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# Rehabilitation Of Post-Stroke Aphasia In Ghana

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**Abstract**

Aphasia is one of the most common consequences of stroke and affects the
communication and social functioning of approximately 30-35% of stroke survivors. Despite
the importance of speech-language pathology (SLP) services for individuals with post-stroke
aphasia, aphasia rehabilitation services in sub-Saharan Africa are riddled with challenges.
Through interviews, demographic information, and syllabi reviews, we examined the SLP
assessment and treatment services available for individuals with post-stroke aphasia in Ghana
and the challenges the stakeholder groups encounter in providing and identifying such
services. Results of the study identified challenges with the current post-stroke aphasia
services in Ghana, and thus the need to improve SLP services for individuals with post-stroke
aphasia in Ghana. The process of data collection itself educated respondents on the
importance of rehabilitation of post-stroke aphasia; by identifying barriers, strategies to
improving services can now be initiated.


Keyword: Stroke, aphasia, speech-language pathology services, sub-Saharan Africa, Ghana

**Summary for Lay Audience**

The occurrence of stroke in the world in general and in Ghana in particular can be attributed to the ever-increasing population of older adults who are mostly at greatest risk of cardiovascular diseases. Aphasia, one of the common consequences of stroke, affects the individual's communication and participation in social activities. The communication abilities and quality of life of individuals affected by aphasia can be improved through speech-language pathology (SLP) services. The few number of speech-language pathologists (SLPs) in African countries like Ghana has been a major problem for assessing and treating individuals with post-stroke aphasia. However, Ghana is making an effort to educate and train more potential SLPs to provide SLP services to individuals with communication disorders. This study explored the assessment and treatment services provided to individuals with post-stroke aphasia in Ghana, the challenges encountered in providing the services to individuals with post-stroke aphasia, and the education and training given to potential SLPs to assess and treat individuals with post-stroke aphasia. Although aphasia rehabilitation was practiced, the current study identified concerns such as, lack of awareness of SLP services and financial challenges with the current aphasia services in Ghana.

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**Chapter 1**

**1.0 Introduction**

Aphasia is one of the most common consequences of stroke, affecting approximately

30-35% of stroke survivors (Code & Petheram, 2011; Dickey et al., 2010; Plowman et al.,

2012). Following the onset of post-stroke aphasia, individuals often experience reduced

participation in social activities, less satisfaction from participating in social activities, and a

reduced quality of life (QOL) (Hilari, 2011). To address post-stroke aphasia and these

activity participation and QOL issues, it is essential to provide rehabilitation that includes

speech-language pathology (SLP) services (Rohde et al., 2018). Research supports the

effectiveness of SLP-based services for post-stroke aphasia, when provided early, intensified

and delivered over a long duration of time (Cherney et al., 2011; Dignam et al., 2016).

However, the provision of aphasia rehabilitation services in sub-Saharan Africa, including

Ghana, is associated with challenges such as the paucity of resources, shortages of staff, lack

of or late referrals, low public awareness regarding post-stroke aphasia or SLP services,

geographic inaccessibility, language barriers, and in some areas, cultural and religious beliefs

(Legg & Penn, 2013; Theunissen & Swanepoel, 2008).

The purpose of the current study was to examine the rehabilitation services available

for individuals with post-stroke aphasia in Ghana by exploring the roles of the stakeholder

groups involved in the assessment and treatment of post-stroke aphasia in Ghana, as well as

the challenges they encounter in providing or identifying services. The stakeholder groups

included educational institutions, interdisciplinary health care professionals, and family

caregivers of individuals with post-stroke aphasia. Before describing the current study, this

chapter provides a literature review about post-stroke aphasia and the rehabilitation services available for post-stroke aphasia. More specifically, the literature review covers the following topics: definition and types of aphasia, caregiving practices for individuals with post-stroke aphasia, information on stroke statistics, aphasia management and its challenges, and aphasia management education and training.

**1.1 Definition of Aphasia**

Aphasia has been defined in different ways by various authors. Aphasia has been defined as the loss or impairment of the complex process of interpreting and formulating language symbols caused by an acquired brain damage affecting the language-dominant hemisphere (Berthier, 2005). From a social approach, the definition of aphasia is compatible with an aspect of the World Health Organization´s International Classification of Functioning, Disability and Health (WHO ICF) framework´s definition of functioning and disability (Jordan & Kaiser, 2013). For a person with aphasia, the definition encompasses: activity, which is the tasks that involve the four language modalities-listening, speaking, reading and writing; participation, which refers to engagement in daily life activities, such as going shopping and attending religious services; and the environment, which includes relationships with others, policies and regulations and attitudes of individuals towards the individual with aphasia (Papathanasiou et al., 2017).

For the purpose of this study, aphasia is defined as an acquired selective impairment of language modalities and functions resulting from a focal brain lesion in the language-dominant hemisphere that affects the person's communicative and social functioning, quality of life, and the quality of life of his or her relatives and caregivers (Papathanasiou et al, 2017). This definition of aphasia includes all of the following elements; physiological aspects, social functions, and the QOL of the individual as well as the caregivers. QOL can relate to the effects of a disease or the treatment of a disease on the physical, mental and

social wellbeing of the individual as well as to the indirect consequences of disease such as unemployment or financial difficulties (Fayers & Machin, 2013). Not only is the QOL of individuals with post-stroke aphasia affected, but that of their caregivers as well.

**1.2 Caregiving practices**

Caregiving is the usual and regular provision of assistance and support by one family member to another (Biegel et al., 1991). The care provided by spouses to each other and the support and love from parents to children can all be defined as caregiving. Caregivers can be paid healthcare professionals (formal) or family members and friends (informal). Within the context of aphasia, most families will opt for informal caregiving because of reasons such as inadequate knowledge of formal caregiving, financial circumstances and a feeling of responsibility toward the individual with aphasia (Stephan et al., 2018). In Africa, due to the cost of formal or paid caregiving, women assume the role of caregiving in the home (Samuel-Hodge et al., 2000). Informal caregiving can affect the QOL of the caregivers because of the physical and emotional burden associated with providing extensive assistance with activities of daily living, social isolation, and financial challenges (Adelman et al., 2014). In a study by Bakas and colleagues (2006) caregivers of individuals with post-stroke aphasia reported more task difficulty, caregiver depression symptoms and negative stroke-related outcomes such as a lack of time for social activities, compared to caregivers of stroke survivors without aphasia.

**1.3 Healthcare in sub-Saharan Africa and Ghana**

Sub-Saharan Africa (SSA) comprises 49 of Africa's 54 countries, with a population of more than one billion people (World Population Review, 2017). Countries in SSA include Benin, Burkina Faso, Togo, Ghana, Kenya, Mozambique, Nigeria, South Africa, and Uganda (United Nations Development Program, 2019). The average economic status of these countries ranges from low to middle income. The many diverse ethnic groups in SSA are

associated with over 1000 spoken languages across the region (Berglee, 2012). SSA is diverse in cultural practices with different beliefs and traditions. However, there are some similarities. The role of women in SSA is consistent through the regions. Women have a very important role in SSA culture because they take care of the house and children (Buvinic & Gupta, 1997). Their roles include cooking, cleaning, washing, farm work, and trading. Religions in SSA include Christianity, Islamic and Traditionalist religions. Traditional African religions believe in a creator, ancestor spirits, territorial spirits, and evil or sicknesses caused by supernatural spirits (Ranger, 1986). The overall health status of people in the countries in SSA is one of the poorest compared to other world regions. The region is burdened by both communicable and non-communicable diseases such as malaria, human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS), diabetes, heart diseases, and stroke (Murray & Lopez, 1996). The healthcare system in SSA is faced with challenges such as scarcity of financial resources, shortage of health workers, and deficiency of infrastructure (Beran & Yudkin, 2006; Bvumbwe & Mtshali, 2018; Randall & Ghebre, 2016; Zachariah, et al., 2009).

Ghana is a West African country in the SSA with a population of 31, 072, 940 (World Population Review, 2020). Ghana is comprised of 16 regions, and is categorized as a middle income country (United Nations Development Program, 2019). English is the official language in Ghana, used in government and business affairs, and is the standard language of instruction in schools; however, there are more than 250 languages and dialects spoken in Ghana (Embassy of Ghana, 2019). Healthcare in Ghana is mostly provided by the government of Ghana and is administered by the Ministry of Health and Ghana Health Services. The healthcare system is comprised of health posts, health centres and clinics, district hospitals, regional hospitals, and tertiary hospitals (Ministry of Health, 2018). There

are also for-profit clinics and hospitals in the country. There are more than 300 government-funded hospitals in Ghana (Ghana Health Service, 2017).

**1.4 Stroke Statistics**

Stroke is defined as any damage to the brain or spinal cord caused by an abnormality of blood supply (Caplan, 2016). Stroke is a global health concern. At the beginning of the 21st century, approximately 1.1 million inhabitants of the European countries suffered a stroke each year (Béjot et al., 2016). Statistics for stroke in the US indicate that each year, 795,000 people experience a new or recurring stroke, with approximately 610,000 first attacks and 185,000 recurring attacks (Benjamin et al., 2019); on average, every 40 seconds, someone in the US has a stroke. The burden of stroke has increased substantially over the years in SSA. A group of researchers reported that the incidence rate of stroke decreased by 42% in high-income countries between the 1970 and 2008, but there was a 100% increase in stroke incidence in low to middle income countries such as Ghana (Feigin et al., 2009). A systematic review by Adeloye (2014) compared stroke incidence between 2009 and 2013 in Africa and found an increase of 10.8% between 2009 and 2013. As well, Owolabi and colleagues (2018) reported that the prevalence of stroke in a large number of SSA countries was 981 per 100,000.

The occurrence of a stroke can result in death. According to the World Health Organization (WHO; 2015), non-communicable diseases and disorders including stroke are the world's leading cause of death. The 2017 final report on mortality data based on medical characteristics in the U. S., presented stroke to be the 5th leading cause of death accounting for 37.6% of all deaths in the U.S. (Murphy et al., 2018). The Global Burden of Disease in 2001 reported 4.6 million deaths from stroke, amounting to 9.5% of all deaths in SSA (Lopez et al., 2006). Global Burden of Disease is a global research program that provides a comprehensive picture of the world's current and future health needs (Murray & Lopez,

1996). Presently, stroke is the second leading cause of mortality worldwide, and 87% of

deaths are recorded in developing countries including most African countries (Sagui, 2017).

However, the burden of stroke is not confined to mortality. Stroke survivors often

suffer long-lasting disabilities. Fifty percent of the 33 million global stroke survivors are

located in low and middle income countries such as Ghana (Mendis et al., 2015). The

surviving population is mostly affected with challenges to their motor ability, cognition, and

ability to carry out activities of daily living, mood, and communication (Arwert et al., 2018;

Damush et al., 2007; Mayo et al., 1999). Among the resultant disabilities of stroke is aphasia,

a focus of the current study.

**1.5 Types of Aphasia**

The types of aphasia are distinguished by site of the lesion in the brain and their

behavioral characteristics. Broca's aphasia is characterized by a lesion in the posterior part of

the inferior gyrus, the insula, and the frontal operculum, with impairment in expressing

spoken language and writing (Papathanasiou et al., 2017). Lesions involving the superior and

middle parts of the posterior temporal lobe can result in Wernicke's aphasia, which is

characterized by impaired auditory language comprehension and relatively unaffected speech

fluency (Robson et al., 2017; Thompson et al., 2015). Other types of aphasia include

conduction aphasia, which is characterized by frequent speech errors, impaired verbatim

repetition, a deficit in phonological short-term memory, and naming difficulties in the

presence of fluent and grammatical speech output (Buchsbaum et al., 2011). Conduction

aphasia can result from a lesion in the left temporal parietal lobe junction (Papathanasiou et

al., 2017). A severe form of aphasia known as global aphasia is characterized by deficits in

all aspects of language with limited or no verbal output and poor auditory comprehension

(Helm-Estabrooks et al., 2014). Global aphasia can occur after a large lesion to the

perisylvian area of the language dominant hemisphere, with infarction of both the frontal and

temporal branches of the left middle cerebral artery (Hanlon et al., 1999). Another type of aphasia is anomic aphasia. Anomic aphasia involves difficulty producing names of objects and people due to an impairment in accessing language representations, and can occur in lesions affecting posterior language-related brain regions (Galletta & Goral, 2018). In transcortical aphasia types, the ability to repeat language is preserved despite marked disturbances in other linguistic domains (Berthier et al., 2014). Transcortical aphasia can be classified as transcortical sensory aphasia, in which repetition is preserved with deficits in auditory comprehension, as transcortical motor aphasia, in which output is non-fluent with preserved comprehension and relatively spared repetition, or as mixed transcortical aphasia, in which there are mixed symptoms of transcortical sensory and motor aphasias (Berthier et al., 2014; Cauquil-Michon et al., 2011).

## 1.6 Aphasia Management Issues

Aphasia can be caused by different types of neurological damage such as stroke, tumor, epileptic foci, head injury and neurodegenerative disease (Crinion et al., 2013). The focus of the current study is on aphasia caused by neurological damage related to strokes. Speech-language pathologists (SLPs) are responsible for diagnosing aphasia using screening or more comprehensive tests and developing a treatment plan with the individual with post-stroke aphasia (Rohde et al., 2018). Recovery from aphasia depends on a combination of language and communication treatment and physiological factors (Watilda & Balarabe, 2015). One factor that influences recovery from post-stroke aphasia is the initial aphasia severity. A higher level of severity has a poorer prognosis for recovery than a mild or moderate severity of aphasia (Gerstenecker & Lazar, 2019). The size and site of lesion are other predictors of recovery. A lesion in the language dominant hemisphere is likely to cause high language deficit severity and poorer recovery from aphasia relative to a larger lesion in other parts of the brain (Watilda & Balarabe, 2015). Non-lesion factors such as female

gender, younger age, left-handedness, higher educational attainment, and good family support can positively affect recovery (Gerstenecker & Lazar, 2019; Schlaug et al., 2011).

SLPs as well as individuals with post-stroke aphasia and their families regard aphasia therapy provided by SLPs as an important aspect of recovery (Simmons-Mackie et al., 2005; Wallace et al., 2017). Despite the anticipation for recovery, there exist challenges both in the access and delivery of speech therapy services for individuals with post-stroke aphasia. Access can be defined as the timely use of health services to attain the preferred health outcome (Mahendra, 2012). Public awareness of aphasia and of the SLP services that are available for aphasia are low compared to other neurological conditions, hindering access to speech-language therapy in the event of post-stroke aphasia (Code, 2003). The results of a study in New Zealand found that in recent years, there has been an increase in the scientific knowledge base related to aphasia but there has been a considerably lower level of awareness about aphasia in the general public and in some health care professionals (McCann et al., 2013). Lack of or late referrals of individuals with post-stroke aphasia from health care facilities to SLPs has been identified as a barrier both to accessing speech therapy services by clients and to delivering aphasia treatment by SLPs (Mahendra, 2012; Taylor et al., 2009). As highlighted earlier, there is a high prevalence rate of individuals with post-stroke aphasia, but there are not enough SLPs to meet the demand for speech therapy services (Lim et al., 2017).

Time has been identified as important to the management and structure of work at hospitals (Riley & Manias, 2006). To control the use of time, fixed schedules of shiftwork have been developed for health care professionals. Contrarily, individuals with post-stroke aphasia often require an extensive length of treatment to improve their language skills (Bhogal et al., 2003), but institutional restrictions to time allocated to assessment and therapy preclude achieving therapy goals (Simmons-Mackie et al., 2005).

In general there appears to be a low and inadequate level of SLP services in SSA. Some countries in SSA have no known resident SLP services (Fagan & Jacobs, 2009). In the few countries that have the SLP services, these services are under-resourced, understaffed, and involve outdated services. In contrast to other SSA countries, South Africa has six university programs that combined graduate approximately 130 SLP professionals per year (Kathard & Pillay, 2013). Many of these SLP graduates from South Africa's SLP programs become employed in private hospitals or private practices. Due to economic hardships, most people in SSA cannot afford private health care services, making it a challenge to access private SLP services.

Language poses a challenge to the delivery of SLP services to individuals with post-stroke aphasia. People migrate for different reasons including political, educational, and socioeconomic (Bhugra & Becker, 2005). There has been a rise in immigrants in countries in Western society due to these countries´ good economic conditions (Moch, 2003). In this study, Western society refers to a society where there is wide-spread industrial activity that has typically resulted in relatively good economic conditions (Harris, 2010). Countries in Western society include the United States of America, Canada, United Kingdom, Australia, Norway, and Japan. The rise in immigrants in Western societies may present individuals who are not fluent in the country's official language. In the event of post-stroke aphasia, language can become a barrier in providing SLP services to the individual because of a lack of culturally and linguistically relevant SLP resources specifically for that population (Centeno, 2015; Guo et al., 2014). In a rural area in South Africa, Legg and Penn (2013) mentioned that therapy was likely to be in English, as opposed in the native language of the individual with post-stroke aphasia. This is the case in most rural settings in SSA where the people are familiar with the local dialect but not English.

For most SSA countries, tertiary hospitals are situated in urban cities and remain geographically inaccessible to rural areas. This also contributes to the challenges of accessing SLP services because there are no locally-based SLP services in rural areas (Legg & Penn, 2013). Users of these tertiary rehabilitation facilities need to travel, and economic hardship often restricts access to these services. Moreover, most of the rehabilitation services in SSA including SLP, are not covered by social services like health insurance, which makes it difficult for potential service users to pay for these services (Imarhiagbe & Abidakun, 2014). Ghana is among the few countries in SSA to implement a nationwide health insurance system called the National Health Insurance Scheme (NHIS; Sarpong et al., 2010). The NHIS act of parliament was established in 2003 with the goal of increasing access to primary healthcare by phasing out the out-of-pocket service popularly known in Ghana as the "cash and carry" system (Amu et al., 2018; Sarpong et al., 2010). The NHIS covers all healthcare services except non-listed drugs, medical examination for visas, mortuary services and germane to this study, rehabilitation services with the exception of physiotherapy (Kotoh, 2013).

The religious, cultural, and traditional beliefs of SSA regions also influence their perception of the cause of post-stroke aphasia (Legg & Penn, 2013). Consequently, there can be relatively low motivation to seek SLP services. Most residents of SSA regions perceive post-stroke aphasia as punishment and ancestral reprisal for sin. Some residents of SSA may also believe that ancestral spirits purposefully remove the language capacity of an individual preventing the victim from giving an account of their encounter with the ancestors. Legg and Penn further stated that people believed witchcraft and sorcery were sources of post-stroke aphasia. These cultural beliefs may influence the treatment and rehabilitation procedures for post-stroke aphasia. For example, individuals with post-stroke aphasia and their families in SSA often seek treatment from traditional healers and prophets instead of healthcare providers and healthcare centers (Hundt, 2004). In other regions of SSA, spiritual responses,

including fasting and prayers, were described as responses to communication disability including post-stroke aphasia (Wylie et al., 2017).

