Nurses' management of stroke-related oropharyngeal dysphagia in a rural province of South Africa

by

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Submitted in fulfilment of the requirements for the degree MA (Speech-Language Pathology) in the Department of Speech-Language Pathology and Audiology at the

UNIVERSITY OF PRETORIA

FACULTY OF HUMANITIES

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October 2019

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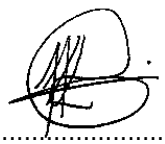
SIGNATURE:  ..... DATE: 09/10/2019

ACKNOWLEDGEMENTS

It's not often that a junior member of a multidisciplinary team makes an ally and close friend in a neurology consultant, but Dr Stacy Rossouw is the single most powerful, driven and inspiring woman in public health care that I have ever met. Her 'putting patients first' attitude is one we should all strive to achieve, and she inspired me to conduct this research in order to improve the outcomes of our stroke patients that we both care so deeply about. Thank you Stacy, you are genuinely my hero!

To my wonderful, patient supervisor's Dr Esedra Krüger, Prof Jeannie van der Linde and Mrs Bhavani Pillay, I want to say thank you. Thank you for believing me and trusting me to do right by this research even though I was far away and sometimes fell off the face of the earth. Your faith in me and my abilities as a researcher gave me the confidence to complete this long-haul of a process. There were times I didn't think that this would ever end, but your kind words and support always came just when I needed them most.

Finally, to my friends and family. Thank you for putting up with me and supporting me through this long and challenging journey. I'm sorry for saying no to events because I had a submission due, or for saying "I should be doing masters" the whole time we were doing something fun. I do believe it was worth it and I cannot wait to spend guilt free time with you all! This research was important to me, and it became important to you too so thank you. I hope that it will be impactful!

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LIST OF ABBREVIATIONS

ASHA – American Speech-Language-Hearing Association

BCM – Buffalo City Metropolitan

CHC – Community health centre

CNAs – Certified nursing assistants

CVA – Cerebrovascular accident

HPCSA – Health Professions Council of South Africa

LMICs – Lower-middle-income countries

OPD – Oropharyngeal dysphagia

SASLHA – South African Speech-Language-Hearing Association

SLP – Speech-Language Pathologist

SLT – Speech-Language Therapist

RNs – Registered nurses

ABSTRACT

***Background*:** Early identification of stroke-related oropharyngeal dysphagia (OPD) using screening by nurses can prevent adverse patient outcomes in lower-middle-income countries (LMICs). Nurses are essential in the OPD management team and should ideally be able to screen and prioritise dysphagia management in stroke patients.

***Objective*:** The aim of this study was to describe nurses' identification and management practices of patients with OPD following a stroke in a rural province of South Africa.

***Methods*:** Qualified nurses from various healthcare levels in a rural province of South Africa were invited to complete a previously published hard copy survey on signs, symptoms, complications, and management of stroke-related OPD. A sample of 130 participants were included. The majority of participants (n=66; 50.8%) had ten or more years of experience.

***Results*:** The mean scores of correct responses for each section were: 8.7/13 (66.7%) for signs and symptoms, 4.7/10 (47.3%) for complications and 3.8/7 (54.2%) for management practices. There were no significant differences between groups for the signs and symptoms section and the complications section. Secondary healthcare nurses demonstrated significantly better knowledge than primary (p=0.022) and tertiary (p=0.010) level nurses regarding management of OPD. Overall, secondary level nurses had significantly higher scores than the other levels.

Conclusions: Moderate knowledge of identification and management of stroke-related OPD among nurses across all health care levels was evident. Interdisciplinary collaboration between nurses and speech-language therapists can improve team members' continued professional development and refining of skills in decision-making regarding stroke-related OPD in LMICs.

Keywords: oropharyngeal dysphagia, dysphagia screening, stroke-related dysphagia, nurse, interdisciplinary collaboration, lower-middle-income country

1. INTRODUCTION

Chapter aim: This chapter provides background information on stroke and oropharyngeal dysphagia, and the impact it has on individuals and society. The chapter demonstrates the importance of early identification of oropharyngeal dysphagia in patients with stroke and good interdisciplinary management. The chapter provides a rationale for this research and concludes with the research question for this study. This shortened introduction is structured in the format of a Journal Article Style dissertation.

