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Master Thesis

Topic: **AFFORDABILITY AND AVAILABILITY OF PHYSIOTHERAPY FOR STROKE PATIENTS AT DIFFERENT LEVELS OF HEALTHCARE IN NIGERIA.**

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Abstract

Globally, stroke is a serious epidemic, and an expensive disease and one of the leading causes of disability. The disease is also one of the most leading causes of mortality and morbidity in advanced countries, imposing enormous economic burden on individuals and society overall. This study investigated the affordability of physiotherapy for stroke patients at levels of health care in Nigeria.

The study adopted purposive research design where qualitative data was collected. The population of the study comprises of physiotherapists, medical officers, nurses, consultant neurologist, clinical psychologists and other relevant health professionals working in some selected hospitals in Nigeria. Using purposive sampling technique, 12 respondents will be picked from the selected hospitals to make up the sample size of the study. Data was collected using in-depth interview, and text analysis will be used to analyze the responses from the interview.

The study findings revealed that majority of the hospitals especially in northern Nigeria that have physiotherapy units have physiotherapists. It was also discovered that the participants accepted that physiotherapy is not affordable to stroke patients at all levels in the country. The study findings revealed that the risk factors may include stress from day-to-day activities of the people, failure of government to provide desired leadership among others. The findings revealed that Nigerian hospitals do not have effective rehabilitation services on site where the rehabilitation of stroke patients are carried out.

The study recommends that primary prevention measures with emphasis mainly on more aggressive control of risk factors should be of utmost importance. There should be public awareness campaigns to educate

the public about stroke risk factors and their modifiability. The media, religious leaders, and community leaders could all be utilized. This will reduce both the prevalence and severity of stroke. There is an urgent need for better stroke care.

Objectives

- ✓ To measure and evaluate the affordability of physiotherapy for stroke patients at different levels of healthcare in Nigeria.
- ✓ To indicate challenges limiting the affordability of physiotherapy services.
- ✓ To measure the availability of physiotherapy in Nigerian public health system.

- Keywords: Affordability, Availability, Physiotherapy, Stroke, Health care, Nigeria.

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Introduction

Globally, stroke is a serious epidemic, and an expensive disease and usually causes disability. The disease is a one of the leading causes of mortality and morbidity in advanced countries, imposing enormous economic burden on individuals and society overall (Birabi et al., 2012). The emergence of stroke in developing countries like Nigeria has becomes a major concern. From human, family and societal perspectives, stroke is a costly disease. Humanly, the disease is one of the leading causes of death and disability. Statistics shows that about 16 million first-time strokes happen annually in the world, leading to a total of 5.7 million deaths (Strong, et al., 2007). As such, the disease ranks as the second cause of death in the world population after ischemic heart disease (Birabi et al., 2012).

However, 85% or more of all deaths resulted from stroke are registered in low- and middle-income countries, this also accounts for about 87% total losses because of stroke in terms of disability-adjusted life years, calculated worldwide, in 72 million per year (Lopez et al., 2006). Stroke has been a leading cause of long-term disabilities, ranging from motor control and urinary incontinence to depression and memory loss. The frequent leading cause is one-sided paralysis and speech difficulties depending on which area of the brain the stroke has occurred. Hence, stroke leads to functional impairments; with about 20% of survivors requiring institutional care after 3 months and 15% to 30% being permanently disabled (Furie et al., 2011). It also leads to limitation in range of motion of joints of the affected limbs and disuse atrophy of muscles which result in chronic pain.

Stroke is mainly categorizing into three major types: intracerebral hemorrhage (ICH), ischemic stroke (ISC), and subarachnoid hemorrhage (SAH), (Musbahu, 2011). The current and the prospects figures of stroke are

strictly related to the demographic transition, occurring in both developed and developing countries. Projection shows that stroke usually happens about 488 million who were aged 60 and above in 1990 and was estimated to be about 1,363 million people in 2030, with a percentage increase of 180%. World Bank Report (2009) shows that in 1990, advanced countries contained the 58% of the world's elderly, while in 2030 about two-thirds of the total elderly population will be dwelling in these countries.

The economic and social burdens associated with stroke are enormous and differ among people. The affordability of direct costs of providing medical care to patients and the indirect costs associated with loss of productivity becomes unbearable especially in developing countries. Studies of the economic burden of stroke typically use a prevalence-based approach to estimate the cost of stroke each year and often focus solely on the direct costs of care. Prevalence-based studies have been used to estimate the cost of treating stroke in Canada, Sweden, the United Kingdom, and the United States (Lopez et al., 2001). The Stroke Prevention Patient Outcomes Research Team conducted the most recent prevalence-based study of the cost of stroke in the United States, which estimated the economic burden of stroke to be $30 billion in 1993, with $17 billion in direct medical costs and $13 billion in indirect costs resulting from lost earnings (Lopez et al., 2001).

The facts and figures available may easily explain why the economic burden of stroke requires increased attention and more effective health care planning, implementation, and resource allocation. An international comparison of stroke cost studies revealed that national health systems spent 0.27 percent of their GDP on stroke, and stroke care accounted for 3% of total expenditures on health care (Strong, Mathers, & Bonita, 2007; Evers et al., 2004).

The total direct and indirect costs of stroke in the United States in 2008 were estimated to be $65.5 billion. Direct costs account for 67 percent of total costs and include the costs of physicians and other health professionals, acute and long-term care, medications, and other medical durables. The remaining 33% is due to indirect costs, such as lost productivity due to morbidity and mortality. (Rosamond et al., 2008). The total annual cost of stroke in 27 EU countries is estimated to be €27 billion: €18.5 billion (68.5 percent) for direct costs and €8.5 billion (31.5 percent) for indirect costs. A further €11.1 billion is estimated to be the value of informal care (European Cardiovascular Disease Statistics, 2008). When informal care is included in the total amount, the percentages change to 48.6 percent for direct, 22.3

The cost of physiotherapy for stroke patients has been studied in various countries. Most of these studies took place in high-income countries. Because of differences in therapeutic procedures and socioeconomic status, it is inappropriate to generalize studies on the affordability of physiotherapy from a high-income country to a low-income country. There are few studies assessing the affordability of physiotherapy for stroke patients at various levels of health care in Nigeria, and the proportion of stroke patients who use this service is unknown. As a result, the purpose of this study is to investigate the affordability of physiotherapy for stroke patients at various levels of health care in Nigeria, and 29.1 percent for informal care costs (Strong, Mathers & Bonita, 2007).

Chapter 1

LITERATURE REVIEW

Stroke

According to World Health Organization (WHO) stroke can be defined as is a syndrome of Symptoms that last 24 hours or more with no obvious cause other than vascular rapidly developing clinical symptoms and signs of focal (or global) loss of cerebral function with symptoms lasting 24 hours or more with no apparent cause other than vascular.

Morris et al., (2011) defined stroke as a non-communicable disease of global health importance. They assert that the disease was widely known as a medical emergency that can result in immediate loss of life or permanent neurological impairment. When blood flow into the brain stopped abruptly or slowed, stroke occurs, that is, when there is blockage or interruption in the supply of blood to the brain or bleeding into or around the brain due to a rupture in the artery (Grol, et al., 2013). According to WHO standard clinical definition, a stroke is reported when there is a sudden neurological disorder of vascular origin caused by an acute focal injury of the central nervous system lasting more than 24 hours or leading to death (WHO, 2016).

Stroke is the driving cause of inability and passing within the world. According to Komolafe et al., (2021) about 15 million cases of stroke occur worldwide each year and over one third of these cases are fatal. However, 2/3 of all cases of strokes are recognized to occur in advanced countries.

In the words of Kumar & Clark (2005), stroke ‘refers to a focal neurological deficit which results from a vascular lesion, usually characterized by rapid onset, and lasts more than twenty-four hours. They further classified stroke as complete when the neurological deficit reaches its peak, in-evolution

when signs and symptoms are getting worse, and minor or transient when a patient recovers without significant deficit.' Stroke could also be categorised into hemorrhagic and cerebral infarction.

The important associated factors include hypertension, diabetes, obesity, aging, previous stroke, estrogen containing some level of hormonal contraception, migraine with aura and thrombophilia and severe rare disorders (Gelb, 2005). The Framingham study which is on-going for the past decades established a strong association between obesity, cardiovascular diseases, and cigarette smoking with stroke and hence they are also risk factors (Framingham Heart Study, 2008).

In Nigeria, stroke cases have been put at 26/100,000. In Nigeria, the disease is a major cause of hospital admissions and deaths, accounting for 2.4 percent of emergency admissions and 17 percent of deaths (Komolafe et al., 2021) incidental stroke is due to modifiable risk factors while the recurrent stroke is 80% preventable through optimal risk factor modification. This study is predicated upon the fact that stroke In Nigeria, risk factors are frequently undiagnosed until a stroke occurs, which is often due to a lack of awareness of stroke risk factors and prevention.

Classification of Stroke

Apparently, there are two common types of strokes known globally; they are ischemic and hemorrhagic. It is very essential to differentiate between the main stroke subtypes to ensure provision of appropriate treatment to acute stroke patients (Donnan, et al., 2013). There is need for specialist skills to make such accurate differentiation and clinical epidemiological data shows that 20% of suspected stroke cases are misdiagnosed (WHO, 2006).

In 2010, stroke epidemiological studies revealed consistency in the dominance of ischemic stroke subtype that constitute about 80% of the

global reported stroke cases, while hemorrhagic stroke constitutes the remaining proportion. However, majority of the stroke-associated mortalities and disabilities are of hemorrhagic origin globally (Feigin, et al., 2015).

