Other conditions (Co-morbidities)		
Diabetes	17	5.2
hypertension	111	94.8
History of alcohol		
Yes	50	38.5
no	83	61.5
Current history of alcohol consumption		
Yes	18	13.3
no	113	83.7
Smoking history		
Yes	14	2.2
no	118	97.8
Family history of stroke		
Yes	61	46.5
no	70	53.5
Health insurance		
Inactive	16	11.8
Active	119	88.2
Total	135	100.0

Source: Field data (2017)

4.3 Association between quality of life and behavioral characteristics of stroke patients

There was no significant association between behavioral characteristics and quality of life of stroke patients ($p>0.05$)

Table 4.3: Association between behavioral characteristics and quality of life of stroke patients (n=135)

Characteristics	Mean diff (95% CI)	P-value
Other conditions (Co-morbidities) Diabetes hypertension	 Ref 0.036 (-0.186, 0.257)	0.7512
History of alcohol Yes no	 Ref 0.009 (-0.149, 0.169)	0.9029
Current history of alcohol consumption Yes no	 Ref 0.0389 (-0.189, 0.266)	0.7357
Smoking history Yes no	 Ref -0.107 (-0.359, 0.144)	0.4000
Family history of stroke Yes no	 Ref 0.146 (-0.008, 0.299)	0.0631
Health insurance Inactive Active	 Ref 0.049 (-0.187, 0.285)	0.6814

Source: Field data (2017)

4.4 Quality of life of stroke patients

Table 4.4 presents a SS QOL measurement scale average score of different domains. It is clear that with the Energy (2.06 (SD 0.60)) and Mobility (2.11 (SD 0.72)) domains, patients recorded less than average score of satisfaction. With Upper Extremity (2.22 (SD 0.79)), Family Role (2.20 (SD 0.69)) and Social Role (2.30 (SD 0.56)) these domains had patients report fair levels of satisfaction. Work Productivity (1.93 (SD 0.65)) domain recorded the lowest mean score. Language (2.77 (SD 0.98)), Mood (2.58 (SD 0.73)), Personality (2.79 (SD 0.86)) and Self-Care (2.50 (SD 0.83)) recorded very average mean scores. Thinking (3.16 (SD 0.88)) and Vision (3.60 (SD 1.16)) recorded the highest mean scores of the domains.

Table 4.4: Mean and standard deviation of the various levels of QOL domains in TGH.

SS QOL Domains	Min	Max	Mean (SD)
Energy	1	5	2.06 (0.60)
Family Role	1	5	2.20 (0.69)
Language	1	5	2.77 (0.98)
Mobility	1	5	2.11 (0.72)
Mood	1	5	2.58 (0.73)
Personality	1	5	2.79 (0.86)
Selfcare	1	5	2.50 (0.83)
Social Role	1	5	2.30 (0.56)
Thinking	1	5	3.16 (0.88)
Upper Extremity	1	5	2.22 (0.79)
Vision	1	5	3.60 (1.16)
Work/Productivity	1	5	1.93 (0.65)
Overall SSQOL	1	5	2.49 (0.45)

Source: Field data (2017) Mean scores were generated from raw scores based on SS QOL measurements scale

4.5 Association between Quality of life and socio-demographic characteristics of stroke patients

The results for regressing the socio-demographic factors against quality of life of stroke patients is a presented in Table 4.5.

