RELATIONSHIP BETWEEN FAMILY FUNCTIONING AND HEALTH BELIEFS AMONG STROKE SURVIVORS IN UNIVERSITY OF BENIN TEACHING HOSPITAL, BENIN CITY

BY

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CERTIFICATION

This dissertation by OJUKONNAYE BLESSING OLUWATOYIN is accepted in present form as satisfying the dissertation requirement of the degree of Bachelor of Physiotherapy of the School of Basic Medical Sciences, College of Medical Sciences of the University of Benin.

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DEDICATION

I dedicate this work to God almighty, my parents, my siblings and friends who stood by me through this entire journey. I'm deeply grateful for the support, motivation and the great love and care.

ABSTRACT

Background: stroke remains a major health concern worldwide, often resulting in long term disability that demands continuous care and support. In Nigeria, family members usually serve as the primary caregivers of individual that have suffered from stroke and their family functioning may strongly affect their beliefs, attitude and adherence to rehabilitation.

Aim: The aim of this study was to explore the connection between family functioning and health beliefs of stroke survivors receiving treatment in the University of Benin Teaching hospital , Benin City.

Methods: A descriptive cross sectional design was carried used and 86 stroke survivors' was selected using convenience sampling. Data was gathered using a demographic form, an adapted short form family assessment device (FAD-GFS), and the health belief model stroke based questionnaire. Descriptive statistics was used for data summarization. Inferential statistics of Pearson's Chi Square was used to assess the connection between family functioning and health beliefs in patients with stroke.

Results: A large population of the respondent (87.2%) had a good family functioning and 68% demonstrated strong health beliefs to stroke recovery. Family functioning was shown to have a significant connection with health beliefs (x^2=11.187[a], p=0.004). marital status, religion, ethnicity and living arrangement significantly influenced family functioning while health beliefs was significantly influence by religion and stroke duration with p=<0.05.

Conclusion: Family functioning influence the health beliefs of stroke survivors in Benin City. Also families and stroke survivors who experienced supportive family system demonstrated a stronger and positive health belief about their stroke recovery. Therefore, incorporating family centered interventions and education into stroke rehabilitation programs is vital for improving the health outcomes of stroke survivors.

Key words: family functioning, health beliefs, stroke survivors.

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CHAPTER ONE

INTRODUCTION

1.1 Background of the study

“Stroke remains the second leading cause of death and the third leading cause of death and disability combined among all the non-communicable disease as expressed by disability adjusted life years lost”. (Global burden of disease, 2021). Until the international disease 11 (ICD- 11), stroke was considered as the disease of blood vessels (Diji & Zhicheng 2020). And the medical cost in the management of post stroke patients will cause a great economic pressure to their families and the society (Liu et al., 2022). In 2021, there was 11.9 million incidence and 93.8 prevalence of stroke. Unhealthy lifestyles, aging and lack of awareness greatly drive the rising burden of stroke. Stroke was once considered a disease of nations with high income but now recent studies show that nearly 80% of death caused by stroke occur in low and middle income countries (Luengo et al., 2020).

Several studies have examined the quality of life among stroke survivors in Africa and the result gotten from this studies indicated consistently that, stroke survivors have poorer quality of life (Bello et al., 2021). Upon discharge stroke survivors are taken care of by their families who ensures that the home environment is comfortable enough to enhance their recovery. (Whitiana et al., 2017). Family relationship is impacted by stroke and parent who experienced a stroke may not be able to assume their role in the home adequately (Harris & Prvu, 2018). Stroke also have a significant effect on marital life and personal relationship (Gawulayo et al., 2021).

Also, as a result of decreased family functioning, stroke survivors find it difficult to actively participate or engage in social activities (Whitiana et al., 2017).

In Africa, the impact of stroke is very devastating. The continent faces a rapid epidemiological change with non-communicable diseases such as stroke increasingly overtaking infectious diseases in mortality rates (Owolabi et al., 2023). Cultural beliefs, stigma, and misconceptions about stroke further complicate recovery, as many people continue to attribute stroke to spiritual causes or moral punishment (Hurst, 2016). In Nigeria, despite increased awareness of risk factors, significant barriers to recovery persist, including poverty, limited access to quality care, and deep-rooted traditional beliefs. Studies by SIREN Nigeria (2018) found that a large proportion of patients and caregivers continue to view stroke through spiritual lenses, which delays hospital presentation and undermines adherence to medical advice.

The family plays a central job for recovery from stroke in Nigeria, yet few families receive formal support or guidance. According to Owolabi et al. (2015), Nigeria faces a high burden of stroke, with increasing incidence in both urban and rural populations and this burden has been linked to epidemiologic and demographical transitions (Adeloye 2014). However, little is known about how family dynamics interact with stroke patients' own beliefs about their illness and recovery.

This study, therefore, aim to assess the relationship between how family function and the beliefs about their health among members with stroke in Benin City, Edo State. By exploring this relationship in a local context, the research aims to contribute to more culturally sensitive and family-focused stroke interventions that can improve outcomes, reduce recurrence, and support holistic rehabilitation across Nigeria and similar African settings.

1.2 Statement of the Problem

In spite of the growing burden of stroke in Nigeria and the critical role families play in post-stroke recovery, to the best of researchers' knowledge, there is a limited understanding of how family functioning influences the health beliefs of stroke patients. In many low-resource settings, family members often play as the major provider of care, supplying physical, emotional, and all the support needed during rehabilitation. However, the nature and quality of these family dynamics vary significantly and may directly impact the way stroke survivors perceive their illness, its causes, and the value of medical interventions (Adeloye et al., 2019).

Prior studies conducted in Nigeria has largely focused on the burden experienced by caregivers or on the cultural and religious perspectives on stroke. While these studies highlighted important issues, they failed to explore how the internal functioning of the family, such as communication, cohesiveness, and role distribution, influence the patient's health beliefs, especially with regards to participation in rehabilitation, treatment adherence and recurrence prevention. This knowledge gap is especially relevant in urban areas like Benin City, where access to healthcare coexists with deep-rooted traditional beliefs and a reliance on informal caregiving (Ming Lo et al., 2024).

Health professionals may overlook important psychosocial factors that influence recovery if they do not have a thorough understanding of the connection between family functioning and health beliefs. Patients may delay seeking treatment or end rehabilitation prematurely if their family environment supports negative beliefs, such as stroke is a spiritual punishment. On the other hand, strong, supportive family systems may reinforce positive beliefs and promote better health outcomes.

However, there is little empirical evidence from the South-South region of Nigeria to back up this assumptions as far as researchers knows.

Therefore, this work intend to assess the relationship between family functioning & health beliefs among stroke survivors in Benin City, Edo State. This will help to guide more family centered and holistic approaches that are in line with medical and cultural realities of stroke recovery in Nigeria.

1.3Research Questions

i. To what extent do stroke survivors attend UBTH demonstrate effective family functioning?
ii. What are the perception of stroke survivors regarding their susceptibility, severity of illness, benefits of treatment, barriers to recovery, cues to action and self efficacy in managing their condition?
iii. Is there an important connection between the way family function and the belief about their health in stoke survivors at the University of Benin Teaching Hospital?
iv. What socio-demographic characteristics influence family functioning among stroke survivors in this hospital setting?
v. What socio-demographic indications affect health beliefs among stroke survivors at the University of Benin teaching hospital?

1.4 Aim of the Study

The aim of this study is to assess the relationship between family functioning and health beliefs among stroke survivors in the university of Benin teaching hospital, Edo State, Nigeria.

1.4.1 Specific Objectives

i. To assess the level of family functioning among stroke survivors' at the university of Benin teaching hospital, Benin City.

ii. To examine the perception of stroke survivors regarding their susceptibility, severity of illness, benefits of treatment, barriers to recovery, cues to action and self-efficacy in managing their condition at the university of Benin teaching hospital.

iii. To know the relationship between family functioning and health beliefs among stroke survivors at the University of Benin teaching hospital.

iv. To identify socio-demographic characteristics that may influence family functioning among stroke survivors.

v. To identify socio-demographic characteristics that may influence health beliefs among stroke survivors.

1.5 Research Hypothesis

1.5.1 Main hypotheses

There is no significant relationship between family functioning and health beliefs among stroke survivors in Benin City, Edo State.

1.5.2 Sub hypothesis

i. There would be no significant relationship between family functioning and gender of the respondents.

ii. There would be no significant relationship between family functioning and marital status of the respondents.

iii. There would be no significant relationship between family functioning and religion of the respondents.

iv. There would be no significant relationship between family functioning and the ethnicity of the respondents.

v. There would be no significant relationship between family functioning and the educational level of the respondents.

vi. There would be no significant relationship between family functioning and stroke duration of the respondents.

vii. There would be no significant relationship between family functioning and the living arrangement/support system of the respondents.

viii. There would be no significant relationship between health beliefs and the gender of the respondents.

ix. There would be no significant relationship between health beliefs and marital status of the respondents.

x. There would be no significant relationship between health beliefs and the religion of the respondents.

xi. There would be no significant relationship between health beliefs and the ethnicity of the respondents.

xii. There would be no significant relationship between health beliefs and the educational level of the respondents

xiii. There would be no significant relationship between health beliefs and the stroke duration of the respondents.

xiv. There would be no significant relationship between health beliefs and the living arrangement/support system of the respondents.

1.6 Significance of the Study

Understanding how family dynamics impact the patient perception about their condition is very important in a country where members of the family are the major givers of health In individuals with stroke in order to improve the response and participation in treatment, rehabilitation and their overall quality of life.

For healthcare professionals, the result gotten from this study can provide valuable insight into how family functioning and health beliefs can influence stroke survivors. It can also help to enlighten healthcare professionals to integrate family based counselling and health education into stroke plans which will thereby promote a more holistic approach to treatment.

For policymakers and hospital administrators, this research can enlighten and help them in the development of support programs that encourage family involvement in care by identifying areas where dysfunctional family systems may hinder recovery. Resources can be better allocated toward family support services and stroke education at the community level.

For academics and researchers, the study will contributes to the literature on stroke recovery in Africa, especially with a focus on the Nigerian South-South region. The study goes beyond multidisciplinary approach that only gives clinical treatment but it also considers both social and psychosocial determinants of health.

Finally, for stroke survivors and their families, the research can help to improve the consciousness about the need of supportive family structure and positive health beliefs. Educating families with this knowledge, may help in the reducing delays that negative health beliefs cause and increase patients' participation in rehabilitation thereby improving long term outcomes.

1.7 Scope and Delimitation of the Study

The study is delimited to investigating the connection between the way and health beliefs among stroke survivors coming to the university of Benin teaching hospital for treatment. The geographical scope is restricted to Benin City, which will serves as a representative location within the South-South region of Nigeria, allowing for a culturally and contextually relevant analysis of the topic.

The study focused specifically on adult stroke patients collecting treatment or follow-up care at U.B.T.H. The work assessed the patient family functioning including areas like communication, role distribution in the home, emotional support by family members and problem solving. The study also examined how this setting relate to the patient health beliefs including their perception of stroke, prevention, risk factor, management, complication and beliefs about treatment and recovery.

1.8 Limitation of the study

i. The work made use of convenience sampling method which may introduce sampling bias. Consequently, the findings cannot be fully generalized to those that recovered from stroke especially those not attending tertiary health facilities.

ii. Data was collected using self-administered questionnaire while some were filled with assistance of family members which can be subjected to social desirability and recall bias. Some respondent may have provided responses they perceived as socially acceptable rather than their true experience and beliefs.

1.9 Definition of Terms

Stroke: "Stroke is a clinically defined syndrome of acute, focal neurological deficit attributed to vascular injury (infarction, hemorrhage) of the central nervous system". (Murphy et al., 2020)

Family functioning: "refers to the family's day to day patterns that are practiced within the family context to enable favorable conditions for family members to thrive and represents the family's capacity to ensure that the basic essential needs of its members are met" (Gawulayo et al., 2021)

Health beliefs: "are individual perceptions about health conditions, their causes, severity, susceptibility, and the benefits or barriers to seeking care" (Alyafei & Raul, 2024). In this research, health beliefs pertain to stroke patients' understanding of what caused their condition, its seriousness, and how they perceive treatment and recovery.

List of Abbreviation

1. FAD: family assessment device
2. FST; family system theory
3. HBM: Health Belief Model
4. SF-FAD: Short form- family assessment device

CHAPTER 2

LITERATURE REVIEW

2.1 Theoretical Framework

This study is guided by two theories; “The Health Belief Model (HBM)” and “the Family System Theory”.

Health Belief Model (HBM)

HBM was done by four social psychologist; “Rosenstock, Godfrey M, Hochbaum, Stepen Kegeles and Howard Leventhal 1950s” (Rosenstock et al., 1958). It is a psychological theory that explains and predict health related behaviors especially in terms of illness prevention and patient compliance. (Rosenstock et al., 1958). The model point at how people perceives their wellbeing threat and make up their mind to act upon the values people place on a particular goal and the hope that the action taken, will yield a positive result in achieving their goal. It is made up of six constructs that affect behavior

The model has been used in various context from chronic disease prevention to health education.

1. Perceived Susceptibility – The belief guage the likelihood of experiencing an illness or undergoing an uncomfortable outcome.

2. Perceived Severity – The belief is used to assess the seriousness of a sickness, a condition or an uncomfortable result e and what is going to happen if no step is carried out to reduce.

3. Perceived Benefits – The belief is used to understand how various steps are done to reduce the likelihood of the sickness suspected.