It was reported that the recurrence of ischemic stroke is 2% within the first seven days of stroke and 29% within the first 5-years after a stroke (Feigin, et al., 2015). The major difference exits in case fatality rates for ischemic stroke between HICs and LMICs. Proof from existing literatures revealed early case fatality in LMIC is comparatively 25% higher than HIC settings, with the distinction attributed primarily to improved care for acute stroke (Feigin, et al., 2015). Although the literatures do not show vivid support for any risk factor as a dominant cause of hemorrhagic stroke, some epidemiologic researches have implicated hypertension and high cholesterol levels (Bots, et al., 2002).

In Africa, even though ischemic stroke incidence surpasses that of hemorrhagic stroke, the percentage of hemorrhagic strokes is higher compared to most high-income regions ((Owolabi, et al., 2015). For example, it was reported in a study conducted by (Sarfo, et al., 2015) that though the incidence of hemorrhagic stroke in Africa was 34%, high income countries recorded only 9% hemorrhagic strokes. However, in Ghana, there is mixed proof related to which type is predominant. Some studies reported a higher prevalence of ischemic strokes, while others indicated hemorrhagic strokes are more common (Sarfo, et al., 2015).

Efforts to prevent or control stroke globally have been weakened by uncertain identification of its main risk factors. There is therefore the need to precisely identify the risk factors and ascertain how they contribute to the current stroke burden. The affirmed risk factors for stroke differ (Norrving, 2014). Furthermore, evidence from the inter-stroke provides a wide-ranging

overview of the main stroke risk factors which revealed that ten main risk factors contribute to 90% of all stroke cases worldwide. They include physical inactivity, psychosocial factors, diabetes mellitus, hypertension, smoking, obesity, and excess alcohol intake and apolipo proteins. Some researchers like Kikano, (2017) argued that there five key significant factors of health interest and they include hypertension, diabetes, lack of physical exercise, atrial fibrillation, and smoking (Sacco, et al., 2013); which collectively contribute to about two-thirds of the world stroke cases. In Nigeria and other African countries according to Aikins (2014), common identified stroke risk factors comprised of hypertension, physical inactivity, smoking, diabetes, and high cholesterol intake. Among these risk factors, the predominant is hypertension accounting for 60 to 70 percent of stroke cases worldwide (Owolabi, et al., 2015). It is believed that individuals with hypertension are predisposed to stroke by an odds ratio of 2.6. Yet, few people are aware of their hypertensive state,and many remain undiagnosed. This is more common in low- and middle-income countries such as Nigeria where recent studies indicate low awareness of hypertension.

Epidemiology of Stroke in Different Countries and Nigeria

Globally, there are 17 million strokes every year, 1 stroke in every 2 seconds, 6.5 million deaths every year and 26 million stroke survivors annually (Akinyemi, 2016). Recent reviews of stroke epidemiology have stressed the need to provide current and accurate prevalence data from developing countries, where the burden and mortality from stroke are projected to be on the rise. Epidemiological studies have revealed risk factors of stroke for many years. They were categorized into the modifiable and non-modifiable risk factors. The modifiable common risk factor is

hypertension. The non-modifiable common risk factors are older age, male gender, black race, and family history. Other common risk factors include cardiac disorders, vasculitis, heavy alcohol consumption diabetes mellitus, central obesity, dyslipidemias, and cigarette smoking (Smith et al, 2005). Further well renowned risk factors are vasculitis lesions Sickle cell disease, oral contraceptives, and hypercoagulable states. Lately, hyperhomocysteinemia and HIV have been revealed as novel risk factors for stroke (WHO report, 2010). The renowned risk factor in Nigeria remains hypertension. Other common risk factors in Nigeria are Diabetes mellitus, central obesity, cardiac disease, previous stroke, and HIV (Ekels, 2013). Africans are revealed to have a larger burden of stroke. Equally, there are more severe strokes seen in Africans than in other races. Mortality is also considered to be escalating in blacks' populations than other races. These variations in the burden, hardness, and death of stroke are seen even in biracial studies (Eken & Ekrikpo, 2014). The fatality rate of stroke in Africa is approximately 35%, but it can be as low as 14.9 percent or as high as 77 percent when caused by cerebral hemorrhage (Odusote, 2009). In Nigeria, the death rates are very high with a range of 21% to 45% (Wahab, et al., 2008). It is commendable to know that most of the deceased patients in the Nigerian studies died within the acute phase (Njoku, 2004). Mortality and morbidity after stroke have been shown to arise from complications. The post-stroke difficulty is a leading cause of death responsible for 23-50% of total mortality in patients with ischemic stroke. These involve both medical and neurological difficulties. Neurological complications usually are responsible for the worsening seen during the acute phase (Balami, et al., 2011).

Forecast of stroke mortality have been revealed in different literatures. Older age (age>60 years) has been shown to be a predictor of mortality (Lango, et al., 2004). This was however not the case in another study (Anderson et al., 1997). Furthermore, the effect of sex on the outcome of stroke is varied. Some literatures have noted that females have increased mortality and a lower one-year survival (Garbunsinski, et al., 2015). While another study noted male sex to be a poor predictor (Brott et al., 2017). Moreover, there was another study that had an inconclusive result (Garbunsinsk and Beeching, 2007).

In stroke epidemiology studies and clinical trials, stroke death is a significant outcome measure. As a result, data on stroke mortality is critical for tracking disease trends and planning public health interventions. The knowledge gained in this study regarding death predictors will be useful in the management of patients, particularly in the emergency services in acute stroke. This will result in a reduction in stroke mortality and disability, as well as being useful in Nigerian health planning and promotion.

Although some literatures with regards to sub-Saharan Africa have indicated an increase in stroke mortality over time, few studies from Tanzania and Seychelles revealed a decrease in trends of stroke mortality (Stringhini et al., 2012; Walker et al., 2000).The studies prove that stroke death differed from 1.9% in Usman Danfodiyo University Teaching Hospital, Sokoto (Nigeria) to 75.0% in Royal Victoria Hospital, Gambia (Njoku and Aduloju, 2004; Walker et al., 2003) Concerning the rate of death, research in Ghana showed that majority of deaths (62.1%) which happened within the researchPeriods occurred within the first seven days of the onset of the stroke (Agyemang et al., 2012).

Moreover, stroke deaths in Seychelles lower from 0.25% in males and 0.14% in females' populations in 1989-1991 to 0.14% in males' populations and 0.09% in females in 2008-2010 (Stringhini et al., 2012). Stroke mortality in Tanzania falls from 0.07 percent in males and 0.09 percent in females in 1992-1993 to 0.04 percent in males and 0.03 percent in females in 1994-1995. (Walker et al., 2000). Males died from strokes at a higher rate, according to two studies from Seychelles and Tanzania.

The determinants of stroke mortality from the reviewed studies included: age (young), sex (male), low socio-economic status (SES), being a migrant, ischemic stroke, heart rate (100 bpm), age (60+), systolic BP (>160 mmHg) and fibrinogen (400 mg/dl and above) (Appendix 3).

In addition, some studies examined the case fatality rate (CFR) of stroke and different periods were examined in these studies (Table 2.3). The 7-day CFR scope is from 32.7% in Ghana to 35% in Zimbabwe (Agyemang et al., 2012; Matenga, 1997). CFR ranged from 23.8 percent in Tanzania to 49.6 percent in Mozambique, according to studies that looked at 28-day mortality. Further, three-month CFR varied from 25.5% to 30% in South Africa (Mudzi et al., 2012; Wasserman et al., 2009). A community-based study in Tanzania showed that the three-year CFR was 60% (Walker et al., 2011). The predictors of case fatality rate recognized from these studies include hypertension, fatness, smoking (Mudzi et al., 2012), stroke severity, hyperglycemia, stage of consciousness of the stroke survivors, presence of difficulties during hospitalization (Wahab et al., 2008), aging population, and ischemic stroke (Longo-Mbenza et al., 2008).

Many of the studies examined showed high stroke mortality. This is consistent with what Feigin et al (2013) found that stroke mortality has increased significantly between 1990 and 2010 globally, and the main

contributors are low-income and middle-income countries. However, studies from Seychelles and Tanzania showed a decrease in stroke mortality over time. A plausible reason for the decrease in stroke mortality in Seychelles over time may be that compared to many of the other SSA countries, the programs on non-communicable diseases in Seychelles may have been effective. As a result, this may mean that the national program for the prevention and control of cardiovascular disease (CVD) which was launched in the country in 1991 has been effective (Gervasoni et al., 1991). Particularly, the main aim of this program was to establish a community-based program that focused on the promotion of healthy lifestyles and control of risk factors of chronic diseases in the population (Gervasoni et al., 1991). This program had three overlapping areas of intervention: 1) Training of health workers; 2) health policies, and 3) intervention in the population. Firstly, the program aimed at improving the knowledge of health workers on cardiovascular disease as well as providing basic medical materials (scales, mercury, sphygmomanometers, glucometers, etc.) in all hospitals and clinics in the country. The provision of these medical materials was partly to ensure diabetes and hypertension control in the country.

Secondly, this program aimed at lobbying policy makers to develop health-oriented policies which targeted reduction in smoking and alcohol consumption and promotion of good diet and physical activity. Thirdly, this program intended to develop and disseminate attractive, health related education material (on diet and physical activity) on the television and other media sources; schools; clubs and working places (Gervasoni et al., 1991). Consequently, this programmed may have enhanced the life expectancy of people living with stroke in this country, thereby reducing stroke mortality over time.