For every unit increase in age of a stroke patient, the quality of life of stroke patients decreases by -0.0111 (p=0.0030). Adjusting for all other variables, a unit increase in age decreases the quality of life stroke patients. However, there is no a significant association between age and quality of life of stroke patients (-0.008 95%CI -0.016, 0.001, p=0.086). The quality of life of female stroke patients is 0.121 higher than the quality of life of male stroke patients, however, sex of a stroke patient does not determine quality of life of stroke patient (p=0.1164). For marital status, the average quality of life score for married patients is about 0.241 (95%CI 0.076, 0.405) higher than single; divorced patients is 0.095 (95%CI -0.0153, 0.343) higher than single and widowed patients have a quality of life 0.204 (95%CI -0.125, 0.533) higher than single. However, adjusting for all the other variables, marital status does not determine the quality of life of stroke patients (p=0.1906). Concerning education, the quality of life of stroke patients with primary education is 0.161 (95%CI -0.060, 0.382) higher than patients with no education; patients with JHS/middle/vocation education have a quality of life 0.383 (95%CI 0.163, 0.603) higher than patients with no education. The quality of life of stroke patients with secondary education is 0.309 (95%CI 0.036, 0.583) higher than patients with no education. The quality of life of stroke patients with tertiary education is 0.453 (95%CI 0.179, 0.726) higher than patients with no education. Adjusting for all other factors, there is a significant association between education and the quality of life of stroke patients (p=0.0431).

With employment status, the quality of life of patients who are employed is 0.166 (95%CI 0.017, 0.315) higher than patients who are unemployed. Adjusting for all other variables, there is no significant association between employment status and quality of life of stroke patients (p=0.7794). The quality of life of Muslims is 0.008 (95%CI -0.201, 0.217) higher than Christians. There is no significant association between religion and quality of life of stroke patients (0.9402). Patients who earn between GHc500-999 have a quality of life of 0.139 higher than those who earn <500. Patients who earn Ghc1000+ have a 0.291 higher quality of life than those who earn <500. Adjusting for all other factors, there is no association between income level and quality of life of stroke patients.

Table 4.5: Multivariable linear regression analysis for the association between outcome of quality of life and socio-demographic characteristics of in-patient admissions

Demographic Characteristics	*Crude*		*Adjusted*	
	Mean diff (95% CI)	*P-value*	*Mean diff (95% CI)*	*P-value*
Age (years)	-0.011 (-0.019, -0.004)	0.0030	-0.008 (-0.016, 0.001)	0.086
Sex		0.1164		
Male	Ref			
Female	0.121 (-0.031, 0.273)			
Marital Status				0.1906
Single	Ref	0.0378	Ref	
Married	0.241 (0.076, 0.405)		0.124 (-0.065, 0.440)	
Divorced	0.095 (-0.153, 0.343)		0.024 (-0.224, 0.271)	
widowed	0.204 (-0.125, 0.533)		0.408 (0.003, 0.812)	
Education		0.0024		0.0431
No education	Ref		Ref	
Primary	0.161 (-0.060, 0.382)		0.203 (-0.034, 0.440)	
JHS/middle/vocation	0.383 (0.163, 0.603)		0.382 (0.139, 0.623)	
Secondary	0.309 (0.036, 0.583)		0.219 (-0.088, 0.526)	
tertiary	0.453 (0.179, 0.726)		0.238 (-0.094, 0.569)	
Employment		0.0296		0.7794
Unemployed	Ref		Ref	
Employed	0.166 (0.017, 0.315)		-0.028 (-0.225, 0.169)	
Religion				
Christian	Ref			
Moslem	0.008 (-0.201, 0.217)	0.9402		
Income				
<500	Ref		Ref	
500-999	0.139	0.0159	0.061 (-0.139, 0.262)	0.5663
1000+	0.291		0.151 (-0.132, 0.434)	

Source: Field data (2017)

CHAPTER FIVE

DISCUSSION

5.0 Introduction

The chapter discusses the results in correspondence with the objectives of the study. It comprised summary and additional discussions of the main findings by relating it with related literature on the quality of life stroke patients lived.