4. Perceived Barriers –The belief is used to know the hindrance in carrying out a necessary health actions that may prevent them from doing what is needed to be done.

5. self-efficacy: is personal belief about their ability to do a particular work or duty effectively.

6. Cues to Action – factors that activate readiness to change behavior (e.g., family influence, media, or illness experience.). (Alyafei& Raul, 2024).

Application to the Present Study

The health beliefs of stroke survivors, their knowledge about them being susceptible to a reoccurrence of stroke and how they can benefit from rehabilitation is crucial in shaping their adherence to treatment and lifestyle modifications. However, their beliefs do not develop due to isolation but it was gotten from interpersonal factors especially the family environment. The use of this model in the study will enhance psychological and social assessment of the dynamics that influence stroke survivors thereby, offering insights for interventions aimed at improving patient outcomes through family-based support systems.

Family System Theory (FST)

It was created as a scientific way for understanding the way human behave, it was originated from the research and observation done by psychiatrist Dr Bowen Murray between 1946 and 11959. The study was created following two pillars: first is the conceptualization of the family as a body subject to the principles of system theory

and the second one is the recognition of emotion a major human development within that familiar environment. When all this theories are combined together, the as a group of individuals that are connected by emotions where the behavior and emotion of one member affect the others Bowen said that to fully understand a family, the totality of its inrternal relationship must be examined instead of viewing only the members isolation because the theory defines gthe family as a living system driven by emotional connection .

The family system is an emotional unit and for better understanding of this system as an emotional unit, Bowen FST proposes eight concept that can be analyzed in the concept of their interaction. A family that is functioning well is characterized by role clarity, communication, emotional support and adaptability. For stroke survivors, these family dynamics can strongly influence their health decisions and belief system (Randy & Natalie, 2023).

2.2 Introduction

Stroke is a major global health concern, representing the second leading cause of death and the third leading cause of disability worldwide (Feigin et al., 2022). It affect individuals, families and also healthcare system especially in poor and slowly growing countries where access to adequate and specialized care is very low. Apart from the physical consequences of stroke, it also disrupt the patient emotional stability, cognitive functioning and their social participation (Johnson et al., 2020). According to Alyafei & Easton (2024) Health beliefs, play a significant role in influencing the way patient respond to medical care, advice and rehabilitation and this beliefs are gotten from individuals experiences , their cultural background and interactions with members of the family.

In many African contexts, including Nigeria, the family serve as the core unit of support both during illness and recovery. Positive family functioning is characterized by communication, emotional support and role sharing by family members, and all this factors has been linked to a better and strong health behavior, improved psychological and social outcomes in stroke survivors (Ming Lo et al., 2024). In Nigeria where due to limited access to healthcare or inadequate health care facilities, there is an increase in stroke, which makes it important for individuals to see the need to have adequate knowledge about how familial and cognitive factors impact stroke outcomes (Erameh et al., 2021). This is especially important in regions like Edo State, where formal stroke rehabilitation programs are still developing and family members often serve as the primary caregivers.

2.3 Concept of Stroke

The WHO characterizes stroke as a clinical syndrome noted with the rapid onset of focal or global cerebral deficits. To confirm a diagnosis these symptoms has have occurred for more than 24 hours or result in death with no obvious cause apart from it being from a vascular origin. . It is an objective proof of cell death in the brain, spinal cord or retina.

The two main types of stroke are ischemic and hemorrhagic. Ischemic stroke, which accounts for approximately 85% of all cases, occurs due to blockage of cerebral arteries, typically from a thrombus or embolus (Campbell et al., 2019). A third, less severe form is Transient Ischemic Attack (TIA), which last less than one hour , more often minutes and can be considered as a red flag of an impending ischemic stroke (Panuganti et al., 2023).

Stroke can cause harm to any part of the brain and this effect is shown on the part of the brain affected. Common impairments include hemiparesis or hemiplegia, aphasia,

dysphagia, cognitive deficits, and emotional disturbances such as depression or irritability (Unnithan et al., 2023). It rank as one of the major causes of prolonged disability nationwide and often results in a significant burden on families and caregivers.

Due to its complex and multifaceted nature, stroke has become a major focus of both medical and public health research. Its impact extends beyond clinical symptoms to include psychological, economic, and social consequences especially in low-resource settings where healthcare systems may lack the infrastructure to provide comprehensive post-stroke care (Owolabi et al., 2022).

2.3.1 Epidemiology

Stroke is ranked as the number two cause of death worldwide and it is associated with an increase in economic cost (Akinyemi et al., 2021). According to the Global Burden of Disease Study, "Stroke is the second leading cause of death worldwide accounting for approximately 12% of total deaths annually" (Feigin et al., 2022). Over 13 000,000 stroke cases and 5,500,000 deaths caused by stroke occur each year, growing more in Low Countries and countries generating moderate income.

Globally, stroke caused due to obstruction of blood flow account for about 65%, intracerebral events made up 28.8% of the total incidence and subarachnoid hemorrhages were less common, contributing only 5.8% with a greater part of ischemic stroke occurring in countries earning more. Among incident strokes 6.3 million or 52% occurred in males and 5.7 million or 47.4% occurred in females (Feigin et al., 2022). The lancet neurology commission on stroke forecast that globally, between 2020 and 2050, deaths from stroke will increase by 50% (Feigin et al., 2022). Global stroke statistics done in 2019 showed that there is a consistent

stroke incidence in low income and middle income countries (Kim et al., 2020). In 2023 Statistics done, out of six death stroke cause one out of them due to death caused by issue with the heart, lungs or cardiovascular related disease, with someone experiencing a stroke in every forty sec leading to a death caused by stroke every 3min and 14sec. annually over 795,000 Americans suffer from stroke (Tsao et al., 2023)

A century ago, stroke was uncommon in Africa but now Africa have the highest indices of stroke burden in the world (Akinyemi et al 2021). Africa can be said to have about 2 to 3 times increase rate of stroke occurrence with greater widespread of stroke than Western Europe and USA. Data that has been released since about 10years ago revealed that in places like Africa, the widespread of stroke is about 1,460 per 100, 00. Many Africans have a stroke within the fourth to sixth decades of life with severe implication for the individual their family and the society at large (Akinyemi et al 2021). The increasing rate of stroke in Africa can be said to be caused by a lot of factors that increase the likelihood of getting a stroke attributed to increase in modifiable risk factors like hypertension which is the major risk factor. The African Stroke Organization has emphasized the urgent need for enhanced stroke surveillance, prevention, and management strategies across the continent (Ezejimofor et al., 2017).

In Nigeria, stroke remains a major public health challenge. It accounts for 60–70% of neurological hospital admissions and is a leading cause of adult disability and death (Akinyemi et al 2021). A population-based study in south-east Nigeria reported a crude stroke prevalence of 1.14 per 1,000 persons, with ischemic stroke being more common than hemorrhagic stroke (Ibrahim et al., 2021). Poor control of hypertension, delayed hospital presentation, and inadequate rehabilitation services

are key contributors to poor stroke outcomes. In the South-South region of Nigeria, including Edo State, stroke prevalence is rising due to increasing urbanization and lifestyle changes limited access to rehabilitation services which complicate stroke outcomes (Adeloye et al., 2019).

Ignorace, the beliefs gotten from their customs, and inadequate access to stroke units hinder effective management and prevention. These statistics underline the immediate attention for health interventions and research focused on stroke risk factors, family support systems, and health beliefs, especially in regions like Edo State where stroke burden is high but resources are limited.

2.3.2 Anatomy and Pathophysiology

The brain, which governs all vital body functions, is highly dependent on a nonchanging and uninterrupted supply of oxygen and glucose through the cerebral vasculature. Any disturbance in this blood flow can lead to cellular dysfunction and irreversible neuronal damage. The brain receives its blood supply primarily from two arterial systems: the anterior circulation, which includes the internal carotid arteries and their branches (anterior and middle cerebral arteries), and the posterior circulation, supplied by the vertebral and basilar arteries (Standring, 2021).

When a stroke occurs, the underlying pathology typically involves either an ischemic process (occurs due to an obstruction in the flow of blood) or a hemorrhagic event (occur due to a burst of a blood vessel). In ischemic stroke, the process of thrombus formation prevent blood flow to some part of the brain with atherosclerosis in large vessels being the most common risk factor. Embolismic event occur when a mass of blood originate from a different region in the body most times from the heart valves or chambers and lacunar infarct which are commonly seen in the portion of the brain located in the region below the cortex supplied by

small perforating arteries usually without collaterals. The underlying pathology of this small vessel is arteriosclerosis caused by hypertension, aging, smoking diabetes mellitus and other convectional vascular risk factors (Kuriakose & xiao, 2020).

In hemorrhagic stroke the primary injury is due to compression of the brain tissue by the hematoma and an increase in intracranial pressure while secondary injury is constituted by inflammation, disruption of the blood brain barrier, edema, and population of free radicals (Unnithan et al., 2023). It as a result of uncontrolled hypertension or aneurysm rupture, bleeding into the brain parenchyma leads to mechanical compression, increased intracranial pressure, and toxicity from blood breakdown products. This can rapidly worsen neurological status and carries a higher early mortality rate than ischemic stroke. The extent and location of brain damage determine the neurological symptoms observed. For example, occlusion of the middle cerebral artery may lead to hemiparesis in the contralateral side of the body, aphasia, or loss of sensory function, while damage in the brainstem can impair vital functions like respiration and consciousness (Liebeskind et al., 2022).

2.3.3 Etiology / Risk Factors

Majority of stroke burden across all countries in the world can be linked to elevated blood pressure which is the single most important risk factor for stroke and unhealthy lifestyles such as smoking decreased physical activity, obesity, unhealthy diet, excess consumption of sugar and salt, alcohol intake and inadequate fruit and vegetable consumption (GBD, 2019). The major non modifiable risk factor for stroke according to Akinyemi et al, (2021) is age.

Observation from the global INTERSTROKE study identified ten most common cause for stroke which include hypertension ,dyslipidemia, diabetes mellitus, central obesity, cardiac causes , current smoking, excessive alcohol intake, consumption of

unhealthy food, lack of exercise and psychosocial factors. Hypertension was the major mutable adverse effect in this study (O'Donnell et al.,2016) while SIREN study found 11 potential risk factors which include hypertension, dyslipidemia , central obesity, consistent meat consumption, diabetes mellitus, decreased intake of green leafy vegetables, stress, adding salt at the table, cardiac diseases, lack of physical activity and current cigarette smoking (Owolabi et al., 2022). The two studies showed that hypertension was the major modifiable risk factor for stroke in African countries.

Ischemic stroke, which accounts for the majority of cases, is primarily caused by athero-thrombotic occlusion, cardio-embolism, or small vessel disease. Cardio-embolic strokes arise when emboli from the heart, most commonly due to atrial fibrillation or valvular disease, travel to cerebral vessels, causing obstruction. Small vessel occlusion, often associated with chronic hypertension and diabetes, can lead to lacunar infarcts in deep brain structures (Aderinto et al., 2025).

In Africa, hypertension remains the major modifiable risk factor for stroke but others include diabeties mellitus, dyslipidemia, obesity, stress, smoking and intake of alcohol not physically active and unhealthy diet (Akinyemi et al 2021). Meanwhile Hemorrhagic stroke occur due to bleeding from the cerebral blood vessels. The leading causes include chronic hypertension, which weakens vessel walls, cerebral aneurysms, arteriovenous malformations, and coagulopathies, either spontaneous or iatrogenic (Unnithan et al., 2023). Uncontrolled use of anticoagulants and illicit drug abuse, particularly cocaine and amphetamines, can also precipitate hemorrhagic events (Owolabi et al., 2021).

A lot of non-mutable adverse effect contribute to stroke risk. These include age, with risk increasing significantly after the age of 55; sex, with men generally at higher

risk, although women have higher mortality; genetics and family history of stroke (Feigin et al., 2021). In contrast, modifiable factors such as hypertension, diabetes, obesity, sedentary lifestyle, smoking, excessive alcohol intake, and poor dietary habits are well-established contributors that can be targeted for prevention.

In sub-Saharan Africa, including Nigeria, the rising prevalence of stroke has been linked to urbanization, limited awareness of risk factors, inadequate access to healthcare, and poor management of chronic conditions like hypertension (Adeloye et al., 2019). Having a good knowledge about this etiological factors is important for developing effective prevention strategies and tailoring public health interventions to local contexts.

2.3.4 Types of Stroke

Stroke is broadly classified into two major types: ischemic stroke and hemorrhagic stroke, with a third, transient type known as transient ischemic attack (TIA). Each type differs in etiology, pathophysiology, clinical features, and management approach. Historically Ischemic stroke is more common than hemorrhagic stroke (Boursin et al., 2018).

1. Ischemic Stroke: is the most common type of stroke accounting for about 80% of all cases (Boursin et al., 2018). It is caused by deficient blood supply to the brain (Kuriakose & Xiao, 2020) which accounts for approximately 85–90% of all strokes globally. It occurs due to obstruction or reduction in cerebral blood flow, typically from a thrombus or embolus. Most ischemic stroke are thrombo-embolitic in nature with the common root of embolism being large arteries atherosclerosis and cardiac disease especially atrial fibrillation. (Campbell et al., 2019) Ischemic strokes are further classified into subtypes such as:

I. Thrombotic stroke: caused by a blood clot forming in a cerebral artery.

II. Embolic stroke – caused by a clot or debris from another part of the body (commonly the heart) traveling to the brain.