This review further indicate decline in stroke death in Tanzania. It is very significant to know that Tanzania is one of the earliest countries where the burden of stroke was first reported; it may be that the programmed on Non communicable Diseases (NCDs) have been effective in reducing the burden of stroke in the country. For instance, the healthcare sector in Tanzania contains the avoidance and control of NCDs as their main target (Metta et al., 2014); the government has also agreed and approved the WHO's framework Agreement for Tobacco (FCTC) in 2004, thus decreasing the demand and supply of tobacco and alcohol (Halabi, 2010). Excise taxation on tobacco and alcohol has also been put into law to lower the consumption of these products (Metta et al., 2014; Osoro et al., 2001). Additionally, the official shave established zero tolerance plans for drinking and driving; supporting of alcohol advertising and sponsorships and reducing for on and off-premises sales of alcoholic beverages (Metta et al., 2014). A National Nutrition Policy that investigates to be sure the nutritional position of all citizens of Tanzania throughout their entire life cycle is in order in the country (Tanzania Ministry of Health and Social Welfare, 2013). The decline in stroke mortality in Seychelles and Tanzania therefore indicates that with effective program on NCDs being initiated and implemented in sub-Saharan Africa, the rising levels of stroke can be halted.

In a study managed in Nigeria, it was unveiled that needs for Physiotherapy is on the high rise due to the growing aging population and resulting in disability and death. But the expenses of healthcare in developing countries are elevating, and healthcare amenities are short in the supply of Physiotherapy services are demanding in rural communities. The availability of physiotherapy may aid in the reduction of disability burdens while also boosting and improving the efficiency of healthcare systems. This study

investigates the main characteristics and alliances of community physiotherapy utilization and supply in Nigeria. The study acquires cross-sectional review of 336 approved community dwelling individuals' people from three chosen communities in Nigeria. A three-section certified self-developed questionnaire which looks for information on socio-demographics, operation, and supply of community Physiotherapy, as well as how to boost the community Physiotherapy services was used.) The primary design unit in the study was a household. The data was collected using expected and illustrative statistics. According to the findings, the lifetime, 12-month, and point utilization of physiotherapy were 21.7, 7.4, and 2.7 percent, respectively. The operation of physiotherapy is crucial in dealing with education level (p=0.007), pain belief as "spiritual" (p=0.020), and religious belief (p=0.001). Informants with primary, secondary, and tertiary education were 14.3, 13.9, and 26 times more likely, respectively, to use. Those who 'agreed' or were 'unsure' that their religious beliefs were anti-physiotherapy were 92 and 83 percent less likely to use it, respectively. Physiotherapy services, respectively than those who 'disagree'. Physiotherapy services were mostly available and pro. The larger part of physiotherapy administration in communities were given on a transitory premise (24.7 percent) and by going physiotherapist (21.4 percent) Exercise (46.6 percent) and soft tissue mobilization were the most used physiotherapy treatments (41.1 percent). Travel expenses (32.6 percent), time constraints (27.9 percent), and work commitments (24.8 percent) were the constraints for Physiotherapy operation, while positive beliefs and higher education improved Physiotherapy utilization. According to the study, utilization, and supply of physiotherapy services in Nigerian rural communities were low. The small operation of physiotherapy services in Nigerian rural communities

was primarily governed by low educational report and pain beliefs. Vided at township teaching hospitals (47.9 percent) and private hospitals (20.5 percent).

Stroke popularity ratio in urban Nigeria is lower than compared to those in most of the developed countries. The lower rates may be related to lower incidence and higher stroke mortality in developing countries (Danesi, Okubadejo and Ojini, 2007).

A study of rural community based in Southeastern Nigeria revealed that the prevalence of hypertension was 46.4% while another rural study in Southwestern Nigeria puts the prevalence of undiagnosed hypertension at 37.7%. Further modifiable risk factor for stroke is obesity. A recent met analysis including more than 2 million American subjects as reported by Prabhakaran and Chong, (2017) concluded that the relative risk of ischemic stroke was 1.64 in obese versus healthy subjects and 1.22 in overweight versus sound subject. Corpulence is predominant in Nigeria with predominance rates of overweight and weight evaluated at 20.30 and 12.5%, separately, in a later huge community-based study of grown-up inhabitants of a semi-urban Nigerian community. Obesity prevalence may, however, be as high as 30% as shown in another study from a rural Nigerian community.

Information from Hospitals in Africa are usually unrepresentative of disease pattern in communities because of selection biases. The male sex, high social classes, high income groups, disempowered groups especially women, children, and the poor easy accessibility and proximity of hospitals and other health care facilities and interests of health care providers are some of the obvious factors which determine utilization of hospital facilities. Nevertheless hospital-based data may give some limited indication of the frequency of a disease such as stroke. Hospital based information on stroke

have been reported from several Sub-Saharan African countries including Ethiopia, Gabon, Ghana, Ivory Coast, Kenya, Niger, Nigeria, South Africa, Tanzania, Uganda, Zambia, and Zimbabwe.

In contrast with communities in the advanced countries, a comparatively high percentage of young Africans appear to suffer from stroke. Cerebral hemorrhage appears to occur in a younger age group than no embolic cerebral infarction (Benjamin, 1994). It was reported by James (1975) that mean ages among Ugandans for SAH, CH and CI as 35, 40, and 42 years respectively. In Senegal, 10% of stroke patients were under the age of 30 years. Even though the peak prevalence for CI (NE) and CH occurred in the seventh and sixth decades, respectively, 17 percent and 20% of stroke patients in one Nigerian study patients with CI (NE) and CH were under 40 years and so were 70% of those who suffered from SAH (Benjamin, 1994). The apparent high frequency of stroke in young Africans may be an artefact as life expectancy is about 50 or less in most communities, and the percentage of the population under the age of 40 years may be as high as 80% or even higher. This view is further supported by the findings in the community-based stroke registry in Ibadan Nigeria which showed that the age specific incidence rates of stroke in Nigerian Africans in those below 40 years were in fact lower than in Caucasians and Japanese.

In a study conducted in Harare, Zimbabwe, first-ever strokes in black Zimbabweans who had lived in Harare for 6 months or more were discovered using several methods, including a daily review of patients with stroke in medical wards in the four hospitals serving the population, as well as a monthly inspection of the post-mortem register and a check of emergency department records for any patients in whose stroke was discovered at autopsy. The attending physician diagnosed stroke and

reviewed the diagnosis with the investigator in difficult cases. There were no CT scans of the patients' brains. The annual stroke incidence was 31 (95 percent confidence interval 27-34) per 100,000 people. When the incidence was normalized to the global population, it was 68 per 100,000. South African6 researchers estimated the incidence of first-ever and recurrent stroke from hospital admission data for stroke patients and discovered a crude incidence of stroke of 101 per 100,000 in a population aged 20 and up (92 of 116 had CT scans). Both studies found a significant increase in incidence with increasing age. In Sub-Saharan African studies, age-specific stroke incidence is higher in younger age groups than in the UK Oxford Vascular Study, but lower in black people in the Northern Manhattan Stroke Study (Sacco, et al., 2013). The Grown-up Dreariness and Mortality Venture (AMMP) was completed within the early 1990s and comprised of three extended ranges: one urban (Dar-es-Salaam) and two countries (Hai and Morogoro). Censuses were conducted once a year in the two rural areas and once every six months in Dar-es-Salaam. The age-standardized and age-specific mortality rates for all three areas for the 10-year age bands up to age 65 years for the three-year period beginning in July 1992.Were elevated than similar data from 1993 in England and Wales, and the greater number of stroke patients died in the outdoor hospital care. In the Hai study population, the overall prevalence of stroke-related impairment and disability was 127 per 100 000 for those aged 15 and over, and 566 per 100 000 for those aged 55 and over. These figures are lower than those from developed countries, perhaps because fatality from stroke is higher in sub-Saharan Africa than in developed countries (Walker, et al., 2010).

Treatment Options Available for Stroke

Stroke treatment is an important component of stroke care. However, the layout, referral pathways, extent of integration into stroke units or stroke multidisciplinary teams, and the time spent on rehabilitation varies widely across the globe. Ideally, stroke treatment should start as soon as possible after a stroke, preferably within a stroke unit, with the aim of achieving early mobilization to reduce complications. However, studies of treatment in African stroke units are scarce. Furthermore, the numbers of stroke rehabilitation professionals, including physiotherapists, occupational therapists, and speech and language therapists, seem to be insufficient (Akinyemi, et al., 2021).

The World Health Organization (WHO) in 2017 launched 'Rehabilitation 2030: a call for action', which emphasizes the need for all nations to scale up treatment services and support the use of health information systems to improve patient follow- up for treatment both within hospitals and in the community. Our daily experience in our stroke care practice in Africa indicates that rehabilitation usually begins shortly after admission and is usually supervised by physiotherapists who are assisted by occupational therapists, speech therapists and social workers. Stroke rehabilitation in Africa is frequently provided in a general medical setting by professionals who also see patients with other conditions. A review published in 2020 identified poor physician knowledge in the role of rehabilitation, lack of rehabilitation components in the standard of care, long interval from stroke onset to rehabilitation, short duration of rehabilitation and poor financial support of rehabilitation services as inherent problems in the rehabilitation landscape in Africa (Bernhardt, 2020). In view of this, the responsibility of post-discharge rehabilitative care of patients with stroke falls on family members and caregivers. Task shifting and tele-health approaches have been

suggested as strategies to mitigate the current scarcity of rehabilitation personnel and improve access to stroke rehabilitation in Africa (Chimatiro, et al., 2019). A study of family- led rehabilitation after stroke was performed in India and this option could also be explored in Africa (Pandian et al., 2017). In a prospective, single- arm, pre–post study, 20 survivors of stroke recruited from a tertiary medical center in Ghana received a smart phone with the 9zest Stroke Rehabilitation Therapy app (9zest) to deliver an individualized, goal- targeted exercise programmed 5 days a week. Rehabilitation was remotely supervised by a tele-therapist for 12 weeks. The study demonstrated the feasibility of administering a mobile health-delivered physical therapy intervention in sub- Saharan Africa, with high user satisfaction (Sarfo, et al., 2018). Present studies include the MAMBO (Measuring Ambulation, Motor, and Behavioral Outcomes with post- stroke fluoxetine in Tanzania), which aims to determine the safety and efficacy of fluoxetine among Africans with acute stroke and to establish whether the treatment is associated with any improvement in motor outcomes (Vogel, et al., 2020).