1.1 Background

The global burden of cerebrovascular accidents (CVAs), commonly referred to as stroke, is increasing (Feigin et al., 2016; Strong, Mathers, & Bonita, 2007). Worldwide, ischaemic heart disease and stroke have been the leading causes of death over the past 15 years, accounting for 15.2 million deaths (Truelsen et al., 2015; World Health Organization [WHO], 2017). It is estimated that over 80% of strokes globally occur in lower-middle-income countries [LMICs] (Maredza, Bertram, & Tollman, 2015; Younger, 2016) resulting in 68.8 in every 100 000 deaths in LMICs (WHO, 2017). In rural South Africa, strokes result in an estimated 30 000 deaths per annum and are the largest cause of disability in the country (Burton, 2016; Maredza, Bertram, Gómez-Olivé, & Tollman, 2016; Maredza et al., 2015). It is also predicted, due to lifestyle changes and medical conditions, that the burden of stroke in South Africa will continue to increase as the average population age increases and becomes more urbanised (Burton, 2016). The universal increased prevalence of stroke can also be attributed to high rates of hypertension, diabetes, alcohol abuse, smoking and poor diet (Feigin et al., 2016; Kolapo & Vento, 2011; Maredza et al., 2016).

The mentioned risk factors may contribute towards, or cause a stroke, which may result in a variety of complications or disabilities influenced by other variables such as the age, gender, and the severity of the stroke (Bustamante et al., 2016). Data shows that approximately 50% of people surviving stroke have some degree of physical or cognitive deficit (Bustamante et al., 2016). Patients who have a stroke may have a variety of impairments (Miller et al., 2010). Impairments include physical difficulties such as loss of sensation, hemiparesis, and ultimately contractures, as well as physiological impairments, which may include oropharyngeal dysphagia (OPD) and

bowel or bladder problems (Miller et al., 2010). Patients with stroke may also have communication difficulties and impaired cognitive functioning (Miller et al., 2010). These impairments greatly impact the functional ability of a person who has experienced a stroke to perform activities of daily living, such as eating and drinking, and hinders their independence and general quality of life (Dondorf, Fabus & Ghassemi, 2015; Gi Hong & Han Yoo, 2017; Threats, 2007).

OPD is an impaired ability to prepare and or transport a bolus, of food or liquid, from the mouth to the stomach (Kiyani & Butt, 2014). OPD can lead to food or liquid entering the lungs, resulting in aspiration pneumonia (Sugiyama et al., 2014). Stroke is one of the leading causes of OPD (Arnold et al., 2016; Joundi et al., 2017; Takizawa, Gemmell, Kenworthy, & Speyer, 2016; Titsworth et al., 2013). OPD can occur after persons have suffered from any type of stroke, regardless of the location of the lesion or the severity (Baroni, Fábio, & Dantas, 2012; Logemann, 1998). Videofluoroscopic studies have revealed unusual responses to oropharyngeal residue following stroke, a lack of sensation in the oro-pharynx, where patients do not attempt to clear residue (Logemann, 1998). When asked, patients often report not feeling anything in their throat (Donovan et al., 2013; Logemann, 1998). Other difficulties can include a delayed oral transit time, apraxia of swallow, delayed triggering of the pharyngeal phase of swallow, weakening of the pharyngeal walls and reduced laryngeal elevation and closure, leaving the airway vulnerable to penetration or aspiration of food or liquids (Logemann, 1998). Penetration or aspiration into the larynx can lead to food or liquid entering the lungs, resulting in aspiration pneumonia (Perry, Miles, Fink, & Huckabee, 2018; Sugiyama et al., 2014). OPD is often underdiagnosed or incorrectly managed in patients with stroke, which may lead to unfavourable outcomes, including aspiration pneumonia, malnutrition, dehydration, extended length of stay in hospital, and death (Arnold et al., 2016; Donovan et al., 2013; Joundi et al., 2017; Rofes, Vilardell, & Clavé, 2013; Takizawa et al., 2016).

A systematic review of studies across several countries reported the prevalence of OPD following stroke varies widely, ranging from 8% to 80% (Takizawa et al., 2016). A Canadian study found that patients who had a stroke and have OPD are three times more likely to acquire pneumonia than those without OPD (Joundi et al., 2017). The

risk of mortality during hospitalisation is also three times more for patients diagnosed with pneumonia and stroke, as opposed to those with stroke alone (Titsworth et al., 2013). A Swiss study found that at three months post-stroke, patients who were diagnosed with OPD, were 8.5 times more at risk for mortality in comparison to patients without swallowing difficulties (Arnold et al., 2016). Early identification of OPD using screening allows for prompt initiation of management plans, which can improve patient outcomes (Sherman et al., 2018).