III. Lacunar stroke– caused by occlusion of small penetrating arteries supplying deep brain structures (Campbell et al., 2019).

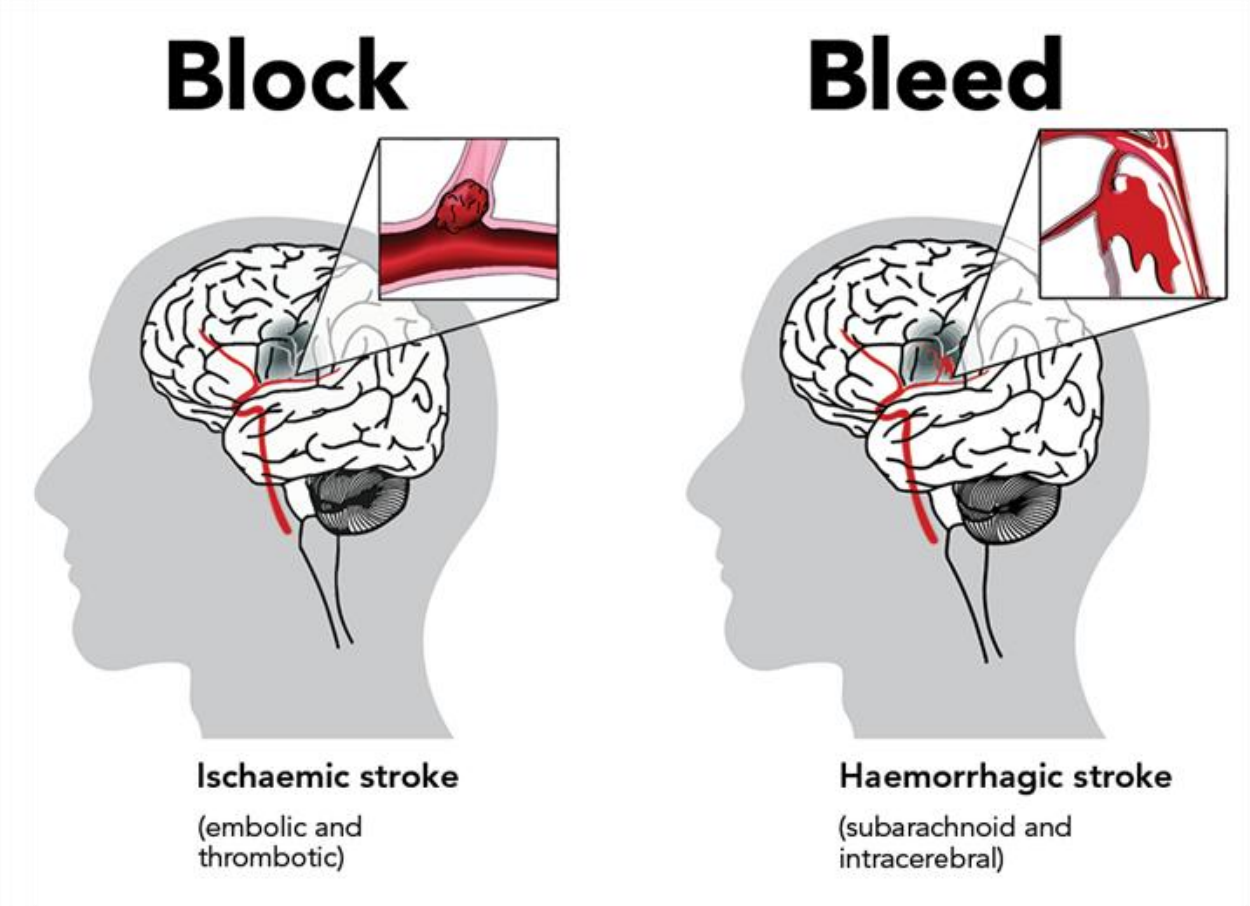
2. Hemorrhagic Stroke; is caused by leaking or bleeding blood vessels (Kuriakose & Xiao, 2020) which constitute about 10–15% of all strokes and are caused by rupture of blood vessels in the brain, leading to bleeding into the brain tissue or surrounding spaces. It can be classified into:

I. Intracerebral hemorrhage – occurs due to loss of blood from a ruptured blood vessel into the brain tissue , often due to chronic hypertension or trauma.

II. Subarachnoid hemorrhage – bleeding into the subarachnoid space, commonly occur due to rupturing of an aneurysm (Gore et al., 2024).

3. Transient Ischemic Attack (TIA): A TIA, also referred to as a "mini-stroke," is characterized by a temporary period of neurological impairment caused by focal ischemia in the brain, retina or spinal cord occurring majorly without any permanent tissue damage or acute infarction (Panuganti et al 2023) . The symptoms may last for few minutes but less than one hour and they may resolve even before the patient meet the clinician. Initial assessment is aimed at excluding conditions that may act like TIA which include hypoglycemia, seizures, tumor or mass lesion, migraine etc. (Panuganti et al 2023)

Proper classification of stroke type is essential as it guides acute intervention strategies such as thrombolysis in ischemic stroke or blood pressure control and surgical interventions in hemorrhagic stroke.



Stroke foundation.org.au 2022

Figure 1: Diagram of ischemic stroke and hemorrhagic stroke

2.3.5 Clinical Presentation

Clinical presentation of stroke varies depending on the type, location, and extent of brain injury, but it typically presents with an abrupt attack leading to damage to the neurological function. Recognizing these signs early is crucial for timely intervention and improved outcomes (Heran et al., 2022).

Common Symptoms

The acronym fast can be used to keep in mind the signs of stroke:

F-Face drooping,

A-Arm weakness,

S-Speech difficulties,

T-Time to call emergency services.

Ischemic Stroke

In ischemic stroke, patients commonly present with symptoms depending on the brain part that is affected:

i. Hemiparesis or hemiplegia
ii. Aphasia (language impairment), especially if the dominant hemisphere is affected.
iii. Dysarthria (slurred speech).
iv. Visual disturbances such as homonymous hemianopia.
v. Sensory deficits or numbness.
vi. Ataxia (impaired coordination). (Campbell et al., 2019)

Hemorrhagic Stroke

Hemorrhagic strokes often present more dramatically and may include:

i. Severe sudden headache (commonly described as "the worst headache ever").
ii. Vomiting.
iii. Loss of consciousness.
iv. Seizures.

2.3.6 Complications

Stroke complications can result from neurological, psychiatric, or other systemic manifestations that may occur in the acute, sub-acute, or chronic stages (Akinyemi et al., 2021). the complications include delirium (sarfo et al., 2020), post stroke aspiration pneumonia (Diendere et al., 2021) , bacteria and urinary infection (Donkor & Darkwah, 2017), aphasia and deglutination disorders (Millar et al., 2014), anxiety (Ojagbemi et al., 2020), sexual dysfunction (Oyewole et al., 2017), central post stroke pain syndrome(Ntsiea, 2020), depressiveness (Ojagbemi et al.,2020), and cognitive impairment that often lead to dementia (Sarfo et al., 2020).. According to Donkor & Darkwah (2017), Stroke is a major contributor to long-term disability globally, and survivors often face numerous neurological, systemic, and physical complications, which may reduce their quality of life.

2.3.7 Preventive Measures

Primary prevention: involves detecting early and controlling risk factors such as hypertension, obesity, diabetes, dyslipidemia and obesity to prevent the occurrence of first stroke incidence. Factors that cannot be altered such as age should be treated as warning signs that promote a deeper evaluation of being prone to stroke. Health systems can also help in the prevention of stroke by providing good

health data about their population, having universal health coverage and trained staffs, providing affordable medicines and treatment for modifiable risk factors and subsidizing the price for healthy foods like fruits and vegetables (GBD 2021).

Secondary stroke prevention: because of the risk of recurrence is high among those who have suffered a stroke, secondary prevention is a major focus. To address this, healthcare systems must equip every patients with the information and the therapeutic interventions required to prevent another incidence. Regular monitoring, medication and behavioral support should be done. Assessment of stroke risk factors should commence immediately after the initial stroke or TIA. Everyone should have access to screening and appropriate management of underlying diseases such as hypertension, diabetes, hyperlipidemia, atrial fibrillation to reduce the occurrence of recurrent stroke. (GBD 2021).

Controlling hypertension by constant monitoring, medication use and life style changes can help reduce stroke risk by up to 50% (Wang et al., 2020).

Use of Medication: medications like antihypertensive drugs, antiplatelet drugs (aspirin, heparin, and clopidogrel) and statins can be used regularly to prevent stroke occurrence especially in high risk individual. In patient with ischemic heart disease or prior stroke, combination therapy can be indicated for use (Katsanos et al., 2021).

Public Health Interventions: On a population level, policies targeting salt reduction in processed foods, public smoking bans, and promotion of healthy lifestyles have been linked to reduced stroke incidence. Community-based stroke education and screening programs for hypertension and diabetes can also promote early detection and intervention (Owolabi et al., 2023).

2.3.8 Management of Stroke

Stroke management requires multidisciplinary approach which involves emergency care, treatment and rehabilitation. Long term support may also be needed. Appropriate intervention that is timely is crucial in minimizing brain damage that result from stroke, improving its outcomes and decreasing the complications. Approaches to improve stroke care in Africa include regular monitoring of risk factors and implementation of prevention strategies in health services, improving acute care and rehabilitation services and encouraging sharing of task (Akinyemi et al., 2021).

Acute Management

Proper management of acute stroke is needed in order to return blood flow in ischemic stroke and control bleeding in hemorrhagic stroke. Rapid neuroimaging (CT or MRI) is essential for stroke subtype differentiation (Powers et al., 2019). Treat ischemic stroke effectively, clinicians are recommended to administer intravenous alteplase within 4 to 5 hours of the first clinical signs. Mechanical thrombectomy is also beneficial for large vessel occlusion within a 6–24 hour window, depending on imaging findings (Saver et al., 2021). For hemorrhagic stroke, management includes blood pressure control, surgical intervention (if indicated), and5intracranial pressure monitoring (Liebeskind et al., 2025).

Supportive Care

Supportive measures are crucial and include: Airway management and oxygen therapy, Fluid and electrolyte balance, Blood glucose control, DVT prophylaxis, and Nutritional support, especially in patients with dysphagia (Tadi & Lui 2023). Early

mobilization and prevention of complications like pressure ulcers, infections, and aspiration pneumonia are also critical at the begining.

Rehabilitation

Post-stroke rehabilitation is essential for functional recovery and includes physiotherapy, occupational therapy, speech therapy, and psychological support. Rehabilitation should begin early ideally within 24–48 hours post-stroke, for best outcomes (Langhorne et al., 2020). Rehabilitation focuses on motor function recovery, communication skills, self-care, and cognitive retraining.

Psychosocial Support and Family Involvement

Effective stroke management extends beyond physical recovery. Patients often experience depression, anxiety, and social isolation. Family involvement, counselling, and community support programs improve emotional wellbeing and treatment adherence (Towfighi et al., 2022). Cultural beliefs and family dynamics can significantly influence recovery and must be addressed as part of holistic care, especially in settings like Nigeria.

2.4 Family Functioning

Family functioning refers to the ability of a family unit to meet the emotional, physical, social, and psychological needs of its members. It encompasses communication patterns, problem-solving abilities, emotional involvement, behavior control, and roles within the family system (Epstein et al., 2021). In the context of illness, particularly chronic conditions like stroke, family functioning becomes a critical factor influencing recovery, rehabilitation adherence, and psychological wellbeing.

Role in Health and Illness

Healthy family functioning provides emotional support, reinforces positive behaviors, and assists in navigating medical care. Conversely, dysfunctional family dynamics can hinder treatment adherence, contribute to stress, and negatively impact health outcomes (Hong ni et al., 2022). For stroke survivors, who often experience physical and cognitive impairments, a supportive and well-functioning family environment can significantly aid in activities of daily living, medication adherence, and participation in rehabilitation (Wang et al, 2022).

Family Functioning and Stroke

After a stroke, the burden of care often shifts to family members. Families are required to adjust roles, responsibilities, and routines to accommodate the survivor's limitations. Poor family functioning, characterized by conflict, lack of communication, or absence of caregiving support can result in depression, non-compliance with therapy, and higher rates of hospital readmission (Kwon et al., 2023). On the other hand, cohesive and adaptable families tend to promote better recovery trajectories and emotional resilience among stroke survivors (Wang et al, 2021).

Cultural Considerations

In African settings, particularly in Nigeria, extended family systems are common, and caregiving is often a shared responsibility. Cultural expectations and traditional gender roles may influence how caregiving tasks are distributed and how emotional support is provided (Tran et al., 2023). However, stigma, poverty, and limited access to caregiver support services can strain even well-intentioned families, making the

assessment of family functioning essential in designing effective post-stroke interventions.

Relevance to the Study

Understanding family functioning offers insights into the psychosocial environment of stroke survivors. It helps identify areas where interventions can strengthen support systems and improve health outcomes. This study, therefore, aim to assess how levels of family functioning relate to patients' health beliefs. A critical area for effective stroke recovery planning, particularly in resource-limited settings like Edo State, Nigeria.