Typically, a health care center related to the treatment of strokes will have a stroke unit. A stroke unit involves a multidisciplinary team of professionals from different disciplines with specialized expertise in the area of stroke who work together to provide quality care to individuals who have experienced a stroke (Clarke & Forster, 2015). The team can include stroke physicians, nurses, neurologists, physical therapists, SLPs, and occupational therapists (Langhorne et al., 2011). Dysphagia, which can occur following stroke, is any disruption in the swallowing process with symptoms such as repetitive swallowing, recurrent pneumonia, and choking (Shaker & Geenen, 2011; Sura et al., 2012). Early detection and treatment of dysphagia in individuals with stroke can reduce their length of hospital stay and health care expenditures (Martino et al., 2005). To be economical, the health care professionals on the stroke unit can make decisions about shifting resources from aphasia therapy towards dysphagia treatment (Law et al., 2010; Rose et al., 2014). The shift of resources from aphasia treatment to dysphagia treatment by other professionals in the stroke interdisciplinary team can result from a low level of knowledge regarding the importance of SLP services for post-stroke individuals (Law et al., 2010).

Becoming aware of a problem contributes to finding the solution. There is a paucity of studies on stroke and its related disabilities, such as aphasia, in SSA. The absence of reliable mortality and morbidity registers in most SSA regions prevent the acquisition of accurate records on prevalence and incidence of cardiovascular diseases (CVD) among the population (Van der Sande, 2003). CVD epidemiology data in SSA can be characterized as sparse and of uneven quality (Moran et al., 2013). With the small number of neurologists and neurology training programs in SSA, interest and support of clinical and epidemiologic research on stroke is limited (Chin, 2012). In a literature review, Dalal and colleagues (2011)

found few community-based studies on non-communicable disease, with countries such as
South Africa being over-represented among the limited investigations. As highlighted
previously, most stroke patients in SSA do not visit the hospital due to scarce financial
resources, distance, and health beliefs (Howitt et al., 2011). Yet, most reports on stroke are
hospital-based resulting in limited and unreliable data because there is an under-
representation of community-based stroke cases (Akinpele & Gbiri, 2009). Furthermore,
because of the burden of communicable diseases such as HIV/AIDS and tuberculosis in SSA,
resources have been channeled into research studies in these areas, therefore restricting
funding for aphasia research (Penn, 2014).

There is a gap between research and practice (Glasgow, Lichtenstein & Marcus,
2003). Evidence-based practice (EBP) is the use of current best evidence in making decisions
about the care of individuals by integrating the health care professionals' clinical expertise
with the best available external clinical evidence from systematic research (Dodd, 2007).
Research studies outline the challenges clients face with SLP services. Despite the growing
literature documenting these challenges and proposed solutions to these challenges, few of
the interventions are implemented in applied settings (Glasgow et al., 2003). The gap
between research and practice can be attributed to time. SLPs have reported having less time
to access the evidence base (Vallino-Napoli & Reilly, 2004). Workplace settings can
contribute to the gap between research and practice because some organizations may provide
little support for implementing EBP (O'Connor & Pettigrew, 2009).

**1.7 SLP Education and Training**

A major function of education lies in providing individuals with the knowledge and
skills to train them for specific and general roles such as training for a job or profession, a
particular skill or technique, introduction to modern culture or teaching of life skills (Biesta,
2009). The SLP program is an educational program that trains individuals to become

professionals who engage in professional practice in the area of communication and swallowing (ASHA, 2016). The education program is required to have both academic (course) and clinical education and training (Brown & Orange, 2006). Clinical education describes the practice of assisting a student to acquire the required knowledge, skills and attitudes in practice settings such as health service clinics and field work sites to meet the standards designed by a university degree structure or professional accreditation or licensing board (Rose & Best, 2005). Despite the role of SLP programs in training prospective SLPs, many SSA countries continue to lack training facilities, contributing to the shortage of qualified rehabilitation specialists (Fagan & Jacobs, 2009). However, some SSA countries have commenced SLP training programs. Among them are Mozambique in 2014, Zambia in 2015, Kenya in 2013, and Ghana in 2015 (Wylie et al., 2016). In Uganda, a Master's degree program was developed to train SLPs to deliver communication rehabilitation to the residents of Uganda (Barrett & Marshall, 2013). Likewise, a French-speaking SLP program was introduced in Togo in 2003 to train SLPs to provide SLP services to francophone regions of that country (Topouzkhanian & Mijiyawa, 2013).

**1.8 Self-declaration**

My final research work in undergraduate centered on the screening and early detection of hearing impairment among children. This study was carried out at the Komfo Anokye Teaching Hospital (KATH), where the audiology and speech therapy units are located in the same building. Through my data collection at the audiology unit, I occasionally observed the process of service delivery at the speech therapy unit (as called in Ghana). I further had casual conversations with the SLPs regarding their clinical practices. Although we never talked specifically about post-stroke aphasia, I realized there is a lot to uncover regarding the post-stroke aphasia rehabilitation process. To satisfy my curiosity, I decided to make SLP services in Ghana my field of research, influencing both my choice of program, as

a speech and language sciences student, and research area. Due to my lack of clinical expertise, I did some background research on issues regarding post-stroke aphasia, which is my specified research area. Based on my previous experience and the reviews of the literature, I chose to do a research project to provide a detailed description of the rehabilitation services available for post-stroke aphasia in Ghana.

## 1.9 Statement of the Problem

Individuals with post-stroke aphasia often have the aims of returning to their pre-stroke life, communicating and receiving information, participating in social activities and attaining independence (Worrall et al., 2011). Post-stroke aphasia rehabilitation services are provided by SLPs. Research supports the effectiveness of SLP-based services for post-stroke aphasia (Cherney et al., 2011; Dignam et al., 2016; Nickels, 2002; Robey, 1998). Individuals with post-stroke aphasia who receive SLP-based services exhibit significant improvement in their language skills compared to individuals with aphasia who do not receive such services (Elman & Bernstein-Ellis, 1999). Researchers have reported that individuals with aphasia recover language skills when SLP-based treatment is initiated early, prior to 6 months post onset of aphasia, and if continued for a considerable amount of time (Godecke et al., 2014; Shewan & Kertesz, 1984). The intensity of the treatment also contributes to its effectiveness. Studies have shown that more intensive SLP services delivered over a long duration results in significant improvement in communication abilities (Bhogal et al., 2003; Brady et al., 2016; Breitenstein et al., 2017).

In spite of the aforementioned importance of rehabilitation services, rehabilitation services in SSA, which includes Ghana, continue to be underdeveloped (Wylie et al., 2016). There are challenges associated with the rehabilitation of stroke-related disabilities such as aphasia in low and middle income countries. Theunissen and Swanepoel (2008) reported the lack of appropriate equipment and shortage of staff to be challenges to SLP services in

African countries. Likewise, there is a paucity of resources and an insufficient number of staff providing SLP services in SSA (Fagan & Jacobs, 2009). Ghana currently has a handful of SLPs. As of 2017, there were only 5 SLPs serving the entire country of 29 million Ghanaians (Wylie et al., 2017). Ghana has made an effort to educate and train more SLPs in the country by establishing one graduate and one undergraduate level SLP programs in the country. These programs are offered in the School of Allied Health Sciences at the University of Ghana, in the Greater Accra region, and at the University of Health and Allied Sciences, in the Volta Region. Despite the effort made by the country, there are only two SLP centres located in two tertiary hospitals in the country; Korle-Bu Teaching Hospital and Komfo Anokye Teaching Hospital of Ghana. For most of the countries in SSA, as in the case of Ghana, tertiary hospitals are situated in urban cities and remain geographically inaccessible to rural areas. This also contributes to the challenges of accessing SLP services because there are no locally based SLP services in rural areas (Legg & Penn, 2013). There have been nominal studies describing SLP services for post-stroke aphasia in SSA including Ghana.

**1.10 Purpose of the current study**

The current study seeks insight on the rehabilitation services for individuals with aphasia. The aim of the current study is to explore the sectors involved in the rehabilitation of post-stroke aphasia in Ghana. The areas include the roles of the interdisciplinary health care professionals, family caregivers, and educational institutions in the assessment and treatment of post-stroke aphasia. Accordingly, this study seeks to explore the SLP services currently available for individuals with post-stroke aphasia living in Ghana and to identify the challenges of providing such SLP services. It is the role of the educational institutions offering the SLP programs in Ghana to educate and train prospective SLPs in all aspects of communication rehabilitation including rehabilitation for persons with post-stroke aphasia. Therefore, the current study also reviewed the SLP programs in Ghana to examine how the

assessment and treatment of the language skills of individuals with aphasia are taught in these programs. The process of data collection may educate respondents on the importance of rehabilitation of post-stroke aphasia. The results of the current study can be used to improve the SLP services for individuals with post-stroke aphasia in the future. Considering the nominal studies on stroke and its related disabilities and the rehabilitation services available in Ghana, the current study will add to existing literature on post-stroke aphasia in Ghana.

**1.11 Research questions:**

1. What SLP services are available for individuals with post-stroke aphasia on inpatient and outpatient basis in Korle-Bu and Komfo Anokye Teaching Hospitals of Ghana?

2. How knowledgeable are health care professionals at the Korle-Bu and Komfo Anokye Teaching Hospitals´ stroke units on post-stroke aphasia and SLP services for post-stroke aphasia?

3. What do health care professionals at Korle-Bu and Komfo Anokye Teaching Hospitals´ stroke units perceive as challenges to providing SLP services to individuals with post-stroke aphasia?

4. What do SLPs in Ghana perceive as challenges to providing SLP services to individuals with post-stroke aphasia?

5. How knowledgeable are family caregivers of individuals with post-stroke aphasia on aphasia and SLP services for post-stroke aphasia?

6. How do the SLP programs offered in Ghana educate and train students regarding SLP services for individuals with post-stroke aphasia?

**Chapter 2**

**2.0 Method**

**2.1 Study design**

The study utilized a qualitative case study approach with thematic data analysis. The qualitative research method uses inductive data analysis to learn about the meanings participants hold about an issue by identifying patterns within the data (Lewis, 2015). This type of research method is most appropriate when a researcher seeks to understand the context of a health problem (Denzin & Lincoln, 2011). A qualitative research method was appropriate for the current study because little has been empirically documented about the SLP services available for individuals with post-stroke aphasia in Ghana. The "what" and "how" questions of qualitative research are suitable for topics for which little is known from the participants' perspective (Carpenter & Suto, 2008).

The case study approach explores a real-life, contemporary bounded system, known as a case or multiple bounded systems (cases), through a detailed and in-depth data collection process (Hyett et al., 2014). Case study designs collect and integrate multiple sources of data such as interviews, observations, document review and audiovisual materials (Creswell & Poth, 2017). Multiple data sources also enhance credibility of the data, with the assumption that data collected from different sources on the same issue can help develop a holistic image of the phenomenon (Baxter & Jack, 2008). The type of case study design used in the current study was an exploratory case study. Exploratory case studies are used to examine those situations in which the intervention being evaluated has no single set of outcomes (Baxter & Jack, 2008).

SLP services for individuals with post-stroke in Ghana represented the selected case for the study. To develop a deeper understanding of aphasia assessment and treatment processes and the current state of SLP services for individuals with post-stroke aphasia in

Ghana, several units responsible for educating and training, and managing stroke and its resultant aphasia were analyzed. Exploring the contributions to and effects on SLP therapy services that post-stroke units and education and training institutions have in Ghana resulted in a rich analysis that illuminated the case (Baxter & Jack, 2008). In the current study, the embedded units included SLPs, health care professionals (i.e., doctors and nurses) in the stroke unit, family caregivers of individuals with aphasia, and SLP university program coordinators.

The current study aligned with the constructivist-interpretive paradigm or philosophy informed by Stake (1995). The goal of case study methodology is to conduct an in-depth analysis of an issue by exploring, understanding and presenting findings from the participants´ perspectives (Harrison et al., 2017). A case study methodology also entails interpretation of the data to draw conclusions (Stake, 1995). The current study data were examined in terms of both personal interpretations of the researchers and external interpretations from the extant literature. This interpretative approach associates with the constructivist-interpretive philosophy that seeks the meaning and understanding of experiences in context along with the researchers´ interpretive role (Stake, 2006). The aim of interpretivists is to explore meaning and interpretations (Finlay, 2002).

The study used thematic analysis as the data analysis procedure for the qualitative methodology. Thematic analysis is used for identifying, analyzing, and reporting patterns (themes) within data (Braun & Clarke, 2006). Researchers who use thematic analysis provide an interpretation of the various aspects of the research topic together with the raw data (Boyatzis, 1998). Out of the data acquired, themes collated from categories and codes in the data were defined and analyzed in accordance with the research questions.

**2.2 Role of the researcher**

The primary researcher (KK) took on the sole active role in the research process. In a qualitative study, the researcher is a central figure who influences the collection, selection and interpretation of data (Finlay, 2002). The primary researcher was responsible for recruiting respondents, conducting interviews, and analyzing data and interpreting the findings. The primary researcher's lack of training in clinical SLP was a disruption during data collection but that was a motivator to inquire more from respondents to get a better understanding of issues in the current research. However, not to be entirely ignorant on the issues, there was a review of the literature (Strauss & Corbin, 1998). Support was received from members of the primary researcher's advisory committee of whom two are expert SLPs in aphasia and all are well-established researchers. To enhance knowledge and understanding on the theoretical and clinical concepts of aphasia and its management, the primary researcher audited two graduate-level, acquired language disorder courses from the School of Communication Disorders in the Faculty of Health Sciences, University of Western Ontario at London, Canada. Keeping in mind the aim of the current research, bracketing was employed in the study. Bracketing refers to researchers examining their prejudices to allow them to include the views of their respondents (Dowling, 2007). This was ensured by being reflexive, which is being consciously self-aware of one's own subjective responses and interpretations (Finlay, 2002). To assist with the interpretation of the data, Stake (1995) summarized the role of qualitative researchers as being in the field, making observations, exercising subjective judgement, analyzing, and synthesizing, while realizing their own consciousness.

**2.3 Procedural rigor**

The approach to optimize the rigor of the current study followed the four criteria proposed by Lincoln and Guba (1985), which are credibility, dependability, confirmability

and transferability. Credibility refers to producing valued and believable findings (Houghton et al, 2013). Credibility can be ensured through triangulation or the use of multiple and different methods, sources and theories to obtain corroborating evidence (Anney, 2014). The primary researcher employed two forms of triangulation, using different sources of data and multiple respondent groups to enhance the quality and credibility of the data. Credibility of the data can further be ensured through peer debriefing (Lincoln & Guba, 1985). It is important to note that no two researchers will interpret the data in the same way and give the exact same coding and thematic structures (Houghton et al, 2013). Rather, the aim of peer debriefing is for two researchers to agree on codes and thematic structures and the process used (Graneheim &Lundman, 2004). Debriefing sessions were held between the primary researcher and committee members to arrive at set of codes and themes for data analysis.

For other researchers to assess the study for trustworthiness, a detailed description of the process used in obtaining the product of the study was outlined (Houghton et al., 2013). The outlined process can assist other researchers to follow the same data collection procedure. To ensure transferability of the study findings, a detailed description of the study contexts, methods and data collected should be provided (Braun & Clark, 2006; Graneheim & Lundman, 2004; Tracy, 2010). The purposive nature of the population sample contributed to the richness of the data because the participants had expert knowledge in the current study. To ensure validity of the data, data saturation was observed. Saturation means sufficient data of the phenomenon have been collected because the collection of additional data adds no new insight (Marshall et al., 2013; Morse et al., 2014). Sample sizes of the stakeholder groups were selected on the basis of saturation along other reasons (see also sections 2.5.2, 2.6.1, and 2.7.2 Participants). To enhance transferability, appropriate quotations (see Results section) were provided along with the findings of the study (Houghton et al., 2013).

**2.4 Ethical considerations**

There are two forms of ethical considerations, namely procedural ethics and "ethics in practice" (Guilleman & Gillam, 2004, p. 263). Procedural ethics refers to the ethical actions dictated as universally necessary by larger organizations, institutions or governing bodies (Tracy, 2010). To comply with this required step in the current research, ethical approval was obtained from the research ethics boards of the University of Western Ontario (see Appendix A), KBTH (see Appendix B), and KATH (see Appendix C). Participants were asked to read the Letter of Information (LOI) and sign an informed consent form (see Appendices D, E, F, & G) prior to data collection. The voluntary nature of the current research and the right to withdraw from the study was made known to participants. "Ethics in practice" was considered throughout the research study. "Ethics in practice" refers to the everyday ethical issues that arise in carrying out a study (Guilleman & Gillam, 2004, p. 263). Confidentiality of the participants' was ensured by storing the data collected on an encrypted computer. Confidentiality and anonymity were ensured by using pseudonyms to describe data from individual participants.

**2.5 Part 1 Methods: Interviewing SLPs and other health care professionals**

**Figure 1: Map of Ghana showing the current study´s research settings**
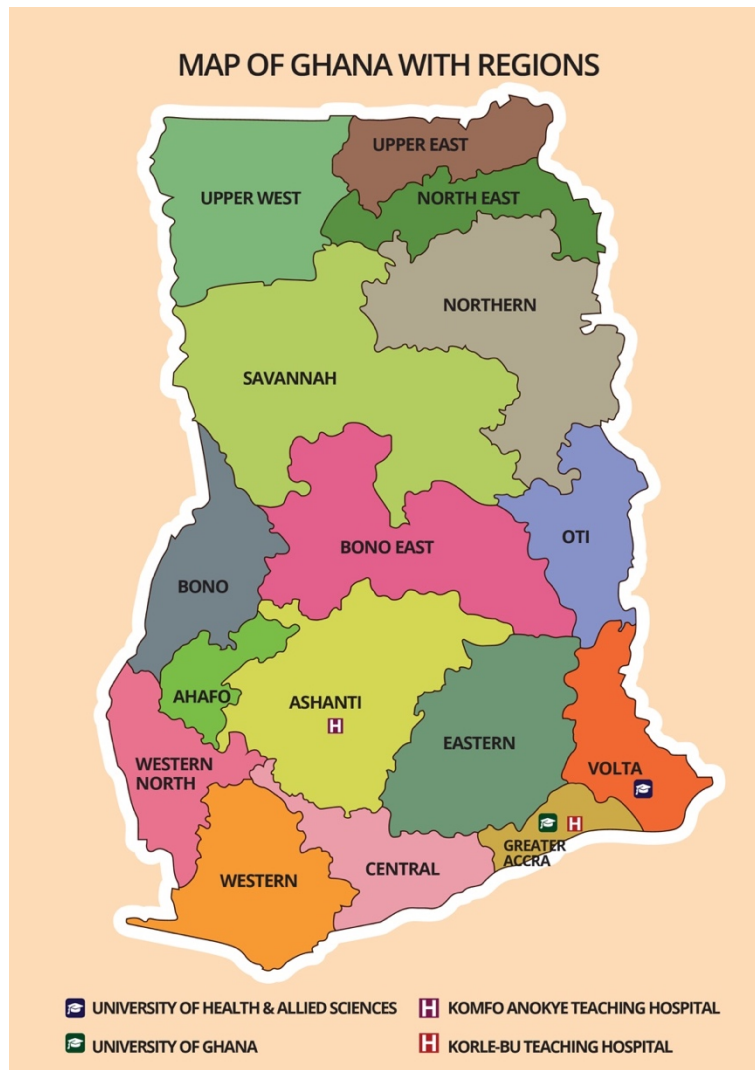


### 2.5.1 Research setting

The research settings for interviewing SLPs and other health care professionals were

KBTH and KATH (see Figure 1). KBTH and KATH are the only hospitals with stroke units

and speech therapy units in the entire country of Ghana. KBTH is a health care facility

located in the capital region of Ghana, Greater Accra. It is currently the only public tertiary

hospital in the southern part of the country. The departments of KBTH include

physiotherapy, cardiology, child health, Ear, Nose and Throat (ENT), psychiatry, audiology,

and speech therapy. KBTH was selected as one of the current research settings because it is

the leading, national referral centre in Ghana (Korle- Bu Teaching Hospital, 2018), resulting

in the hospital caring for many patients including individuals with post-stroke aphasia.