5.1 Summary of main findings

Most of the respondents were in the age category of 60-69 years, which is an indicator that stroke usually affects the elderly which is concurrent with findings from developed countries which reports that stroke usually affects older people (Owolabi, Ugoya, & Platz, 2009; Bravata, Wells, Gulanski, et al., 2005). Most of the patients had JHS/Middle/Vocation education while majority of the patients were females and married. Contrarily, Sampane-Donkor (2014), who assessed the epidemiology, quality of life and community perceptions of the stroke patients in southern Ghana found that stroke patients were primarily males, aged between 50-59 years, with tertiary education. Also most of the patients were married and this was a repeat of findings of Jaracz & Kozubski (2003), who evaluated the quality of life of stroke patients in Poland.

In contrast to a study by Urimubenshi and Rhoda (2011) who found that more than half of the respondents affected by stroke were males, we found in the study that females were affected more with stroke compared with their male counterparts. This could be due to the fact that females are more susceptible to the risk factors associated with stroke, especially,

those concerned with poor lifestyle such as eating 'junk' and fatty foods compared to males.

With regard religion, stroke was prevalent among Christians in contrast to Muslims. There was not much variation in the employment status of the patients as 58.2% of the patients were unemployed as compared with those employed (41.8%). The average employed patient earned less than GHc500 every one month.

The behavioral characteristics of patients span across comorbidity, history of alcoholism, current history of alcoholism, smoking history, family's stroke history and health insurance holders. The comorbidities of hypertension was more than diabetes. This could mean that hypertension is a strongest risk factor after age. People with hypertension are about 3 or 4 times more likely to have stroke (Chobanian, Bakris, Black, 2003; Iadecola & Gorelick, 2004). Nevertheless, most of the stroke patients have had no smoking history and no current history taking alcoholic beverages. Again, most of the patients had no history of stroke in their families while majority of the patients have active 'renewed' health insurance.

5.2 Association between QoL and socio-demographic characteristics of stroke patients

Most of the patients (39.3%) were very old, aged between 60-69 years. This depicts that using age as a social indicator, the QoL of patients decreases with increasing age. In this study, age did not predict QoL among stroke patients. This finding is in agreement with studies which did not find age to be a predictor of HRQoL (Lai, Studenski, Duncan, 2002; Owolabi, 2008). This could be due to the fact that patients at such ages have difficulty

seeking treatment through physical and strenuous exercise. However, Sampane-Donkor (2014) found that age as a significant determinant of HRQoL

The study showed that using sex as a social indicator, does not predict QoL among stroke patients. The finding agrees with Sampane-Donkor (2014) who found that gender is not a determinant of HRQo. Some other studies have however reported sex as a determinant of HRQoL (Owolabi 2008; Gokkaya, Aras, Cakei 2005; Kong, Yang, 2006). This could be attributed to the fact that under different settings both sexes are exposed to risky lifestyles such as smoking, eating fatty foods with minimal exercising.

Patients who were married, divorced and widowed were more likely to have good QoL as compared to those who were single. This corroborate that marital status and spousal support provide good QoL (Gbiri, Akinpelu & Odole, 2010; Gbiri & Akinpelu, 2012). This could be ascribed to the fact such patients will have easy access to companionship, support and encouragement by extended and nuclear family members. However, marital status as a social indicator, does not predict QoL among stroke patients.

Again, the study showed that patients with any form and/or level of formal education have good QoL in contrast to patients without any form of formal education. This could be attributed to the fact that these group of patients have knowledge to try other forms of treatment. Educational level as a social indicator, predicts QoL among stroke patients. Thus, level of education improves the perception of patients as well as their general beliefs (Coulter et al., 2008).

The employment level of patients does not predict QoL. This is in agreement with Gbiri & Akinpelu, (2012) who found that occupational status improves QoL. This could be

attributed to the fact that a once active and energetic patients could not accept that they are invalid and depend on 'people' for support and financial aid. Furthermore, religion does not predict QoL among stroke patients. Plausible explanation could be that some attribute the disease to spirituality and may not seek treatment to be healed.