2.5 Relationship between Family Functioning and Health Beliefs

The intersection between family functioning and health beliefs plays a critical role in determining how stroke survivors understand their condition, adhere to treatment, and engage in health-promoting behaviors. According to the research done by Psihogos et al., (2018), result showed that low family conflict, increase in family cohesion, greater flexibility in the family, more positive communication and greater family problem solving were associated with better medical adherence. The family system serves as a source of physical support as a foundation upon which patients build their understanding of illness, recovery expectations, and perceived ability to manage their health .(Psihogos et al., 2018)

A study was carried out in Beijing Luhe hospital and 240 stroke patient were assessed using the FAD and the champion health belief model scale. The family functioning score was average while that of health beliefs was moderate. The result gotten showed that better family functioning has a good connection with lower total health belief score with $p< 0.05$.

Also in rural Thailand a quasi-experimental study was conducted with the sample size as 60. It was an eight week program, based on health belief model and family support. Participant showed significant improvement with medication adherence, dietary habit, physical activity and recognizing warning signs.

Stroke recovery often involves long-term lifestyle modifications, such as medication adherence, dietary changes, physical rehabilitation, and stress management. The success of these interventions is influenced by the patient's health beliefs, particularly perceptions of severity, susceptibility, and treatment efficacy (Champion & Skinner, 2022). A well-functioning family provides emotional encouragement, models health-seeking behaviors, and reinforces positive actions, all of which can strengthen patients' beliefs in their capacity to recover and prevent recurrence (Cha-chi Li et al., 2024).

According to literature, patients are far more likely to take their diagnosis seriously and accept the use of rehabilitation when they are supported by families with high levels of cohesion and problem solving capability. These beliefs, in turn, enhance their motivation to adhere to rehabilitation protocols and engage in secondary prevention efforts. Conversely, dysfunctional families, marked by conflict, poor communication, or emotional neglect, can undermine a patient's health beliefs, fostering denial, helplessness, or fatalism (Ni hong et al., 2022).

In African contexts, particularly in Nigeria, the role of the family extends beyond caregiving into decision-making, health financing, and psychosocial support. When family functioning is compromised, stroke survivors may lack the necessary guidance or encouragement to follow through with rehabilitation, especially when health literacy is low. Traditional beliefs about illness causation, such as spiritual or

supernatural explanations, may further shape health beliefs, sometimes negatively if not balanced by family education and support (Okafor et al., 2022).

2.6 Empirical Review

AUTOR/ YEAR/COUNTRY	TITLE	SAMP LE SIZS	AIM OF THE STUDY	STUDY TYPE	OUCOME MEASURE	RESULT
Pshogios et al/ 2018/U.S.A, Canada, U.K, Australia 2.6 empirical review	Family functioning and medical adherence across children and adolescents with chronic health condition	6, 427 particip ant across 62 studies done	To carry out a systematic meta analysis reviewing existing data on how family functioning impacts medical adherence within paediatric populations	Meta-analysis	Family assessment device, family environment scale, McMaster family assessment, family APGAR,	Analysis showed a strong positive correlation, indicating that when family dynamics are healthy, patients are more likely to adhere to their medical treatment
Amaibi& Okeafor/2023/port Harcourt	Family function and depression among stroke survivors in the university of port Harcourt teaching hospital	381 stroke survivor s	To evaluate the link between family dynamics and the incidence of depression in people that survived stroke receiving care at the university of port Harcourt teaching hospital	A hospital based cross sectional study	The Beck's depression inventory-ii and family APGAR questionnaire	The findings established a clear statistical link connecting the quality of family functioning to the likelihood of developing depression following stroke
Chen et al/2015/China	Investigation of health beliefs and analysis of influencing factors in hospitalized patient with stroke		To investigate the health beliefs and analyze factors influencing hospitalized stroke patient	A cross sectional study	Champions health belief model scale and family assessment scale	Family functioning was significantly associated with health beliefs

Ling et al/2023/china	Correlation between family functioning and health beliefs in patient with stroke in Beijing china	253 patients with stroke in Beijing hospital	To analyse the correlation connecting family functioning with the personal health beliefs of stroke patients residing in Beijing	A cross sectional study	Family assessment device and the champion health belief model	Data analysis indicated an inverse relationship where family functioning scores showed a negative correlation with the overall health belief scores
Liu et al.,/2019	Survey on the current status of health beliefs and health behaviors among elderly patient	114 elderly patient.	To assess the prevailing health behaviors and beleifs among elderly people who survived stroke and determine how these two variables interacts	Cross sectional survey	Champion health belief model scale (CHBMS)and health promoting lifestyle scale	The total score of CHBMS was 103.7+or- 12.81. the dimension from high to low where perceived barriers to health behavior, motivation
Sarabi et al/ 2024/Iran	Investigating influential factors in preventing stroke based on the health belief model in patients with type 2 diabetes: a cross sectional study	140 patiemts with type 2 diabetes	To identify critical preventive factors for stroke among type 2 diabetes patients utilizing the health belief model as a guide	cross sectional study	The health belief model questionnaire	There was a strong positive connection between the total score of health belief and educational level, patients perception about stroke prevention is low

2.7 Summary

The reviewed literature highlights a growing recognition on how family functioning affect the formation and reinforcement of health beliefs, particularly among patients recovering from chronic conditions such as stroke. Global studies have consistently shown that supportive family environments promote healthier beliefs, such as increased perception of illness severity, greater confidence in treatment efficacy, and reduced perceived barriers to recovery (Martire & Schulz, 2021).

Nigerian studies reinforce these conclusions. Evidence shows that stroke patients in Nigeria are highly influenced by their family's dynamics, with family functioning impacting their motivation, emotional stability, and beliefs about the cause, treatment, and prevention of stroke (Okonkwo et al., 2022). Cultural beliefs, spiritual explanations, and caregiving strain further complicate the patient's belief systems when not mediated by a cohesive and informed family structure.

Despite these insights, there remains a critical gap in research specific to Edo State and the broader South-South region of Nigeria, where sociocultural norms and healthcare access may be different from other parts of the country. Few studies have directly examined how structured family functioning relates to the development of health beliefs among stroke patients in this region.

This gap underpins the relevance of the present study, which aims to check the link connecting family functioning and health beliefs in stroke patients in Benin City, Edo State. By focusing on this under-researched population, the study seeks to provide context-specific evidence that can inform the design of family-centered rehabilitation interventions and improve stroke outcomes in Nigeria

CHAPTER 3

MATERIALS AND METHODS

3.1 Materials

3.1.1Paticipant

The population study will include 110 stroke survivors both male and female attending the physiotherapy department at the University of Benin Teaching Hospital (UBTH Medical Record 2025).

3.1.2 Selection Criteria

3.1.2.1 Inclusion Criteria

i. Only adults aged 18 years and older will be considered, to ensure legal consent and psychological maturity for understanding the research content.

ii. Only patients who are stable, mentally aware and capable of understanding and responding to the study questionnaire will be included.

iii. Patients must have been living with stroke for at least six months to ensure that they have had sufficient time to develop personal health beliefs and experience family interactions during recovery.

iv. Only those who can communicate (with or without assistance) was included to ensure they can respond to the research instruments appropriately.

v. Participation is strictly voluntary.

3.1.2.2 Exclusion Criteria

i. Those with major speech or language disorders, such as global aphasia or severe dysarthria that significantly impair their ability to communicate verbally or in writing was not included.

ii. Individuals with other neurological conditions, serious psychiatric illnesses (schizophrenia, bipolar disorder) that may influence their health beliefs or interfere with family dynamics was excluded for ethical and safety reasons.

iii. Any subject who decline voluntary involvement or lack the mental capacity to grant legal informed consent was excluded from participation.

3.1.3 List Of instruments

The instruments that was used for this study are as follows:

1. Structured Questionnaire (Researcher-Designed).
2. "The short form family assessment device- general functioning subscale".
3. The short form -Health belief model based stroke questionnaire.

3.1.4 Description of Instrument

1. Structured questionnaire: was used to collect socio-demographic data such as: Age, Sex, Marital status, and Religion, Tribe, educational level Duration since diagnosis, Living arrangement, and support system. This section provided context for analyzing the relationship between family functioning and health beliefs.

Validity and Reliability

The researcher-designed questionnaire was subjected to expert review by professionals in the fields of physiotherapy, public health, and clinical psychology. This review ensured that each item was clear, culturally appropriate, and relevant to the study objectives. Suggestions for improvement was incorporated to enhance clarity and contextual relevance.

2. The short form family assessment device- general functioning subscale; The general functioning subscale is a short version of the FAD with all the domains but reduced items for rating (Muneer et al., 2020) it consist of subscales assessing the six dimensions of the overall family functioning.

Problem solving: this dimension evaluates the families ability to resolve issues effectively while maintain a stable environment

Communication: this measures how clearly and effectively information is exchanged between family members.

Roles: this aspect examines whether the family has established reliable patterns of behavior and if members fulfill their task responsibly

Affective responsiveness: this focus on the degree to which family members show genuine interest and invent in each other's activities and wellbeing.

Behavior control: this analyses the standards and rules the family uses to express and maintain discipline among it members.

The instrument comprises of 12 specific items. Respondents rate each statement on a 4-pont likert scale to indicate how well it describes their family situation ranging from strongly agree to strongly disagree. The tool is validated for use by any family member from age 12 and above (Epstein et al.,1983).

Family functioning was assessed using “short form family assessment device (SF-FAD)”. Which was simplified by Wang using the family assessment device (Wang, 2020).

Reliability of the family assessment device

With the help of experts, the questionnaire was translated and was approved by a Malay language specialist. The result of the study found out that the reliability of the FAD scale was 0.971 exceeding the alpha value of 0.6 (Walsh, 2003) further more according to White (2003) , reliability less than 0.60 is low and unacceptable while a reliability of 0.60 to 0.80 is considered acceptable and the reliability above 0.80 is considered good. According to Epstein et al, (1983) the reliability of all the 7 scale (general functionality and the six dimensions) where all above 0.80 which is considered to be good and that this instrument is very reliable also the study carried out by Wan et al(2022) reported that the scale is highly reliable in excess of the dimension a= 0.7.

Validity of the short form general functioning scale

The short form family assessment device (SF-FAD) based on the general functioning subscale of the McMaster FAD has shown strong construct and has been validated as a single index measure of the family functioning (Boterhoven et al 2014). Comparism was made and it was found that the short form general functioning scale correlates well with the full scale and captures the same construct. Negatively worded items in the scale were reversed scored and the scale has been used widely with cross cultural validations. (Boterhoven et al 2014).

Health Belief Model-Based Stroke Questionnaire

A validated questionnaire adapted from the "Health Belief Model" (HBM) was used to assess participants' beliefs with 20 questions related to stroke recommended behaviors to stroke.

Response for all construct items were measured with options ranging from strongly agree to strongly disagree. The scoring system assigned 1 to 4 to each of them. Higher scores means higher perceived susceptibility, severity, benefit, barriers, self-efficacy and cues to action. The instrument was adapted from previous study on health beliefs (Mitra et al., 2020) with comprehensive review of existing literature the health belief of stroke survivors.

Validity

In order to find out the face validity, the instrument was subjected to a preliminary review using eight copies of the questionnaire. The process evaluated the tool in terms of clarity, lexical complexity and the participants ability to interpret the items correctly. To know the content validity, the questionnaire was given to 3 experts (2 experts in physiotherapy, and one expert in public health) one of the expert was requested to asses if the questions covers all relevant aspect of stroke. Also to assess each domains of the health belief model and to ensure items reflect real life experiences and challenges of stroke survivors. Another expert was requested to evaluate that the questionnaire design is robust enough to test the connecrion between the variables. The group of expert reached a consensus on the tool suitability. Similar items were merged or removed and the questions were brief to prevent undue fatigue on stroke patient and concise.

Reliability

To establish the reliability of this instrument, the Cronbach's alpha coefficient was calculated individually for each of the six subscales. The reliability of a questionnaire is determined by the internal consistency or Cronbach's alpha calculation. (Mitra et al., 2020). The Cronbach's alpha coefficient above 0.7 means that the questionnaire has good internal consistency and acceptable reliability. (Nunnally & Bernstein 1994). The split- half method of reliability was used in obtaining the data that was subjected to spearman and a coefficient of 0.79 was obtained. The questionnaire was completed by 8 participant to test the internal consistency of the method. The questionnaire was analyzed using the SPSS 27 and all questions that yield an ICC score greater than 0.7 was retained as statistically acceptable.

3.2 Methods

3.2.1 Research Design

A cross sectional design was utilized to conduct this research.

3.2.2 Sampling Technique

Stroke survivors in the university of Benin teaching hospital was selected via convenience sampling.

Sample Size

Sample size was calculated using Taro Yamane's formula considering a confidence level of 95% and margin error of 5%

Taro Yammer's formula is $n=N/ (1+N (e)^2)$ (Yamane, 1997)

Where; n= sample size

N= population size =110

e= level of precision or sampling error which is ± 5%

Therefore $n=110/ (1+110(0.05)^2) = 86$.

3.2.3 Procedure for Data Collection

The participants who were recruited for this study met all the inclusion criteria. Their informed consent was taken, and the objectives of the investigation was clarified to each subject. The demographic profile of each participant was documented covering all the variables required. .the survey instrument was administered directly to the patients who completed it with the assistance of their family members. A total of 86 questionnaires was distributed and 86 were recovered immediately after complete filling of the questionnaire.

3.2.4 Ethical Consideration

Prior to initiating the fieldwork, formal ethical clearance was secured from the research ethics committee of the University of Benin Teaching Hospital. Patients were told the importance of the study; participation was voluntary, and they were asked to sign a written informed consent before the research begins.