KATH is in Kumasi, the regional capital of Ashanti Region, the third largest region in

Ghana. The departments of KATH include emergency medicine, trauma and orthopedics,

child health and family medicine, oncology and, eye, ear, nose and throat. The road network

of the country and the commercial nature of Kumasi make the hospital accessible to all areas

that share boundaries with the Ashanti region (Komfo Anokye Teaching Hospital, 2017). As

such, referrals at KATH are received from most of the other regions in Ghana.

**2.5.2 Participants**

The case study approach allowed the embedded units within the overall case with

different perspectives regarding the current study's focus to be purposefully selected

(Creswell & Poth, 2017). The participants included SLPs, neurologists, general medical

doctors, nurses and other health care professionals on stroke units. The participants were

purposefully sampled because of their knowledge and affiliation to the current research and

because they are involved in the assessment and treatment of stroke and/or post-stroke

aphasia. Purposive sampling involves choosing participants who can give rich and clarified

information on the current research (Polkinghorne, 2005). Qualitative research is interested in

understanding a phenomenon from the participants' perspective; therefore it is important to

select the sample most informed about the current research topic (i.e., post-stroke aphasia

therapy in Ghana; Merriam, 2002).

**Health care professionals.** Health care for and rehabilitation of individuals who have

suffered a stroke, including those with post-stroke aphasia, are typically provided by a

multidisciplinary team consisting of medical and nursing staff, as well as SLPs (Langhorne,

Bernhardt & Kwakkel, 2011). Neurologists are specialized physicians with knowledge of

brain anatomy and function (Caplan, 2003). They are familiar with the signs, symptoms and diagnosis of neurological disorders such as stroke. They are also knowledgeable about stroke recovery and rehabilitation. The stroke neurologist can be the manager of a stroke team consisting of other relevant rehabilitation specialists such as SLPs (Tomek, 2016). General medical doctors are usually the coordinators of the rehabilitation team and they are responsible for the medical assessment and management of stroke (Miller et al., 2010). Nurses play a key role in the interdisciplinary team of health professionals in the stroke unit. Nurses provide general care, assessment of needs and the integration of rehabilitation into the care of individuals with post-stroke aphasia (Burton, Fisher & Green, 2009). Generally, in inpatient care settings, nurses often have the most direct contact (compared to other team members) with individuals receiving health care including individuals with aphasia and their caregivers, compelling them to be informed about the rehabilitation services and procedures provided by the interdisciplinary team (Miller et al., 2010). The health care professionals in the current study were recruited from the stroke units at the two hospitals specified above. The inclusion criteria for health care professionals were individuals with one or more years of working experience in the stroke units of KBTH and KATH.

Qualitative research studies conducted in clinical settings may have sample sizes as low as one participant, six or seven participants, or twelve to fifteen participants (Michael et al., 2013). Indeed some prior qualitative case study investigations involving health care professionals adopted sample sizes ranging from three to fifteen (e.g., Flinkman et al., 2013; Trible et al., 2008). The current study recruited six health care professionals from KBTH and KATH. The sample size of health care professionals was an adequate number to provide the required data because it fell within the proposed range of sample size for interviewing health care professionals. The sample size of the health care professionals also proved sufficient to identify themes within the data as data saturation was observed.

**Speech-language pathologists.** An essential rehabilitation specialist for post-stroke aphasia is the SLP. SLPs are credentialed and trained individuals who provide screening, assessment, and intervention services to individuals with communication disorders including aphasia and swallowing disorders (ASHA, 2004). The interventions provided by SLPs aim at improving language, communication and/or swallowing abilities (Langhorne et al., 2011). The inclusion criteria for this respondent group were SLPs working in KBTH or KATH speech therapy units. Taking into consideration the number of SLPs reported to be in Ghana in 2017 (i.e., 5 SLPs; Wylie et al., 2017), interviewing three SLPs was ideal for both the availability of the SLPs at the above specified speech therapy units and obtaining the required data.

### 2.5.3 Recruitment procedure

Following the approval of organizational ethics at University of Western Ontario, KBTH and KATH hospitals, healthcare professionals whose practice involves persons with post-stroke aphasia were identified using the following methods. Heads of stroke units in the hospitals acted as gatekeepers and assisted in recruiting health care professionals from the stroke units. In bureaucratic settings like hospitals, formal gatekeepers are the authoritative figures who grant official permission of entry into a research setting (Burgess, 1991). The healthcare professionals were introduced to the primary researcher by the head of the stroke unit. SLPs were approached directly at their units of practice in KBTH and KATH by the primary researcher.

Participants were asked by the primary researcher to read the Letter of Information (LOI) (see Appendices D & E). The primary researcher answered all of the participants' questions before the participants were asked to sign the informed consent prior to the interview. One health care professional declined participation because he felt he didn´t have much knowledge regarding the topic of the current study.

**2.5.4 Data collection procedure**

Data were collected using interview guides (see Appendices L & M), that included a set of questions pertaining to demographic information (see Appendices J & K).

**Interview guide and procedure.** An interview guide contains the list of questions or issues to be explored with the participants (Neale et al., 2006). An in-depth interview was conducted with the interview guide. In-depth interviewing is a qualitative research technique that involves conducting intensive individual interviews with a small number of participants to explore their perspective on an issue (Boyce, 2006). The interview guide was comprised of open-ended questions. The open-ended nature of the questions allowed the participants to fully express their viewpoints and experiences and provide detailed information on the subject (Turner, 2010). The nature of the current research required different interview guides for the various sample groups. Questions included in the interview guides for the current study were developed based on past literature (Bennett, Cartwright & Young, 2017; Hopper, Cleary, Oddson, Donnelly & Elgar, 2007).

There were three steps to interview each participant. The first step involved providing participants with information about the research study and the interviews, presenting the LOI, answering questions, signing the informed consent form, and scheduling a date and time for the next interview. This step took approximately 15 minutes to complete. The second step addressed the research questions via an in-depth interview. The third step, a follow-up interview, was conditional on the emergence of unclear data during data analysis. Both the second and third steps lasted approximately 1 hour. All interviews were conducted through Skype or Zoom. Interviews were audio recorded with the approval of the participants. Audio recording is helpful for getting all of the data and the exact words used (Stake, 1995). Hand written notes were made along with the audio recordings.

**Demographic information.** Data collected included demographic information from study participants at the beginning of the second step of the interview. Demographic data are used to describe the sample of respondents in a study (Connelly, 2013). Such information can include age, sex, level of education, employment and other topic-specific characteristics (Hinde, 2014). Information collected and analysed should also be relevant to the current study (Morse, 2008). The questions pertaining to demographic information were shared via email to the participants; participants then filled out their responses and returned them to the primary researcher of the current study in the same medium.

**2.5.5 Data analysis strategies**

Analysis of data was done alongside data collection. This process shapes the ongoing data collection by allowing the researcher to refine the interview questions, inquire deeper understanding of the data, and/or restructure the population sample (Pope et al., 2006). Data analysis is the process of providing coherence and structure to the cumbersome data collected (Ritchie & Spencer, 2002). The aim of data analysis is to organize rigorously, find patterns and obtain themes from the data collected (Houghton, Murphy, Shaw & Casey, 2015). A framework is important to help achieve the aims and outputs through systematic analysis of the data (Ritchie & Spencer, 2002).

**Interviews.** The current study adopted the framework of Braun and Clarke (2006) based on six cognitive processes of analysis: familiarizing yourself with the data, generating initial codes, searching for themes, reviewing themes, defining and naming themes and producing the report. Although these six cognitive processes follow a sequential pattern because moving on to the next phase depends on completion of the previous phase, thematic analysis is also a recursive process as there is a back and forth movement throughout the phases (Braun & Clarke, 2006; Morse, 1994).

Familiarizing yourself with the data requires that you immerse yourself in the data to become familiar with every aspect of the content through repeated reading in an active way, which is searching for meanings and patterns (Braun & Clarke, 2006). Familiarizing was ensured by transcribing the verbal data collected through interviews. Attention was paid to using punctuations while transcribing to represent the true meaning of the data. Each transcription was compared with the audio recordings twice for accuracy and read three times for familiarization before generating codes.

Generating initial codes begins after you have familiarized yourself with the data (Braun & Clarke, 2006). A code is a descriptive or conceptual label that is assigned to a section of the data (Houghton et al., 2015). Coding is an analysis process that helps the researcher to sort the data and uncover underlying meaning in the text (Morse, 1994). The coding strategy for the current study was data-driven, retaining accounts of data that appeared to depart from the dominant story, as they might be useful in the later stages of analysis (Braun & Clarke, 2006). There was an observation of similarities among codes from the different participant groups. Examples of codes in the current study included: stroke unit, post-stroke aphasia treatment, and post-stroke aphasia education.

The next stage of data analysis is searching for themes. This phase involves collating all similar codes identified in the data into potential themes (Braun & Clarke, 2006). This process can also be known as pattern coding (Miles & Huberman, 1994). Similar codes from the different participant groups were collated into themes. During this phase of analysis, memos can be formulated. Memos are summaries of key information derived from coding (Houghton et al., 2015). Braun and Clarke (2006) explained that memos can be made by writing the name of each code with a brief description in a book and further organizing them into themes. The primary researcher developed a memo when collating the codes into themes. The extracted codes were used to create themes, which were used later in analysis.

Reviewing themes involves refining the themes created: Some themes might be discarded because of insufficient data, some themes may be merged, and others may be broken down to form various themes (Braun & Clarke, 2006). All collated codes in the current study were re-read to ensure a coherent pattern in the theme.

After a satisfactory review of themes, themes were further refined and named (Braun & Clarke, 2006). As recommended by Braun and Clarke, it is vital to not paraphrase the content of the extracted data but to identify the essence of the theme developed. Names of the themes must be concise, and immediately give the reader a summary of the theme. Naming of the themes developed in the current study occurred at this stage. The above process of data analysis was done in consultation with the primary researcher´s advisor, Dr. Laura Murray, as well as members of the International Consortium for Communication, Aging, and Neurodegeneration (ICCAN) Research Laboratory at Elborn College, University of Western Ontario.

The final stage of data analysis is the write-up of the report (Braun & Clarke, 2006). The write-up must provide enough evidence of the themes within the data, not just describe the data, and make an argument in relation to the research questions. Comparisons among the embedded units of the overall case were made. For example, themes related to post-stroke aphasia education were not described or discussed in isolation, but rather a comparison of aphasia education themes identified among the various stakeholder groups who were interviewed was made. The final report of themes in the current study was produced together with the researcher's interpretation of the emerged themes. Analysts need to take a dual position in thematic analysis as both cultural members and cultural commentators.

The thematic framework presented was used to analyse all interviews of the various units of cases. To acquire a holistic understanding of the case study, the individual units were examined to identify comparisons across the various units (Crowe et al., 2011).

**Demographic information.** The demographic information for the current sub-study described the respondents. Demographic information expands our knowledge of the study and can be used to analyse the data (Connelly, 2013). The demographic information was useful in drawing relationships between the respondents and their interview data. For example, their profession, educational level, and languages used were considered when interpreting their comments about SLP service delivery.

## 2.6 Part 2: Interviewing caregivers

### 2.6.1 Participants

The participants for this sub-study were family caregivers of individuals with aphasia. The participants were purposefully sampled because of their affiliation to the current research.

**Family caregivers of people living with aphasia.** Caregiving by family members is the usual and regular provision of assistance and support by one family member to another (Biegel, Sales & Cchulz, 1991). Therefore, when husbands and wives provide care to their family or parents provide support to their children, the act can be defined as caregiving. Caregivers can be paid health providers, family members or friends of the individual. In Africa, due to the rise in cost of formal or paid caregiving, families, particularly, women, assume the role of caregiving in the home (Samuel-Hodge et al., 2000). The term caregivers used in this study represents family members who provide extraordinary care to other family members due to conditions such as post-stroke aphasia. Family caregivers are an integral part of SLP services provided to individuals with post-stroke aphasia (Johansson et al., 2011). In an online survey regarding recommendations for aphasia best practice, 100% of the experts and multinational stakeholders involved with aphasia agreed upon the importance of including families or caregivers in the rehabilitation process (Simmons-Mackie et al., 2017).

Mackenzie and Greenwood (2012) conducted a systematic review on the experiences of caregiving in stroke and the sample sizes of the qualitative research studies ranged from four to ninety participants. Examples of qualitative case studies conducted with family caregivers of individuals with aphasia have had small sample sizes of one to three participants (e.g., Davidson et al., 2008; Le Dorze et al., 2009). The current research focused on four informal or family caregivers of individuals with aphasia to assess their understanding of aphasia and SLP services for aphasia. Based on the cited systematic review study and example aphasia studies, the sample size was hypothesized to be appropriate to get different opinions on the subject. Data saturation was observed with the family caregivers participant group.

**2.6.2 Recruitment procedure**

Permission for the primary researcher to connect with family caregivers of individuals with post-stroke aphasia, both in- and out-patients, was obtained first by SLPs and other health care professionals before the primary researcher contacted the family caregivers. Once permission was secured from the caregivers, they were contacted via telephone by the primary researcher using the contact information from either the SLPs or other health care professionals. A brief introduction about the primary researcher and the current study was given. On agreeing to know more about the current study, a Skype or Zoom meeting was set at a convenient date and time. Individuals in this study group were family caregivers of individuals diagnosed with aphasia.

**2.6.3 Data collection procedure**

The primary researcher collected data from this sample group using an interview guide (see Appendix N). The interview procedure described for the SLPs and other healthcare professionals (part 1 above) was applied for this study group as well. The interview guide was developed in-part by reviewing past literature on caregivers (U.K. Department of Health and Social Care, 2016).

**2.6.4 Data analysis strategies**

The data analysis procedure for the interview followed the framework of Braun and Clarke (2006) concurrent to data collection and as described above for Part 1.

**2.7 Part 3: Information regarding university training programs**

**2.7.1 Research setting**

The largest university in Ghana, the University of Ghana's College of Health Sciences, took the initiative to introduce in its School of Allied Health Sciences, the Speech and Language Therapy program (as called in Ghana; University of Ghana, 2014; see Figure 1). The program has the goal of educating and training SLPs to provide services to individuals with communication disorders. Including the School of Allied Health Sciences in the current study was relevant because the current research sought to examine if and how the Speech and Language Therapy program educates and trains students to provide services to individuals with aphasia.

Another research setting was the Speech and Language Therapy program at the University of Health and Allied Sciences (see Figure 1). This university is in Ho, in the Volta Region of Ghana. Though the University of Health and Allied Sciences was only recently established in 2011, it is the first state university wholly dedicated to the training of healthcare professionals in Ghana (University of Health and Allied Sciences, 2018), including SLPs.

**2.7.2 Participants**

The participants recruited to give information on the SLP training programs were the university coordinators at the above cited universities in Ghana.

**SLP university program coordinators.** Higher education provides an opportunity for students to gain fundamental knowledge and become skilled clinicians and experts in their

field of study in the future (Sommers & Caruso, 1995). Similarly, in Ghana, SLP university programs are responsible for providing adequate education and training in aspects of speech and language therapy including aphasia assessment and treatment to prospective professionals. Prospective SLPs are required to have preservice education, clinical practice, mentorship and supervision for future practice (American Speech-Language-Hearing Association, 2016). To acquire all of the relevant education and training in aphasia management, SLP programs must be designed accordingly. Program administrators and/or coordinators are responsible for making administrative decisions related to program designs and curriculum (Ladyshewsky & Flavell, 2012). To develop a link between the education and training provided to SLPs and the therapy services provided to address post-stroke aphasia, the current curriculum and syllabi used in the SLP university programs in Ghana were reviewed by the primary researcher of the current study. Program coordinators were further interviewed by the primary researcher of the current study to provide detailed explanations on emerging subjects from the reviewed documents. The inclusion criterion for this group of respondents was program coordinators for SLP programs at the University of Ghana or the University of Health and Allied Sciences in Ghana. The program coordinator from each of the two cited universities was interviewed for the current study and both of the program coordinators were deemed qualified to provide the primary researcher with the relevant information.

**2.7.3 Recruitment procedure**

Program coordinators were introduced to the primary researcher by gatekeepers from the two cited universities. In addition to reviewing the syllabi of the two SLP programs in Ghana, the primary researcher conducted interviews with the coordinators of the two university SLP programs through Skype.

**2.7.4 Data collection procedure**

Data were collected using an interview guide (see Appendix O) and from a review of the SLP university programs syllabi. The interview guide was developed in part based on previous literature (Brown & Orange, 2006; Orange, MacNeill & Stouffer, 1997).

**Interview guide.** The interview process followed the procedure outlined for the two previously described sub-studies.

**Document review.** A copy of the SLP program curriculum and syllabi in the universities in Ghana was reviewed for the content and number of hours of coursework instructions and clinical training dedicated to aphasia. These documents were obtained directly from the program coordinators.

**2.7.5 Data analysis strategies**

**Interview.** The interview were analyzed using the framework of analysis of Braun and Clarke (2006) as described above for Part 1.

**Documents review.** Documents often serve as a substitute for records of activities that the researcher could not observe directly or as a confirmation of respondents' responses (Stake, 1995). While keeping in mind the case being explored, the SLP university programs´ curriculum and syllabi were analyzed in line with the data collected regarding the education and training provided to SLPs in the field of aphasia management by the primary researcher. For example, the various topics taught and the number of hours of classroom education and clinical training pertaining to aphasia management were identified; this information was then compared to determine if it meshed with the interview data from the university program coordinators and SLPs (as two SLPs had received their training in Ghana).

**Chapter 3**

**3.0 Results**

**3.1 Introduction**

Study findings are discussed under the following topics: the structure of the stroke units of Korle-Bu and Komfo Anokye Teaching Hospitals of Ghana, knowledge of SLP services, SLP service delivery, access to SLP services, challenges in both delivery and access to SLP services, and suggestions for improving SLP services.

**3.2 Participants**

The table below indicates the percentage distribution of all individuals who participated in the study.