Nursing staff are most likely to be the first professionals to detect early signs or symptoms of OPD during admission or while in the ward (Barnard, 2011; Bhimte & Rangasayee, 2015). Nurses administer medication and regularly feed patients as they are often present during mealtimes (Barnard, 2011; Bhimte & Rangasayee, 2015). Patients identified with possible OPD should ideally then be referred to a speech-language therapist (SLT) for formal and comprehensive assessment and management (American Speech-Language-Hearing Association [ASHA], 2016; Health Professions Council of South Africa [HPCSA], 2009; South African Speech-Language-Hearing Association [SASLHA], 2011). However, South Africa has few SLTs and only a limited number of SLTs are employed in the public sector in South Africa (Blackwell & Littlejohns, 2010; Ostrofsky & Seedat, 2016). Consequently, not all sectors or levels of healthcare have access to SLTs that perform assessments and manage OPD (Blackwell & Littlejohns, 2010; Ostrofsky & Seedat, 2016). Due to limited human resources in public healthcare settings, SLTs often have large caseloads (Ostrofsky & Seedat, 2016). Nurses are therefore valuable members of the OPD management team and the importance of accurate early identification of OPD by nurses is evident, as this may guide initial OPD management (Barnard, 2011; Behera et al., 2018; Donovan et al., 2013; Joundi et al., 2017; Palli et al., 2017). Early identification of stroke-related OPD enables the best possible management and it is essential that the professional conducting swallow screening has the knowledge and ability to do so, even in an environment with time constraints, lack of staff, and limited material resources (Ostrofsky & Seedat, 2016).

Ideally, nurses should effectively identify OPD and risk for aspiration using a swallow screening before patients receive any food, liquids, or oral medication (Behera et al.,

2018; Campbell, Carter, Kring & Martinez, 2016; Donovan et al., 2013; Masrur et al., 2013; Palli et al., 2017; Smith et al., 2018). Nurses can implement initial swallowing precautions, keeping patients nil per os, in order to prevent unfavourable outcomes until an SLT is able to perform a comprehensive swallow assessment (Cummings et al., 2015; Huahua, Yu, Yuting, Ruiping & Hong, 2016; Liu, Shi, Shi, Hu & Jiang, 2016; Sherman et al., 2018). OPD screening should ideally be conducted with people who had a stroke within 24 hours of admission (Hines, Kynoch & Munday, 2016; Rhoda & Pickel-Voight, 2015; Smithard, 2016; Sørensen et al., 2013; Werner, 2010). If a patient fails a swallow screen and OPD is suspected, prompt referral to an SLT for further assessment is imperative (Huahua et al., 2016; Sherman et al., 2018). However, in LMICs such as South Africa, swallow screenings by nurses or other medical staff are inconsistently conducted due to insufficient screening protocols in health care facilities, and inadequate implementation thereof (Blackwell & Littlejohns, 2010). This may also be due to a severe staff shortage, resulting in large caseloads as well as dealing with limited material resources and a lack of standardised screening protocols for the developing context (Jobson, 2015; Ostrofsky & Seedat, 2016). The mentioned challenges culminate in a lack of clarity as to who has the responsibility to refer to an SLT or which patients require further assessment following stroke (Bhimte & Rangasayee, 2015). Early detection of OPD may reduce length of hospital stay (Palli et al., 2017) and assist in the prevention of poor patient outcomes such as aspiration pneumonia, malnutrition, dehydration and in severe cases, death (Arnold et al., 2016; Joundi et al., 2017).

In South Africa, the majority of people with stroke are managed by doctors, nurses, and other health care professionals and the roles of each professional are not always clearly communicated (Willie, 2011). Some professionals may not have a large amount of experience or training in the field of OPD (Willie, 2011) and, according to ASHA (2016), SLTs have expertise in the differential diagnosis and management of swallowing disorders (ASHA, 2016). There is also a shortage of nurses within the public health sector in South Africa reducing the amount of time spent with patients (Robbertse, 2018). International studies report that nurses, including certified nursing assistants (CNAs) and registered nurses (RNs), display difficulty in identifying swallowing disorders effectively and timeously following stroke, which may delay

appropriate referral for OPD intervention (Bhimte & Rangasayee, 2015; Werner, 2010). When nurses receive sufficient training to perform screenings for OPD, they may be more likely to make use of swallow screening protocols (Schepp, Tirschwell, Miller & Longstreth, 2012; Sivertsen, Graverholt & Espehaug, 2017; Titsworth et al., 2013) and to appropriately refer to SLTs (Titsworth et al., 2013). It is, however, important to consider the context in which these protocols have been designed, as they cannot simply be replicated within a LMIC such as South Africa where constraints on staff, time and resources provide additional challenges to nurses' daily workload (Ostrofsky & Seedat, 2016). Nursing staff in South Africa demonstrated a lack of awareness of the role of the SLT in OPD management, which could have resulted from a shortage of training during their undergraduate studies, as well as minimal opportunities for interaction with SLTs in practice (Robbertse, 2018).

The current research study was conducted with nurses working in the Eastern Cape, a rural province of South Africa. The Eastern Cape province has the highest level of poverty in the country at approximately 68.4%, resulting in the majority of the population relying on the public health system (Willie, 2011). Stroke is the third largest cause of death in the Eastern Cape, responsible for 6% of deaths in the province (Bradshaw et al., 2000) indicating that the burden of stroke in the Eastern Cape province is large (Cunningham & Rhoda, 2014). The Eastern Cape has 70% of the population situated in a rural setting, in contrast to the national distribution of the population being 37% rural and 63% urban (Willie, 2011). The increased rural distribution and lower income of the population seen in the Eastern Cape (Willie, 2011) are contributing to a higher risk for the occurrence of stroke (Burton, 2016; Maredza et al., 2016, Maredza et al., 2015). Therefore, the prevalence of stroke-related OPD in this setting may be high, leading to a much higher burden on the government sector SLT (Vose, Kesneck, Sunday, Plowman, & Humbert, 2018). However, if nurses support the SLT in identifying OPD early on, then patients may have better outcomes (Hines et al., 2016).