3.2.5 Data Analysis

All qualitative processing was conducted using IBM SPSS version 27.0 Descriptive statistics of frequency, mean, standard deviation, and percentages was used to summarize socio-demographic variables of the respondents. Inferential statistics of

Pearson's Chi Square was used to find out the association between family functioning and health beliefs in patients with stroke, with an alpha level set at <0.05

CHAPTER 4

RESULT

4.1.1 Introduction

The primary objective of this research is to evaluate the correlation between family functioning and the personal health beliefs of individuals recovering from stroke and receiving care at the university of Benin teaching hospital. The study involved a sample size of 86 respondents. For statistical processing IBM SPSS statistics version 27 was used descriptive statistical method were applied to summarize the participants demographic profile and also their family functioning and health beliefs scores. The chi square test was utilized to determine the connection between these variables, with statistical significance established at a probability level p=0.05

4.1.2 Descriptive Statistics of Respondents Socio Demographics

The final sample consisted of 86 respondents. 43(50%) were females and 43(50%) were males. In terms of relationship status 64.6% of the respondents were married. 15(17.4%) of the respondents are widowed, while 10(11.6) are single and 6(7.0) are divorced. Greater part of the respondents were Christians accounting for 91.9 %(79) and this is expected because the study was carried out in a Christian dominated environment. 5(5.8%) were traditional worshippers while 2(2.3%) are Muslim. Also, Majority of the respondents were Bini by tribe with a population of 41(47.7%), 10(11.6) were Yoruba, 9(10.5) were Esan, 8(9.3) were Igbo, 7(8.1) were Urogbo, 5(5.8) were Isako, 4(4.7) were Delta Igbo, 1(1.2) were Ika and 1(1.2) were Fulani. Regarding the level of education, Majority of the respondents 37(43.0%) had a university or high institute education, while 19(22.1) had no formal education,

16(18.6) were primary and 14(16.3) were secondary. Majority of the respondents stroke duration was more than a year accounting for 55.8 %(48) while 44.2% (38) was between 6 to 12 months. A greater part of the respondents live with their spouse 49(57.0%) while 19(22.1) live with their children, 13 (15.1) live with other relative and 5(5.8) live alone.

Table 1: Descriptive Statistics of the Demographic Parameters of the Respondents

Variable	Frequency	Percentage (%)	mean	s.d
Age				
Mimimum	25		58.70	15.478
maximum	90			
Gender				
Male	50	50		
Female	50	50		
Marital status				
Single	10	11.6		
Married	55	64.6		
Widowed	15	17.4		
Divorced	6	7.0		
Religion				
Christianity	79	91.9		
Islam	2	2.3		
Traditional	5	5.8		
Tribe				

Benin	41	47.7
Esan	9	10.5
Yoruba	10	11.6
Urhobo	7	8.1
Igbo	8	9.3
Isako	5	5.8
Delta Igbo	4	4.7
Ika	1	1.2
Fulani	1	1.2
Educational status		
No formal education	19	22.1
Primary	16	18.6
Secondary	14	16.3
Tertiary	37	43.0
Stroke duration		
6 to 12 months	38	44.2
>1year	48	55.8
Living arrangement		
Alone	5	5.8
Spouse	49	57.0
Children	19	22.1
Other relatives	13	15.1

4.1.3 Descriptive Statistics of the Short Form Family Assessment Device and the Short Form Health Belief Model Stroke Based Questionnaire

Majority of the respondents 75(87.2%) had good family functioning while 10(11.6%) Had moderate and 1(1.2%) had bad family functioning. Also, most of the

respondents 60(69.8) had strong health beliefs while 26(30.2%) had weak health belief. This is reflected in table 2 below

Table 2: Assessment of the Short Form Family Assessment Device and the Short Form Health Belief Model Stroke Based Questionnaire

Variables	Categories	Frequency	Percentage (%)
Short form family assessment device	Bad	1	1.2
	Moderate	10	11.6
	Good	75	87.2
Short form health belief stroke based questionnaire	Weak	26	30.2
	Strong	60	69.8

Figure 2: short form family assessment device for stroke survivors

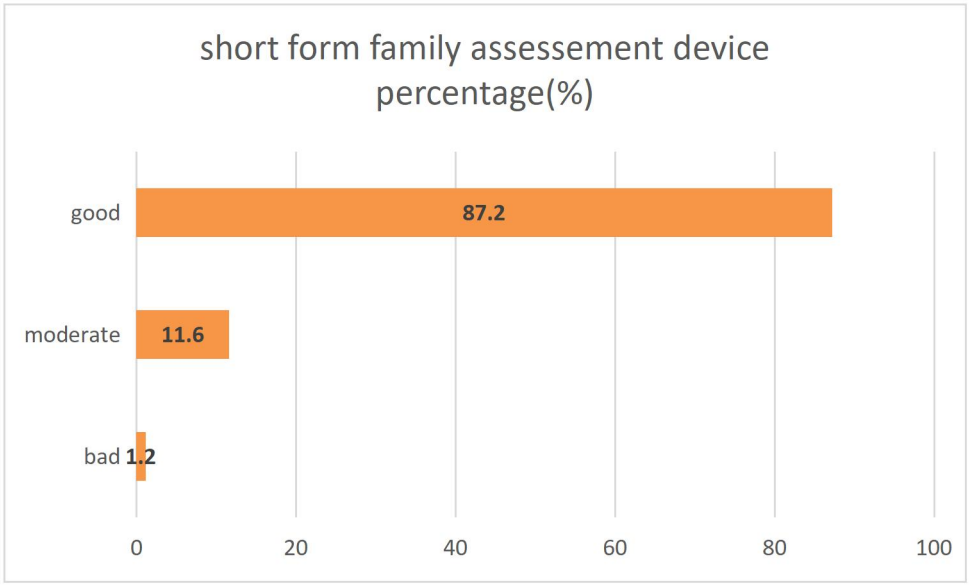
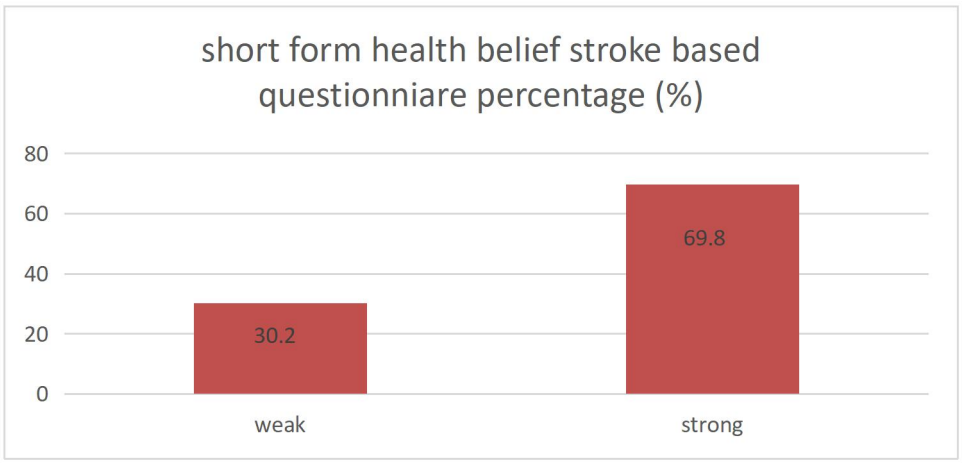


Figure 3: short form health belief model for stroke survivors



4.1.4 Descriptive statistics of the health belief domains

Looking at table 3, we see that many of the respondents had a very high perceived benefit accounting for 98.8% while 1.2% had a low perceived benefit. 60(69.8) had a high perceived susceptibility, 26(30.2) had low perceived susceptibility, 53(61.6%) had high perceived severity, 33(38.4%) had low perceived severity, had 25(29.1%) high perceived barriers, 61(70.9%) had low perceived barriers, 74 (86.0%) had high perceived self-efficacy while 12(14.0%) had low perceived self-efficacy , 58(67.4%) had high cues to action while 28(32.6%) had low cues to action.

Table 3: Descriptive analysis of the health belief domains

Variable	Frequency	percentage
Perceived susceptibility		
High perceived susceptibility	60	69.8
Low perceived susceptibility	26	30.2
Perceived severity		
High perceived severity	53	61.6
Low perceived severity	33	38.4
Perceived benefits		
High perceived benefit	85	98.8
Low perceived benefit	1	1.2
Perceived barriers		
High Perceived barriers	25	29.1
Low perceived barriers	61	70.9
Perceived self- efficacy		
High perceived self-efficacy	74	86.0
Low perceived self-efficacy	12	14.0
Cues to action		
High cues to action	58	67.4
Low cues to action	28	32.6

4.2 Chi-square test of association

Table 5 below revealed that the chi-square test of association between family functioning and health beliefs was X^2=11.187[a]; and p=0.004. This implies that family functioning significantly influence the health belief of stroke survivors. The association between family functioning and gender of stroke survivors X^2=2.933[a] and p=0.231 which implies that there would be no significant relationship between family functioning and gender of stroke survivors. There is a significant relationship between family functioning and marital status of stroke survivors with X^2= 15.365[a] and p=0.018. There would also be no significant relationship between family functioning and religion of stroke survivors (X^2= 46.973a and p= <0.001). The association between family functioning and ethnicity of stroke survivors X^2= 92.281[a] and p=<0.001 which implies that there would be no significant relationship between family functioning and ethnicity of stroke survivors. There would however be no significant relationship between family functioning and educational level of stroke survivors (X^2= 4.561[a] and p=0.601). It is also observed that that there would be no significant relationship between family functioning and stroke duration of stroke survivors X^2=1.795[a] and p=0.408. The association between family functioning and support system or living arrangement of stroke survivors X^2= 27.830[a] and p=<0.001 which implies that there would be no significant relationship between family functioning and support system or living arrangement of stroke survivors.

The relationship between health belief and gender of stroke survivors X^2=0.000[a] and p=1.00 which implies that there would be no significant relationship between health belief and gender of stroke survivors. However, there would be no significant relationship between health belief and marital status of stroke survivors with X^2=

2.228[a] and p value =0.527 the association between health beliefs and religion of stroke survivors X^2=5.054[a] and p=0.080 which implies that there would be a significant relationship between health belief and religion of stroke survivors. The association between health belief and ethnicity of stroke survivors X^2 =5.299[a] and p=0.725 which implies that there would be no significant relationship between health belief and ethnicity of stroke patients. There would be no significant relationship between health belief and educational level of stroke survivors X^2=4.353[a] and p=0.226. The association between health beliefs and stroke duration of stroke survivors X^2= 4.503[a] and p=0.034 which implies that there would be a significant relationship between health belief and stroke duration of stroke survivors. There is however no significant relationship between health beliefs and support system or living arrangement of stroke survivorsX^2=2.974[a] and p= 0.396.

Table 4: Chi-square test of association between variables

	Family functioning			**Health belief**		
	X2	**Df**	**P**	**X2**	**Df**	**P**
Family functioning				11.187a	2	0.004
Health beliefs	11.187a	2	0.004			
Age						
Gender	2.933a	2	0.231	0.000a	1	1.000
Marital status	15.365a	6	0.018	2.228a	3	0.527
Religion	46.973a	4	<0.001	5.054a	2	0.080
Ethnicity	92.281a	16	<0.001	5.299	8	0.725
Educational level	4.561a	6	0.601	4.353	3	0.226
Stroke duration	1.795a	2	0.408	4.503a	1	0.034
Living arrangement/support system	27.830a	6	<0.001	2.974a	3	0.396

4.3 Hypotheses Testing

Main hypothesis: There would be no significant relationship between family functioning and health beliefs among stroke survivors in Benin City, Edo State.

Alpha level: .0.05

Test statistic: Chi-square test

Observed: P<.05

Decision: Since the observed p-values of the association between family functioning and health belief was <.05, the hypothesis was REJECTED.

Hypothesis 1: There would be no significant relationship between family functioning and gender of the respondents

Alpha level: .0.05

Test statistic: Chi-square test

Observed: P>.05

Decision: Since the observed p-values of the association between family functioning and gender was >.05, the hypothesis was NOT REJECTED.

Hypothesis 2: There would be no significant relationship between family functioning and marital status of the respondents

Alpha level: .0.05

Test statistic: Chi-square test

Observed: P<.05

Decision: Since the observed p-values of the association between family functioning and marital status was <.05, the hypothesis was REJECTED.

Hypothesis 3: There would be no significant relationship between family functioning and religion of the respondents

Alpha level: .0.05

Test statistic: Chi-square test

Observed: P<.05

Decision: Since the observed p-values of the association between family functioning and religion was <.05, the hypothesis was REJECTED.

Hypothesis 4: There would be no significant relationship between family functioning and the ethnicity of the respondents

Alpha level: .0.05

Test statistic: Chi-square test

Observed: P<.05

Decision: Since the observed p-values of the association between family functioning and ethnicity was <.05, the hypothesis was REJECTED.

Hypothesis 5: There would be no significant relationship between family functioning and the educational level of the respondents.

Alpha level: .0.05

Test statistic: Chi-square test

Observed: P>.05

Decision: Since the observed p-values of the association between family functioning and educational level was >.05, the hypothesis was NOT REJECTED.

Hypothesis 6: There would be no significant relationship between family functioning and stroke duration of the respondents.