**Table 3.0: Distribution of all participants by their job description or role**

| Job description | Frequency | Percentage |
|---|---|---|
| SLPs | 3 | 20 |
| Doctors | 3 | 20 |
| Nurses | 3 | 20 |
| University Program Coordinators | 2 | 13.3 |
| Family Caregivers | | |
| Wife | 2 | |
| Brother | 1 | |
| Niece | 1 | |

| Total | 4 | 26.7 |
|---|---|---|
| Total | 15 | 100 |

**Table 3.1: Demographic information of the health care professionals and SLPs**

| Job description | Age | Number of working years | Educational level completed |
|---|---|---|---|
| Neurologist | 41 | No response | PhD |
| Doctor 1 | 34 | 8 years | Doctor of medicine |
| Doctor 2 | 34 | 10 years | Doctor of medicine |
| Nurse 1 | 30 | 3 years | Diploma |
| Nurse 2 | 35 | 10 years | Bachelor degree |
| Nurse 3 | 37 | 9 years | Bachelor degree |
| SLP 1 | 58 | 5 years | Master´s degree |
| SLP 2 | 39 | 9 years | Master´s degree |
| SLP 3 | 28 | 1 year | Master´s degree |

**3.3 Demographics of the participants**

    **3.3.0 Health care professionals.** The health care professionals consisted of participants who graduated from nursing training institutions or universities, with qualifications including a diploma in nursing, degree in nursing, medical doctors or specializations in neurology education (see Table 3.1). All health care professionals worked in KBTH or KATH government hospitals, with their number of working years ranging from 3 to 10 years. Most health care professionals spoke English and Twi fluently and provided services in either English, Twi, or both languages.

    **3.3.1 SLPs.** The SLPs recorded working a range of 1 year to 10 years in the above listed government hospitals in Ghana (see Table 3.1). All SLPs provided services to all age groups, from preschool to older adults, as well as services for all communication disorders. A Master´s degree in Speech and Language Therapy/Pathology was held by all SLPs.

    **3.3.2 Caregivers.** All caregivers were family members and mostly females. The participant group included wives, a niece, and a brother of 4 males with post-stroke aphasia.

**3.4 Structure of Korle-Bu and Komfo Anokye Teaching Hospitals´ stroke units**

    The Korle-Bu and Komfo Anokye Teaching Hospitals both had stroke units with a multidisciplinary team (MDT; as referred to in Ghana) of health care professionals. The MDT in both hospitals included physicians, stroke care nurses, physiotherapists, occupational therapists, pharmacists, dieticians, and clinical psychologists. There was one additional health care professional on the KBTH stroke unit, an SLP; KATH´s MDT lacked an SLP.

    At both KBTH and KATH, post-stroke aphasia diagnosis was made by a physician either at the hospital´s emergency unit or at the stroke unit. KBTH reserves the comprehensive assessment and intervention procedure of post-stroke aphasia for SLPs. All health care professionals at the KBTH stroke unit confirmed that providing post-stroke

aphasia treatment was the role of SLPs. One health care professional said, *"We do more of the diagnosis and the SLTs will do the assessment and recommendations."*

In contrast at KATH, most health care professionals reported that no specific treatment was offered for post-stroke aphasia, either by them or other health care professionals. Their main concern was to improve the overall outcome of the stroke. When asked if an aphasia treatment is given to individuals with post-stroke aphasia, one health care professional said *"A specific treatment for aphasia? We don't really have a specific treatment for aphasia."*

**3.5 Knowledge regarding SLP services for individuals with post-stroke aphasia**

All participant groups were asked about their knowledge regarding post-stroke aphasia. Knowledge questions focused on determining the aphasia education and training health care professionals and SLPs received during their school years, the aphasia training they are still receiving, or their general awareness of post-stroke aphasia and the treatment services available.

**3.5.0 Health care professionals.** Health care professionals from both hospitals mentioned not taking a specific course on post-stroke aphasia during their school training except the neurologist, due to his specialized training in stroke management. The educational courses for nurses and general medicine doctors covered general stroke management, which included some basic knowledge on aphasia but no detailed information on post-stroke aphasia assessment and treatment. Health care professionals at both hospitals mentioned their weekly MDT meetings to be a form of education and training on stroke-related issues including aphasia. Health care professionals on the stroke unit met once a week to discuss and answer questions about their patients and their health conditions, complications, and improvements. Additionally, health care professionals at KBTH, as part of their stroke unit

training, reported receiving detailed stroke management training from an international health partner organization in the United Kingdom called Wessex-Ghana Stroke Partnership (WGSP). One health care professional stated, *"We have all been trained on the core skills of stroke management by our partners in the UK."*

KBTH utilizes a "train the trainers" approach in which the hospital organizes training sessions for new health care professionals on the stroke unit and in other hospitals. These sessions cover stroke education including information about post-stroke aphasia assessment and treatment services.

Due to their WGSP training, health care professionals at KBTH reported feeling knowledgeable on the importance of SLP services for individuals with post-stroke aphasia and therefore referred all post-stroke aphasia cases to SLPs for assessment and treatment.

On the other hand, most health care professionals at KATH reported feeling they lacked knowledge on the existence and/or importance of SLP services for individuals with post-stroke aphasia who were patients in their hospital. The few who felt knowledgeable on the importance of SLP services for individuals with post-stroke aphasia had attended the WGSP education and training program at KBTH; these past attendees of the WGSP program mentioned that just a few KATH health care professionals had been able to receive education and training from WGSP because of financial challenges (e.g., travel expenses for the duration of the training program). Most KATH health care professionals reported hearing about the importance of SLP services for individuals with post-stroke aphasia for the first time when they were contacted for participation in the current study. One health care professionals stated, *"...I'm really surprised, I'm surprised, was like wow, the day I saw the letter of information from you, I was like wow, this is something we need to take up because it is really important."*

**3.5.1 SLPs.** SLPs at both hospitals mentioned they had taken courses on acquired language disorders, including aphasia and its assessment and treatment procedures. In addition to classroom learning, they received clinical training for addressing acquired language disorders, either general clinical training on all communication disorders or aphasia-specific clinical training by working with individuals with post-stroke aphasia during their clinical placements. One SLP said, *"We did a clinical course in general, not specifically for aphasia,"* whereas another SLP stated, *"… We were assigned to work with adults with aphasia."* Despite the differences in their knowledge and clinical skill acquisition on post-stroke aphasia, all SLPs at the speech therapy units involved in the study reported currently providing assessment and treatment services to individuals with post-stroke aphasia.

**3.5.2 Family Caregivers.** To inquire about the aphasia knowledge and awareness level of the public and the SLP services available for individuals with post-stroke aphasia, family caregivers of individuals with post-stroke aphasia on stroke units of KBTH and KATH were interviewed. Although all interviewed family caregivers were aware of their relatives´ communication difficulties, none at the time of the interview had been given information about the SLP services available for their relatives. One family caregiver expressed concern over the lack of information saying, "No they haven't told me anything about the services." Family caregivers expressed a lack of awareness about existing SLP services available for individuals with post-stroke aphasia. However, they all acknowledged the importance of SLP services for individuals with post-stroke aphasia and were willing to receive such services. A family caregiver commented, *"Oh yes! I will agree, it is importance so I will agree to such services."*

**3.5.3 SLP University program coordinators.** In the two public universities offering Speech and Language Therapy programs in Ghana, formal classroom education on aphasia was provided to students in a course labelled Acquired Language Disorders (ALD). At the

University of Ghana where the Speech and Language Therapy program is offered as a 2-year Master´s program, the ALD course is taught in the first semester of the second year. Out of the 14 weeks of ALD lectures (2 hours per lecture), seven or eight weeks are dedicated to aphasia. To fulfil the program requirement, throughout the semester, each student has to complete 8 weeks of clinic at the hospital´s speech clinic. The students are at the clinic for a full day, once a week for the 8 weeks. The clinical training covers all communication disorders but at the end of the 8-weeks placement, the student would have contact with an individual with post-stroke aphasia. The program coordinator stated *"... But in the course of the program, all the students will have met and worked with an aphasia client."*

At the University of Health and Allied Sciences however, the program is a 4-year Bachelors program entitled Speech Language and Hearing Sciences. The ALD course is taught in the second semester of year 3. In the first 2 years of the program, students complete course requirements for both audiology and speech therapy but choose an area of specialization in the 3rd year of study.  Students in the Speech and Language Therapy stream receive at least 2 hours per week of formal classroom education on ALD, which includes aphasia, for 13 weeks. Along with classroom education, students undergo at least 3 hours per week of clinical education in a speech clinic. Although the clinical training covers all courses in communication disorders, students also receive training on ALD including aphasia.

Both universities mentioned that the ALD courses had been taught since the beginning of the programs therefore inculcating their students with aphasia-based knowledge. When asked about the history of the ALD course, one program coordinator said, *"Yeah, it was part of the original curriculum."*

**3.6 SLP service delivery**

Questions and responses regarding SLP service delivery focused on the assessment and treatment practices and processes at the stroke and SLP units of KBTH and KATH, as well as the challenges and effects the health care professionals face in delivering such services.

**3.6.0 Health care professionals.** Health care professionals at the stroke units of both KBTH and KATH used a number of assessment procedures to arrive at a diagnosis of post-stroke aphasia. For example, a diagnosis stemmed from neuroimaging data to identify the location of the stroke, which can suggest the presence of aphasia. Other procedures included assessment of fluency, comprehension, repetition, and naming to help classify the type of aphasia. The health care professionals also reported using informal assessment procedures such as communicating with the patient and expecting a verbal response, assessing the clarity of the response as well as asking the patient to read or give responses to a written statement or question, to classify the type of aphasia. When discussing the assessment tools, one health care professional said *"Of course there are assessment tools you can use but it is not routinely used to diagnose aphasia."*

After diagnosis, KBTH reserved the treatment of post-stroke aphasia for SLPs at the hospital. The treatment process starts on an in-patient basis where the SLP visits the stroke unit as part of the MDT requirements. After discharge from the stroke unit, individuals with aphasia are then referred to the SLP unit at KBTH, where treatment continues. When asked if all individuals with post-stroke aphasia are referred to an SLP, a health care professional at KBTH confirmed that, *"Yes all of them, all of them are seen by a speech therapist."*

There was a contrast in the treatment of individuals with post-stroke aphasia at the stroke unit of KATH versus KBTH. Although the KATH stroke unit assessed and diagnosed individuals with post-stroke aphasia, no specific post-stroke aphasia treatment was given and

the majority of the post-stroke aphasia cases were not referred to an SLP. Some health care professionals at KATH attributed the nonreferral of individuals with post-stroke aphasia to their lack of awareness regarding SLP services for individuals with post-stroke aphasia. Others expressed a lack of awareness of existing SLP services at KATH, describing the situation as *"a lack of means or faculty to tackle rehabilitation of speech."* Health care professionals at KATH who were both knowledgeable and aware of existing SLP services termed referring individuals with post-stroke aphasia to an SLP as "not top of the things" in stroke management. They explained that from their experience, in the event of a stroke, individuals have many disability-related issues to deal with and coupled with financial challenges, aphasia treatment is neglected. One health care professional stated *"...If you are looking at risk factor management, rehabilitation, physio, occupational, speech therapy, home re-arrangement if they have to, all those things make it difficult. There is a competing interest here that we are trying to use limited resources from the patient's finances to address so many issues and so unfortunately aphasia tends to suffer in terms of how we manage our patients."*

**3.6.1 SLPs.** Within the SLP units, informal tools such as activities (e.g., reading a SLP self-developed short story) and picture cards were mainly used to assess the spoken language expression and comprehension, reading, writing, and cognitive skills of both in-patient and out-patient clients. The SLPs reported that these tools were self-developed and culturally appropriate. The SLPs at both hospitals adopted an individual approach to intervention due to the low number of aphasia clients on their caseloads. Concerning group therapy, one SLP also mentioned that, *"The group dynamics and its challenges are difficult to manage so we haven't thought about any group therapy yet at the moment."*

**3.6.2 Challenges of SLP service delivery**

A number of challenges were identified within the stroke and SLP units of both

KBTH and KATH in terms of providing post-stroke aphasia assessment and treatment.

Although the KBTH stroke unit was offering more post-stroke aphasia services compared to

KATH, health care professionals and SLPs at both hospitals reported similar challenges.

**3.6.2.0 Inadequate number of SLPs.** At KBTH where SLPs were part of the MDT

and provided in-patient care to individuals with post-stroke aphasia on the stroke unit, the

health care professionals mentioned that the SLPs sometimes were understaffed, resulting in

delays and/or reductions in in-patient aphasia services. The health care professionals

attributed understaffing to the fact that the available SLPs provide services to all units of

KBTH; with the low number of SLPs (i.e., 6 full time and 2 part time SLPs), they get

overwhelmed with work and that limits their availability to the stroke unit.

The stroke unit of KATH also attributed the absence of aphasia treatment in their

stroke management practices to the inadequate number of SLPs (i.e., 1 full time and 1

voluntarily worker) at their hospital. One health care professional stated, *"We don't have*

*enough speech therapists so the few available are overwhelmed with other neurological*

*disorders."*

**3.6.2.1 Lack of interest in SLP field.** Although the SLP program is offered in two

educational institutions in Ghana, both health care professionals and program coordinators

expressed worry over the lack of interest of students and health care professionals in studying

or continuing their education, respectively, in the SLP field. The program coordinators

mentioned that between audiology and SLP, students prefer the audiology stream. For

example at UHAS where students choose between SLP and audiology area of specialization

in the 3rd year of their undergraduate program, the department records fewer students in the

SLP program. For example, the first and second batches of graduates from this SLP program were three and nine, respectively. Currently there are 21 students in their third year of the program, of which seven are in the SLP field. One program coordinator said, *"They prefer audiology to the speech field."*

Reasons generated by health care professionals for the lack of interest in the SLP field included a lack of awareness of the SLP training programs, the limited number of institutions offering the SLP program and the availability of a ready job market on completion. One health care professional explained the reason for lack of interest in the SLP field of study as, *"... When you graduate do you have a ready job market to employ you because sometimes some programs, you will further and come back barely visible."*

**3.6.2.2 Language.** One post-stroke aphasia assessment and treatment challenge reported among health care professionals and SLPs was language. Health care professionals and SLPs used one or a combination of the following in their health care delivery: English, the nation´s official language, or Twi, an ethnic dialect spoken widely in the country. Because both hospitals received referrals from all regions in the country, the probability of a language barrier is high because of the more than 250 different languages and dialects spoken in the country.

Health care professionals mentioned language to be a challenge when assessing individuals with post-stroke aphasia. One health care professional stated, *"Sometimes you may not be able to speak the person´s language so it may throw a shadow into whether the patient is really appreciating what you are saying or it is a matter of language barrier."*

One SLP described the language barrier as a major challenge. He said *"One major difficulty is the language barrier. You know there are a number of languages in Ghana and I only speak Twi, Ga and Late. So if someone comes in speaking Ewe or from the North and*

*cannot speak any of the languages I speak, it becomes very difficult."* He further explained that working with an interpreter was also a challenge in the assessment and treatment process as many interpreters would give responses to questions asked of the client (vs. letting the clients respond for themselves).

**3.6.2.3 Lack of tools.** Both SLP units at KBTH and KATH reported a lack of formal assessment and treatment tools or an inadequate number of tools for delivering SLP services to individuals with post-stroke aphasia. The KATH SLP unit mentioned sometimes purchasing informal assessment tools with personal funds; they described their biggest challenge to be the lack of appropriate tools.

**3.6.2.4 Lack of area of specialization.** Some SLPs described their lack of specialization in a specific age group or communication disorder to be a challenge in providing SLP services. That is, they noted that their approach to service delivery was for every SLP to provide services to all age groups and all communication disorders. Being responsible for such a broad client population sometimes disrupted their service; for example, one SLP said, *"...but sometimes it's a mixed up of people with all areas of communication disorders and it's difficult so sometimes we have to rebook them for another time."*

**3.6.3 Effects of challenges**

Health care professionals and SLPs acknowledged that the challenges described above disrupted the quality of health care provided to individuals with post-stroke aphasia. For example, the language barrier might obstruct the SLP-client relationship as clients might not feel comfortable during sessions, the lack of tools can distort the progress of the sessions and clients may not benefit from sessions if SLPs lack the appropriate knowledge regarding their communication disorders. The SLPs mentioned that all these factors can additionally discourage individuals with post-stroke aphasia from seeking SLP services.

**3.7 Access to SLP services**

Family caregivers of individuals with post-stroke aphasia were interviewed regarding their access to SLP services. A number of challenges were identified.

**3.7.0 Lack of awareness of SLP services.** The main challenge for family caregivers was the lack of awareness of SLP services for their relatives with post-stroke aphasia currently in stroke units. When health care professionals at KBTH stroke unit were asked about family caregivers´ lack of awareness of SLP services, even though the health care professionals reported informing and providing SLP services to individuals with post-stroke aphasia, they cited time issues. For instance, one health care professional said, *"The timing of SLP review varies depending on the individual patient. Some might be quite ill and so we have other concerns in the initial period, some are stable and so SLP usually sees them within 48 hours. If they have prominent speech deficits, then much earlier. Other times not until after discharge and follow up."*

**3.7.1 Financial difficulties.** Family caregivers of individuals with post-stroke aphasia already accessing SLP services mentioned the cost of treatment to be a challenge. For example in KBTH, the cost of one SLP session is 70 Ghana cedis, which is equivalent to 17.80 Canadian dollars. Family caregivers of individuals with post-stroke aphasia found it difficult to cover such costs in addition to the cost of other rehabilitation services. Both SLPs and family caregivers explained that aphasia treatment costs were not covered under health insurance. One caregiver stated, *"the health insurance covers some of the therapies but not speech therapy."*

**3.7.2 Distance.** As both SLP units received referrals from other regions of the countries, distance was yet another challenge reported. Individuals with post-stroke aphasia and their family caregivers have to travel long distances, sometimes from outside Accra or

Kumasi to access SLP services. Even travels within the region can still involve long distances. One SLP explained that some individuals with post-stroke aphasia and their family caregivers residing in the region could spend close to 5 hours for their round trip to the SLP unit. One caregiver explained her reason for missed rehabilitation sessions, stating, *"I live at Sereso, Lake road, and because of the distance, I have to charter a taxi and pay 70 cedis for my trip to KATH, but things are hard so I stopped coming for sessions."*

       **3.7.3 Transportation.** Both SLPs and family caregivers expressed worry over lack of accessible transportation for individuals with post-stroke aphasia who might have other forms of disabilities such as mobility issues. One SLP stated, *"We don't have suitable transportation because some of the clients we have are wheelchair bound so they need appropriate transportation but they have to be carried in taxis, those who cannot afford taxis cannot go on the trotro, the public transport so it makes it challenging coming back for sessions."*

       **3.7.4 Spiritual and traditional beliefs.** Health care professionals stated that spiritual and traditional beliefs of individuals might be a reason hindering access to SLP services. That is, because of their spiritual beliefs, individuals with post-stroke aphasia and their caregivers may seek alternative treatment such as visits to pastors or herbalists. Health care professionals explained that the long duration of aphasia treatment could be a motivating factor for seeking alternative treatments. One health care professional explained, *"Well you refer the patient but for the patient to be able to follow through and sometimes you know aphasia treatment takes quite a while and if you get to understand a bit of the context of how stroke is seen locally you will get to understand that right after stroke, even those of us in orthodox medicine struggle to keep our patients, because right after discharge they are going next to see a herbalist or they are going to see erm a pastor so even for those of us in*

*orthodox medicine, the best you can get for them is inpatient, when they are discharged from here you will be lucky they come back to you."*

**3.7.5 Availability of caregivers.** One reason mentioned for the lack of access to SLP services was the lack of available caregivers to accompany the individuals with post-stroke aphasia to treatment sessions. Due to economic challenges, family caregivers were mostly used by individuals with post-stroke aphasia. Sometimes, these family caregivers also have to work or attend school, limiting their frequency of access to SLP services. A health care professional stated, *"The issue is usually most of the patients may also have some weakness, maybe some hemiparesis or neurological deficits so if they don't have caretakers who are going to be available to bring them regularly for their visits, some eventually miss out."*

**3.7.6 Effects of the access challenges**

All of the above reported challenges can disrupt the delivery of SLP services to individuals with post-stroke aphasia. As previously mentioned, individuals with post-stroke aphasia were reported to fail to attend some or all SLP sessions due to the challenges outlined above, which in turn will likely hinder the expected results from SLP services. One SLP mentioned, *"All these factors affect the number of sessions they are able to come and for those who do not have the means to overcome these challenges, it becomes a difficulty accessing service, whether for assessment or for treatment."*

**3.8 Suggestions for improving SLP services**

All respondent groups were asked about their views regarding ways to minimize and or remove barriers to providing and accessing SLP services.