Prevention of OPD-related complications and the establishment of screening protocols to clearly indicate the roles and responsibilities of various professionals, within a hospital context, is the role of the SLT (ASHA, 2016; Bhimte & Rangasayee, 2015;

Campbell et al., 2016; Rhoda & Pickel-Voight, 2015). The involvement of the SLT in interdisciplinary team work and collaboration with nursing staff and medical doctors could ensure that team members are informed and adequately prepared for identification of stroke-related OPD through screening and so improve communication across professions (ASHA, 2016; Bhimte & Rangasayee, 2015; Campbell et al., 2016; Rhoda & Pickel-Voight, 2015). By working with individuals from different professional backgrounds and attending further training, SLTs have the ability to increase their own knowledge and skills to assist in the achievement of patient goals (Dondorf et al., 2015). This interdisciplinary collaboration in management of patients with stoke-related OPD may lead to a reduction in length of hospital stay, lessen the amount of patient complications and decrease mortality rates (Dondorf et al., 2015). Improved interprofessional collaboration could in turn assist with the heavily burdened patient load of the SLT within the hospital context (Vose et al., 2018). The World Health Organisation [WHO] states that collaboration between health professionals will have a positive impact on the coordination of health services, increase accurate and necessary referrals between team members, and result in better patient safety and improved long term patient outcomes (WHO, 2010). Improved communication and working relationships amongst multidisciplinary team members in hospitals can promote and emphasise patient safety in persons with OPD (Dondorf et al., 2015; WHO, 2010). More regular interaction between nurses and SLTs can allow for sharing of knowledge and expertise between professions (Robbertse, 2018). Team work between the SLT and nurses is vital in the identification and management of OPD following stroke, and interdisciplinary training and education on stroke-related OPD by the SLT will improve nurses' knowledge and confidence when interacting with a patient with OPD (Dondorf et al., 2015).

1.2 Rationale

It is essential for nurses to have sufficient knowledge on the signs and symptoms of OPD as they are often the first team members to identify swallowing difficulties in patients following a stroke (Cichero, Heaton, & Bassett, 2009). Nurses have other vital roles in the management of stroke-related OPD such as overseeing mealtimes and training family members when necessary, as well as making appropriate referrals to

team members such as the SLT (Blackwell & Littlejohns, 2010). Improved and more frequent training opportunities may be required for nurses regarding the signs and symptoms of OPD and its management in order to be able to fulfil these critical roles (Bhimte & Rangasayee, 2015; Campbell et al., 2016; Rhoda & Pickel-Voight, 2015).

The Eastern Cape has a high burden of stroke, with stroke being the third largest cause of death in the province (Bradshaw et al., 2000; Cunningham & Rhoda, 2014). Conducting a swallow screening followed by appropriate recommendations regarding oral intake can reduce the risk of aspiration pneumonia amongst patients with stroke (Schepp et al., 2012; Sivertsen et al., 2017; Titsworth et al., 2013). In order to conduct a swallow screening, nurses need to have a certain level of knowledge about OPD, where SLTs may play a valuable role (Rhoda & Pickel-Voight, 2015). A study by Campbell et al. (2016) indicated that there are areas where nurses may require more knowledge regarding OPD, and through interdisciplinary collaboration and increased training opportunities, an SLT could support nurses' continued professional development in swallow screening (Campbell et al., 2016). Many barriers to OPD management exist for nurses in South Africa, including limited time and staff shortages, a reduced understanding of the SLT's role in OPD management, and insufficient training on OPD care (Robbertse, 2018). It is therefore important to describe nurses' current OPD identification and management practices in a rural province of a LMIC, such as South Africa, to identify possible training needs and guide future interprofessional collaboration between SLTs and nurses in the care of persons with stroke-related OPD (Sivertsen et al., 2017).

1.3 Research question

What are the identification and management practices of nurses of patients with OPD following a stroke in a rural province of South Africa?

1.4 Terminology as used in dissertation

Stroke-related oropharyngeal dysphagia: Oropharyngeal dysphagia (OPD) is an impaired ability to prepare and or transport a bolus, of food or liquid, from the mouth to the stomach (Kiyani & Butt, 2014). OPD can lead to food or liquid entering the lungs, resulting in aspiration pneumonia (Sugiyama et al., 2014). OPD is frequently associated with stroke (Henke, Foerch & Lapa, 2017) and is often underdiagnosed in persons with stroke, which may lead to unfavourable outcomes (Rofes et al., 2013).