Alpha level: .0.05

Test statistic: Chi-square test

Observed: P>.05

Decision: Since the observed p-values of the association between family functioning and stroke duration was >.05, the hypothesis was NOT REJECTED.

Hypothesis 7: There would be no significant relationship between family functioning and the living arrangement/support system of the respondents.

Alpha level: .0.05

Test statistic: Chi-square test

Observed: P<.05

Decision: Since the observed p-values of the association between family functioning and Living Arrangement/ Support System was <.05, the hypothesis was REJECTED.

Hypothesis 8: There would be no significant relationship between health belief and the gender of the respondents.

Alpha level: .0.05

Test statistic: Chi-square test

Observed: P>.05

Decision: Since the observed p-values of the association between health beliefs and gender was >.05, the hypothesis was NOT REJECTED.

Hypothesis 9: There would be no significant relationship between health belief and marital status of the respondents

Alpha level: .0.05

Test statistic: Chi-square test

Observed: P>.05

Decision: Since the observed p-values of the association between health belief and marital status was >.05, the hypothesis was NOT REJECTED.

Hypothesis 10: There would be no significant relationship between health belief and the religion of the respondents.

Alpha level: .0.05

Test statistic: Chi-square test

Observed: P<.05

Decision: Since the observed p-values of the association between health beliefs and religion was <.05, the hypothesis was REJECTED.

Hypothesis 11: There would be no significant relationship between health belief and the ethnicity of the respondents

Alpha level: .0.05

Test statistic: Chi-square test

Observed: P>.05

Decision: Since the observed p-values of the association between health beliefs and ethnicity was >.05, the hypothesis was NOT REJECTED.

Hypothesis 12: There would b no significant relationship between health belief and the educational level of the respondents.

Alpha level: .0.05

Test statistic: Chi-square test

Observed: P>.05

Decision: Since the observed p-values of the association between health beliefs and educational level was >.05, the hypothesis was NOT REJECTED.

Hypothesis 13: There would be no significant relationship between health belief and the stroke duration of the respondents.

Alpha level: .0.05

Test statistic: Chi-square test

Observed: P<.05

Decision: Since the observed p-values of the association between health beliefs and stroke duration was <.05, the hypothesis was REJECTED.

Hypothesis 14: There would be no significant relationship between health belief and the living arrangement/support system of the respondents.

Alpha level: .0.05

Test statistic: Chi-square test

Observed: P>.05

Decision: Since the observed p-values of the association between health beliefs and Living Arrangement/ Support System was >.05, the hypothesis was NOT REJECTED.

CHAPTER 5

DISCUSSION, CONCLUSION, RECOMMENDATIONS AND IMPLICATIONS

5.1 Discussion

The result of this study revealed that equal number of males and females (50%) participated in this study which indicate that stroke affect both males and females equally. This agrees with the study conducted by Hussen & Girma (2022) which reported that stroke occurs in both male and female. The mean age of the respondent (58.7 years) corresponded with the age group of the individuals who is at a higher risk of having a stroke and also corresponded to the 57.0 years African mean age of first stroke and the study conducted by Sadiya et al (2023) which reported a mean age for stroke respondent of 58.20 years.

In relation to relationship status, more than 60% of the respondents were married which indicate that majority of the respondents had a good family structure. This is reflected in the study that marital status has a significant relationship with family functioning ($p<0.05$) with married respondents reporting a good family scores compared to the other respondents who were single, widowed or divorced. This is consistent with the study conducted by Lingli et al (2023) which reported that marital status has a significant role to play in post stroke recovery. Most of the respondents were Christian (91.9%) which shows that this work was done in a Christian dominated state and in the study religion had a significant relationship with family functioning. This corresponded with the study carried out by Rasoul et al (2025) which indicate that spiritual wellbeing, religious congruence and religious

commitment are significantly associated with marital satisfaction even among stroke patient.

Most of the respondent in this study had a tertiary education accounting for 43% of the total respondent which was related to the fact that majority of the participant were middle aged and elderly this shows that majority of the respondent have a relatively high educational background. The result revealed that educational level had no influence on family functioning and health beliefs of the respondent which means that irrespective of the educational level of the patient it doesn't have any significance in shaping how the family function or belief about their recovery. This is controversial with previous studies which indicated that there is a positive connection between level of education and family functioning. Nasrin et al (2024) reported that there is a significant relationship between health beliefs and education level of stroke survivors.

The highest proportion of the respondent were Bini which is expected because the work was done in Benin and the ethnic diversity demonstrate the fact that the University of Benin Teaching Hospital is a referral point for multiple ethnic communities in Nigeria. More than half of the respondent (55.8%) had lived with stroke for more than a year while 44.2% had lived with stroke between 6month and 12month which obey the inclusion criteria for this study and the respondent has adequate experience to form a personal health belief about stroke.

Majority of the respondent live with their spouse this highlight the need for a good support system in after recovering from stroke . The study also revealed that living arrangement/ support system has a significant role to play in family functioning. More so, So and Park (2024) revealed that "better family caregiver status tends to be more favorable for post stroke functional recovery at home". Deepradit et al, (2023)

showed that a good family based system improve the way of living and decrease depression and fewer difficulites in people recovering from stroke. The study revealed that there is no significant relationship between the gender, marital status, ethnicity, educational level and living arrangement on health beliefs of stroke survivors which also corresponded with the research carried out by Lamidi and Adegbenro (2017).

A statistically significant p=0.004 important link surrounding family functioning and health belief among stroke survivors in the university of Benin teaching hospital which means that stroke survivors who experience a good family functioning tends to have a stronger health belief about their recovery from stroke. This corresponds with the study carried out by Lingli et al (2023) which reported that good family functioning makes it easier for patients with stroke to get help and support in material and mental aspects. Relatives play a crucial role in creating an environment for rehabilitation which boost the patient confidence in managing disease and consequently strengthen their health beliefs. If the family unit fails to provide enough care, lack effective communication or cannot offer timely psychological support, the patient's recovery needs remain unmet. This result is also consistent with the result of Noser et al (2017) which reported that a supportive and collaborative family environment is an important prerequisite for the development of good health beliefs and other relevant self-management skills.

Majority of the respondents in this study had a very high perceived self-efficacy (86.0%) and perceived benefit (98.8%) they believed that following their stroke rehabilitation, taking their medications regularly and adopting a healthy life style will reduce their risk of getting another stroke which indicated that most of the patients were confident in their ability to follow health behaviors and believed that

they could persist in them (Lingli et al 2023). The increase in perceived self-efficacy and perceived benefit could be as a result of the high score of majority of the respondents in their perceived susceptibility (69.8%) to stroke which increased their motivation to take preventive actions. Although majority had a low perceived barrier to stroke recovery, a significant number of the respondent (29.1%) had a high perceived barrier to recovery due to the economic problems leading to decreased access to healthy food and fruit while some are not able to come for their rehabilitation regularly. This barriers also correspond to the research carried out by Sarabi et al (2022) who reported that people belief that having a healthy diet is expensive and majority of the respondent stated that they do not have easy access to the clinic. This significant score in barriers indicate the need to pay attention to this matter because it can be a serious risk to predispose a person to stroke (Sarabi et al., 2022)

67.4% of the respondent had a high cues to action but a significant number of the respondent 32.6% had a low cues this is due to the fact that the respondent do not know the warning signs of stroke and they do not know the steps to take when they feel stroke symptoms again. This issues shows that although majority of the respondent have high cues to action, a significant number of them have poor understanding of stroke risk and how it should be managed. (Sarabi et al., 2022).

5.2 Conclusion

This study concluded that family functioning has a significant influence on the health beliefs of stroke survivors in Benin City also families and stroke survivors who experienced supportive family system demonstrated a stronger and positive health belief about their stroke recovery. Therefore incorporating family centered

interventions and education into stroke rehabilitation programs is necessary for enhancing the method of living for those that recovered from stroke**.**

5.3 Recommendations

Health care providers should integrate structured family counselling and education into stroke management programs. Stroke survivors and their families should receive continuous health education in order to foster strong positive health beliefs for quick recovery. Physiotherapist, psychologist and social workers should work together to assess family functioning often and design individualized interventions that enhance physical and psychological recovery of stroke survivors. Further research should be done to address the connection between socio demographic data and the health beliefs of stroke survivors.

5.4 Implications for Further Study

The result gotten from this study showed the critical position of family functioning ins the on the health beliefs and recovery of stroke survivors. However, further studies should establish relationship between family functioning and long term rehabilitation outcomes of stroke survivors. More studies should be done to provide deeper insight into cultural, religious and socio-demographic factors that that mediate family influence and health beliefs on stroke recovery in various regions in Nigeria.

REFERENCE

Abdu H, Seyoum G, (2022). Sex differences in stroke risk factors, clinical profiles, and in-hospital outcomes, among stroke patients admitted to the medical ward of Dessie comprehensive specialized hospital, Northeast Ethopia. Degenerneurol Neuromuscul Dis 2022 Oct 21; 12:133-144. Doi: 10.2147/DNND.S383564. PMID: 36304698; PMCID: PMC9595065

Adeloye D (2014) an estimate of the incidence and prevalence of stroke in Africa: a systematic review and meta-analysis. PLoS One. 2014;9(6):el00724. [DOI] [PMC free article] [PubMed] [Google Scholar]

Adeloye D, Ezejimofor M, Auta A, Mpazanje RG, Ezeigwe N, Ngige EN, Harhay MO, Alemu W, Adewole IF (2019). Estimating morbidity due to stroke in Nigeria: a systematic review and meta-analysis. J Neurol Sci. 2019 Jul 15;402:136-144. doi: 10.1016/j.jns.2019.05.020. Epub 2019 May 23. PMID: 31151064; PMCID: PMC6650746.

Alyafei A, Easton-Carr R. (2025) the Health Belief Model of Behavior Change. [Updated 2024 May 19]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK606120/

Akinyemi RO, Ovbiagele B, Adeniji OA, Sarfo FS, Abd-Allah F, Adoukonou T, Ogah OS, Naidoo P, Damasceno A, Walker RW, Ogunniyi A, Kalaria RN, Owolabi MO (2021). Stroke in Africa: profile, progress, prospects and priorities. Nat Rev Neurol. 2021 Oct;17(10):634-656. doi: 10.1038/s41582-021-00542-4. Epub 2021 Sep 15. PMID: 34526674; PMCID: PMC8441961

Bello UM, Chutiyami M, Salihu D, Abdu SI, Tafida BA, Jabbo AA, Gamawa A, Umar L, Lawan A, Miller T, Winser SJ (2021). Quality of life of stroke survivors in Africa: a systematic review and meta-analysis. Qual Life Res. 2021

Jan;30(1):1-19. doi: 10.1007/s11136-020-02591-6. Epub 2020 Jul 25. PMID: 32712933

Blossom G. Dharmaraj, Vicky L. Ng, (2021) 43 - Psychosocial Outcomes After Pediatric Liver Transplantation,Editor(s): Nedim HadÅ¾iÄ‡, Ulrich Baumann, ValÃ©rie AnneMcLin,PediatricLiverTransplantation,Elsevier,2021,Pages420430,ISBN 9780323636711,https://doi.org/10.1016/B978 0323636711.000434.(https://www.sciencedirect.com/science/article/pii/B978 0323636711000434)

Boursin P, Paternotte S, Dercy B, Sabben C, Maïer B. Sémantique, épidémiologie et sémiologie des accidents vasculaires cérébraux (2018) [Semantics, epidemiology and semiology of stroke]. Soins. 2018 Sep;63(828):24-27. French. doi: 10.1016/j.soin.2018.06.008. PMID: 30213310.

Campbell BCV, De Silva DA, Macleod MR, Coutts SB, Schwamm LH, Davis SM, Donnan GA. (2019) Ischaemic stroke. Nat Rev Dis Primers. 2019 Oct 10;5(1):70. doi: 10.1038/s41572-019-0118-8. PMID: 31601801.

Chia-Chi Li, Su-Ju Tsai, Jo-Ching Tai, Tzu-Jung Wu, Shu-Mei Tsai, Shu-Chuan Kao, Hsiang-Chu Pai, (2024). Association Between Family Functioning and Health-related QualityofLifeinStrokeSurvivorâInformalFamilyCaregiverDyads,AsianNursingResearch,Volume18,Issue2,2024,Pages141147,ISSN19761317,https://doi.org/10.1016/j.anr.2024.04.006.(https://www.sciencedirect.com/science/article/pii/S1976131724000380).

David S Liebeskind, MD, FAAN, FAHA, FANA; Andrew K Chang, MD, MS , J Stephan Huff, Howard f Kirshner,Richard S Krause,Helmi L Lutsep,Denise Nassisi, Jeffery fs (2025) hemorrhagic stroke treatment andmanagement.medscape

Deepradit S, Powwattana A,Lagampan S, Thiangtham W (2023). Effectiveness of a family based program for post- stroke patients and families: aA cluster randomized control trial. Int J Nurs Sci. 2023 sep 27; 10(4):446-455. Doi: 10.1016/j.ijnss.2023.9.020.PMID:38020842; PMCID: PMC10667323.

Diendéré J, Millogo A, Philippe F, Kaboré J, Napon C, Dabilgou A, Boncoeur-Martel MP, Preux PM, Salle JY, Desport JC, Jésus P. (2021). Post-stroke Complications and Mortality in Burkinabè Hospitals: Relationships with Deglutition Disorders and Nutritional Status. Dysphagia. 2021 Feb;36(1):85-95. doi: 10.1007/s00455-020-10111-4. Epub 2020 Apr 17. PMID: 32303906.