**3.8.0 Awareness creation.** A common suggestion was creating awareness among all stakeholder groups including health care professionals and the general public of the importance and existence of SLP services. Health care professionals also agreed that

knowledgeable family caregivers and relatives of individuals with post-stroke aphasia can compel health care professionals to make more referrals. It was noted that even at KATH where most of the aphasia cases from the stroke unit are not referred to SLPs, some referrals were made because family caregivers requested SLP services or raised concern over the communication disorder of their relatives. One family caregiver explained her relative´s referral process as, *"He (doctor) hadn't informed us about any therapy for almost one and half years. It was when I came for the review last week and complained about the delay in his speech, that was when he gave me a referral note to come here."*

In hospitals such as KATH where SLPs are not included in the stroke unit care of individuals with post-stroke aphasia, it was reported that increasing the awareness of SLP services among health care professionals can impel the hospital´s management team to include SLP services in stroke care. One health care professional noted that the inclusion of dieticians on the MDT within the KATH stroke unit resulted from suggestions from the health care professionals. He also added, *"The good thing about the stroke unit in KATH is that when you suggest to the doctors and management, because we are a team they really take your suggestion, so whatever we suggest to them they really try to incorporate."*

**3.8.1 Education.** Health care professionals suggested educating other peripheral hospitals on aphasia assessment and treatment, as stroke cases are also managed in these hospitals. One health care professional said, *"And of course educating other physicians who manage stroke patients. In this country it is not only neurologists who manage stroke patients. We have general physicians and most of them, speech therapy may not even cross their mind. They may think that they may want to use some medications to help the patients regain speech function, when indeed the patient has to see a speech therapist."*

To help increase the number of SLPs in the country, students can be educated on the benefits of SLP program. They can be motivated to choose the SLP field of study.

**3.8.2 Health insurance coverage.** A lot of the economic problems such as transportation fares were considered individual problems but including the cost of SLP services in the health insurance coverage can decrease the burden of other challenges and motivate more  individuals to access SLP services in Ghana.

**CHAPTER 4**

**4.0 Discussion**

**4.1 Introduction**

The current study examined rehabilitation services for individuals with post-stroke aphasia in Ghana by exploring the roles of the stakeholder groups involved in the assessment and treatment of post-stroke aphasia in Ghana, as well as the challenges they encounter in providing or identifying services. The stakeholder groups included interdisciplinary health care professionals including SLPs, family caregivers of individuals with post-stroke aphasia, and educational institutions. Study findings are discussed under the following topics: the structure of Korle-Bu and Komfo Anokye Teaching Hospitals´ (KBTH and KATH) stroke units, knowledge of SLP services, SLP service delivery, challenges of SLP service delivery as well as access to SLP services, effects of the challenges and, suggestions for improving SLP services in Ghana.

**4.2 Structure of KBTH and KATH´s stroke units**

The findings revealed that both hospitals had an multidisciplinary team (MDT) on their stroke units which include a number of professionals including physicians, stroke care nurses, physiotherapists, pharmacists, occupational therapists, dieticians, and clinical psychologists. The MDT at KBTH stroke unit included a SLP. It is a similar situation in the United Kingdom (UK) and Canada where MDTs on stroke units included stroke physicians, stroke nurses, physiotherapists, occupational therapists, and SLPs (Clarke, 2013; Rac et al., 2017). Clarke and Forster (2015) mentioned that patients on a stroke unit with a full MDT benefitted from early intervention and effective rehabilitation. The existence of a full MDT including a SLP on KBTH´s stroke unit could be because KBTH is the premier health care facility located in the capital region of Ghana. As explained by Johnson et al. (2017), the partnership between Wessex (UK) and KBTH called the Wessex-Ghana Stroke Partnership in

2009 encouraged the development of a MDT on the stroke unit with various disciplines including SLP.

Although KATH is the second largest hospital in Ghana, their stroke MDT lacked a SLP. The lack of a full MDT on stroke units is observed in most SSA countries (Walker et al., 2010). The absence of a SLP on their stroke unit could be attributed to management priorities. As the study results revealed, the KATH stroke unit management deemed SLP services subsequent to other rehabilitation services. This could be because the unit´s management lacked guidance and information on priority setting of services and the appropriate resources to make such SLP services available (Sibbald et al., 2009).

**4.3 Knowledge of SLP services**

The study findings revealed a lack of knowledge on post-stroke aphasia and SLP services for post-stroke aphasia among the health care professionals interviewed for this study, except the few who had been trained at their respective stroke units. Similarly in a study by Carragher (2020), the study themes revealed that although health care professionals wanted to assist patients with aphasia in healthcare, they lacked knowledge on aphasia care. Cameron et al. (2018) also highlighted that health care professionals need education and training to ensure the consideration of QOL measures for individuals with post-stroke aphasia and that includes providing SLP services. As stroke care nurses spend a lot of time with patients on stroke units, there is a demand for increased awareness and knowledge on assessment and rehabilitation practices for individuals with post-stroke aphasia (Vallumrød et al., 2016). Therefore, Vallumrød and colleagues suggested the need for more education and training on aphasia and its therapy services for health care professionals on MDTs. However, the current findings indicated that the training curriculum of health care professionals lacked specific courses on aphasia and its assessment and treatment topics. Mezei et al. (2011)

affirmed that education in training institutions are the basis of knowledgeable health care professionals in a specific field, including aphasia and its therapy services.

Another stakeholder group in the current study with a lack of knowledge and awareness of aphasia and its management was family caregivers. Family caregivers´ awareness and knowledge of SLP services for individuals with post-stroke aphasia are essential in the patronage of service (Chazhikat, 2014). However, the study findings revealed a lack of knowledge and awareness of SLP services among the family caregivers of individuals with post-stroke aphasia who participated. This finding was consistent with a study conducted in southern Ontario, Canada, in which public awareness and knowledge of aphasia was low (Patterson et al., 2015). Similarly, McCann et al. (2015) found that public awareness and knowledge of aphasia was limited in New Zealand. Lack of awareness and knowledge of aphasia is regarded as a universal challenge. Code et al. (2016) conducted a study in six countries from three continents on the public´s awareness of aphasia, and found that the knowledge and awareness level of aphasia was low. Both health care professionals and SLPs on stroke units can take up the role of educating family caregivers on existing SLP services for their relatives with post-stroke aphasia. As explained by Johansson et al. (2011), involving family caregivers in aphasia management is important, especially providing information on aphasia and its treatment services.

Because SLPs are an integral part of aphasia rehabilitation on stroke units (Babur & Habibullah, 2017; Rodgers & Price, 2017; Seidel & Seidel, 2018), it is important for them to have the necessary education and training on aphasia and its rehabilitation practices. Whereas SLPs interviewed for this study received formal classroom education on aphasia and its management, not all SLPs received specific clinical training on post-stroke aphasia. A forum on SLPs practices in South Africa mentioned that SLPs should be clinically competent, but they lack such training because of a number of challenges from training institutions such as

lack of relevant human resources (e.g., professors in specific fields; Mophosho, 2018).

Therefore, the lack of appropriate SLP clinical training on post-stroke aphasia assessment and

treatment practices in the current study might reflect the lack of clinical supervisors with

knowledge on aphasia rehabilitation practices during the SLPs´ time of study. As

recommended by Mulwafu et al. (2017), to improve SLP practices, it is important for training

institutions to invest in appropriate teaching staff and training.

Finch et al. (2013) reported that many SLP students do not receive practical training

on aphasia therapy. To avoid such a situation, both educational institutions offering the SLP

program in Ghana had included in their curriculum formal classroom education and clinical

training equipping prospective SLPs with knowledge of aphasia and its management. This

arrangement can help improve SLP services given to individuals with post-stroke aphasia as

prospective SLPs will be more knowledgeable on aphasia management. As stated by

Farrugia- Bernard (2018), when SLP programs provide prospective SLPs with coursework

and pre-service clinical experiences, it can increase their confidence and competence in

providing SLP services including aphasia management practices.

## 4.4 SLP service delivery

The results of the study showed that both stroke units used different forms of

assessment procedures to identify the presence of aphasia in their stroke patients. The

procedures included examining patients´ neuroimaging findings to determine the lesion site

and size, which in turn can suggest the presence of aphasia. As stated by Rhode et al. (2018),

post-stroke language deficits can be evaluated through a series of clinical measures and

assessments including neuroimaging. Assessment of aphasia begins with an assessment of all

components of language functioning and the process should be carried out with appropriate

tools (Murray & Coppens, 2017), but the KBTH and KATH stroke units lacked such

resources. Health care professionals from the KBTH and KATH stroke units classified

aphasia through an evaluation of fluency of verbal output, auditory comprehension skills, and repetition skills as recommended by Helm-Estabrooks et al. (2014).

As compared to individuals with post-stroke aphasia at KATH, those with post-stroke aphasia at KBTH´s stroke unit have the potential to maximize their recovery because KBTH SLPs were involved in further assessment and treatment procedures after aphasia diagnosis via in-patient services. Early identification, diagnosis and treatment of post-stroke aphasia are important steps in increasing rehabilitation gains (Salter et al., 2006). The inclusion and presence of SLPs on stroke units´ MDTs can ensure early assessment and rehabilitation (Clarke & Foster, 2015; Miller et al., 2011).

SLPs at KBTH and KATH followed up with further assessment and treatment procedures either at the stroke units for inpatient clients or at the SLP units for outpatient clients. Formal assessment tools are defined by Murray and Coppens (2017) as published quantification tools that are either purchased or found in the experimental literature. On the other hand, informal assessments are non-standardized tools that are often designed by the clinicians or the unit (Hersh et al., 2018; Thomson et al., 2018). Similar to the health care professionals, SLPs at both KBTH and KATH utilized informal assessment and treatment tools for post-stroke aphasia. Although informal assessment and treatment tools developed by health care institutions can be used in the diagnosis and treatment of post-stroke aphasia (Rhode et al., 2018), using informal assessment tools in isolation without standardized tools has its limitations. Such limitations can include a lack of administration and interpretation consistency (Cruice & Ten, 2019; Morrow-Odom et al., 2017). Therefore there is a need to use both formal and informal assessment procedures for post-stroke aphasia (Murray & Coppens, 2017).

**4.4.0 Challenges of SLP service delivery**

The study findings revealed that there were a number of challenges affecting the effective delivery of SLP services at KBTH and KATH, and likely more broadly in Ghana. Both hospitals reported an inadequate number of SLPs within their stroke and SLP units. In a study to determine challenges to SLP service delivery across Australia and Canada, Lim and colleagues (2017) reported that an inadequate number of SLPs to meet the increased caseload was a major barrier. The challenge remains similar in most SSA countries. A cross-sectional study by Mulwafu et al. (2017) to assess changes in SLP service in SSA from 2009 to 2015 showed little increase in the number of SLPs over the years, with the inadequate number of SLPs remaining a challenge. This challenge can contribute to the late or even missed assessment and treatment of individuals with post-stroke aphasia, thereby affecting aphasia recovery. The insufficient number of SLPs in Ghana and at both hospitals might reflect that SLP services are regarded as a newly established and evolving rehabilitation service.

The SLP university program coordinators reported a lack of interest in SLP programs by students. The low number of enrolling and graduating students in the only two SLP programs in Ghana will further contribute to the inadequate number of SLPs in the country. The lack of interest in SLP programs can be linked to the lack of availability of stable jobs for SLPs in the country. Data from a study on the employment of SLPs in SSA, including Ghana, revealed that most SLPs held part-time or temporary work roles (Wylie et al., 2018). This was observed in the current study as one SLP respondent was working as a voluntary worker at the SLP unit.

Health care professionals and SLPs reported the use of multiple languages in Ghana to be a major challenge to post-stroke aphasia management services. This is a common challenge to any type of services in a multi-linguistic country like Ghana, where there are more than 250 different languages and dialects (Embassy of Ghana, 2019). Even in the

United States, where a vast majority of the population are monolingual English speakers, SLPs still have reported language to be a challenge in service delivery due to the rise in linguistically diverse clients (Santhanam et al., 2018). Language barriers can affect the effective delivery of SLP services. Mophosho (2018) mentioned that clients who do not speak the same language as their health care professionals receive limited health services compared with those who do and that in turn, can result in poor health outcomes.

Lack of appropriate resources for assessment and treatment of post-stroke aphasia was yet another challenge reported by health care professionals and SLPs in the current study. In Australia, SLPs similarly identified the lack of resources as a major challenge to SLP service delivery (Rose et al., 2014). This tool shortage or lack of formal assessment resources may reflect that the available funds do not cover such resources (Hall-Mills et al., 2017; Morrow-Odom et al., 2017). Indeed health care providers reporting using informal, self-developed assessment tools. The multilingualism of Ghana likely contributes to the use of informal assessment resources designed by local SLPs. A study conducted with Aboriginal Australians cited that effective screening was a challenge because assessment tools will mostly be in English and not linguistically or culturally appropriate (Armstrong et al., 2019). This is the case in countries where there is a lack of resources or a lack of culturally appropriate developed tools (Khoja, 2019).

Adequate knowledge and experience is needed to deliver effective health care. However, an inadequate level of knowledge in aphasia management practices was reported by SLPs participating in the current study. These SLPs suggested that the lack of expertise in aphasia management could be a result of the low aphasia management content in the SLP program curriculum during their education and training. Wylie and colleagues (2018) reported that most SLPs in SSA provide services to a range of communication disorders and age groups, with a predominant focus on paediatrics. Accordingly, this focus on paediatrics

may reflect clinicians feeling better prepared to provide services to children than adults, including those with post-stroke aphasia.

**4.5 Access to SLP services**

For individuals and families to benefit from existing SLP services, they have to be able to access the services. The current findings, however, revealed that individuals with post-stroke aphasia and their caregivers faced a number of access challenges. For individuals with post-stroke aphasia and their families on KBTH and KATH stroke units, the main challenge preventing their access to SLP services was their lack of awareness of SLP services for post-stroke aphasia. Surveys of public awareness of aphasia and its therapy services around the world have shown that there is low level of awareness by the public, including caregivers (Chu et al., 2019; Guo et al., 2014; Simmons-Mackie et al., 2019; Tiwari & Krishnan, 2011). On the KATH stroke unit, the lack of awareness of family caregivers of individuals with post-stroke aphasia can be linked to the lack of knowledge among KATH health care professionals regarding existing SLP services. The rehabilitation services priorities of health care professionals can also influence the kind of information they give to caregivers of individuals with post-stroke aphasia. Although most health care providers are knowledgeable about factors that are important for recovery in post-stroke aphasia, their recommendations do not always reflect the importance of access to rehabilitation for improving functional communication abilities (Mahendra & Hahner Hayes, 2018).

Caregivers of individuals with post-stroke aphasia already accessing SLP services reported the cost of such services to be a major challenge. As SLP services are not covered under the health insurance policies in Ghana, it is a challenge for an average person to afford out of pocket payment. Families´ financial hardships are significant risk factors to access to rehabilitation services, but rehabilitation access can be less problematic for families who can afford self-pay plans (O´Neil et al., 2009).

The patronage level of SLP services was low because of the long distances individuals with post-stroke aphasia and their families had to travel within or out of their region for aphasia therapy services. These long travel distances result from the few SLP centers in Ghana. This barrier also contributes to the economic challenges of accessing SLP services as additional funds are needed for such travels. In many countries, distance has been reported as a challenge to accessing healthcare, including SLP services, because clients are located in distant areas from therapy centers (Annet, 2013; Gallego et al., 2017; Gomado, 2018; Goodridge et al., 2011).

Relatedly, the lack of appropriate transportation for individuals with post-stroke aphasia who might have physical disabilities was another reported barrier to accessing SLP services. Public transportation in Ghana is inaccessible for individuals with physical impairments. Clients and their caregivers have to resort to self-arranged, private transportation, which is also not completely accessible as well as costly. Accessible public transportation is virtually non-existent in developing countries such as Ghana (Naami, 2019).

The study findings revealed that spiritual and traditional beliefs of individuals with post-stroke aphasia and their caregivers is another barrier to accessing SLP services. The cultural or religious perceptions about the cause of a disability can prevent individuals from seeking rehabilitation services (Wegnar & Rhoda, 2015). For example, most SSA residents might attribute the cause of post-stroke aphasia to sorcery and witchcraft or as a punishment from ancestral spirits for sin, thus, seeking traditional or religious responses such as fasting and prayers (Legg & Penn, 2013; Nweke & Eze, 2019). Such spiritual beliefs do not exist only in SSA but also in populations such as Aboriginal groups in Australia, where the causes of stroke and aphasia are related to supernatural causes (Armstrong et al., 2015). Individuals with post-stroke aphasia might require long durations of SLP services (Dignam et al., 2016), and that too might encourage them to seek spiritual or traditional services with the hope of a

quick recovery. It is common for people who are Aboriginal and rural residents to seek traditional medicine after discharge (Penn & Armstrong, 2017).

Individuals with post-stroke aphasia in the study attended therapy services with informal caregivers. Informal caregivers are to be commended for their roles in assisting individuals with post-stroke aphasia to access SLP services. However, due to other social responsibilities, informal caregivers may be limited in their availability to help their family member with post-stroke aphasia access SLP services (Lim et al., 2017; Rose et al., 2014).

**4.6 Effects of challenges in the delivery and access to SLP services**

Providing SLP services to individuals with post-stroke aphasia helps improve their language and communication abilities as well as their quality of life (QOL) (Kotov et al., 2018). However, the challenges in both the delivery and access to SLP services by health care professionals, SLPs and the public can affect the effectiveness and quality of post-stroke aphasia therapy. For example, job stress arising from a heavy workload due to the inadequate number of SLPs can make it difficult to provide high quality rehabilitation services (Oh, 2019). As the use of an interpreter can be a solution to the language barriers, as reported by SLPs in the current study and other researchers, interpreter-mediated therapy sessions can be subject to content validity issues (Guo et al., 2014; Roger & Code, 2011)

Challenges faced by individuals with post-stroke aphasia and their caregivers can also prevent individuals with post-stroke and their caregivers from accessing SLP services. For example, lack of awareness of SLP services for post-stroke aphasia among the health care professionals and the public, including family caregivers can prevent the utilization of such services, and in turn, negatively affect improved care and outcome (Mahak et al., 2018).