Swallow screening: A swallow screening (also known as a dysphagia screening) is a pass/fail assessment used to detect if an individual will require a comprehensive dysphagia assessment (Donovan et al., 2013). The latest guidelines for the early management of patient with acute ischemic stroke, by the he American Heart Association/American Stroke Association, recommend a dysphagia screening to occur early in patients' admission in order to determine if they will be able to feed orally safely (Powers et al., 2018) . A dysphagia screening may reduce aspiration pneumonia and its importance is emphasised in clinical guidelines irrespective of the severity of the stroke (Palli et al., 2017).

Lower-middle income country: According to The World Bank, most of the world's population (73%) live in lower or upper-middle income countries (The World Bank, 2018). A country is considered to have a lower-middle-income economy if the gross national income per capita is between $1,026 and $3,995, and there are currently 47 LMICs including South Africa, as well as many African, Middle-Eastern and Asian countries (The World Bank, 2018).

Levels of health care: The public healthcare system in South Africa is divided into various levels. The Kwazulu Natal Department of Health (2014) describes the structure of South African public health sector, with level one (primary) including clinics, health care centres and district hospitals which is usually the first contact patients have to the system where they receive treatment for common diseases and basic interventions. If a patient requires more specialist assistance than what is available at the primary health care level, they will be referred to a level two (secondary) regional hospital

(Kwazulu Natal Department of Health, 2014). When further sub-specialist intervention is needed, patients will be sent to a level three (tertiary) hospital where they will receive services such as neurology or cardiology (Kwazulu Natal Department of Health, 2014). The fourth and final level consists of central and specialised hospitals which provide the highest level of healthcare and very specialised services (Kwazulu Natal Department of Health, 2014).

Interprofessional collaboration: This involves persons from two or more health care professions working together, enabling them to learn from one another and work as a cohesive team to provide the highest quality of care to their patients and improve overall patient outcomes (Dondorf et al., 2015).

Professional Nurses: Also known as Registered Nurses or Nursing Sisters, are the highest level of nurses in South Africa. They are required to supervise Staff Nurses and Enrolled Nursing Assistants, as well as perform their normal nursing responsibilities (Maidment, 2018).

Staff Nurses: Also known as Enrolled Nurses, are nurses who perform limited nursing care (Maidment, 2018).

Enrolled Nursing Assistants (ENAs): Also known as Enrolled Nursing Auxiliaries are nurses who perform basic procedures and provide general care for patients (Maidment, 2018).

1.5 Outline of chapters presented in the dissertation

Chapter 1: Introduction to the research topic, presentation of the rationale of the study and research question, and an explanation of terminology used in this dissertation.

Chapter 2: A description of the research methodology used for this study.

Chapter 3: Research article submitted to *Topics in Stroke Rehabilitation* (this chapter is formatted in accordance with the editorial guidelines of the journal and therefore differs from the rest of the dissertation).

Chapter 4: Summary of the main findings, clinical and theoretical implications of the study, recommendations for future research and conclusion.

2. METHOD

Chapter aim: This chapter aims to describe the research method followed in this study. It provides the main aim as well as information on the design followed, ethical considerations that were made, the context where the research was conducted, the sampling methods used, participant selection and descriptions, and an explanation of materials used. A detailed description of the data collection procedures and data analysis was provided, and a discussion of the reliability and validity of this study was also included.

2.1 Study aim

The aim of this study was to describe nurses' identification and management practices of patients with OPD following a stroke in a rural province of South Africa.

2.2 Research design

A quantitative-descriptive design was followed (Leedy & Ormrod, 2014; Strydom, Fouché & Delport, 2005) and data were collected using a validated survey where responses were confidential. This research design was used in order to describe the current knowledge and practices of nurses in the field of stroke-related OPD, as well as to draw possible associations between various characteristics of the participants and their responses. Quantitative data is easy to capture and can be used to draw statistically significant conclusions if the results so indicate (Leedy & Ormrod, 2014). Survey research is ideal for describing how a situation currently is (Kelley, Clark, Brown & Sitzia, 2003), and in this study, it allowed nurses to directly report on their current knowledge in a confidential manner in order to elicit the most accurate responses as possible. If face-to-face interviews were used, participants may have been less candid with their responses for fear of being incorrect or even judged (Leedy & Ormrod, 2014). A published questionnaire, the *"Survey about eating and swallowing difficulties"* (Rhoda & Pickel-Voight, 2015) was used to accurately and objectively measure the current practices of the participants (Maxwell & Satake, 2006). The research was based on a published Namibian study (Rhoda & Pickel-Voight, 2015). The quantitative data obtained in the current study were used to describe the identification and management practices of nurses in relation to OPD using similar methods previously published (Rhoda & Pickel-Voight, 2015).