Approximately 35% of people who have initial leg paralysis do not regain useful lower extremity function, and 20 to 25% are unable to walk without full physical assistance (Infield, et al., 1995). Six months after a stroke, approximately 65 percent of patients are unable to resume normal activities with the affected hand. Comprehensive rehabilitation after a stroke is required to reduce disability and maximize functional recovery.

Patients who have had a stroke typically spend four to five days in the intensive care unit. Patients who present early may benefit from acute intervention with intravenous or intra-arterial tissue plasminogen activator (tPA) and/or mechanical thrombectomy. Rehabilitation therapy should

ideally begin within 24 to 48 hours of admission. Swallowing is evaluated to see if there is a risk of dysphagia or aspiration. The occupational therapist initiates the self-care assessment, and the physical therapist begins working on mobility. Speech pathologists treat communication and cognitive deficits. A physiatrist (physical medicine) consult is warranted at this time for a more specific assessment of therapy needs and functional potential. Following discharge from acute care, the patient will receive additional therapy in an outpatient or inpatient setting, depending on his or her functional needs and medical stability.

Early detection of aspiration risk can help reduce the complications of post-stroke swallowing problems. Management of communication barriers caused by aphasia or cognitive impairments can alleviate feelings of isolation associated with a communication disability. Counseling can reassure family members by providing compensatory communication strategies, which are also beneficial to other members of the health care team.

The rehabilitation of visual impairments entails training in the reacquisition of visual discrimination ability as well as instruction in compensatory strategies to reduce more permanent visual field limitations. These impairments can have an impact on all aspects of stroke rehabilitation. The treatment of visual perceptual deficits is shared by an occupational therapist and a speech-language pathologist. Deficits in the visual field can impair performance in functional daily activities and limit the efficient use of visual language. The occupational therapist assists the stroke survivor in making better use of incoming visual information for better performance of daily living tasks such as eating, bathing, and dressing. The speech-language pathologist teaches the stroke survivor how to interpret visual language for

use in reading newspapers, traffic signs, medication labels, calendars, restaurant menus, and other printed materials.

Stroke rehabilitation is based on two distinct but related concepts. The first concept is to create techniques to compensate for the deficits caused by the stroke. For example, one of these techniques could be learning to use the unaffected upper limb and hand to perform two-handed tasks with one hand. To lessen the impact of the deficits, modifications to the home and community, as well as adaptive equipment, may be required. The second concept is to maximize functional recovery from the deficits caused by the stroke. This review will concentrate on the theories underlying functional recovery after a stroke, as well as the therapeutic techniques used to enhance functional recovery (Steinle & Carbaley, 2011).

Emergency management of Acute Stroke

Studies revealed that patients with acute stroke can be treated with the same concern as patients with serious trauma or acute myocardial infarction, despite the severity of neurological deficits. The first assessment of a possible stroke patient is the same as that of other seriously ill patients: instant stabilization of the airway, breathing, and circulation (ABCs). This is followed by a short history and the single most vital part of historical information is the time of symptom onset. For patients not capable of supplying this information or who awaken with stroke symptoms, the occasion of start is explained as when the patient was last awake and symptom free or known to be “normal.” The general objective is not simply to discover patients with a likely stroke but also to keep out stroke imitates (Hypoglycemia, and Migraine with aura, Seizures, hypertensive, and Wernicke’s encephalopathy). It is imperative to inquire about menace aspects for arteriosclerosis and cardiac sickness, as well as any history of

seizure, infection, drug abuse, migraine, trauma, or pregnancy. Pastin formation concerning eligibility for therapeutic interventions in acute ischemic stroke is equally significant. The early neurological assessment should be pithy but systematic. Formal stroke scales, such as the National Institute of health stroke scale (NIHSS) may be carried out speedily, have showed utility, and may be given by a wide spectrum of healthcare providers. Use of a standardized evaluation and stroke scale helps enumerate the number of neurological shortfalls, facilitate communication, discover the position of vessel occlusion, offer early prognosis, help choose patients for diverse interventions, and discover the possibilities of impediments. Moreover, the blood samples should be collected in the emergency department and the lab should be alerted.

Parenchymal brain imaging

Non enhanced CT (NECT) keeps out parenchymal hemorrhage. NECT may reveal slight noticeable parenchymal injury in 3 hours. Its widespread instant accessibility, relative ease of elucidation, and gaining speed make NECT the most frequent modality used in acute ischemic stroke imaging. ASPECTS (Alberta stroke program early CT score) is a 10-point quantitative score used to detect early ischemic changes in patients suspected of having an acute large artery anterior circulation stroke (Figure 4). An aspect of 10 represents a normal CT scan. When there is evidence of early ischemic change in any of the ten regions, one point is deducted. As a result, the lower the aspects, the greater the extent of ischemic damage.

Acute Reperfusion therapies

There is unequivocal evidence that intravenous thrombolysis with rtPA and endovascular thrombectomy with a retrievable stent improves neurologic outcomes in patients with acute ischemic stroke. Both treatments, which can

be combined and are safe in appropriately selected candidates, should be administered as soon as possible after the onset of the stroke. After recanalization, IV thrombolysis and mechanical thrombectomy can cause reperfusion injury. Hemorrhage and edema can occur because of reperfusion damage. When the area of established infarction is larger, it is more severe. To avoid this complication, good patient selection and prompt treatment are essential.

Secondary prevention of stroke

Secondary stroke prevention is a personalized clinical approach to lowering the risk of recurrent stroke and other vascular events in people who have already had a stroke or transient ischemic attack. Acute care, stroke prevention clinics, and community-based care settings can all address secondary prevention recommendations. For patients with a prior history of stroke, a healthy lifestyle that includes a healthy balanced diet, exercise, weight control, and the reduction and avoidance of alcohol and tobacco reduces the risk of an initial stroke as well as the risk of a subsequent stroke. Numerous population-based studies have discovered that high blood pressure is a significant risk factor for both first and recurrent stroke. While the optimal target blood pressure to prevent a first or recurrent stroke has not been formally established, the current treatment recommendation for people who have had a cerebro vascular event is to maintain a blood pressure consistently lower than 140/90 mm Hg. Serum lipid levels in patients who have had an ischemic stroke or transient ischemic attack should be measured and aggressively managed. Lipid levels, including total cholesterol, total triglycerides, low-density lipoprotein (LDL) cholesterol, and high-density lipoprotein (HDL) cholesterol, should be measured in all stroke or transient ischemic attack patients. Treatment to more aggressive targets (LDL-C

70mg/dl or >50% reduction) should be considered for individuals with stroke and acute coronary syndrome or established coronary disease. Patients who have had an ischemic stroke or a transient ischemic attack should be tested for diabetes using fasting plasma glucose, 2-hour plasma glucose, or glycated hemoglobin (A1C). Lowering A1C values to 7% / fasting plasma glucose of 72-126mg/dl and 2-hours postprandial plasma glucose of up to 180mg/dl in both type 1 and type 2 diabetes, as well as stroke or transient ischemic attack, provides significant benefits for the prevention of micro vascular complications. Anti-platelet therapy should be prescribed to all patients who have had an ischemic stroke or a transient ischemic attack as secondary prevention of recurrent stroke. Patients who have had a transient ischemic attack or a stroke and have non-valvular atrial fibrillation should be given oral anticoagulation. To minimize adverse events in patients with atrial fibrillation who are taking warfarin, careful dosing, and consistent international normalized ratio (INR) monitoring are recommended; warfarin efficacy is dependent on maintaining therapeutic INR control (INR range 2.0–3.0; in the presence of mechanical valve, range 2.5–3.5), and declines significantly when the international normalized ratio falls below 2.0. Patients who have had a recent transient ischemic attack or a non-disabling stroke and have ipsilateral significant symptomatic carotid stenosis should be evaluated by a stroke expert, and selected patient's Carotid endarterectomy (revascularization) should be offered as soon as possible. Dual antiplatelet therapy combined with aggressive management of all vascular risk factors, including blood pressure, lipids, diabetes mellitus, and other at-risk lifestyle patterns, is recommended in patients with intracranial atherosclerotic disease. These secondary prevention strategies should be implemented under the supervision of a doctor.

The Role of Physiotherapy in Rehabilitation of Stroke Patients

Physiotherapy is essentially dealt with the provision of care and services to ill or injured individuals, to maintain, develop and restore optimal movement and useful ability throughout natural life (Ghana Physiotherapy Association, 2014). It is concerned with the provision of physical care in conditions where standard locomotion and function are endangered by the process of aging, injury, or disease.

Physiotherapy involves spotting and maximizing movement potential in the areas of promotion, prevention, treatment, and rehabilitation (Ghana Physiotherapy Association, 2014). Physiotherapy is certainly one of the key elements of rehabilitation for stroke patients and has over the years proven to make optimistic effect on the outcome of most stroke patients (Davidson & Waters, 2000). Therefore, its roles cannot be overstated.

First, stroke rehabilitation care concerning physiotherapy decreases mortality as compared to standard care (Foley et al., 2007). Physiotherapy's role in stroke rehabilitation has to do with improvement of functional outcomes for patients (Ottenbacher & Jannell, 1993).

Furthermore, stroke rehabilitation involving physiotherapy stops the reappearance of acute stroke events and supports the individual's ability to live independently through planned and targeted interventions aimed at improving balance, strength, coordination, and function. It is thus a key component in the continuum of care by providing support in the transition from hospital to home. More so, physiotherapy services following stroke decreases the risk for poor health outcomes, enhances and promotes personal activities of daily living and cuts the costs to the health care system (Ontario Physiotherapy Association, 2013). Physiotherapy at the OPD level is reported to be cost-effective and estimated to be around $2000 per patient

for 8-12 weeks of therapy compared with 2-3 weeks at a cost of about $10,000 per patient at the in-patient level in Canada. Physiotherapy following stroke has a positive impact on disability, physical and social function and quality of life and reduces the risk of poor health outcomes. Therefore, increasing the availability of outpatient physiotherapy resources for stroke patients would lead to significant savings and an increase in the effective use of health care resources.