Donkor ES, Darkwah S, Akpalu A. Post-Stroke Bacteriuria (2017). : A Longitudinal Study among Stroke Outpatients and Inpatients at the Korle-Bu Teaching Hospital in Ghana. Med Sci (Basel). 2017 Jun 2;5(2):11. doi: 10.3390/medsci5020011. PMID: 29099028; PMCID: PMC5635783

Epstein LH, Schechtman KB, Kilanowski C, Ramel M, Moursi NA, Quattrin T, Cook SR, Eneli IU, Pratt C, Geller N, Campo R, Lew D, Wilfley DE (2021) . Implementing family-based behavioral treatment in the pediatric primary care setting: Design of the PLAN study. Contemp Clin Trials. 2021 Oct;109:106497. doi: 10.1016/j.cct.2021.106497. Epub 2021 Aug 10. PMID: 34389519; PMCID: PMC9664376

Erameh CO, Emorinken A, Akpasubi BO (2023). A comprehensive analysis of stroke admissions at a rural Nigerian tertiary health facility: Insights from a single-center study. J Neurosci Rural Pract. 2023 Oct-Dec;14(4):703-709. doi: 10.25259/JNRP_76_2023. Epub 2023 Jun 24. PMID: 38059259; PMCID: PMC10696323.

Ezejimofor MC, Chen Y-F, Kandala N-B, Ezejimofor BC, Ezeabasili AC, Stranges S, et al (2016). . Stroke survivors in low-and middle-income countries: a meta-

analysis of prevalence and secular trends. Journal of the neurological sciences. 2016;364:68–76. [DOI] [PubMed] [Google Scholar

Ezejimofor MC, Uthman OA, Maduka O, Ezeabasili AC, Onwuchekwa AC, Ezejimofor BC, Asuquo E, Chen YF, Stranges S, Kandala NB (2017). Stroke survivors in Nigeria: A door-to-door prevalence survey from the Niger Delta region. J Neurol Sci. 2017 Jan 15;372:262-269. doi: 10.1016/j.jns.2016.11.059. Epub 2016 Nov 25. PMID: 28017225.

Feigin VL, Brainin M, Norrving B, Martins S, Sacco RL, Hacke W, Fisher M, Pandian J, Lindsay P. (2022). World Stroke Organization (WSO): Global Stroke Fact Sheet 2022. Int J Stroke. 2022 Jan;17(1):18-29. doi: 10.1177/17474930211065917. Erratum in: Int J Stroke. 2022 Apr;17(4):478. doi: 10.1177/17474930221080343. PMID: 34986727.

Feigin VL, Owolabi MO; (2023). World Stroke Organization–Lancet Neurology Commission Stroke Collaboration Group. Pragmatic solutions to reduce the global burden of stroke: a World Stroke Organization-Lancet Neurology Commission. Lancet Neurol. 2023 Dec;22(12):1160-1206. doi: 10.1016/S1474-4422(23)00277-6. Epub 2023 Oct 9. Erratum in: Lancet Neurol. 2023 Dec;22(12):e13. doi: 10.1016/S1474-4422(23)00425-8. PMID: 37827183; PMCID: PMC10715732.

Gawulayo S, Erasmus CJ, Rhoda AJ.(_2021). Family functioning and stroke: Family members' perspectives. Afr J Disabil. 2021 Oct 25;10:801. doi: 10.4102/ajod.v10i0.801. PMID: 34858798; PMCID: PMC8603059.

GBD (2019) Stroke Collaborators. Global, regional, and national burden of stroke and its risk factors, 1990-2019: a systematic analysis for the Global Burden of Disease Study 2019. Lancet Neurol. 2021 Oct;20(10):795-820. doi:

10.1016/S1474-4422(21)00252-0. Epub 2021 Sep 3. PMID: 34487721; PMCID: PMC8443449.

GBD (2021). Stroke Risk Factor Collaborators. Global, regional, and national burden of stroke and its risk factors, 1990-2021: a systematic analysis for the Global Burden of Disease Study 2021. Lancet Neurol. 2024 Oct; 23(10):973-1003. doi: 10.1016/S1474-4422(24)00369-7. PMID: 39304265; PMCID: PMC12254192.

Gore M, Bansal K, Khan Suheb MZ, et al. (2025). Lacunar Stroke. [Updated 2024 Mar 10]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK5632

Harris GM, Prvu Bettger J.(2018). Parenting after stroke: a systematic review. Top Stroke Rehabil. 2018 Jul;25(5):384-392. doi: 10.1080/10749357.2018.1452366. Epub 2018 Apr 2. PMID: 29607739.

Heran M, Lindsay P, Gubitz G, Yu A, Ganesh A, Lund R, Arsenault S, Bickford D, Derbyshire D, Doucette S, Ghrooda E, Harris D, Kanya-Forstner N, Kaplovitch E, Liederman Z, Martiniuk S, McClelland M, Milot G, Minuk J, Otto E, Perry J, Schlamp R, Tampieri D, van Adel B, Volders D, Whelan R, Yip S, Foley N, Smith EE, Dowlatshahi D, Mountain A, Hill MD, Martin C, Shamy M. (2024). Canadian Stroke Best Practice Recommendations: Acute Stroke Management, 7th Edition Practice Guidelines Update, 2022. Can J Neurol Sci. 2024 Jan;51(1):1-31. doi: 10.1017/cjn.2022.344. Epub 2022 Dec 19. PMID: 36529857.

Hurst S, Arulogun O, Owolabi MO, Akinyemi RO, Uvere E, Warth S, Fakunle G, Ovbiagele B. (2016). The Use of Qualitative Methods in Developing Implementation Strategies in Prevention Research for Stroke Survivors in Nigeria. J Clin Hypertens (Greenwich). 2016 Oct;18(10):1015-1021. doi:

10.1111/jch.12817. Epub 2016 Apr 1. PMID: 27038071; PMCID: PMC8031481.

Ibrahim AO, Olowoyo P, Ajetunmobi AO, et al. (2021). Stroke Subtypes, Risk Factors and Treatment Outcomes at A Tertiary Hospital Situated in Rural Southwestern Nigeria: A Five- Year Restrospective Observational Study. Cardiol Vasc Res. 2021; 5(6): 1-8.

Johnson L, Bird ML, Muthalib M, Teo WP. (2020). An Innovative STRoke Interactive Virtual thErapy (STRIVE) Online Platform for Community-Dwelling Stroke Survivors: A Randomized Controlled Trial. Arch Phys Med Rehabil. 2020 Jul;101(7):1131-1137. doi: 10.1016/j.apmr.2020.03.011. Epub 2020 Apr 10. PMID: 32283048.

Katsanos AH, Palaiodimou L, Zand R, Yaghi S, Kamel H, Navi BB, Turc G, Romoli M, Sharma VK, Mavridis D, Shahjouei S, Catanese L, Shoamanesh A, Vadikolias K, Tsioufis K, Lagiou P, Alexandrov AV, Tsiodras S, Tsivgoulis G.(2020). The Impact of SARS-CoV-2 on Stroke Epidemiology and Care: A Meta-Analysis. Ann Neurol. 2021 Feb;89(2):380-388. doi: 10.1002/ana.25967. Epub 2020 Dec 9. PMID: 33219563; PMCID: PMC7753413.

Kim J, Thayabaranathan T, Donnan GA, Howard G, Howard VJ, Rothwell PM, Feigin V, Norrving B, Owolabi M, Pandian J, Liu L, Cadilhac DA, Thrift AG. (2019). Global Stroke Statistics 2019. Int J Stroke. 2020 Oct;15(8):819-838. doi: 10.1177/1747493020909545. Epub 2020 Mar 9. PMID: 32146867.

Kwon BM, Lee HH, Sohn MK, Kim DY, Shin YI, Oh GJ, Lee YS, Joo MC, Lee SY, Song MK, Han J, Ahn J, Chang WH, Lee J, Kim YH. (2023). Contributing Factors to the Burden on Primary Family Caregivers of Stroke Survivors in South

Korea. Int J Environ Res Public Health. 2023 Feb 3;20(3):2760. doi: 10.3390/ijerph20032760. PMID: 36768126; PMCID: PMC9914967

Kuriakose D, Xiao Z. Pathophysiology and Treatment of Stroke (2020): Present Status and Future Perspectives. Int J Mol Sci. 2020 Oct 15;21(20):7609. doi: 10.3390/ijms21207609. PMID: 33076218; PMCID: PMC7589849.

Langhorne P, Ramachandra S. (2020). Stroke Unit Trialists' Collaboration. Organised inpatient (stroke unit) care for stroke: network meta-analysis. Cochrane Database Syst Rev. 2020 Apr 23;4(4):CD000197. doi: 10.1002/14651858.CD000197.pub4. PMID: 32324916; PMCID: PMC7197653.

Lui F, Khan Suheb MZ, Patti L. Ischemic Stroke (2025). [Updated 2025 Feb 21]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK499997/

Liebeskind DS, Saber H, Xiang B, Jadhav AP, Jovin TG, Haussen DC, Budzik RF, Bonafe A, Bhuva P, Yavagal DR, Hanel RA, Ribo M, Cognard C, Sila C, Hassan AE, Smith WS, Saver JL, Nogueira RG; (2022). DAWN Investigators. Collateral Circulation in Thrombectomy for Stroke After 6 to 24 Hours in the DAWN Trial. Stroke. 2022 Mar;53(3):742-748. doi: 10.1161/STROKEAHA.121.034471. Epub 2021 Nov 3. PMID: 34727737.

Liu L, Xu M, Marshall IJ, Wolfe CD, Wang Y, O'Connell MD.(2023). Prevalence and natural history of depression after stroke: A systematic review and meta-analysis of observational studies. PLoS Med. 2023 Mar 28;20(3):e1004200. doi: 10.1371/journal.pmed.1004200. PMID: 36976794; PMCID: PMC10047522.

Lo, C.K.M., Chen, Q., Chen, M. et al.(2024). Changes in, and factors associated with family functioning: results of four cross-sectional household surveys from 2011 to 2017 in Hong Kong. BMC Public Health 24, 160 (2024). https://doi.org/10.1186/s12889-024-17643-6

Luengo-Fernandez R, Violato M, Candio P, Leal J.(2019). Economic burden of stroke across Europe: A population-based cost analysis. Eur Stroke J. 2020 Mar;5(1):17-25. doi: 10.1177/2396987319883160. Epub 2019 Oct 29. PMID: 32232166; PMCID: PMC7092742.

Millar PJ, Levy AS, McGowan CL, McCartney N, MacDonald MJ. (2013). Isometric handgrip training lowers blood pressure and increases heart rate complexity in medicated hypertensive patients. Scand J Med Sci Sports. 2013 Oct;23(5):620-6. doi: 10.1111/j.1600-0838.2011.01435.x. Epub 2012 Jan 20. PMID: 22260503.

Muneer GB, Sobia B, Zamros YM, Karuthan C, Jennifer GD. (2020). Cross cultural adaptation of the general functioning subscale of the McMaster family assessment device.sep 25th 2020. Doi: https://doi.org/10.21203/rs.3.rs-79354/v1

Murphy SJ, Werring DJ. (2020) Stroke : causes and clinical features. Medicine (Abingdon). 2020 sep; 48(9): 561-566. Doi: 10.1016/j.mpmed.2020.06.002.Epub 2020 Aug 6. PMID: 32837228;PMCID: PMC7409792.

Nasrin Sarabi, Ahmad Moosavi, Shahzad Mehranfard, Younes Toosang . (2024). investigating influential factors in preventing stroke based on the health belief model in patients with type 2 diabetes: a cross sectional study *research in health & medical sciences*. Jrhms.thums.ac.ir

Nicholas Aderinto, Bonaventure Michael Ukoaka, Abdulrahmon Moradeyo, Precious Miracle Wagwula, Ntishor Gabriel Udam, Opabode Muntaqim, Adedoyin

Veronica Babalola, Ikponmwosa Jude Ogieuhi, Tajuddeen Adam Wali, Adefusi Temiloluwa Oluwakorede, Adetola Emmanuel Babalola, Israel Charles Abraham, Gbolahan Olatunji, Emmanuel Kokori. (2025). Prevalence, characteristics, and treatment outcomes of stroke in Nigeria: A systematic review,NextResearch,Volume2,Issue3,2025,100410,ISSN3050-4759,https://doi.org/10.1016/j.nexres.2025.100410.(https://www.sciencedirect.com/science/article/pii/S3050475925002805)

Ni H, Lin Y, Peng Y, Li S, Huang X, Chen L. (2022). Relationship Between Family Functioning and Medication Adherence in Chinese Patients With Mechanical Heart Valve Replacement: A Moderated Mediation Model. Front Pharmacol. 2022 Feb 22;13:817406. doi: 10.3389/fphar.2022.817406. PMID: 35273498; PMCID: PMC8902640.