Monthly salaries and/or allowance is not a good predictor of QoL among stroke patients. This corroborates that fiscal status was not associated with quality of life (Owolabi & Ogunniyi, 2009; Owolabi, 2011). Also most of the study participants may have retired from active service before or after the on-set of stroke hence the weak association.

5.3 Association between quality of life and behavioral characteristics of stroke patients

The influence of behavioral characteristics on stroke patients was extremely low. Majority of the patients were hypertensive as compared to those who were diabetic. Research has proven that comorbid conditions (hypertension and diabetes) predicts poorer functional status, a higher risk of dying, and greater use of health services (van Weel & Schellevis, 2006). That notwithstanding, patients with hypertension did not predict good quality of life compared with diabetic patients.

Although patients without any history of drinking alcoholic beverages and smoking cigarette, have higher quality of life, drinking alcoholic beverages and smoking cigarette are not determinants of quality of life among stroke patients.

Even though, patients with no history of stroke have a higher quality of life, family history of stroke does not predict quality of life among stroke patients. Though patients with active health insurance could access health care with ease, possessing an active health insurance

is not an indicator of quality of life among stroke patients. This has been reported by Appleby (2012), who also found that physiotherapy services often brings additional cost that must be financed by health insurance companies or by patients themselves which impact QoL.

Overall, none of the defined behavioral characteristic of patients predict quality of life among stroke patients. Results from this study is contrary to findings which indicates that the determinants of quality of life (QoL) of stroke patients include co-morbidities (Gokkaya, Aras, Cakei, 2005; Kong & Yang, 2006). This could be due to the fact patients who were struck with stroke do not adjust psychologically to the illness and thus live sub-standard lives.

5.4 Quality of life of stroke patients

The quality of life of stroke patients as measure by the SS QOL domains was fairly good. That is, energy, work/productivity, mobility, social role, upper extremity and family role were domains that did not predict quality of life of stroke patients.

The results of the domain described as poor is in disagreement with studies which acknowledged the significance of family to the elderly and invalid persons (Lau & McKenna, 2001; Holmen, Ericsson & Andersson, 1992). Likewise, the social lives of several elderly persons are linked to close family relations who provides for them materially as well as sensitively.

Contrary to the findings that social role/support does not predict quality of life, Robinson et al. (1999) recounted that, the initial days ensuing a stroke, social support is indispensable to avert depression, while during the advanced stage, elements comprising fiscal haven and

good condition of living turn out to be imperative. In contrast with the findings that upper extremity and work/productivity were not related to quality of life of stroke patients, Lin, Wu, Fu et al., (2010) found upper extremity function and work/productivity has fair associations with quality of life.

Language, mood, personality and self-care, thinking and vision were related to quality of life of stroke patients. This corroborates with research done to evaluate the QoL among stroke patients in Nigeria showed good scores in the vision, thinking, mood and language domains (Akosile et al, 2013). It could be inferred that patient's rate themselves more satisfied in terms of happenings concerning relations with family and close relations.

5.5 Study limitations

As a hospital-based study, the interpretations made may not be demonstrative of all strokes patients at Tema and its environs. Again, the sample size for the study was relatively small, which connotes a fairly homogeneous group of stroke patients suffering mild to moderate stroke, and does not comprise patients with obvious mental or speech malfunction, and the discoveries should be corroborated using a bigger and heterogeneous model. Pending the authentication of substitute measures of stroke-specific quality of life, the effects of speech and mental changes on stroke-specific quality of life are challenging to evaluate. Some respondents did not want to disclose their income and others under reported

CHAPTER SIX

CONCLUSION AND RECOMMENDATIONS

6.0 Introduction

This section provides conclusion to the study and make constructive recommendations based on the study findings and practicable suggestions from respondents. It presents a summary of findings, recommendations research limitation and suggest areas for further studies.