Approaches to Physiotherapy Rehabilitation for Stroke Patients

The common prototype of care for people who suffer stroke is admission to hospital followed by a period of multidisciplinary rehabilitation with physical management conducted primarily by physiotherapists (Wiles et al., 2004). There are substantial doubts in the physiotherapy line of work about the best possible timescale and success of physiotherapy involvements due to scarcity of research and distinctions in evidence as to the type or approach to physiotherapy treatment after stroke.

However, irrespective of the handling approach, the prime goal remains to attain sensory motor control of the upper and lower limbs; sitting and standing, balance and dexterity; mobility; activity within daily living and health related quality of life (Pollock et al., 2008). In addition, the type of approach depends largely on the extent to which a physiotherapist's skill has a bearing on a patient's outcome and whether the functional outcome of the patient is directly related to the amount of treatment received (Khan et al., 2012). Pollock et al., (2014) identified the common approaches to physiotherapy rehabilitation. Orthopedic approach primarily consists of corrective exercises related to contraction and relaxation of muscles with emphasis on regaining physical function. This approach focuses on re-establishing function to the musculoskeletal system involving joints,

tendons, ligaments, and bones. The methods and strategies commonly used include stretching (lower and upper limbs mobilization exercises), strength training, endurance exercises (bracing), hot and cold packs, ultrasound, electrical muscle stimulation and joint mobilization through progressive strengthening exercises (Pollock et al., 2014: Ping et al., 2014). Unlike the Orthopedic approach, neurological/neurophysiological approach involves interventions in the recovery of the paretic side. This is the most popular approach used in rehabilitation of stroke patients. It is also known as the Bo bath method (Davidson & Waters, 2000). Physiotherapists using this approach concentrate on teaching stroke patients to adapt to mobility, balance, visual, muscle loss impairments for activities of daily living (Pollock et al., 2008). Geriatric approach on the other hand deals with special and unique movement needs of patients. The goal of geriatric physiotherapy is to help regain mobility, reduce pain, accommodate physical limitations, and increase physical fitness of stroke patients (Pollock et al., 2014).

Cardiopulmonary Approach focuses on assisting patients who suffer from cardiovascular and pulmonary conditions, such as heart attacks, chronic obstructive pulmonary disease (COPD), and pulmonary fibrosis. The aim is to increase endurance and improve functional independence of patients (Davidson & Waters, 2000). Ping et al., (2014) identified other approaches such as proprioceptive neuromuscular facilitation (PNF), the motor learning approach, and the functional approach. The Bobath concept is most widely preferred approach and used by physiotherapists as a technique to aid patients to regain movement and balance control, as well as mobility, using sensorimotor key points of control and reflex-inhibiting pattern control of the affected limbs and trunk (Davidson & Waters, 2000: Ping et al., 2014).

The PNF involves the use of proprioceptive stimulation to strengthen and relax a particular group of muscles and advocates the use of peripheral inputs, such as stretch and resisted movements to reinforce the existing motor response and mostly used for stroke rehabilitation by physiotherapists in India (Khan et al., 2012). The emphasis of the motor relearning approach is task specific training and involves usually given feedback to patients during the practice of context-specific motor tasks aims at promoting learning and motor recovery. It essentially aims at improving the smoothness and accuracy of movement (Ping et al., 2014). The principle of the functional approach is to use the remaining motor capabilities of a patient to compensate for those that were lost.

This approach's treatment strategies include task-specific training and drilling on the task or a portion of the task, such as bed to chair transfer, walking, and stair climbing strengthening exercises. Research indicates that a combination of approaches such as manual therapy, acupuncture, transcutaneous electrical nerve stimulation, hydrotherapy as well as task-oriented training, gait training, balance training, and constraint-induced movement therapy is crucial to induce improvement in functional outcomes of rehabilitation of stroke patients (Ping et al., 2014: Jetta et al., 2005). This study, therefore, aims at determining the approaches or modalities being used by physiotherapists in the rehabilitation of stroke patients at Tema General Hospital.

Availability of Physiotherapy in Nigeria

Physiotherapy services are available in secondary and tertiary hospitals in Nigeria's public health sector. Patients in public health facilities frequently receive their first access to physiotherapy services through a physician referral. In Nigeria, however, patients of both private and public health

services can refer themselves to a physiotherapist without first consulting another health professional (Nigeria Society of Physiotherapy, 2021).

In Nigeria, physiotherapists have clinical autonomy; they can assess patients, make diagnoses, provide treatment and/or prevention services, and refer patients to other health care providers (Nigeria Society of Physiotherapy, 2021). Furthermore, physiotherapists are permitted to provide private services to patients if they maintain their registration/licensure.

Therapist Preparation (Degree/Credentialing)

In Nigeria, entry-level physiotherapy education is a 6-years Doctor of Physiotherapy programme (Medical Rehabilitation Therapists (Registration) Board of Nigeria, 2021). Only seven universities presently run entry-level physiotherapy programmes, and four of them also have postgraduate (Advanced Masters and Doctor of Philosophy) physiotherapy courses.

New physiotherapy graduates must complete a one-year internship in an accredited hospital. Successful completion of the clinical internship qualifies you to apply for a full practicing license, which is renewable on an annual basis. The Medical Rehabilitation Therapists Board of Nigeria (MRTB) regulates physiotherapy and other rehabilitation professions' academic and internship programs, as well as clinical practices (Medical Rehabilitation Therapists (Registration) Board of Nigeria, 2021).

Specialization

In Nigeria, physiotherapy specialization is typically obtained through post-graduate physiotherapy studies. Special Groups of the Nigerian Society of Physiotherapy include**:**

- ✓ Musculoskeletal Physiotherapy
- ✓ Cardio-Pulmonary Physiotherapy
- ✓ Pediatric Physiotherapy

- ✓ Neurological Physiotherapy
- ✓ Exercise and Sports Physiotherapy
- ✓ Women's Health Physiotherapy
- ✓ Community Physiotherapy
- ✓ Palliative Care Physiotherapy

Professional Associations

Evidently, there are approximately 2,450 registered physiotherapists working in Nigeria today. The Nigeria Society of Physiotherapy (NSP), Nigeria's main professional association of Physiotherapists, was founded in 1959, was recognized by the federal government in 1962, and became a member of World Physiotherapy in 1967. As of 2020, the NSP had 722 physiotherapists as members.

Availability of Health Access to Health

The World Health Organization has advocated for equitable access to health, which is defined as "the capacity and opportunity for all individuals to access health care services of comparable quality, regardless of barriers" (WHO). Health systems all over the world are working to improve access to health care and the effectiveness of healthcare delivery systems. Unfortunately, anecdotal evidence suggests that Nigeria, particularly in rural communities, has yet to achieve universal healthcare coverage. Most Nigerian communities are rural, with low living standards and an aging population with disabilities (Owolabi, et al., 2015).

According to reports on increasing demand for Physiotherapy services globally, living with a disability among rural dwellers is a key factor that may lead to an increase in the utilization of healthcare, including Physiotherapy, among the population. According to the literature, the

increased use of physiotherapy is primarily due to an aging population, population growth, rising incidences of chronic disease, and survival from accidents or illness (Komolafe et al., 2021). Because young adults are also at risk for chronic diseases and accidents, their demand for or use of physiotherapy is not well documented. Young people are at a higher risk of morbidity and mortality because of violence, mental health, and reproductive health issues, which may necessitate physiotherapy. To facilitate resource allocation for effective physiotherapy services, information on utilization, access to, or factors restraining physiotherapy provision among this age demographic is required.

The demand-supply imbalance for physiotherapy services is a critical shortcoming in Sub-Saharan Africa. Even though the number of practicing physiotherapists has increased in some countries, workforce growth is unlikely to compensate for current or future shortages. This is since physiotherapy services (or supply) have not kept up with rising demand, creating an access (right to use) challenge in most settings. In general, the factors influencing the utilization and supply of physiotherapy services vary greatly across countries. Some of these factors include an aging workforce and attrition, a lack of or poor remuneration and recognition, workforce shortages, a lack of locum opportunities and rural-urban related factors, cost, waiting time, location, travel burden, flexibility in work hours, professional support and development, and practice autonomy.

Other factors include overwhelming workloads, limited access to continuous professional development and limited opportunities for career advancement, a lack of employment opportunities for partners, a perceived scarcity of high-quality secondary schools, and a desire to travel. Furthermore, context-specific factors contributing to the demand-supply gap in physiotherapy

services in Nigeria include a lack of physiotherapy services, inadequate knowledge of the scope and role of physiotherapy, and incongruous health outcomes seeking behavior and stigmatization, and poor referral. Anecdotally, the use of mobility aids such as walkers, canes, crutches, and other assistive devices is viewed negatively in the Nigerian context, as users are viewed and judged negatively related to, as significantly disabled, like accounts reported among rural and minority populations in other studies. Limited availability or nonexistence of Physiotherapy services seems to be more apparent in rural than urban settings in Nigeria, as most Physiotherapy facilities are in urban cities, like reports from developing countries. Workforce misdistribution and lack of incentivization and required skills to practice remain as challenges to having equitable Physiotherapy services in rural population, especially, in the resource-constrained countries.

According to the Australian Physiotherapy Association (2019), employers of physiotherapists in rural and remote areas frequently struggle to recruit and retain physiotherapists. To practice in these areas, physiotherapists must have unique skills that can only be acquired through rural experience. Despite available data and anecdotes indicating that residents of rural communities have greater health needs and poorer health outcomes, many of these communities lack access to a wide range of health services when compared to urban communities. Physiotherapy services in rural communities are severely underserved when compared to other healthcare professions.