O'Donnell MJ, Chin SL, Rangarajan S, Xavier D, Liu L, Zhang H, Rao-Melacini P, Zhang X, Pais P, Agapay S, Lopez-Jaramillo P, Damasceno A, Langhorne P, McQueen MJ, Rosengren A, Dehghan M, Hankey GJ, Dans AL, Elsayed A, Avezum A, Mondo C, Diener HC, Ryglewicz D, Czlonkowska A, Pogosova N, Weimar C, Iqbal R, Diaz R, Yusoff K, Yusufali A, Oguz A, Wang X, Penaherrera E, Lanas F, Ogah OS, Ogunniyi A, Iversen HK, Malaga G, Rumboldt Z, Oveisgharan S, Al Hussain F, Magazi D, Nilanont Y, Ferguson J, Pare G, Yusuf S; (2016). INTERSTROKE investigators. Global and regional effects of potentially modifiable risk factors associated with acute stroke in 32 countries (INTERSTROKE): a case-control study. Lancet. 2016 Aug 20;388(10046):761-75. doi: 10.1016/S0140-6736(16)30506-2. Epub 2016 Jul 16. PMID: 27431356.

Okafor IP, Oyewale DV, Ohazurike C, Ogunyemi AO (2022). Role of traditional beliefs in the knowledge and perceptions of mental health and illness amongst rural-dwelling women in western Nigeria. Afr J Prim Health Care Fam Med. 2022

Sep 29;14(1):e1-e8. doi: 10.4102/phcfm.v14i1.3547. PMID: 36226933; PMCID: PMC9575354.

Okonkwo UP, Agbo CF, Ibeneme SC, Igwe ES, Akosile CO, Onwuakagba IU, Emmanuel OC, Maduagwu SM, Ezenwankwo EF, Ekechukwu EN. The

Owolabi MO, Akarolo-Anthony S, Akinyemi R, Arnett D, Gebregziabher M, Jenkins C, Tiwari H, Arulogun O, Akpalu A, Sarfo FS, Obiako R, Owolabi L, Sagoe K, Melikam S, Adeoye AM, Lackland D, Ovbiagele B; (2015). Members of the Africa Consortium. The burden of stroke in Africa: a glance at the present and a glimpse into the future. Cardiovasc J Afr. 2015 Mar-Apr;26(2 Suppl 1):S27-38. doi: 10.5830/CVJA-2015-038. PMID: 25962945; PMCID: PMC4557491.

Owolabi MO, Thrift AG, Mahal A, Ishida M, Martins S, Johnson WD, Pandian J, Abd-Allah F, Yaria J, Phan HT, Roth G, Gall SL, Beare R, Phan TG, Mikulik R, Akinyemi RO, Norrving B, Brainin M, Feigin VL; (2022). Stroke Experts Collaboration Group. Primary stroke prevention worldwide: translating evidence into action. Lancet Public Health. 2022 Jan;7(1):e74-e85. doi: 10.1016/S2468-2667(21)00230-9. Epub 2021 Oct 29. Erratum in: Lancet Public Health. 2022 Jan;7(1):e14. doi: 10.1016/S2468-2667(21)00281-4. PMID: 34756176; PMCID: PMC8727355.

Panuganti KK, Tadi P, Lui F. (2023). Transient Ischemic Attack. [Updated 2023 Jul 17]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK459143/

Powers WJ, Rabinstein AA, Ackerson T, Adeoye OM, Bambakidis NC, Becker K, Biller J, Brown M, Demaerschalk BM, Hoh B, Jauch EC, Kidwell CS, Leslie-Mazwi TM, Ovbiagele B, Scott PA, Sheth KN, Southerland AM, Summers DV, Tirschwell DL. (2019). Guidelines for the Early Management of Patients With Acute Ischemic Stroke: 2019 Update to the 2018 Guidelines for the Early

Management of Acute Ischemic Stroke: A Guideline for Healthcare Professionals From the American Heart Association/American Stroke Association. Stroke. 2019 Dec;50(12):e344-e418. doi: 10.1161/STR.0000000000000211. Epub 2019 Oct 30. Erratum in: Stroke. 2019 Dec;50(12):e440-e441. doi: 10.1161/STR.0000000000000215. PMID: 31662037.

Psihogios AM, Fellmeth H, Schwartz LA, Barakat LP.(2019). Family Functioning and Medical Adherence Across Children and Adolescents With Chronic Health Conditions: A Meta-Analysis. J Pediatr Psychol. 2019 Jan 1;44(1):84-97. doi: 10.1093/jpepsy/jsy044. PMID: 29982694; PMCID: PMC7967873.

Rosenstock, I. M., Strecher, V. J., & Becker, M. H. (1988). Social learning theory and the Health Belief Model. Health Education Quarterly, 15(2), 175–183

Sarfo FS, Akassi J, Obese V, Adamu S, Agbenorku M, Ovbiagele B. (2020). Prevalence and predictors of post-stroke epilepsy among Ghanaian stroke survivors. J Neurol Sci. 2020 Nov 15;418:117138. doi: 10.1016/j.jns.2020.117138. Epub 2020 Sep 12. PMID: 32947087.

Saver JL, Chaisinanunkul N, Campbell BCV, Grotta JC, Hill MD, Khatri P, Landen J, Lansberg MG, Venkatasubramanian C, Albers GW; XIth (2021). Stroke Treatment Academic Industry Roundtable. Standardized Nomenclature for Modified Rankin Scale Global Disability Outcomes: Consensus Recommendations From Stroke Therapy Academic Industry Roundtable XI. Stroke. 2021 Aug;52(9):3054-3062. doi: 10.1161/STROKEAHA.121.034480. Epub 2021 Jul 29. PMID: 34320814.

So J, Park MH. Family's (2024) caregiving status and post-stroke functional recovery during subacute period from discharge to home: A Retrospective study. J Clin

Med. 2024 nov 17; 13 (22):6923. Doi : 10.3390/jcm13226923. PMID: 39598067; PMCID: PMC11594447.

SO Ojagbemi A, Akinyemi J, Owolabi M, Akinyemi R, Arulogun O, Gebregziabher M, Akpa O, Olaniyan O, Salako B, Ovbiagele B. (2020). Predictors and prognoses of new onset post-stroke anxiety at one year in black Africans. J Stroke Cerebrovasc Dis. 2020 Sep;29(9):105082. doi: 10.1016/j.jstrokecerebrovasdis.2020.105082. Epub 2020 Jul 3. PMID: 32807479; PMCID: PMC7673258.

Tadi P, Lui F. Acute Stroke (2025) . [Updated 2023 Aug 17]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK535369/

Towfighi A, Ovbiagele B (2022). Health Equity and Actionable Disparities in Stroke: 2021 Update. Stroke. 2022 Mar;53(3):636-642. doi: 10.1161/STROKEAHA.122.035816. Epub 2022 Feb 28. PMID: 35226543.

Tran JT, Theng B, Tzeng HM, Raji M, Serag H, Shih M, Lee WM. (2023). Cultural Diversity Impacts Caregiving Experiences: A Comprehensive Exploration of Differences in Caregiver Burdens, Needs, and Outcomes. Cureus. 2023 Oct 5;15(10):e46537. doi: 10.7759/cureus.46537. PMID: 37927752; PMCID: PMC10625452

Tsao CW, Aday AW, Almarzooq ZI, Anderson CAM, Arora P, Avery CL, Baker-Smith CM, Beaton AZ, Boehme AK, Buxton AE, Commodore-Mensah Y, Elkind MSV, Evenson KR, Eze-Nliam C, Fugar S, Generoso G, Heard DG, Hiremath S, Ho JE, Kalani R, Kazi DS, Ko D, Levine DA, Liu J, Ma J, Magnani JW, Michos ED, Mussolino ME, Navaneethan SD, Parikh NI, Poudel R, Rezk-Hanna M, Roth GA, Shah NS, St-Onge MP, Thacker EL, Virani SS, Voeks JH, Wang NY, Wong ND, Wong SS, Yaffe K, Martin SS; (2023). American Heart

Association Council on Epidemiology and Prevention Statistics Committee and Stroke Statistics Subcommittee. Heart Disease and Stroke Statistics-2023 Update: A Report From the American Heart Association. Circulation. 2023 Feb 21;147(8):e93-e621. doi: 10.1161/CIR.0000000000001123. Epub 2023 Jan 25. Erratum in: Circulation. 2023 Feb 21;147(8):e622. doi: 10.1161/CIR.0000000000001137. Erratum in: Circulation. 2023 Jul 25;148(4):e4. doi: 10.1161/CIR.0000000000001167. PMID: 36695182; PMCID: PMC12135016

Unnithan AKA, Das JM, Mehta P. (2023) Hemorrhagic Stroke. [Updated 2023 May 8]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK559173/

Wang X, Hu CX, Lin MQ, Liu SY, Zhu FY, Wan LH. (2022). Family Functioning is Associated with Post-Stroke Depression in First-Ever Stroke Survivors: A Longitudinal Study. Neuropsychiatr Dis Treat. 2022 Dec 29;18:3045-3054. doi: 10.2147/NDT.S393331. PMID: 36601104; PMCID: PMC9807129.

Whitiana, G.D., Vitriana, V. & Cahyani, A., (2017), Level of activity daily living in post stroke patients', Althea Medical Journal 4(2), 261–266. 10.15850/amj.v4n2.1068 [DOI] [Google Scholar

Zhang L, Shu Y, Han C, Liu J. (2023). Correlation between Family Functioning and Health Beliefs in Patients with Stroke in Beijing, China. J Multidiscip Healthc. 2023 Apr 18; 16:1067-1074. doi: 10.2147/JMDH.S394396. PMID: 37096237; PMCID: PMC10122470

APPENDIX

APPENDIX A

INFORMED CONSENT FORM

I, Ojukonnaye Blessing Oluwatoyin.i'm completing my undergraduate studies in the physiotherapy department, School of Basic Medical Sciences, and University of Benin. I am conducting a study on "THE RELATIONSHIP BETWEEN FAMILY FUNCTIONING AND HEALTH BELIEFS AMONG STROKE SURVIVORS IN THE UNIVERSITY OF BENIN TEACHING HOSPITAL". This research is carried out to assess how family functioning can influence the health beliefs of stroke survivors towards their recovery .Your identity will remain anonymous throughout the reporting process.

My email is ojukonnayeblessing.o@gmail.com and my phone number is 07014096360.

Please note that your involvement is entirely optional

Consent: Now that this study has been explained to me in details and I understand the nature purpose and benefits of the study, I consent to be a participant in this study

_____ _____

Signature of the Guardian/Date **Signature of Researcher/Date**

APPENDIX B

QUESTIONNAIRE

Project Title: "Relationship between Family Functioning and Health Beliefs among Stroke Survivors in the University of Benin Teaching Hospital"

Section A: Socio-demographic Data

Instruction: Please indicate the appropriate response by checking [✓] the box in the space provided

- 1. Current age in years: _____ years
- 2. Biological Sex: ☐ Male ☐ Female
- 3. Relationship Status: ☐ Single ☐ Married ☐ Widowed ☐ Divorced
- 4. Religious Affiliations: ☐ Christianity ☐ Islam ☐ Traditional ☐ Others: _____
- 5. Ethnic Group: ----------
- 6. highest Educational Qualification: ☐ No formal education ☐ Primary ☐ Secondary ☐ Tertiary
- 7. Duration of stroke condition: ☐ less than 6 months ☐ 6 to12 months ☐ more than 1 year
- 8. Who do you live with? ☐ Alone ☐ Spouse ☐ Children ☐ Other relatives

Section B: Short Form Family Assessment Device – General Functioning Subscale (FAD-GFS)

The items below are adopted directly from the "General functioning subscale" developed by Epistein et al. (1983) and are presented here verbatim for research validity.

Instruction. Please read each statement carefully. Tick [✓] the response that best reflects how your family typically functions.

Statement	Strongly Agree	Agree	Disagree	Strongly Disagree
1. "Planning family activities is difficult because we misunderstand each other".				

2. “In times of crises we can turn to each other” for support.				
3. “We cannot talk to each other about the sadness we feel”.				
4. “Individuals are accepted for what they are”.				
5. “We avoid discussing our fears and concern”.				
6. “We can express feelings to each other”.				
7. “There are a lot of bad feelings in the family”.				
8. “We feel accepted for what we are”.				
9. “Making decisions is a problem for our family”.				
10. “We are able to make decisions about how to solve problems”.				
11. “We don’t get along well together”.				
12. “We confide in each other”.				

Section C: The short form-Health Beliefs about Stroke Questionnaire (HBM-Based)

Instruction: Tick [✓] the option that suits your beliefs.

Statement	**Strongly Agree**	**Agree**	**Disagree**	**Strongly Disagree**
1. “According to my health condition and living and working condition, I am at risk of having another stroke”				
2. “If I don’t take my medications regularly, I can get another stroke”				
3. “God protect me even if I do not follow the principles of health and prevention”				
4. “Having a stroke has a negative effect on my job or education”				

5. “Stroke complications could lead to long term reliability”				
6. “I worry about the serious health impact if I have another stroke”				
7. “Following my stroke rehabilitation reduces my risk of another stroke”				
8. “Taking my medications regularly helps to prevent stroke recurrence”				
9. “Adopting a healthier lifestyle lowers my risk of stroke”				
10.”Due to economic problems, I do not have access to healthy food and fruits to improve my health”				
11. “I forget to go for my stroke rehabilitation”				
12. “I don’t know how to use my medications properly”				
13. “I can get news and information about stroke from reputable places”				
14. “I can manage the stress of stroke by communicating properly with my family”				
15. “As much as possible, I can avoid the risk factors of stroke”				
16. “Advice from healthcare providers motivates me to manage my stroke risks”				
17. “Family support encourages me to maintain healthy habits”				
18. “Reminders help me take my medication on time”				
19. “I understand the warning signs of another stroke”				
20. “I know what steps to take if I feel stroke symptoms again”				