6.1 Conclusion

The study sought to assess the factors influencing the quality of life of stroke patients attending Tema General Hospital. The researcher posed questions that assisted in finding responses to the research questions vis-a-vis assisted in realizing the objectives from the answers provided. Also, the study looked at Quality of life (QOL) of stroke patients using stroke specific quality of care tool (SS-QoL and factors influencing the Quality of life (QOL) of stroke patients attending the TGH.

The study found Quality of life (QOL) domains such as language, mood, personality and self-care, thinking and vision to be significant domains that influenced the quality of life of stroke patients attending TGH. Also, none of the behavioral factors contributed significantly to the quality of life of stroke patients attending the TGH. However, only educational level of patients contributes significantly to the quality of life of stroke patients attending TGH.

In the study area, stroke patients have a low or below average socio-economic status. This was evident in their level of education, occupation and wealth. There exist vast disparities between those with higher levels of education and those with lower levels of education. Lower levels of education was related to poor quality of life as well as more patients with stroke were unemployed.

The quality of life of stroke patients as measured by SS QoL domains, was fairly good across all domains of energy, work/productivity, mobility, social role, upper extremity, language, mood, personality and family role even though scores for work productivity was lower. However, the level of quality of life is not reflective in the overall reported health status of the patients.

There are significant differences in the quality of life lived the by stroke patients in terms of his/her socio-economic standings. Education, employment and wealth were significant socio-economic indicators that affects the quality of life lived by stroke patients. Differences existed between the highly educated and the lowly educated.

6.2 Recommendations

Aside giving clinical care, the findings of this study indicate the necessity for health professionals to pay more attention to other factors that may affect treatment regimens of stroke patients. Therefore, the study recommends to the Ghana Health Service and other stakeholders that;

- Health facilities must intensify health education on better treatment outcomes to sustain and improve the current quality of life of stroke patients. Specifically, education must be targeted at patients who are women, lowly educated, aged, unemployed and those with comorbidities. This will impact positively on the quality of life of these stroke patients.
- To reduce the risk and incidence of stroke, educational out-reach programmes on life style modifications and risk factors for stroke targeted at women, unemployed and the lowly educated person must be encouraged.
- In the training of healthcare professionals, counselling modules must be included. This will better equip health professionals in giving out counseling sessions to clients who suffer stroke to improve their conditions of quality of life.
- Interventions aimed at improving the socio-economic conditions of the patients are needed. This could be in monetary or kind form as it will ensure access to health and other services needed for better treatment outcomes.
- The Physiotherapy Unit of The Tema General hospital should consider increasing the number of physical activity sessions for stroke patients and the individual patients must strictly adhere to physiotherapy and other forms of moderate physical activities to improve client's energy and work/productivity domains.
- Advocate for more gymnasiums in the community of stroke patients in the Tema Metropolis to help improved their life after stroke since such facilities are not common and must be affordable

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APPENDICES

Appendix 1: Informed Consent Form for Patients

Title: Factors Influencing the Quality of Life of Stroke Patients attending Tema General Hospital

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Introduction

Dear Participants, Stroke is the sudden death of some brain cells due to lack of oxygen when the blood flow to the brain is lost by blockage or rupture of an artery to the brain. Quality of life (QOL) is the individual's perception of his/her position in life in the context of the culture and value systems in which he/she lives, and in relation to his/her goals, expectations, standards and concerns. This study therefore seeks to determine the factors that influence the quality of life of stroke patients attending the Tema General Hospital in order to promote maximal health related quality of life (HRQOL) improvements in these patients.

Procedure, Possible Risk and Benefits

Questions will be asked based on factors influencing the quality of life of stroke patients. It will involve the use of questionnaire. No risk or discomfort is foreseen concerning your participation in this research apart from your time that will be spent on answering the questionnaire. You are at liberty, however, to decline questions that are sensitive to you. Each questionnaire will take 15-20 minutes on the average to complete. No direct benefit to participant, however the outcome of this study will be used to inform policy on stroke management.