Unfortunately, there is a paucity of literature on the factors that influence the utilization and supply of rural physiotherapy services, particularly in low-and-middle-income countries like Nigeria. Empirical analysis of physiotherapy service utilization and supply in rural settings may help to

inform the development and implementation of effective and efficient health policies to improve the health outcomes of individuals in such communities**.**

Chapter 2

Methodology

1.1Preamble

The chapter explains the methodology used in conducting the research in conducting the research work. It explains the research design, population and sampling size, sampling technique used, sources of data, research instruments as well as validity and reliability of the instrument. The chapter also explains the sources of data, method of data collection, method of data analysis and justification of choice.

1.2 **Philosophical View**

Research philosophy is concerned with the origin, nature, and evolution of knowledge. A research philosophy is a set of beliefs about how data about a phenomenon should be collected, analyzed, and used.

For this research work, positivism was adopted in this because the empirical in nature where both qualitative and quantitative data are gathered to get information on affordability of physiotherapy for stroke patients at different levels of health care in Nigeria.

1.3 Research Design

A research design is a plan or blueprint that specifies how data pertaining to a specific problem should be collected and analyzed; it also serves as the procedural outline for the conduct of any given investigation (Nworgu, 2019).

The purposive research design was used to carry out the study, and qualitative data was collected.

1.4 Population of the study

According to Orodho (2015), population of the study is a group of individuals selected based on inclusion and exclusion criteria which relate to the variable being studied. It is the population from which the sample population was randomly or purposively selected. The population of this study comprises of physiotherapists, medical officers, nurses, neurologist consultants, clinical psychologists and other relevant health professionals working in some selected hospitals in Nigeria.

The choice of these professionals working in some selected hospitals in Nigeria is ideal because it gives the researchers ample opportunity to gather information on the affordability of physiotherapy for stroke patients at different levels of health care in Nigeria.

1.5 Sample size

Sample size is the selection of some subset from study`s population of interest which allows a researcher to make inferences about a population based on the nature of the sample (Aina, 2015). A sample size is said to be a representative of the population from which it is drawn, if the aggregate characteristics of the sample closely approximate those same aggregate for the population.

To this study, 12 respondents will be picked from the selected hospital to make up the sample size of the study.

1.6 Sample technique

A sampling technique is the name or other identification of the specific process used to select the entities of the sample. Sampling techniques can be used in conjunction with one another or on their own in a qualitative dissertation.

In this study, the purposive sampling technique was used to select a total of 12 professionals from four hospitals selected in four major cities in Nigeria namely, Federal Teaching Hospital Gombe, Gombe State, Aminu Kano Teaching Hospital Kano, Kano State, General Amadi Rimi Orthopedic Hospital Katsina, Katsina State and Barau Dikko Teaching Hospital Kaduna, Kaduna State, Nigeria as shown in the table below:

Table 3.1 List of the sampled respondents from the four hospitals:

Hospitals	Number selected	Percentage
Federal Teaching hospital Gombe	3	25%
F Aminu Kano Teaching hospital, Kano	3	25%
General Amadi Rimi Orthopedic Hospital, Katsina.	3	25%
Barau Dikko Teaching Hospital, Kaduna.	3	25%
Total	12	100%

1.7 Type and sources of data.

Data collection standout amongst the most essential stages in carrying on research. You can have the best research plan in the world; however, if you can't gather the necessary data, you will not have the capacity to compete your venture. Data collection begins with figuring out what sort of data is needed, followed by the collection of a sample from a certain section of the

population. Following that, you must use a specific tool to collect data from the selected sample.

1.8.1 Type of data use in the study

Data may be qualitative or quantitative. You can use them once you understand the distinctions between them.

- ✓ **Qualitative Data** A naturalist inquiry process that seeks a comprehensive understanding of social phenomena in their natural context. It focuses on the "why" rather than the "what" of social phenomena and is based on direct human experiences. However, for the purposes of this study, qualitative data was gathered.

1.8.2 Source of data

There are two types of data collection sources: primary and secondary data collection.

Primary data

These are data gathered using interviews. Because semi structured in depth interview was conducted as a data collection instrument, the study relied on primary data.

Secondary data

They are the data that have been sourced from somewhere else, where it was originally collected. This means that this type of data has already been collected by some researchers or investigators and is either published or unpublished. This information is impure as statistical operations may have been performed on them already. However, for the purpose of this research work therefore, primary source of data will be used to gather information on the affordability of physiotherapy for stroke patients at different levels of health care in Nigeria.

1.8 Instrument for Data Collection.

The gathering of data is an important step in the research process. The data collection instrument you select will be determined by the type of data you intend to collect (qualitative or quantitative) and how you intend to collect it. Because this research is quantitative in nature, a semi-structured interview will be used to collect data.

1.9 Method of data analysis.

Text analysis will be used to analyze the semi structured in-depth interview responses when analyzing the data collected from the respondents.

Summary

This research has been able to describe the sampling, data collection, and data analysis methods and techniques used in the research study, which aids the researcher in providing answers to the research questions and ultimately achieving the stated research objectives. The simple random sampling technique will be used for sampling, with a semi structured in-depth interview serving as the primary data collection instrument. The main data analysis techniques used were text analysis.

Chapter 3

Result

This section deals with analysis of result, discussion, evaluation, and interpretation. During the study, a semi-structured in-depth interview was conducted with the staff of the selected hospitals to gather information on the affordability of physiotherapy for stroke patients at different levels of health care in Nigeria. The researcher contacted twenty (20) potential candidates, of which (15) responded. From the 15 respondents the researcher chooses twelve (12) respondents to participate in the study; that is three (3) from each of the four (4) selected hospitals in the study. A formal letter of introduction requesting the hospitals to participate in the study were initially sent to them, the letters covered the aim and scope of the study. However, follow-up phone calls were made to the participants to arrange the suitable time for the interview. The interviewees were staffs of the selected hospitals with relevant professional skills to supply answers to the research questions. This selection criterion was informed by the pilot study that indicated the level of the staff to be interviewed and obtain the required information for the study.

The researcher used the semi-structured in-depth interview protocol in conducting the interview, each interview took between 30 to 60 minutes giving the interviewee enough time to think and give the appropriate answers and not too long to make them bored or take them away from their patients. The participants were firstly asked to sign a consent form, giving permission for the interview, to record the interview, and subsequently to use the data for research purposes. To encourage participants to provide truthful answers, confidentiality was assured. While the numbers of interviews conducted were small, more than one interview was conducted in

each participating organization. To reduce the risk of any person being identified during the research, the person was anonymized prior to the interview by allocating a unique identifier for each person prior to the interview and using only the identifier when further processing the data.

Data were stored with confidentiality and only the researcher had access to the data. As a result, data were treated confidentially at all stages of the process, and participants' anonymity was maintained.

An introduction highlighting the background and objective of the study was given to the participants. While this provided detailed information to the participants, it helped the researcher get the interviewee to start talking and build a rapport; then, the interview protocol was used as a guide to structure the interviews.

0.1Data Analysis

0.2**Demographic Information of the Participants**

The table below presents the demographic data of the participants.

Table 0.3 Demographic Information

Sex	Frequency	Percentage%
Male	8	66.7
Female	4	33.3
Age		
20-30 years	2	16.7
31-40 years	7	58.3
41 and above	3	25
Marital Status		

Married	9	58.3
Single	5	41.7
Separated/Divorced	0	0.0
Indicate your profession		
Nurses	2	16.7
Physician Specialist	2	16.7
Physiotherapist	6	50
Neurologist Consultant	0	0.0
Neurologist Emergency	0	0.0
Senior Medical Officer	1	8.3
Medical Officer	1	8.3
Clinical Psychologist	0	0.0
Years of working experience with stroke		
1-5 years	2	16.7
6-10 years	4	33.3
11-15 years	4	33.3
16-20 years	2	16.7
21 years and above		00.0
Years of working experience		
1-5 years	2	16.7
6-10 years	4	33.3
11-15 years	4	33.3
16-20 years	2	16.7
21 years and above	0	0.0

The above table shows that 8 out of 12 (66.7%) respondents are male, while 4 (33.3%) of the respondents are female. This shows that majority of the respondents are male, this might not be unconnected with the fact that the study was conducted in northern part of Nigeria, where majority of female do not attend high level of education but preferred to be households. The table also presents the age of the respondents. It shows that 2 (16.7) are between the ages of 20 and 30, 7 (58.3) are between the ages of 31 and 40, while 3 (25%) are 41 and above years old. With regards the marital status of the respondents, it shows that 9 (58.3%) respondents are married while 5 (41.7) are single, and none of the is separated or divorced. However, the table shows that 2 (16.7%) are nurses, 2 (16.7%) are physician specialist, 6 (50%) are physiotherapists, while the information shows that there is only 1 (8.3%) Senior Medical Officer and 1 (8.3%) Medical Officer.

0.4Interview Analysis

This section focuses on the analysis of the data gathered from the semi structured interview conducted with the 12 respondents from the four selected hospitals in northern part of Nigeria. The research was able to summarize the observations that was there during and after the interview had during and after the interview.

0.5There is availability 0f physiotherapy at all levels in Nigeria.

This focuses on the participants' awareness on the availability of physiotherapy at all levels in Nigeria. Five out of the twelve participants are aware that there is availability of physiotherapy at all levels in Nigeria. They made mentioned that majority of the hospitals especially in northern Nigeria that have physiotherapy units have physiotherapists. The other seven participants do not accept the fact that there is availability of physiotherapy at all levels in Nigeria. They give instances

that the country is having shortage of physiotherapy, and that much needs to be done to complement the effort of the government in ensuring that more staff are engaged.