**4.7 Suggestions for improving SLP services**

Suggestions for improving SLP services for individuals with post-stroke aphasia were made by the stakeholders involved in the current study. First increasing awareness of SLP services for post-stroke aphasia was a common suggestion. Channels such as the media, MDT meetings, and one-on-one conversations with family caregivers of individuals with post-stroke aphasia were suggested to increase awareness levels. A study by Vuković and colleagues (2017) to assess the awareness level of people in Serbia and Montenegro revealed that the few who were knowledgeable of aphasia gained such knowledge through professional interaction or the media. Increasing awareness of SLP services and their value for addressing post-stroke aphasia can increase the patronage of therapy services (Góngora-Rivera et al., 2018). Similarly, educating health care professionals about the importance of SLP services for post-stroke aphasia can also improve the referral process and foster inclusion of SLPs on stroke units of hospitals. SLPs can take the initiative in educating health care professionals about the importance of SLP services and about their presence in their designated locations (Rose, 2014).

Second, health insurance coverage has been reported to improve health seeking and utilization behaviors and access to health care services  (Kibusi et al., 2018; Sommers et al., 2017). Despite challenges such as inaccessible transportation, distance, and cultural and traditional beliefs, health insurance coverage of SLP services can motivate individuals with post-stroke aphasia to access therapy services.

**4.8 Study Limitations and Future Directions**

A limitation that was noted by the primary researcher was the inclusion of only two hospitals, KBTH and KATH, as the research settings for recruiting health care professionals for the current study. Although the choice of the research settings was justified, the researcher noted that other government and private hospitals also contribute to the treatment

of post-stroke aphasia, as they too provide care to individuals with post-stroke aphasia. Results from the health care professionals who participated can be difficult to generalize to healthcare facilities across the whole country. This is the first study in Ghana to use multiple data sources, respondent groups, and research settings to understand the assessment and treatment procedures, and the current state of SLP services for individuals with post-stroke aphasia in Ghana. However, future studies should consider including other government and private hospitals in the quest to understand the assessment and treatment services provided to individuals with post-stroke aphasia. For example, within hospitals without a designated stroke unit in Ghana, it remains to be determined how, where, and who manages stroke patients and post-stroke aphasia assessment and treatment services, or referrals given for post-stroke aphasia treatment. Although results from the health care professionals who participated in the current study can be difficult to generalize to healthcare facilities across Ghana, the results can be generalized for the two stroke units in the current study (Boddy, 2016).

To further enhance the credibility of the data, observation could have been included in the multiple data collection sources (Abdallah et al., 2018). Observation of assessment and treatment procedures for individuals with post-stroke aphasia on stroke and SLP units could further improve the credibility of data. However, due to various reasons (e.g., visa renewal issues and academic requirements), the researcher could not be physically present in the field during data collection to conduct observation, which is another limitation to the study. Future research should include observation of assessment and therapy services for individuals with post-stroke aphasia in their data collection procedures to enhance data credibility.

Due to the absence of the researcher in the field of study, other channels of communication, such as Zoom or Skype, were used for data collection. Although technology made it possible for a successful data collection, the researcher noted that such technology

could be a reason for non-participation. That is, other potential participants might not have the means or were not comfortable communicating through such channels. In future research, researchers could be physically present in the study field and get to know respondents to encourage participation. The current findings about the awareness of aphasia and SLP services for aphasia by the public were based on responses from family caregivers at KBTH and KATH. The general public in Ghana could also be studied to determine their awareness level of aphasia and of the existing SLP services for individuals with post-stroke aphasia. Further, individuals with post-stroke aphasia could be included in future studies to determine their views on aphasia management in Ghana.

As reported by respondents, the majority of the interventions suggested to address the challenges to the provision of SLP services is through policy change and development. Future studies should explore the available and proposed policies regarding SLP services for post-stroke aphasia in Ghana. For example, researchers could interview the Speech Therapists and Audiologists Association of Ghana as well as hospital management boards regarding their roles in establishing or maintaining SLP services for individuals with post-stroke aphasia. Subsequently, aphasia support groups could be interviewed with respect to their views on the policies currently in place and for their suggestions for policies that could be implemented in the future for individuals with post-stroke aphasia.

As a lack of interest in the SLP field was reported, another stakeholder group, students, should be interviewed to determine their views and concerns with respect to the SLP field of work. Specifically, students in the combined audiology and SLP program could be interviewed to find out why they chose audiology versus SLP and vice versa. The current study also identified a lack of aphasia management in health care professionals´ education and training. Future research could explore the education and training given to health care professionals about aphasia management in educational institutions. For example, stroke care

course curricula could be examined and program coordinators of health institutions could be interviewed regarding their views on including aphasia management in their curricula.

The current study focused mainly on the challenges affecting post-stroke aphasia assessment and treatment services, but future studies could focus on the facilitators to access and delivery of SLP services for post-stroke aphasia. For example, there remains a need to explore how public awareness can increase access to SLP services, how professional practices such as telepractice can increase the delivery of SLP servicers, and how healthcare settings might adopt such telepractice procedures.

The case for the current study focused on the SLP services for individuals with post-stroke aphasia in Ghana. Through data collection, it was observed that other rehabilitation services for stroke patients were prioritized over SLP services. Future case studies could focus on the broader rehabilitation services available for stroke patients in Ghana to assess the professionals responsible for such rehabilitation services, the delivery and access of such services, differences among the type of rehabilitation services provided for different diagnoses, and reasons for providing such services; such research might further inform ways to improve access and delivery of SLP services for post-stroke aphasia. Finally, future case studies might also compare the process of SLP service delivery for individuals with post-stroke aphasia in Ghana to that of a developed country to explore the differences in service delivery and the lessons that could be learned from each country.

**4.9 Conclusion**

As the burden of stroke and its resultant disabilities such as aphasia increase in SSA including Ghana, it is important to have in place rehabilitation services to assist the surviving population (Feigin et al., 2017; Owolabi et al., 2018). Early rehabilitation is vital to aid in recovery; therefore there is a need to commence therapy in acute care and provide continued

therapy in rehabilitation centres (Bernhardt et al., 2017). To deliver quality therapy services, it is important for rehabilitation centres to be equipped with the appropriate resources such as human resources, tools and equipment, and funds (Chu et al., 2019; Jesus et al., 2017). The current study found that there are rehabilitation services available in Ghana for individuals with post-stroke aphasia. Although KBTH and KATH both had stroke and SLP units, KBTH had made an effort to include SLP services in the rehabilitation services for stroke patients on stroke units. There were, however, challenges with the delivery of SLP services in the SLP units at both hospitals, even though SLPs continued to deliver therapy to individuals with post-stroke aphasia.

Some health care professionals and family caregivers who were uninformed about SLP services for individuals with post-stroke aphasia reported that the process of data collection for the current study educated them on the importance of rehabilitation of post-stroke aphasia and the existing SLP services. To address the human resource need, the University of Ghana and University of Health and Allied Sciences, Ghana, had in place SLP programs to train prospective SLPs. To equip prospective SLPs with the required knowledge on post-stroke aphasia, aphasia management content and practicum training were included in the curriculum of these programs. However, such educational content and training could be increased; for example, all students could be provided with practicum experiences in stroke and SLP units. By identifying challenges to the delivery and access to SLP services in Ghana, strategies to improving services such as the health insurance coverage for service users can be implemented.

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# Appendix A

## Research Ethics Board Approval- University of Western Ontario

![Western Research logo]

**Date:** 9 October 2019

**To:** Dr Laura Murray

**Project ID:** 113486

**Study Title:** Rehabilitation of post-stroke aphasia in Ghana.

**Application Type:** HSREB Initial Application

**Review Type:** Delegated

**Meeting Date / Full Board Reporting Date:** 05/Nov/2019

**Date Approval Issued:** 09/Oct/2019

**REB Approval Expiry Date:** 09/Oct/2020

_____

Dear Dr Laura Murray

The Western University Health Science Research Ethics Board (HSREB) has reviewed and approved the above mentioned study as described in the WREM application form, as of the HSREB Initial Approval Date noted above. This research study is to be conducted by the investigator noted above. All other required institutional approvals must also be obtained prior to the conduct of the study.

**Documents Approved:**

| Document Name | Document Type | Document Date | Document Version |
|---|---|---|---|
| Demographic information questionnaire (Health care professionals) | Paper Survey | 07/Oct/2019 | 1.0 |
| Demographic information questionnaire (SLPs) | Paper Survey | 07/Oct/2019 | 1.0 |
| Email Script | Email Script | 03/Oct/2019 | 1.0 |
| Interview guide (family caregivers) | Interview Guide | 03/Oct/2019 | 1.0 |
| Interview guide (Health care professionals) | Interview Guide | 03/Oct/2019 | 1.0 |
| Interview guide (Health care professionals) | Interview Guide | 07/Oct/2019 | 1.0 |
| Interview guide (Speech-Language Pathologists) | Interview Guide | 07/Oct/2019 | 1.0 |
| Interview guide (University program coordinators) | Interview Guide | 03/Oct/2019 | 1.0 |
| Letter of Information and Consent- Family caregivers | Written Consent/Assent | 03/Oct/2019 | 1.0 |
| Letter of Information and Consent- Healthcare professionals | Written Consent/Assent | 07/Oct/2019 | 1.0 |
| Letter of Information and Consent- Speech- language pathologists | Written Consent/Assent | 07/Oct/2019 | 1.0 |
| Letter of Information and Consent- University Program coordinators | Written Consent/Assent | 03/Oct/2019 | 1.0 |
| Research plan | Protocol | 28/May/2019 | 1.0 |
| Telephone script (family caregivers) | Telephone Script | 03/Oct/2019 | 1.0 |

**Documents Acknowledged:**

| Document Name | Document Type | Document Date | Document Version |
|---|---|---|---|
| References (rationale for the study) | References | 28/May/2019 | 1.0 |

No deviations from, or changes to, the protocol or WREM application should be initiated without prior written approval of an appropriate amendment from Western

HSREB , except when necessary to eliminate immediate hazard(s) to study participants or when the change(s) involves only administrative or logistical aspects of the trial.

REB members involved in the research project do not participate in the review, discussion or decision.

The Western University HSREB operates in compliance with, and is constituted in accordance with, the requirements of the TriCouncil Policy Statement: Ethical Conduct for Research Involving Humans (TCPS 2); the International Conference on Harmonisation Good Clinical Practice Consolidated Guideline (ICH GCP); Part C, Division 5 of the Food and Drug Regulations; Part 4 of the Natural Health Products Regulations; Part 3 of the Medical Devices Regulations and the provisions of the Ontario Personal Health Information Protection Act (PHIPA 2004) and its applicable regulations. The HSREB is registered with the U.S. Department of Health & Human Services under the IRB registration number IRB 00000940.

Please do not hesitate to contact us if you have any questions.

Sincerely,

Patricia Sargeant, Ethics Officer (ext. 85990) on behalf of Dr. Philip Jones, HSREB Vice-Chair

***Note: This correspondence includes an electronic signature (validation and approval via an online system that is compliant with all regulations).***

**Appendix B**

**Research Ethics Approval- Korle-Bu Teaching Hospital**

In case of reply the number
And the date of this
Letter should be quoted

My Ref. No.................................
Your Ref. No.........................

KORLE BU TEACHING HOSPITAL

8th August, 2019

KEREN SARPOMAA KANKAM
SCHOOL OF COMM. SCIENCES & DISORDERS
CANADA

<u>**INSTITUTIONAL APPROVAL: KORLE BU TEACHING HOSPITAL-SCIENTIFIC AND TECHNICAL COMMITTEE/INSTITUTIONAL REVIEW BOARD (KBTH-STC/IRB/00097/2019**</u>

Following approval of your study entitled "Rehabilitation of post stroke aphasia in Ghana" by the Korle Bu Teaching Hospital-Scientific and Technical Committee/Institutional Review Board.

I am pleased to inform you that institutional approval has been granted for the conduct of your study in Korle Bu Teaching Hospital.

Please contact the Head of Department to discuss the commencement date of the study.

Please note that, this institutional approval is rendered invalid if the terms of the Institutional Reviewed Board/Scientific and Technical Committee approval are violated.

Sincere regards,

Dr. Ali Samba
Director of Medical Affairs
For: Chief Executive Officer

Cc: The Chief Executive
Korle Bu

# Appendix C

# Research Ethics Board Approval- Komfo Anokye Teaching Hospital

**KOMFO ANOKYE TEACHING HOSPITAL**

**RESEARCH AND DEVELOPMENT UNIT (R & D)**

## CERTIFICATE OF REGISTRATION

REG. NO:

This is to certify that

Prof/Dr/Mrs/Mr/**Ms** *Kankam Keren Sarpomaa*

has registered his/her proposed study titled *Rehabilitation of*
*Post-Stroke Aphasia in Ghana.*

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

............................. with the Research and Development Unit.

Date: *16-July-2019*

Name of issuing officer        Signature

*Mr. Isaac Boakye*

*Receipt number must tally with pay-in slip from the bank

**Note**

This certificate does not constitute ethical clearance for the conduct of the study but proof of registration of study with KATH. Ethical clearance from the Committee of Human Research, Publications and Ethics (CHRPE) is required to conduct the study in KATH. Copies of all relevant regulatory approvals including CHRPE **must** be submitted to the R&D Unit prior to commencement of the study.

Version RD/REG-30TH MAY, 2019
Please note: All previous versions of the certificate of registration becomes obsolete      Form expires 30TH JUNE, 2020

**Appendix D**

**Letter of Information/Consent Form- Health care professionals**

**Project Title**: Rehabilitation of post-stroke aphasia in Ghana

**Principal Investigator**

Laura Murray, PhD

School of Communication Sciences and Disorders

Western University

**Co-Investigators**

Keren Kankam, MSc candidate

Health and Rehabilitation Sciences Program, Western University

J.B. Orange, PhD

School of Communication Sciences and Disorders, Western University

Yolanda Babenko-Mould, RN, PhD

School of Nursing, Western University

**Invitation to participate**

You are being invited to participate in a research study. The study is examining post-stroke aphasia services in Ghana. The study also involves learning about the assessment and treatment services you provide for individuals with post-stroke aphasia. You are being asked

to participate because you are a health care professional involved in stroke care including individuals with post-stroke aphasia.

This study is a student project which is part of the requirements for Ms. Keren Kankam to complete her Master's degree at Western University.

**Why is the study being done?**

The purpose of this study is to explore the speech and language services available for individuals with post-stroke aphasia in Ghana. The study also will examine the education and training given to prospective speech therapists (as called in Ghana) regarding assessing and treating individuals with post-stroke aphasia in Ghana.

Our research is intended to provide information regarding access to speech and language services for individuals who have post-stroke aphasia in Ghana. The research may identify barriers to speech and language therapy services for post-stroke aphasia, and in turn, contribute to improving aphasia assessment and treatment services in Ghana.

**How long will you be in the study?**

It is expected that you will be in the study for two sessions. There will be one to two study visits during your participation in the study. Each visit will last approximately 1 hour. Maximum participation time is expected to be 3 hours. The additional 1 hour will cater for any interruptions, breaks or delays that would lead one or both sessions to go beyond one hour.

**Who can participate in the study?**

We are looking for healthcare professionals who work on stroke units in Korle-Bu (KBTH) or Komfo Anokye (KATH) Teaching Hospitals in Ghana.

Healthcare professionals are eligible to participate in the study if:

- They are over the age of 18

- They speak and read English fluently

- They are health care professionals in KBTH or KATH, and are willing and able to participate

There will be a maximum of six health care professionals from KBTH and KATH, Ghana in the study.

**What are the study procedures?**

If you agree to participate in the study, you will be asked to complete a demographic information questionnaire on the first meeting.

You can be assured that the personal information you give will be treated as confidential. The completed demographic information questionnaire will be stored in a locked cabinet in a secured study room in the home of Ms. Kankam, whiles she is in Ghana. The completed demographic information questionnaire will be kept in a locked carry-on bag in the possession of Ms. Kankam at all times during her travel from Ghana to Canada. When in Canada, the demographic information questionnaire will be stored in the International Consortium for Communication, Aging and Neurodegeneration (ICCAN) Research Laboratory in a locked and private filing cabinet in our locked research laboratory at Western University.

Version 07/10/2019

You will also be asked to complete one to two interviews. The first interview will also occur at the first meeting. The two interviews will not be longer than two weeks apart. Each interview will last approximately one hour. Ms. Kankam will conduct the interviews at a date, time and place that is convenient to you.

For Interview 1, you will be required to answer questions on the speech and language assessment and/or treatment services you directly provide to individuals with post-stroke aphasia or to which you refer individuals with post-stroke aphasia.

Within the two weeks, Ms. Kankam will type up and read over Interview 1.

Interview 2 may be conducted if there is any unclear information from Interview 1. Interview 2 will be conducted to clarify any unclear information.

Interviews will be digitally audio-recorded. Audio recording of the interview is mandatory in the study. Please **<u>do not consent</u>** to participation in the study if you do not give your permission to be audio recorded.

All of what you and I say in the audio-recordings will be typed up and stored on an encrypted computer and on our University secure cloud storage called One Drive. Your typed-up interviews will not include any identifying information. If the typed-up interviews have to be

printed for any reason, the printed interviews will be stored in the International Consortium for Communication, Aging and Neurodegeneration (ICCAN) Research Laboratory in a locked and private filing cabinet in our locked research laboratory at Western University.

**What are the risks and harms of participating in the study?**

The time taken to participate in the study (that is, up to 3 hours maximum) may be inconvenient for some individuals.

There is the risk of breach of privacy as personal identifiers will be collected for the study.

You can be assured that all measures will be taken to ensure your privacy. All audio-recordings, typed-up and printed interviews will not be shared with any individual except the researchers involved in the study.

**What are the benefits of participation in the study?**

There may be no direct benefits to you for participating in the study.

The possible benefits to society may be:

- Contributing to scientific research

- Increasing awareness of the need for speech and language assessment and treatment services for individuals with post-stroke aphasia in Ghana

- Improved speech and language assessment and treatment services for individuals with post-stroke aphasia in Ghana in the future

**Can participants decide to leave the study?**

You have the right not to answer any questions that you do not want to.

You can withdraw from the study at any point in time. If you decide to withdraw from the study, you have the right to request (e.g., by phone, in writing, etc.) the destruction of information collected about you. If you wish to have your information removed, please let Ms. Kankam know and your information will be destroyed from our records. Once the study has been published, we will not be able to withdraw your information.

**How will participants' information be kept confidential?**

Representatives of Western University's Health Sciences Research Ethics Board may require access to your study-related records to monitor the conduct of the research.

Any information provided will be treated confidential. All information collected will remain private and accessible only to the investigators of the study. Anything that could identify you personally will be removed from the audio recordings.