Right to Refuse and Confidentiality

Your participation in this study is voluntary and you are at liberty to withdraw at any time. There will not be any penalty in opting out of this study or not answering any question. This study has been reviewed and approved by the Ethical Review Committee of Ghana Health Services. Participant personal identification such as names and address will not be written on questionnaire. Each questionnaire will be given a unique identification number.

Thank you.

PARTICIPANT CONSENT FORM

I have been thoroughly briefed on the entire methodology and significance of the ongoing study which is being conducted by Gloria Odoom. On my own free will, I hereby consent to be part of the study, based on my understanding of what the study entails.

I am doing this on condition that under no circumstance should my references be made to my actual identity to any other person(s) after providing all the information requested from me for this particular study as promised by the researcher.

Signature…… Date……

Thumb print

FACTORS INFLUENCING THE QUALITY OF LIFE OF STROKE PATIENTS

QUESTIONNAIRE

I am a student from the School of Public Health, University of Ghana, Legon. I am conducting a study on factors influencing the Quality of Life of stroke patients. I will be glad if you could answer the questions below. The answers given will be used only for academic purposes and the information will be treated confidential.

No	Questionnaire	Response
	SOCIODEMOGRAPHIC	
1	Age of respondent (Age at last birthday)	……
2	Sex 1. Male 2. Female	
3	Marital status 1. Single 2. Married 3. Divorced 4. Widowed	
4	What is your highest level of education? 1. No education 2. Primary 3. JHS/Middle School/Vocational 4. Secondary 5. Tertiary	

5	What is your occupation? 1. Unemployed 2. Self employed 3. Public Sector 4. Private Sector (formal) 5. Others Specify	
6	What is your estimated monthly income	GHS……..
7	Do you have Health Insurance? 1. Yes currently enrolled 2. No previously enrolled 3. No never enrolled	
8	If yes what type of insurance? 1. NHIS 2. Private 3. Other	
9	Religion 1. Christian 2. Muslim 3. Traditionalist 4. Other [specify] ……	

10	Does any person in your family have stroke (or ever had stroke)? 1. Yes 2. No	
11	What other conditions do you have apart from the stroke? 1. Diabetes 2. Hypertension 3. Lungs Disease 4. Other……	
12a	Previous history of alcohol consumption 1. Yes 2. No	
12b	Current history of alcohol consumption 1. Yes 2. No	
13	Smoking history 1. Yes 2. No	

Stroke Specific Quality of Life Scale (SS-QOL)

Please I would like to make the following statements and ask you to respond whether you agree or disagree on a scale of 1 to 5. 1 stands for when you strongly agree and 5 for when you strongly disagree.

		Strongly Agree	Agree	Neutral	Disagree	Strongly disagree	Response/score
A	**Energy**						
	1. I felt tired most of the time.	1	2	3	4	5	
	2. I had to stop and rest during the day.	1	2	3	4	5	
	3. I was too tired to do what I wanted to do	1	2	3	4	5	
B	**Family Roles**						
	1. I didn't join in activities just for fun with my family.	1	2	3	4	5	
	2. I felt I was a burden to my family.	1	2	3	4	5	
	3. My physical condition interfered with my personal life.	1	2	3	4	5	
C	**Language**						

		Strongly Agree	Agree	Neutral	Disagree	Strongly disagree	Response/score
	1. Did you have trouble speaking? For example, get stuck, stutter, stammer, or slur your words?	1	2	3	4	5	
	2. Did you have trouble speaking clearly enough to use the telephone?	1	2	3	4	5	
	3. Did other people have trouble in understanding what you said?	1	2	3	4	5	
	4. Did you have trouble finding the word you wanted to say?	1	2	3	4	5	
	5. Did you have to repeat yourself so others could understand you?	1	2	3	4	5	
D	**Mobility**						