I: Is there availability of physiotherapy at all levels in Nigeria?

P: NO. {R3}

I: There is availability of physiotherapy at all levels in Nigeria

P: Of course, I accept. Physiotherapy is widely available at all levels of the count**ry. Physio**therapy is affordable to stroke patients at levels in the country. {R1}

Physiotherapy is affordable to stroke patients at all levels in the country

With regards to the weather physiotherapy is affordable to stroke patients at all levels in the country. Nine (9) out of the twelve participants accepted that physiotherapy is affordable to stroke patients at all levels in the country. They supported their views with the fact that majority of the hospitals that treat stroke in Nigeria are government owned hospitals and the fees charge by the hospitals are relatively low and affordable to almost all the patients.

I: Is physiotherapy affordable to stroke patients at all levels in the country?

P: Yes, I agreed that physiotherapy is affordable to stroke patients at all levels in the country because most of our hospitals are owned by the government and the fees charged are reasonable**. {R8}**

0.7 Stroke burdens are attributable to modifiable risk factors.

This focuses on the participants views on whether the burdens of stroke are attributable to modifiable risk factors. All the twelve respondents accepted that the burdens of stroke are attributable to modifiable risk factors. They assert that the risk factors may include stress from day-to-day activities of

the people, failure of government to provide desired leadership among others.

I: The burdens of stroke are attributable to modifiable risk factors

P: Yes, I accepted that the burdens of stroke are attributable to modifiable risk factors, and the modifiable risk factors are numerous given the state of our country. {R1}

0.8Your hospital has effective rehabilitation services on the same site

This section seeks participants' opinion on whether their hospitals have effective rehabilitation services on the same site. Seven (7) of the total number of the respondents accept that their hospitals have effective rehabilitation services on the same site, while the remaining five (5) respondents do not accept. They argued that the rehabilitation services are carried out other places, they might sometimes give referral to other hospitals that are more equipped with both facilities and personnel.

I: Your hospital has effective rehabilitation services on site?

P: Yes, I agree. Our hospital is only a few years old, but it is well-equipped, and the management has hired competent personnel. {R4}

0.9 **How will you describe the current availability and affordability of physiotherapy from the national level for acute stroke care?**

In this section, the researcher seeks the participants' opinion on how they will describe the current availability and affordability of physiotherapy from the national level for acute stroke care. With respect to how the participants will describe the current availability and affordability of physiotherapy from the national level for acute stroke care, seven (7) out of twelve (12) participants believed physiotherapy was not affordable at

primary health care centers, and it discouraged stroke patients from accessing physiotherapy. Furthermore, three (3) participants believed that the affordability at secondary healthcare level is low, that means to say its expensive. While the remaining two participants believe that the affordability of physiotherapy in the tertiary level for acute stroke care was relatively low. This is to say in general physiotherapy in different levels of healthcare is relatively unaffordable

I: How will you describe the current availability and affordability of physiotherapy from the national level for acute stroke care?

P: All I can say is that the support is average, because if I said that the availability and affordability of physiotherapy is low, I would be unfair to the authority. {R7}

I: How will you describe the current availability and affordability of physiotherapy from the national level for acute stroke care?

P: Absolutely no support. That's all I have to say about low support. {R2}

1.0 **What Neuroimaging challenges - availability and cost your hospital faces?**

This section presents the participants' view on the Neuroimaging challenges - availability and cost your hospital faces. Five dimensions were presented to the participants, and they include (1) Lack of stroke rehab facilities (2) Inequity of access to health care (3) Stroke literacy and cultural beliefs (4) Lack of stroke systems of care and (5) Strong Leadership and Teamwork.

With respect to neuroimaging challenges – availability and cost the participants' hospital faces, they mentioned lack of stroke rehab facilities, stroke literacy and cultural beliefs and lack of stroke systems of care.

I: What Neuroimaging challenges - availability and cost your hospital faces?

P: It is a lack of stroke rehab facilities, as well as a lack of stroke literacy and cultural beliefs.... {R5} it is, of course, a lack of stroke systems of care, as well as a lack of stroke literacy and cultural beliefs. {R11}

1.1 There is access to advanced diagnostic services in your hospital

This focuses on the participants' awareness on the access to advanced diagnostic services in our hospital. Five out of the twelve participants are aware that there is access to advanced diagnostic services in our hospital. They accepted the fact that there is access to advanced diagnostic services in our hospital. The other seven participants do not accept the fact that there is access to advanced diagnostic services in our hospital. They give instances that the country is having shortage of physiotherapy, and that much needs to be done to complement the effort of the government in ensuring that more staff are engaged.

I: Is there access to advanced diagnostic services in your hospital?

P: No at all.{R4}

1.2 There is availability of specialist rehabilitation therapist in your hospital

With regards to the whether there is availability of specialist rehabilitation therapist in our hospital or not. Nine (9) out of the twelve participants accepted there is availability of specialist rehabilitation therapist in our

hospital. They supported their views with the fact that majority of the hospitals that treat stroke in Nigeria are government owned hospitals and government employs available and specialist rehabilitation therapists in our hospital.

I: Is there is availability of specialist rehabilitation therapist in our hospital?

P: Yes, I accepted that there is a specialist rehabilitation therapist available in our hospital. {R8}

1.3Fully Coordinated stroke care is provided across geographically discrete regions

This focuses on the participants views on whether fully coordinated stroke care is provided across geographically discrete regions. All the twelve respondents do not accept that fully coordinated stroke care is provided across geographically discrete regions. They assert that the country lacks specialist hospitals that provide 100% care to stroke patients only.

I: Fully Coordinated stroke care is provided across geographically discrete regions

P: I doubt that I do not agree to that. {R4}

1.4 There is access to basic diagnostic services laboratory, ECG, CT scan, ultrasound in our hospital.

This section seeks participants' opinion on whether there is access to basic diagnostic services laboratory, ECG, CT scan, ultrasound in their hospitals or not. Seven (7) of the total number of the respondents do not accept that their hospitals have access to basic diagnostic services laboratory, ECG, CT scan, ultrasound, while the remaining five (5) respondents do accept that. They argued that their hospitals have access to all diagnostic services laboratory fully furnished with all necessary facilities and personnel.

I: Is there access to basic diagnostic services laboratory, ECG, CT scan, ultrasound in your hospital?

P: In our hospital, we lack an effective diagnostic services laboratory.{R4}

1.5 Is their patient information leaflets/literature available/offered on stroke admission and at discharge?

In this section, the researcher seeks the participants' response on whether their patient information leaflets/literature available/offered on stroke admission and at discharge. With respect to the believe of the participants on patient information leaflets/literature available/offered on stroke admission and at discharge, seven (7) out of twelve (12) participants agreed that Is there is patient information leaflets/literature available/offered on stroke admission and at discharge. Furthermore, four (4) participants believed that there is patient information leaflets/literature available/offered on stroke admission and at discharge.

I: Is there patient information leaflets/literature available/offered on stroke admission and at discharge?

P: Of course, all I can offer is average assistance, because claiming that physiotherapy is scarce and expensive is not fair to the authorities. {R7}

I: How will you describe the current availability and affordability of physiotherapy from the national level for acute stroke care?

P: Low support, absolutely. Yea, that is all I can say low support. {R2}

1.6 Is there a physician specialist as the principal person for stroke at your hospital?

This focuses on the participants' response whether there a physician specialist as the principal person for stroke at their hospital. All the twelve (12) participants testified that yes, their physician specialists as the principal persons for stroke at their hospitals.

I: Is there a physician specialist as the principal person for stroke at your hospital?

P: Yes, there is. {R12}

1.7 Is there a program for the continuing education and professional development of staff on stroke clinical care?

This focuses on the participants' response whether there a program for the continuing education and professional development of staff on stroke clinical care. All the twelve (12) participants testified that there a program for the continuing education and professional development of staff on stroke clinical care.

I: Is there a program for the continuing education and professional development of staff on stroke clinical care?

P: Yes, there is. {R5}

1.8 **There are some specific physiotherapies and health policies, or interventions (national or hospital specific) meant to improve stroke care**

This focuses on the participants' response whether there are some specific physiotherapies and health policies, or interventions (national or hospital specific) meant to improve stroke care. All the twelve (12) participants testified that there are some specific physiotherapies and health policies, or interventions (national or hospital specific) meant to improve stroke care

I: There are some specific physiotherapies and health policies, or interventions (national or hospital specific) meant to improve stroke care?

P: Yes, there is. {R9}

1.9 What do you see as the current limitations of the acute stroke services package?

This section seeks participants' opinion what they see as the current limitations of the acute stroke services package. Five dimensions were presented to the participants, and they include (1) No Stroke Unit (2) Inadequate stroke clinical staff (3) Financial constraints (4) Health-policy support (5) Lack of political will. Six (6) of the total number of the participants believed that the limitations of the acute stroke services package are health policy support, four (4) participants believe it is because of lack of political will, and the remaining participants stated that it is because of inadequate stroke clinical staff.

I: What do you see as the current limitations of the acute stroke services package? **P:** It is because of lack of political will. {R8}

I: What do you see as the current limitations of the acute stroke services package? **P:** It is because there are no adequate stroke clinical staff {R6}

2.0 The hospital has proper plan to promote acute stroke care?

With regards to the statement that the hospital has proper plan to promote acute stroke case. Of the twelve participants interviewed during the study, five (5) strongly agreed that their hospitals have proper plan to promote acute stroke care, three (3) participants agreed, four participants strongly disagreed with the statement.

I: The hospital has proper plan to promote acute stroke care?

P: I wholeheartedly agreed with the statement. Because the management of my hospitals recently implemented a new plan in response to an increase in the number of stroke cases. {R10}

2.1 The stroke team in the hospital has been involved in quality improvement activities and on strategies to improve care?