The researcher will keep all your audio-recordings in a secure and confidential location at Western university for 7 years. All electronic data will be stored on an encrypted computer and cloud storage, One Drive from Ghana and on a password-secured computer at Western University in a locked room with restricted access.

The results of this study may be presented at research conferences. The results of this study may be published in the form of research articles and the thesis of Ms. Keren Kankam.

**Are participants compensated to be in this study?**

This study has no cost. You will not be compensated financially for your time.

**What are the rights of participants?**

Your participation in this study is voluntary. You may decide not to be in this study. Even if you consent to participate you have the right not to answer individual questions or to withdraw from the study at any time.

**Who do participants contact for questions?**

If you have questions about this research study, please contact:

- Laura Murray, PhD

- Keren Kankam, MSc candidate

If you have any questions about your rights as a research participant or the conduct of this study, you may contact The Office of Human Research Ethics. This office oversees the ethical conduct of research studies and is not part of the study team. Everything that you discuss will be kept confidential.

***This letter is yours to keep for future reference.***

**Western**
**HealthSciences**

## Consent Form – Health care professionals

**Project Title:** Rehabilitation of post-stroke aphasia in Ghana

I have read the Letter of Information, have had the nature of the study explained to me and I agree to participate. All questions have been answered to my satisfaction.

I consent to the use of unidentified quotes obtained during the study in the dissemination of this research

☐ **YES**     ☐ **NO**

_____     _____     _____

Print Name of Participant          Signature               *Date (DD-MMM-YYYY)*

My signature means that I have explained the study to the participant named and I have answered all questions.

_____     _____     _____

Name of Person Obtaining          Signature               *Date (DD-MMM-YYYY)*

Consent

Appendix E

**Letter of Information/Consent Form- Speech Therapists**

**Project Title**: Rehabilitation of post-stroke aphasia in Ghana

**Principal Investigator**

Laura Murray, PhD

School of Communication Sciences and Disorders

Western University

**Co-Investigators**

Keren Kankam, MSc candidate

Health and Rehabilitation Sciences Program, Western University

J. B. Orange, PhD

School of Communication Sciences and Disorders, Western University

Yolanda Babenko-Mould, RN, PhD

School of Nursing, Western University

**Invitation to participate**

You are being invited to participate in a research study. The study is examining post-stroke aphasia services in Ghana. The study also involves learning about the speech-language pathology services you provide for individuals with post-stroke aphasia. You are being asked

to participate because you are a speech therapist and you provide speech and language treatment to individuals with communication disorders.

This study is a student project which is part of the requirements for Ms. Keren Kankam to complete her Master's degree at Western University.

**Why is the study being done?**

The purpose of this study is to explore the speech and language services available for individuals with post-stroke aphasia in Ghana. The study also will examine the education and training given to prospective speech therapists (as called in Ghana) regarding assessing and treating individuals with post-stroke aphasia in Ghana.

Our research is intended to provide information regarding access to speech and language services for individuals who have post-stroke aphasia in Ghana. The research may identify barriers to speech and language therapy services for post-stroke aphasia, and in turn, contribute to improving aphasia assessment and treatment services in Ghana.

**How long will you be in the study?**

It is expected that you will be in the study for two sessions. There will be one to two study visits during your participation in the study. Each visit will last approximately 1 hour. Maximum participation time is expected to be 3 hours. The additional 1 hour will cater for any interruptions, breaks or delays that would lead one or both sessions to go beyond one hour.

**Who can participate in the study?**

We are looking for family caregivers of individuals diagnosed with post-stroke aphasia.

Speech therapists are eligible to participate in the study if:

- They are over the age of 18

- They speak and read English fluently

- They are speech therapists working in Korle-Bu (KBTH) or Komfo Anokye (KATH) Teaching Hospitals, and are willing and able to participate

There will be a maximum of four speech therapists from KBTH and KATH, Ghana in the study.

**What are the study procedures?**

If you agree to participate in the study, you will be asked to complete a demographic information questionnaire on the first meeting.

You can be assured that the personal information you give will be treated as confidential. The completed demographic information questionnaire will be stored in a locked cabinet in a secured study room in the home of Ms. Kankam, whiles she is in Ghana. The completed demographic information questionnaire will be kept in a locked carry-on bag in the possession of Ms. Kankam at all times during her travel from Ghana to Canada. When in Canada, the demographic information questionnaire will be stored in the International Consortium for Communication, Aging and Neurodegeneration (ICCAN) Research Laboratory in a locked and private filing cabinet in our locked research laboratory at Western University.

You will also be asked to complete one to two interviews. The first interview will also occur at the first meeting. The two interviews will not be longer than two weeks apart. Each interview will last approximately one hour. Ms. Kankam will conduct the interviews at a date, time and place that is convenient to you.

For Interview 1, you will be asked questions about the speech and language assessment and/or treatment services you provide to individuals with post-stroke aphasia.

Within the two weeks, Ms. Kankam will type up and read over Interview 1.

Interview 2 may be conducted if there is any unclear information from Interview 1. Interview 2 will be conducted to clarify any unclear information.

Interviews will be digitally audio-recorded. Audio recording of the interview is mandatory in the study. Please **<u>do not consent</u>** to participation in the study if you do not give your permission to be audio recorded.

All of what you and I say in the audio-recordings will be typed up and stored on an encrypted computer and on our University secure cloud storage called One Drive. Your typed-up interviews will not include any identifying information. If the typed-up interviews have to be printed for any reason, the printed interviews will be stored in the International Consortium for Communication, Aging and Neurodegeneration (ICCAN) Research Laboratory in a locked and private filing cabinet in our locked research laboratory at Western University.

**What are the risks and harms of participating in the study?**

The time taken to participate in the study (that is, up to 3 hours maximum) may be inconvenient for some individuals.

There is the risk of breach of privacy as personal identifiers will be collected for the study.

You can be assured that all measures will be taken to ensure your privacy. All audio-recordings, typed-up and printed interviews will not be shared with any individual except the researchers involved in the study.

**What are the benefits of participation in the study?**

There may be no direct benefits to you for participating in the study.

The possible benefits to society may be:

- Contributing to scientific research
- Increasing awareness of the need for speech and language assessment and treatment services for individuals with post-stroke aphasia in Ghana
- Improved speech and language assessment and treatment services for individuals with post-stroke aphasia in Ghana in the future

**Can participants decide to leave the study?**

You have the right not to answer any questions that you do not want to.

You can withdraw from the study at any point in time. If you decide to withdraw from the study, you have the right to request (e.g., by phone, in writing, etc.) the destruction of information collected about you. If you wish to have your information removed, please let Ms. Kankam know and your information will be destroyed from our records. Once the study has been published, we will not be able to withdraw your information.

**How will participants' information be kept confidential?**

Representatives of Western University's Health Sciences Research Ethics Board may require access to your study-related records to monitor the conduct of the research.

Any information provided will be treated confidential. All information collected will remain private and accessible only to the investigators of the study. Anything that could identify you personally will be removed from the audio recordings.

The researcher will keep all your audio-recordings in a secure and confidential location at Western university for 7 years. All electronic data will be stored on an encrypted computer and cloud storage, One Drive from Ghana and on a password-secured computer at Western University in a locked room with restricted access.

The results of this study may be presented at research conferences. The results of this study may be published in the form of research articles and the thesis of Ms. Keren Kankam.

**Are participants compensated to be in this study?**

This study has no cost. You will not be compensated financially for your time.

**What are the rights of participants?**

Your participation in this study is voluntary. You may decide not to be in this study. Even if you consent to participate you have the right not to answer individual questions or to withdraw from the study at any time.

**Who do participants contact for questions?**

If you have questions about this research study, please contact:

- Laura Murray, PhD

- Keren Kankam, MSc candidate

If you have any questions about your rights as a research participant or the conduct of this study, you may contact The Office of Human Research Ethics. This office oversees the ethical conduct of research studies and is not part of the study team. Everything that you discuss will be kept confidential.

*This letter is yours to keep for future reference.*

## Consent Form – Speech Therapists

**Project Title:** Rehabilitation of post-stroke aphasia in Ghana

I have read the Letter of Information, have had the nature of the study explained to me and I agree to participate. All questions have been answered to my satisfaction.

I consent to the use of unidentified quotes obtained during the study in the dissemination of this research

□ **YES** □ **NO**

_____ _____ _____

Print Name of Participant Signature *Date (DD-MMM-YYYY)*

My signature means that I have explained the study to the participant named and I have answered all questions.

_____ _____ _____

Name of Person Obtaining Signature *Date (DD-MMM-YYYY)*

Consent

## Appendix F

## Letter of Information/Consent Form- Family caregivers

**Project Title**: Rehabilitation of post-stroke aphasia in Ghana

**Principal Investigator**

Laura Murray, PhD

School of Communication Sciences and Disorders

Western University

**Co-Investigators**

Keren Kankam, MSc candidate

Health and Rehabilitation Sciences Program, Western University

J. B. Orange, PhD

School of Communication Sciences and Disorders, Western University

Yolanda Babenko-Mould, RN, PhD

School of Nursing, Western University

**Invitation to participate**

You are being invited to participate in a research study. The study examines post-stroke aphasia services in Ghana. The study also involves learning about your experiences with speech- language pathology services for individuals with post-stroke aphasia. You are being

asked to participate because you are a family caregiver of an individual diagnosed with post-stroke aphasia.

This study is a student project which is part of the requirements for Ms. Keren Kankam to complete her Master's degree at Western University.

**Why is the study being done?**

The purpose of this study is to explore the speech and language services available for individuals with post-stroke aphasia in Ghana. The study will examine the education and training given to prospective speech therapists (as called in Ghana) regarding assessing and treating individuals with post-stroke aphasia in Ghana.

This research study is intended to provide information regarding access to speech and language services for individuals who have post-stroke aphasia in Ghana. The research may identify barriers to speech and language therapy services for post-stroke aphasia, which will contribute to improving aphasia assessment and treatment services in Ghana.

**How long will you be in the study?**

It is expected that you will be in this study for two sessions. There will be one to two study visits during your participation in the study. Each visit will last approximately one hour. Maximum participation time is expected to be 3 hours. The additional 1 hour will cater for any interruptions, breaks or delays that would lead one or both sessions to go beyond one hour.

**Who can participate in the study?**

We are looking for family caregivers of individuals diagnosed with post-stroke aphasia.

Family caregivers are eligible to participate in the study if:

- They are over the age of 18

- They speak and read English fluently

- They are caregivers of a family member diagnosed with post-stroke aphasia, and are willing and able to participate

A maximum of four family caregivers from Accra and Kumasi, Ghana will be interviewed in this study.

**What are the study procedures?**

If you agree to participate in the study, you will be asked to complete one to two face-to-face interviews. The interviews will not be longer than two weeks apart. Each interview will last approximately one hour. Ms. Kankam will conduct the interviews at a date, time and place that is convenient to you.

For Interview 1, you will be asked questions about the speech and language assessment and/or treatment services your family member who is diagnosed with post-stroke aphasia received or is receiving.

Within the two weeks, Ms. Kankam will type up and read over Interview 1

Interview 2 may be conducted if there is any unclear information from Interview 1. Interview 2 will be conducted to clarify any unclear information.

Interviews will be digitally audio-recorded. Audio recording of the interview is mandatory in the study. Please **<u>do not consent</u>** to participation in the study if you do not give your permission to be audio recorded.

All that is said during the audio-recording session of the interview will be typed up and stored on an encrypted computer and on our University secure cloud storage called One Drive. Your typed-up interviews will not include any information about your identity. If the typed-up interviews have to be printed for any reason, the printed interviews will be stored in the International Consortium for Communication, Aging and Neurodegeneration (ICCAN) Research Laboratory in a locked and private filing cabinet in our locked research laboratory at Western University.

**What are the risks and harms of participating in the study?**

The time taken to participate in the study (that is, up to 3 hours maximum) may be inconvenient for some individuals.

There is the risk of breach of privacy as personal identifiers will be collected for the study.

You can be assured that all measures will be taken to ensure your privacy. All audio-recordings, typed-up and printed interviews will not be shared with any individual except the researchers involved in the study.

**What are the benefits of participation in the study?**

There may be no direct benefits to you for participating in the study.

The possible benefits to society may be:

- Contributing to scientific research

- Increasing awareness of the need for speech and language assessment and treatment services for individuals with post-stroke aphasia in Ghana

- Improved speech and language assessment and treatment services for individuals with post-stroke aphasia in Ghana in the future

**Can participants decide to leave the study?**

You have the right not to answer any questions that you do not want to.

You can withdraw from the study at any point in time. If you decide to withdraw from the study, you have the right to request (e.g., by phone, in writing, etc.) the removal of information collected about you. If you wish to have your information removed, please let Ms. Kankam know and your information will be destroyed from our records. Once the study has been published, we will not be able to withdraw your information.

**How will participants' information be kept confidential?**

Representatives of Western University's Health Sciences Research Ethics Board may require access to your study-related records to monitor the conduct of the research.

Any information provided will be treated confidentially. All information collected will remain private and accessible only to the investigators of the study. Anything that could identify you personally will be removed from the audio recordings.

The researcher will keep all your audio-recordings in a secure and confidential location at Western university for 7 years. All electronic data will be stored on an encrypted computer and cloud storage, One Drive from Ghana and on a password-secured computer at Western University in a locked room with restricted access.

The results of this study may be presented at research conferences and seminars. The results of this study may be published in the form of research articles and the thesis of Ms. Keren Kankam.

**Are participants compensated to be in this study?**

This study has no cost. You will not be compensated financially for your time.

**What are the rights of participants?**

Your participation in this study is voluntary. You may decide not to be in this study. Even if you consent to participate, you have the right not to answer individual questions or to withdraw from the study at any time.

**Who do participants contact for questions?**

If you have questions about this research study, please contact:

- Laura Murray, PhD

- Keren Kankam, MSc candidate

If you have any questions about your rights as a research participant or the conduct of this study, you may contact The Office of Human Research Ethics. This office oversees the

Version 03/10/2019

ethical conduct of research studies and is not part of the study team. Everything that you

discuss will be kept confidential.

*This letter is yours to keep for future reference.*

**Consent Form – Family caregivers of individuals with Post-stroke aphasia**

**Project Title:** Rehabilitation of post-stroke aphasia in Ghana

I have read the Letter of Information, have had the nature of the study explained to me and I agree to participate. All questions have been answered to my satisfaction.

I consent to the use of unidentified quotes obtained during the study in the dissemination of this research

□ **YES**    □ **NO**

_____    _____    _____

Print Name of Participant          Signature                    *Date (DD-MMM-YYYY)*

My signature means that I have explained the study to the participant named and I have answered all questions.

_____    _____    _____

Name of Person Obtaining          Signature                    *Date (DD-MMM-YYYY)*

Consent

**Appendix G**

**Letter of Information/Consent Form- University Program Coordinators**

**Project Title**: Rehabilitation of post-stroke aphasia in Ghana

**Principal Investigator**

Laura Murray, PhD

School of Communication Sciences and Disorders

Western University

**Co-Investigators**

Keren Kankam, MSc candidate

Health and Rehabilitation Sciences Program, Western University

J. B. Orange, PhD

School of Communication Sciences and Disorders, Western University

Yolanda Babenko-Mould, RN, PhD

School of Nursing, Western University

**Invitation to participate**

You are being invited to participate in a research study. The study is examining post-stroke aphasia services in Ghana. The study also involves learning about the role of the speech-language pathology program in providing rehabilitation services to individuals with post-

stroke aphasia. You are being asked to participate because you are a university program coordinator at the University of Ghana or the University of Health and Allied Sciences.

This study is a student project which is part of the requirements for Ms. Keren Kankam to complete her Master's degree at Western University.

**Why is the study being done?**

The purpose of this study is to explore the speech and language services available for individuals with post-stroke aphasia in Ghana. The study also will examine the education and training given to prospective speech therapists (as called in Ghana) regarding assessing and treating individuals with post-stroke aphasia in Ghana.

Our research is intended to provide information regarding access to speech and language services for individuals who have post-stroke aphasia in Ghana. The research may identify barriers to speech and language therapy services for post-stroke aphasia, and in turn, contribute to improving aphasia assessment and treatment services in Ghana.

**How long will you be in the study?**

It is expected that you will be in the study for two sessions. There will be one to two study visits during your participation in the study. Each visit will last approximately 1 hour. Maximum participation time is expected to be 3 hours. The additional 1 hour will cater for any interruptions, breaks or delays that would lead one or both sessions to go beyond one hour.

**Who can participate in the study?**

We are looking for university program coordinators from the University of Ghana and the University of Health and Allied Sciences.

University program coordinators are eligible to participate in the study if:

- They are over the age of 18

- They speak and read English fluently

- They are program coordinators for the Schools of Allied Health Sciences in University of Ghana or the University of Health and Allied Sciences, and is willing and able to participate

There will be a maximum of 2 program coordinators from the University of Ghana and the University of Health and Allied Sciences, Ghana in the study.

**What are the study procedures?**

If you agree to participate in the study, you will be asked to complete one to two interviews through Skype or Zoom. They will not be longer than two weeks apart. Each interview will last approximately one hour. Ms. Kankam will conduct the interviews at a date, time and place that is convenient to you.

For Interview 1, you will be asked questions about the aphasia assessment and/or treatment classroom courses and clinical training your students receive during their speech and language pathology degree.

Within the two weeks, Ms. Kankam will type up and read over Interview 1.

Interview 2 may be conducted if there is any unclear information from Interview 1. Interview 2 will be conducted to clarify any unclear information.

Interviews will be audio-recorded using the Skype or Zoom call recording feature. The call recording feature is cloud-based making it secure. Audio recording of the interview is mandatory in the study. Please **<u>do not consent</u>** to participation in the study if you do not give your permission to be audio recorded.

All of what you and I say in the audio-recordings will be typed up and stored on an encrypted computer and on our University secure cloud storage called One Drive. All typed-up interviews will not include any identifying information. If the typed-up interviews have to be printed for any reason, the printed interviews will be stored in the International Consortium for Communication, Aging and Neurod5tgegeneration (ICCAN) Research Laboratory in a locked and private filing cabinet in our locked research laboratory at Western University.

**What are the risks and harms of participating in the study?**

The time taken to participate in the study (that is, up to 3 hours maximum) may be inconvenient for some individuals.

There is the risk of breach of privacy as personal identifiers will be collected for the study.

You can be assured that all measures will be taken to ensure your privacy. All audio-recordings, typed-up and printed interviews will not be shared with any individual except the researchers involved in the study.

**What are the benefits of participation in the study?**

There may be no direct benefits to you for participating in the study.

The possible benefits to society may be:

- Contributing to scientific research

- Increasing awareness of the need for speech and language assessment and treatment services for individuals with post-stroke aphasia in Ghana

- Improved speech and language assessment and treatment services for individuals with post-stroke aphasia in Ghana in the future

**Can participants decide to leave the study?**

You have the right not to answer any questions that you do not want to.

You can withdraw from the study at any point in time. If you decide to withdraw from the study, you have the right to request (e.g., by phone, in writing, etc.) the destruction of information collected about you. If you wish to have your information removed, please let Ms. Kankam know and your information will be destroyed from our records. Once the study has been published, we will not be able to withdraw your information.