		Strongly Agree	Agree	Neutral	Disagree	Strongly disagree	Response/score
	1. Did you have trouble walking? (If patient can't walk, go to question 4 and score questions 2-3 as	1	2	3	4	5	
	2. Did you lose your balance when bending over to or reaching for something?	1	2	3	4	5	
	3. Did you have trouble climbing stairs?	1	2	3	4	5	
	4. Did you have to stop and rest more than you would like when walking or using a wheelchair?	1	2	3	4	5	
	5. Did you have trouble with standing?	1	2	3	4	5	
	6. Did you have trouble getting out of a chair?	1	2	3	4	5	

		Strongly Agree	Agree	Neutral	Disagree	Strongly disagree	Response/score
E	**Mood**						
	1. I was discouraged about my future.	1	2	3	4	5	
	2. I wasn't interested in other people or activities.	1	2	3	4	5	
	3. I felt withdrawn from other people.	1	2	3	4	5	
	4. I had little confidence in myself.	1	2	3	4	5	
	5. I was not interested in food.	1	2	3	4	5	
F	**Personality**						
	1. I was irritable.	1	2	3	4	5	
	2. I was inpatient with others.	1	2	3	4	5	
	3. My personality has changed.	1	2	3	4	5	

		Strongly Agree	Agree	Neutral	Disagree	Strongly disagree	Response/score
G	**Self Care**						
	1. Did you need help preparing food?	1	2	3	4	5	
	2. Did you need help eating? For example, cutting food or preparing food?	1	2	3	4	5	
	3. Did you need help getting dressed? For example, putting on socks or shoes, buttoning buttons, or zipping?	1	2	3	4	5	
	4. Did you need help taking a bath or a shower?	1	2	3	4	5	
	5. Did you need help to use the toilet?	1	2	3	4	5	
H	Social Roles						

		Strongly Agree	Agree	Neutral	Disagree	Strongly disagree	Response/score
	1. I didn't go out as often as I would like.	1	2	3	4	5	
	2. I did my hobbies and recreation for shorter periods of time than I would like.	1	2	3	4	5	
	3. I didn't see as many of my friends as I would like.	1	2	3	4	5	
	4. I had sex less often than I would like.	1	2	3	4	5	
	5. My physical condition interfered with my social life.	1	2	3	4	5	
I	**Thinking**						
	1. It was hard for me to concentrate.	1	2	3	4	5	
	2. I had trouble remembering things.	1	2	3	4	5	
	3. I had to write things down	1	2	3	4	5	

		Strongly Agree	Agree	Neutral	Disagree	Strongly disagree	Response/score
	to remember them.						
J	Upper Extremity Function	1	2	3	4	5	
	1. Did you have trouble writing or typing?	1	2	3	4	5	
	2. Did you have trouble putting on socks?	1	2	3	4	5	
	3. Did you have trouble buttoning buttons?	1	2	3	4	5	
	4. Did you have trouble zipping a zipper?	1	2	3	4	5	
	5. Did you have trouble opening a jar?	1	2	3	4	5	
K	**Vision**						
	1. Did you have trouble seeing the television well enough to enjoy a show?	1	2	3	4	5	

		Strongly Agree	Agree	Neutral	Disagree	Strongly disagree	Response/score
	2. Did you have trouble reaching things because of poor eyesight?	1	2	3	4	5	
	3. Did you have trouble seeing things off to one side?	1	2	3	4	5	
L	Work/Productivity						
	Did you have trouble doing daily work around the house?	1	2	3	4	5	
	Did you have trouble finishing jobs that you started?	1	2	3	4	5	
	Did you have trouble doing the work you used to do?	1	2	3	4	5	
	TOTAL SCORE						

Scoring: each item shall be scored with the following key

Total help - Couldn't do it at all - Strongly agree 1

A lot of help - A lot of trouble - Moderately agree 2

Some help - Some trouble - Neither agree nor disagree 3

A little help - A little trouble - Moderately disagree 4

No help needed - No trouble at all - Strongly disagree 5