With regards to the statement that the stroke team in the hospital has been involved in quality improvement activities and on strategies to improve care. Out of the twelve participants interviewed during the study, five (5) strongly agreed that their hospitals have proper plan to promote acute stroke care, three (3) participants agreed, four participants strongly disagreed with the statement.

I: The stroke team in the hospital has been involved in quality improvement activities and on strategies to improve care?

P: I strongly agreed with the statement. {R9}

2.2 At discharge, patients or caregivers are provided with a physiotherapy contact details

This focuses on the participants' awareness on whether at discharge, patients or caregivers are provided with a physiotherapy contact details. Five out of the twelve participants are aware that patients or caregivers are provided with a physiotherapy contact detail when discharged. They accepted the fact that at patients or caregivers are provided with a physiotherapy contact details. The other seven participants do not accept the fact that patients or caregivers are provided with a physiotherapy contact details at discharge.

I: At discharge, patients or caregivers are provided with a physiotherapy contact details

P: NO. {R4}

I: At discharge, patients or caregivers are provided with a physiotherapy contact details

P: Yes of course.{R2}

Chapter 4

Discussion

The aim of this study was to examine the affordability and availability of physiotherapy for stroke patients at different levels of health care in Nigeria. The researcher contacted twenty (20) potential candidates, of which (15) responded, From the 15 respondents the researcher chooses twelve (12) respondents to participate in the study; that is three (3) from each contacted twelve (12) respondents to participate in the study; that is three (3) from each of the four (4) selected hospitals in the study. With regards to demographic data of the respondents, the study findings revealed that 8 out of 12 (66.7%) respondents are male, while 4 (33.3%) of the respondents are female. This shows that majority of the respondents are male, this might not be unconnected with the fact that the study was conducted in northern part of Nigeria, where majority of female do not attend high level of education but preferred to be households. It was also discovered that 2 (16.7) are between the ages of 20 and 30, 7 (58.3) are between the ages of 31 and 40, while 3 (25%) are 41 and above years old. With regards the marital status of the respondents, it shows that 9 (58.3%) respondents are married while 5 (41.7) are single, and none of the participants is separated or divorced. However, the demographic information revealed that 2 (16.7%) are nurses, 2 (16.7%) are physician specialist, 6 (50%) are physiotherapists, while the information shows that there is only 1 (8.3%) Senior Medical Officer and 1 (8.3%) Medical Officer.

The study findings revealed that the participants are aware that there is availability of physiotherapy at all levels in Nigeria. They made mentioned that majority of the hospitals especially in northern Nigeria that have physiotherapy units have physiotherapists. It was also discovered that the

participants accepted that physiotherapy is affordable to stroke patients at all levels in the country. The study findings revealed that the risk factors may include stress from day-to-day activities of the people, failure of government to provide desired leadership among others. The findings revealed that Nigerian hospitals have effective rehabilitation services on the same site and that the rehabilitation services of stroke patients are carried out there.

The study further revealed that about three-quarters of the stroke survivors were referred for physiotherapy. This is a disproportionate number of stroke patients admitted to the hospital. Physiotherapy is not provided routinely for patients in Nigeria because of the need for physician referral. The high referral rate found in this study suggests that physicians understand the value of physiotherapy in improving functional independence following a stroke. It could also reflect the level of adherence of physicians in this hospital to recommended clinical practice guidelines that stroke patients be referred for physiotherapy as soon as possible soon as life-threatening problems are under control. Evidence suggests that a well-organized, multidisciplinary approach to post-acute rehabilitation after a stroke benefits patient. This multi-disciplinary approach to stroke rehabilitation includes physiotherapy. The time between a patient's admission to the hospital and the start of physiotherapy varies greatly. Most clinical practice guidelines recommend waiting 24 hours after the onset of a stroke. It should be noted that the severity of life-threatening problems varies between patients and practice settings. This could be contributing to the delay in referring stroke patients to this hospital.

Only about two-thirds of the patients referred for physiotherapy received physiotherapy. This is comparable to findings in literature about utilization of physiotherapy. McKevitt et al (2016) and Leemrijse et al (2018) reported

utilization rates of 70.7% and 69.0% respectively for physiotherapy. However, Lee et al (2018) in a similar study reported a utilization rate of 33% for physiotherapy in acute stroke. This is rather low in comparison to the study's findings. The findings of Lee and colleagues may be related to the reported dearth of physiotherapists and consequent rationing of rehabilitation services in Taiwan. Although the physiotherapist to population ratio in Nigeria is worse at 1:42,000, the utilization rate was higher and comparable with utilization in countries with high physiotherapists to patient ratio. This suggests that non-availability or death of physiotherapists all by itself has minimal effect on utilization of physiotherapy.

There was no difference in physiotherapy utilization based on age, sex, and type of stroke. This is comparable to the report of Lee that utilization of inpatient rehabilitation for acute stroke was similar irrespective of patients' age, sex, and year of onset. The fact that demographics were not related to utilization may be an indication that physiotherapy utilization for stroke patient in Ibadan, Nigeria is equitable though underused. Documentation inaccuracies and difficulty in verifying records may affect the pattern of referral and utilization reported in this study. The records of patients who died while in the hospital were not reviewed. If these records were reviewed, the pattern of referral for and utilization of physiotherapy among the patients could be different. Comparison between severity of stroke and referral for and utilization of physiotherapy could not be made because stroke severity was not documented consistently in an objective manner in these patients.

Recommendation

Primary prevention measures, with a focus on more aggressive risk factor control, should be prioritized. There should be public awareness campaigns to educate the public about stroke risk factors and their modifiability, as stroke is one of the main causes of disability in Nigeria. This usually causes a chain reaction, because there is lack of structural support for people with disability, a lot of people after stroke lose their jobs or means of livelihood which will push them to poverty. It is very important that post-stroke rehabilitation be prioritized by the government through various avenues, the media, religious leaders, community leaders and any other mediums that could all be utilized. This will not only reduce both the prevalence and severity of stroke, but also the negative impacts of stroke on the socioeconomic situations of the patients. There is an urgent need for better stroke care, because with stroke an effective rehabilitation is needed to be designed for the patient to have a swift recovery, as we have seen that many post-stroke patients tend to come to the hospital for a long period of time for rehabilitation.

This will include acute evaluation, monitoring, and investigation to achieve optimal results. Health workers who care for stroke patients require additional training particularly in the prevention of complications, as many of them are very much preoccupied with work making it hard to attend continuing professional development programs. For proper stroke care, the government should invest in the development of health workers that deals with stroke patients. Also, there is an urgent need to establish stroke units in tertiary hospitals across the country, this will give a more patient-centered care, it will also help with data collection which can go a long way to help in making research that can make positive impacts on stroke rehabilitation.

Better health-care funding will go a long way toward improving outcomes. In the absence of these, high prevalence of disability, harsh socioeconomic conditions and high mortality will regrettably continue.

Conclusion

This study was set out to investigate the affordability of physiotherapy for stroke patients at levels of health care in Nigeria. The study findings concludes that majority of the hospitals especially in northern Nigeria that have physiotherapy units have physiotherapists, however the ratio of patient to physiotherapist is very high in primary and secondary healthcare levels compared to tertiary healthcare level. This is because urban hospitals have higher number of physiotherapists and patients, but some of the patients can afford private care, which is abundance in urban areas, while in rural areas there is a low number of physiotherapists coupled with high number of patients. This can be since there are no private practices in rural areas and even if there is, most of the patients in those areas cannot afford it. It also concludes that the participants accepted that physiotherapy is not affordable to stroke patients at all levels in the country. The study findings revealed that the risk factors may include stress from day-to-day activities of the people, failure of government to provide necessary support and aids among others. The study also found that most Nigerian hospitals do not have effective rehabilitation services or adequate number of staffs to provide the most effective care for patients.

Also, the rate of utilization of physiotherapy among patients with stroke appears to be inadequate. Utilization of physiotherapy during hospital admission is associated with reduced length of hospital stay among patients with stroke. Therefore, utilization of physiotherapy among stroke patients should be encouraged for reduced length of hospital stay and improved functional outcome. Utilization of out-patient physiotherapy was low. Strategies to enhance out-patient utilization should be explored.

Stroke mortality is very high in Nigeria. This high mortality rate is particularly pronounced during the acute phase. This high death toll has been observed in other Nigerian studies. The presence of comorbid conditions, NIHSS score, and loss of consciousness were found to be important predictors of mortality in our study. These are indicators of the disease's severity.

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APPENDIX

In-depth interview questions for the hospitals personnel.

1.Is there availability of physiotherapy at levels in Nigeria?

2.Physiotherapy is affordable to stroke patients at all levels in the country.

3.Is the burden of stroke attributable to modifiable risk factors?

4.Your hospital has effective rehabilitation services on-site?

5.How will you describe the current availability and affordability of physiotherapy from the national level for acute stroke care?

6.What Neuroimaging challenges - availability and cost do your hospital face?

7. Is there access to advanced diagnostic services in your hospital?

8.Is there an availability of specialist rehabilitation therapists in our hospital?

9.Fully Coordinated stroke care is provided across geographically discrete regions

10.Is there access to basic diagnostic services laboratory, ECG, CT scan, and ultrasound in our hospital

11.Is there patient information leaflets/literature available/offered on stroke admission and at discharge?

12.How will you describe the current availability and affordability of physiotherapy from the national level for acute stroke care?

13. Is there a physician specialist as the principal person for stroke at your hospital?

14.Is there a program for the continuing education and professional development of staff on stroke clinical care?

15.There are some specific physiotherapies and health policies, or interventions (national or hospital-specific) meant to improve stroke care?

16.What do you see as the current limitations of the acute stroke services package?

17.The hospital has a proper plan to promote acute stroke care.

18.The stroke team in the hospital has been involved in quality improvement activities and strategies to improve care.

19.At discharge, patients or caregivers are provided with physiotherapy contact details.