2.3 Ethical considerations

Ethical clearance was obtained from the Research Ethics Committee of the Faculty of Humanities [Appendix A] and the Faculty of Health Sciences [Appendix B] of the University of Pretoria prior to data-collection. Following receipt of ethical clearance from the University of Pretoria, provincial permission was obtained from the Eastern Cape Department of Health where the study was conducted [Appendix C]. The researcher then acquired district permission [Appendix D] before approaching the institutions. Participants from various health care facilities were approached, and institutional permission was obtained from a representative within each participating facility [Appendix E]. Participation was voluntary and informed consent was requested from each participant.

In line with the South African National Department of Health's ethics in health research principles (National Department of Health, 2015), the following principles, norms, and standards were followed:

- *Beneficence and non-maleficence:* As this research were conducted using a survey, participants were not at risk of any harm. Being non-experimental, participants were not at risk for any pain, injury, psychological or material damage (Hammersley & Traianou, 2012). Participants may have felt inadequate and embarrassed to take part in a survey about knowledge that they did not train for, however there was no damage to reputation or occupation as answers were confidential and were only used to describe current practices (Hammersley & Traianou, 2012). The participants were required to take approximately 10 minutes of their workday to complete the survey, which may have inconvenienced them. The time required in order to participate was specified when participants were approached.
- *Distributive justice:* All participants were treated as equal and any/all benefits from findings and potential further training will be shared with the participants. Upon full submission, the findings of this study will be shared with the participating institutions to highlight potential areas that may benefit from further training.

- *Dignity and autonomy:* The choices of all participants throughout the research process were respected, including the right to decline the invitation to participate. Participants were able to withdraw their consent or discontinue participation at any point during the research process. The level of knowledge participants possess was respected as they may not have had formal training in the field of OPD management. The current practices were used to make deductions relating to the strengths and needs of the participants.
- *Relevance and value:* This research study determined whether further training of nurses in the field of OPD was required in order to improve stroke patient outcomes in a rural province such as the Eastern Cape and therefore it was deemed a valuable and relevant topic of study (Dondorf et al., 2015).
- *Scientific integrity:* A valid and reliable published survey was used, and a sound research method was followed in order to ensure accurate results were acquired (Kelley, Clark, Brown & Sitzia, 2003). Findings were reported in a dissertation and in a scientific article.
- *Fair selection of participants:* The selection of participants, as well as the inclusion and exclusion criteria were fair and just. No participants were excluded on the grounds of any form of discrimination, including race, age or gender, and no participants were forced to partake in this study (Maxwell & Satake, 2006).
- *Confidentiality:* The privacy and confidentiality of all participants was preserved throughout the study process and no personal identifying information was requested or captured. Each participant was assigned a random numeric code and no identifying information was linked to the data collected from the participant. Any correct/wrong answers were not connected to a specific participant and the data were reported on as the group's knowledge and practices. Surveys from each institution were kept in separate files in order to draw possible inferences or comparisons during the data analysis. The names of facilities were also kept confidential.

- *Informed consent:* Participation in this research study was voluntary, and all participants were informed of the purpose of the study. Participants had the choice to participate and informed consent was requested [Appendix F] prior to the commencement of the study. Participants were able to withdraw their consent at any time during the research process if they no longer wished to participate in the study. The participants were informed of the numeric code assigned to them and were able to withdraw their survey from study using that code.
- *Researcher competence and expertise:* The researcher was suitably qualified for the research study and appropriate supervision was provided throughout the research process. The researcher completed an undergraduate degree in Speech-Language Pathology. The researcher was practicing as an SLT in a government hospital setting, regularly working with patients with stroke. The researcher was also appropriately registered as an independent practitioner with the HPCSA at the time of data-collection.
- *Plagiarism:* All previous research that were used within this research study were appropriately cited (Maxwell & Satake, 2006).

2.4 Research setting

The study was conducted in the Buffalo City Metropolitan (BCM) municipality in the Eastern Cape province of South Africa. According to the 2011 Census by Statistics South Africa (StatsSA, 2011), the BCM has a population size of 755,200 people. This population is comprised of 85.1% black African, 7.7% white, 6% coloured and 1.1% other races. The population is 52.5% female and 47.5% male, with an unemployment rate of 35.1%. Participants were recruited from five sites in the rural province of the Eastern Cape, South Africa. The Eastern Cape province has the highest level of poverty in the country with approximately 68.4%, which results in the majority of the population relying on the public health system (Willie, 2011). Data were collected in a municipality which includes both rural and semi-urban areas, that provide all levels of health care services.

The BCM was selected as it has multiple health care facilities providing various levels of services within one municipality. The participants were recruited from medical wards, casualties, and clinics where patients with stroke present or are treated.