**How will participants' information be kept confidential?**

Representatives of Western University's Health Sciences Research Ethics Board may require access to your study-related records to monitor the conduct of the research.

Participants can be assured of confidentiality because all Skype to Skype and Zoom video and audio calls are encrypted.

Any information provided will be treated confidential. All information collected will remain private and accessible only to the investigators of the study. Anything that could identify you personally will be removed from the audio recordings.

The researcher will keep all your audio-recordings in a secure and confidential location at Western university for 7 years. All electronic data will be stored on an encrypted computer and cloud storage, One Drive from Ghana and on a password-secured computer at Western University in a locked room with restricted access.

The results of this study may be presented at research conferences. The results of this study may be published in the form of research articles and the thesis of Ms. Keren Kankam.

**Are participants compensated to be in this study?**

This study has no cost. You will not be compensated financially for your time.

**What are the rights of participants?**

Your participation in this study is voluntary. You may decide not to be in this study. Even if you consent to participate you have the right not to answer individual questions or to withdraw from the study at any time.

**Who do participants contact for questions?**

If you have questions about this research study, please contact:

Version 03/10/2019

- Laura Murray, PhD

- Keren Kankam, MSc candidate

If you have any questions about your rights as a research participant or the conduct of this study, you may contact The Office of Human Research Ethics. This office oversees the ethical conduct of research studies and is not part of the study team. Everything that you discuss will be kept confidential.

*This letter is yours to keep for future reference.*

## Consent Form – University Program Coordinators

**Project Title:** Rehabilitation of post-stroke aphasia in Ghana

I have read the Letter of Information, have had the nature of the study explained to me and I agree to participate. All questions have been answered to my satisfaction.

I consent to the use of unidentified quotes obtained during the study in the dissemination of this research

□ **YES**          □ **NO**

_____          _____          _____

Print Name of Participant                    Signature                    *Date (DD-MMM-YYYY)*

My signature means that I have explained the study to the participant named and I have answered all questions.

_____          _____          _____

Name of Person Obtaining                    Signature                    *Date (DD-MMM-YYYY)*

Consent

## Appendix H

### Telephone script- Family caregiver

Researcher KK                       Hello.

Family caregiver participant    Hello.

Researcher KK                       Good morning/afternoon/evening. My name is Keren Kankam.

I am a graduate research student from Canada. I will like to

speak with … (name of participant)

Family caregiver participant     This is X … or I will get X. Just one moment please.

Researcher KK                      Hi X, (say name of SLP or healthcare professional) told me that

you gave me permission  to call you concerning a

research study on the rehabilitation of post-stroke aphasia in

Ghana. She/he mentioned that she/he talked to you about

participating in the project which you agreed to be contacted

and she/he gave me your contact information.

My research study involves interviewing family caregivers of

individuals with post-stroke aphasia in Ghana. I am seeking

their views on the speech and language pathology services

given to their family members. I spoke to (say name of SLP

or health care professional) about finding family caregivers of

individuals with post-stroke aphasia for this research study.

This is the reason for calling. I will like us to meet and talk

more about this study. I will be glad to answer any questions

that you might have about this research study. I can send you a copy of the description of my research study (i.e., a letter of information), through email.[Obtain email address to send LOI]. What date, time and place will be convenient for us to meet and to begin the study with you?

| | |
|---|---|
| Family caregiver participant | (Answers) |
| Researcher KK | Thank you for your time and for agreeing to participate. I look forward to meeting you! Good-bye. |

OR

| | |
|---|---|
| Researcher KK | Hello. |
| Family caregiver participant | Hello. |
| Researcher KK | Good morning/afternoon/evening. My name is Keren Kankam. I am a graduate research student from Canada. I will like to speak with … (name of participant) |
| Family caregiver participant | No, she/he is not available at the moment |
| Researcher KK | Do you know when he/she will be available? I will like to call back. Or can she/he contact me via text when she/he is available? |
| Family caregiver participant | (Answers) |
| Researcher KK | Okay, thank you. Good-bye. |

# Appendix I

## Email Script- University Program Coordinators

**Project Title**: Rehabilitation of post-stroke aphasia in Ghana

Dear................ (Name of SLP University program coordinator),

My name is Keren Sarpomaa Kankam, an MSc. Speech and Language Science student of Western University, London, Canada. As part of my requirements for a degree, I am conducting a research study on the "Rehabilitation of post-stroke aphasia in Ghana". The participants for the study include the agencies in Ghana contributing to the assessment and treatment of post-stroke aphasia, including speech-language pathology university program coordinators.

I am writing this email to invite you to participate in the research study. I have attached to this email a letter of information that explains the study objectives and your roles as a participants.

It will be a pleasure to have you participate on this study. I will be looking forward to your response.

I can be reached via this email address if you have any questions. Thank you.

Warm regards,

Keren

**Appendix J**

**Demographic information- Health care professionals**

**Project Title**: Rehabilitation of post-stroke aphasia in Ghana

1. What is your profession?

2. What is your age?

3. How many years have you been working (either full-time or part-time) in your

    profession?

4. What is your practice setting? (select all that apply)

    ☐ Government hospital

    ☐ Private hospital

    ☐ Rehabilitation home

    ☐ Other (please describe) …………………….

5. What post-secondary educational institution(s) did you attend?

6. What educational level(s) have you completed? (select all that apply)

    ☐ Diploma

    Please indicate content area (e.g., biology, health studies, linguistics, psychology,

    etc.)

    ☐ Bachelors

    Please indicate content area (e.g., biology, health studies, linguistics, psychology,

    etc.)

    ☐ Master's

    Please indicate content area (e.g., biology, health studies, linguistics, psychology,

    etc.)

    ☐ PhD

Please indicate content area (e.g., biology, health studies, linguistics, psychology, etc.)

☐ MD

☐ RN

☐ Other (please describe) ……………….

7. What year did you complete your highest degree/diploma?

8. What language(s) do you speak, write and understand?

    a. Rate your proficiency in each language

      ☐ Very proficient

      ☐ Moderately proficient

      ☐ Only a little proficient

9. In what language(s) do you typically provide health care services?

## Appendix K

## Demographic information- SLPs

**Project Title**: Rehabilitation of post-stroke aphasia in Ghana

1. What is your age?

2. How many years have you been working (either full-time or part-time) as a speech therapist?

3. What is your practice setting? (select all that apply)

   ☐ Government hospital

   ☐ Private hospital

   ☐ Rehabilitation setting

   ☐ Other (please describe)…………………….

4. What age group(s) do you serve? (e.g., preschool, school aged, young adults 18-29; adults 30-60; older adults 60+)

5. What is your caseload (e.g., voice disorders, developmental speech disorders etc.)?

6. What post-secondary educational institution(s) did you attend?

7. What educational level(s) have you completed? (select all that apply)

   ☐ Diploma- Please specify content area (e.g., health studies, linguistics, psychology etc.)

   ☐ Bachelors- Please specify content area (e.g., health studies, linguistics, psychology, etc.)

   ☐ Master's- Please specify content area (e.g., health studies, linguistics, psychology, etc.)

   ☐ PhD- Please specify content area (e.g., health studies, linguistics, psychology, etc.)

8. In what field/subject area was your highest degree?

9. What year did you complete your degree/diploma in SLP?

**Appendix L**

**Interview guide - Health care professionals**

1. Please tell me about the education and training you received regarding post-stroke aphasia

2. Are you part of a stroke interdisciplinary team?

   Yes- Go to Q3

   No- Go to Q4

3. If Yes to Q2, what are the professions of the other team members?

4. If No to Q2, what could be the reason(s) for your absence on the stroke team?

5. Who provides the diagnosis of post-stroke aphasia in your health care unit?

6. Have you diagnosed an individual with post-stroke aphasia?

   Yes- Go to Q7

   No- Go to Q8

7. What assessment procedures did you use to arrive at an aphasia diagnosis?

8. Do you provide any aphasia treatment?

   Yes- Go to Q8a

   No- Go to Q8b

   a. If Yes to Q8,

   i. What aphasia treatments are typically provided?

   ii. How much aphasia treatment is typically provided (e.g., Give number of sessions; Give number of hours per treatment session; Give total number of hours overall)?

   iii. In what format is the aphasia treatment provided (e.g., individual and/or group format; family-based interventions; remediation, tele-rehabilitation, etc.)?

iv. Where is the aphasia treatment provided (e.g., hospital, rehabilitation centre, home, community centre, etc.)?

v. Please tell me about the challenges you encounter in providing assessment and treatment for individuals with post-stroke aphasia

b. If No to Q8,

i. Why isn't post-stroke aphasia treatment provided by you?

ii. Is post-stroke aphasia treatment provided by other health care professionals?

iii. If yes, what is/are their profession(s)?

9. Do you refer individuals with post-stroke aphasia to other health care professionals to address their communication issues?

Yes- Go to Q9a

No- Go to Q9b

a. If Yes to Q9, what is/are their profession(s)?

b. If No to Q9, what are your reasons for not referring?

10. What role do speech therapists/speech-language pathologists have in the assessment and/or treatment of post-stroke aphasia?

11. In your view, what steps should be taken to assure inclusion of speech therapists/speech-language pathologists in the assessment and/or treatment of post-stroke aphasia?

12. Please tell me about the challenges you experience in providing referrals for individuals with post-stroke aphasia

13. How do the other professionals on the stroke unit and the hospital at large deal with these challenges?

14. What are your ideas to remove or to minimize barriers to providing individuals with

post-stroke aphasia language therapy services?

**Appendix M**

**Interview guide -SLPs**

1. Please tell me about the formal classroom education you had/have concerning the assessment and treatment of aphasia.

2. Please tell me about the clinical practice you had/have concerning the assessment and treatment of aphasia.

3. Do you currently provide assessment and/or treatment services to individuals with post-stroke aphasia?

   Yes- Go to Q4

   No- Go to Q20

**If Yes to Q3- SLPs**

4. What language(s) do you speak, read, write in and understand?

5. In what language(s) do you typically provide assessment and/or treatment services to individuals with post-stroke aphasia?

6. On average, how many individuals do you see on your monthly caseload?

7. On average, how many individuals with post-stroke aphasia are on your monthly active caseload?

8. On what care basis do you provide services to individuals with post-stroke aphasia? (e.g., in-patient, out-patient, home health, other)

9. How many individuals with aphasia are on your waiting list?

10. How quickly can/do you attend to those on your waiting list?

11. From whom do/did you get post-stroke aphasia referrals?

12. Do you work as part of a stroke interdisciplinary team?

    Yes- GO to Q12a

    No- Go to Q12b

a. If Yes to Q12, what are the professions of the other team members?

b. If No to Q12, what could be the reason(s)?

13. Do you work on a specialized stroke-care unit?

   Yes- Go to Q13a

   No- Go to Q14

    a. If Yes to Q13, please describe the unit and its specialized care

14. If No to Q13, please describe the unit on which you provide post-stroke aphasia care.

15. What assessment tools do you typically use to identify and/or characterize the language, communication and cognitive skills of individuals with post-stroke aphasia?

16. What types of interventions (e.g., individual and/or group format; remediation; compensatory strategy training, etc.) do you typically provide to individuals with post-stroke aphasia?

a. What influences your decision to provide a certain type of intervention?

17. Do/did the individuals with aphasia who you treat as an SLP typically have caregivers?

Yes- Go to Q17a

No

    If Yes to Q17,

a. Were they formal/ paid or informal/unpaid caregivers?

b. Did you involve them in the aphasia assessment and/or therapy?

 Yes, Why?

 No, Why? What are the possible reasons?

If Yes to Q17b,

c. Describe their involvement in the assessment and/or interventions for post-stroke aphasia?

d. What are your expectations for caregiver involvement in interventions for post-stroke aphasia?

18. Are there any challenges you experience:

a. In your assessment of individuals with post-stroke aphasia? If Yes, please describe them.

b. In providing treatment for individuals with post-stroke aphasia? If Yes, please describe them

19. How do these challenges affect your:

a. Assessment?

b. Treatments?

20. What are your ideas about how to remove or to minimize barriers to providing individuals with post-stroke aphasia language, communication and cognitive therapy services?

**If No to Q3- SLPs**

21. To which age group do you typically provide speech therapy services?

22. What types of speech-language disorders do you typically see in your speech-language pathology practice?

23. Do you work as part of an interdisciplinary stroke care team?

 Yes- Go to Q24

 No- Go to Q25

If Yes to Q23,

24. What services are you providing as part of the stroke team?

25. Do you think speech-language pathologists have a role in the:

   a. Assessment process of individuals with post-stroke aphasia, and what could be the reason for your response?

   b. Treatment process of individuals with post-stroke aphasia, and what could be the reason for your response?

26. What could be some of the barriers hindering the inclusion of speech-language pathologists in the:

   a. Aphasia assessment process

   b. Aphasia treatment process

27. In your view, what steps should be taken to assure the inclusion of speech-language pathologists in the:

   a. Aphasia assessment process

   b. Aphasia treatment process

**Appendix N**

**Interview guide- Family caregivers**

1. Gender

   ☐ Female

   ☐ Male

   ☐ Other

   ☐ Prefer not to indicate

2. What is your relationship to your family member with post-stroke aphasia?

3. When did your family member have a stroke?

4. When did your family member receive a diagnosis of aphasia? How long after the stroke was your family member diagnosed with aphasia?

5. Who informed you about the diagnosis?

6. Where was the diagnosis given?

7. Were you given information on post-stroke aphasia treatment?

- If yes to Q7,

a. Who gave you the information?

b. When were you provided with the information (e.g., at the time of diagnosis)?

c. In what format was the information provided (e.g., verbal, brochure, website)?

d. Was your family member referred to anyone for post-stroke aphasia treatment?

If yes to Q7d,

    i. To whom was your family member referred?

    ii. Where was your family member referred to receive services?

e. How long did your family member have to wait to see this individual?

f. Were you included in the treatment process?

    i. If yes to Q7f, in what ways?

      ii.      If no to Q7f, would you have liked to be included and why?

g. How much treatment did your family member receive (e.g., number and length of session)?

h. Was/is the therapy helpful? If yes, please describe how it is/was helpful

- If no to Q7,

    a. What was done to improve your family member's aphasia?

        i.      By the health care professionals

        ii.      By you or other family members/friends

8. If you had been informed about the treatment services, would you have accessed them, and what is the reason for your response

**Appendix O**

**Interview guide- University program coordinators**

**(If education and clinical training in aphasia is provided)**

1. In what course(s) is material and/or training pertaining to aphasia covered?

2. How many years has the course been taught? Continuous or every other year or an "as needed basis", etc.?

3. Is the course elective or required?

4. How many hours of instruction are dedicated to aphasia?

5. Is clinical practice included in the course?

    If yes,

        a. How many hours of aphasia clinical practice are provided?

        b. Where is the clinical practice offered?

        c. What type of clinical supervision is provided (e.g., individual supervision; group supervision; interdisciplinary supervision, etc.)?

    If no,

        d. Is the clinical training provided in a separate clinical training course or practicum?

  If yes,

  i. How many hours of aphasia clinical practice are provided?

  ii. Where is the clinical practice offered?

  iii. What type of clinical supervision is provided (e.g., individual supervision; group supervision; interdisciplinary supervision, etc.)?

  If no,

        e. What is the reason for not including clinical training in aphasia assessment and treatment?

f.   Are you considering providing clinical training in aphasia assessment and treatment?

g.   What steps are being taken to include clinical training for prospective SLPs in aphasia assessment and treatment?

**If a course/clinical training in aphasia is not offered**

6.   In your view, do you regard course work in aphasia assessment and treatment as important? What are your reasons for your response?

7.   Do you regard clinical training in aphasia assessment and treatment as important? What are your reasons for your response?

a.   What might be the reason/s for the absence of coursework/clinical training in the program's syllabi?

b.   Is the university/faculty taking steps to include coursework/clinical training in aphasia in the SLP program?

If yes,

c.   What are the steps being taken?

d.   When is the coursework/clinical training expected to be introduced?

e.   How many hours of instruction will be dedicated to aphasia?

f.   How many hours of clinical training will be dedicated to aphasia?

If no,

g.   What could be the reasons?

**Curriculum Vitae**

**Keren Sarpomaa Kankam**


## Education

- Master of Science, Speech and Language Science     Sep., 2018- Expected, Aug.,2020

 University of Western Ontario, London, Ontario, Canada.

- Bachelor of Science, Disability and Rehabilitation Studies     Sept., 2013- May, 2017

Kwame Nkrumah University of Science and Technology, Kumasi, Ghana.

- West African Secondary School Certificate Examination     Sept., 2010- May, 2013

Kumasi Anglican Senior High School, Kumasi, Ghana.


## Research experience

- Challenges associated with the screening and early detection of hearing impairment among children in the Kumasi metropolis.

## Publication

Article Publication

- Challenges of screening and early detection of hearing impairment among children in some selected hospitals in Kumasi metropolis. Saudi Journal of Medical and Pharmaceutical Sciences., Vol-3, Iss-12B (Dec, 2017): 1330-1334

Abstract Publication

- Rehabilitation of post-stroke aphasia in Ghana, HRSGRC, 2020, University of Western Ontario.
- Screening and early detection of hearing impairment among children in Kumasi metropolis: A focus on services and associated challenges. Ghana Biomedical Convention, 2017 Conference.

## Conference attended

Health & Rehabilitation Science Graduate Research Conference     4th February, 2020

*University of Western Ontario, London, Ontario*

- Oral presentation on Master´s thesis
- Listened to fellow students present on their research

5TH AFRINEAD Conference and 7TH College of Health          7th- 9th August, 2017
Sciences Scientific Conference.

- Volunteering work

Ghana Biomedical Conference                    26th - 28th July, 2017

- Oral presentation on undergraduate thesis
- Poster viewing of fellow conference attendees
- Listened to fellow conference attendees present on their research

## Professional development

Graduate Student Teaching Assistant                    Sept., 2018- April, 2020

*Health and Rehabilitation Sciences, University of Western Ontario, London, Ont.*

- Supervised an average group of 80 students during poster day presentations
- Marked and recorded student´s assignments
- Proctored examinations and mid-semesters for an average group of 80 students
- Conducted a class for an average group of 60 students

Teaching and Research Assistant                    Sept., 2017- Aug., 2018

*Centre for Disability and Rehabilitation Studies, KNUST, Ghana*

- Supervised and organized tutorials for undergraduate students
- Delivered presentations at tutorials
- Prepared lecture space and materials, such as, computers and projectors
- Marked and recorded students' assignments
- Led and guided students' field trip experience

Intern                    June, 2015

*Edwenase Rehabilitation Centre, Kumasi, Ghana*

- Daily supervised persons with disabilities in vocational training
- Assisted persons with disabilities to set-up working area
- Assisted persons with disabilities to complete their assigned vocational jobs
- Assisted persons with disabilities to tidy up working area

Intern (Eye department)                    July, 2014

*Komfo Anokye Teaching Hospital (KATH), Kumasi, Ghana*

- Determined visual acuity of patients
- Assisted optometrist in giving eyeglasses to patients
- Recorded patients' information
- Assisted patients with inquiries