2.5 Sampling

A purposive sampling method, targeting a smaller group of individuals to represent the attributes of a larger group, was used in this study (Maxwell & Satake, 2006). Participants were approached and invited verbally to take part in the study on a voluntary basis, and this method was used until an adequate number of participants in each group had completed the survey for results to be statistically significant. A power analysis was conducted by a statistician in order to determine the number of participants needed to obtain a representative sample. A power analysis is a calculation that can determine the sample size required (from each institution) in order to acquire a representative sample of the population for results to be clinically significant (Kraemer & Blasey, 2017). The results indicated that at least 30 participants per level of health care were required in order to statistically analyse and compare the results.

Inclusion criteria:

- All participants were required to have completed their studies (certificate, diploma or degree) and be actively working as professional nurses, staff nurses or enrolled nursing assistants (ENAs).
- Participants needed to be working in a clinic, medical ward, or casualty where they were exposed to, and involved in, the assessment and/or management of patients with stroke.
- Participants were required to be proficient in English to partake in this study as the validated written survey was in English. As all participants have completed their tertiary level education (certificate, diploma or degree) it was assumed that they were proficient in English, and participants were informed that they could ask for clarification on any questions or words that were not understood.

Exclusion criteria

- Nursing students were excluded from the research as they were at various levels of study, and their exposure in the field of OPD cannot be adequately determined.
- Nurses working in wards or clinics where they are not exposed to patients who had strokes were also excluded.

2.6 Participant description

One hundred and thirty-five participants were prospectively recruited using purposive sampling (Strydom et al., 2005) where participants who met the inclusion criteria were invited to complete the survey. The socio-demographic characteristics and experience of the participants are presented in Table 1. Most participants (n=66; 50.8%) had ten or more years of experience and 86 participants (66.2%) were working in medical wards (Table 1). There were five surveys that were excluded as they were either incomplete or were not returned and therefore the sample used for the study was 130.

Table 1: Participants' socio-demographic characteristics and professional experience (n = 130)

Characteristic	*n*	%
Total complete responses	130	–
Level of health care		
Primary	44	33.8
Secondary	50	38.5
Tertiary	36	27.7
Age		
20 – 30 years	21	16.2
31 – 40 years	28	21.5
41 – 50 years	39	30.0
51 – 60 years	41	31.5
More than 60 years	1	0.8
Qualification		
Enrolled nursing assistant	29	22.3
Staff nurse	21	16.2
Professional nurse	80	61.5
Years of nursing experience		
0 – 3 years	17	13.0
4 – 6 years	27	20.8
7 – 9 years	20	15.4
10 – more years	66	50.8
**Current work context*		
Medical ward	86	66.2
Casualty	7	5.4
Out-patient clinic	20	15.4
Day hospital	24	18.5

*Participants may be actively working in more than one context

2.7 Materials

A published survey, the *"Survey about eating and swallowing difficulties"* [Appendix G] (Rhoda & Pickel-Voight, 2015), was used to collect data (Maxwell & Satake, 2006). The survey was previously validated by five practicing SLTs with experience in OPD,

who agreed that all areas of OPD were appropriately covered and the test-retest method was used to ensure reliability (Rhoda & Pickel-Voight, 2015). Of the five SLTs who validated this survey, two worked in private practice in Namibia, one worked in the public health sector and the other two worked in a stroke unit in Germany (Rhoda & Pickel-Voight, 2015). To ensure reliability, the authors used the test-retest method with 15 nurses in two week intervals between tests (Rhoda & Pickel-Voight, 2015). The survey was then adapted and questions with moderate to poor results were removed (Rhoda & Pickel-Voight, 2015). The survey consisted of four sections, which are described in Table 2, and took 10 to15 minutes to complete. In the present study, the hardcopy survey was hand-delivered, and the researcher was present to answer any questions or clarify uncertainties during the completion of the survey.

Table 2: Sections in the "Survey about eating and swallowing difficulties" (Rhoda & Pickel-Voight, 2015)

Section	Description
Demographic information and level of experience	Describes the participant, their qualification and time spent working as a nurse.
Signs and symptoms of OPD	Includes signs of aspiration and OPD, where participants were required to differentiate between accurate answers and distractors.
Complications of OPD	Identification of the complications and implications of OPD in patients who have suffered a stroke.
Management of OPD	Participants were required to select the responses that best described how they were managing OPD.

OPD = oropharyngeal dysphagia

2.8 Data collection procedures

Data were collected prospectively for a period of three months using a hand-delivered hard copy survey. A pilot study was conducted with 10 participants prior to data collection to ensure the survey was understood and completed correctly and to identify if any adaptations were required. The pilot study increased the reliability of the research procedures and confirmed that the desired data would be obtained in the research study. A summary of the pilot study is found in Table 3. Participants completed the survey independently with minimal clarification of questions required.

Table 3: Pilot study (n = 10)

Aim	Participants	Materials	Procedures	Outcomes	Inclusion in the study
The pilot study was conducted to determine if participants would be able to understand the survey and complete it appropriately.	Ten participants were recruited from a medical ward at one specific hospital, a secondary level healthcare institution.	The "Survey about eating and swallowing difficulties" (Rhoda & Pickel-Voight, 2015) was used.	Participants were invited to complete the survey on a voluntary basis. The surveys were hand-delivered, and the researcher was present to answer any questions.	None of the participants asked any questions in relation to content, and two participants were directed to the back pages to complete them as they were initially missed. The addition of page numbers ensured the back pages were easily found and completed. No other changes were required.	The surveys completed during the pilot were included in the data collected from the study as the content of the survey did not change.

The researcher consulted with the lead nursing sisters or clinical managers of each site, prior to approaching the potential participants, to identify when would be the most appropriate time to collect data. One hundred and thirty-five surveys were distributed; however, three surveys were incomplete, and two surveys were not returned, therefore 130 surveys were analysed.

In order to prevent interruptions of daily tasks, participants were invited to complete the survey during a designated break time that was convenient to them. Once informed consent was received, participants were asked to complete the survey in writing. The survey was distributed by hand in a hard copy format to prevent any restrictions or limitations of accessibility and it took approximately 10 to 15 minutes to complete. The researcher was available at the time the survey was completed in order to clarify any terms or answer questions participants may have had. Due to the unpredictability of time available and workload, some nurses were given a day to complete the survey and deposit it into a sealed box for collection. In such cases, the researcher's contact details were given for any questions or clarity required.

2.9 Data analysis

A statistician was consulted in the analysis and interpretation of the data. Descriptive statistics were used to illustrate the current identification and management practices being used by participants. These statistics were used to summarize the findings of the survey and describe the data acquired, including the population sample (Pérez-Vicente & Expósito Ruiz, 2009). The study also made use of inferential statistics to explore potential relationships between variables. These statistics allowed for generalisations to be made about the population based on the sample population, which was determined by the power analysis (Pérez-Vicente & Expósito Ruiz, 2009).

The survey was scored like a test, each statement required a specific answer and the participants response would be classified as correct or incorrect, and results demonstrated the number of correct responses. Data were analysed using the Statistical Package for the Social Sciences (SPSS) version 25. The Kolmogorov-Smirnov or the Shapiro-Wilk test can be used (Field, 2014) to test for normality, however, the Shapiro-Wilk test is known to have more power in detecting differences from normality and was selected for this study (Field, 2014). Between-groups analyses of two independent samples were analysed using the Mann-Whitney U test. Between-group analyses of three or more independent groups were analysed using the Kruskal-Wallis test. If the p-value for either of these tests was less than 0.05, there were statistically significant differences between the groups.

2.10 Reliability and validity

The *"Survey About Eating And Swallowing Difficulties"* (Rhoda & Pickel-Voight, 2015) was used in this study. The survey was validated by five actively practicing SLTs with experience in the field of dysphagia, working in various contexts including private practice, the public health sector and a specialised stroke unit in Germany (Rhoda & Pickel-Voight, 2015). The authors used the test-retest method to assess the reliability of the survey, in which a two week interval between tests was used (Rhoda & Pickel-Voight, 2015). Based on the findings of the reliability assessment, the survey was adapted to remove questions that resulted in poor responses (Rhoda & Pickel-Voight,

2015). The survey was trialled in a pilot study to ensure it was appropriate for the target population, and no changes were required, increasing the reliability of the study. The Cronbach Alpha coefficient was used to determine the reliability of the survey, and it equalled 0.707, demonstrating that it was reliable tool to use for data-collection (Goforth, 2015).

3. ARTICLE

The following article was submitted to the journal 'Topics in Stroke Rehabilitation' for review [Appendix H]. The article format is different to that of the dissertation as it was formatted, including referencing style, in order to meet the specific requirements of the journal.

Nurses' management of stroke-related oropharyngeal dysphagia in a rural province of South Africa

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Abstract

***Background*:** Early identification of stroke-related oropharyngeal dysphagia (OPD) using screening by nurses can prevent adverse patient outcomes in lower-middle-income countries (LMICs). Nurses are essential in the OPD management team and should ideally be able to screen and prioritise dysphagia management in stroke patients.

***Objective*:** To describe nurses' identification and management practices of patients with stroke-related OPD.

***Methods*:** Qualified nurses from various healthcare levels in a rural province of South Africa, were invited to complete a hard copy survey on signs, symptoms, complications, and

management of stroke-related OPD. A sample of 130 participants were recruited. Majority of the participants (n=66;50.8%) had ten or more years of experience.

***Results*:** The mean scores of correct responses for each section were: 8.7/13 (66.7%) for signs and symptoms, 4.7/10 (47.3%) for complications and 3.8/7 (54.2%) for management practices. There were no significant differences between groups for the signs and symptoms section and the complications section. Secondary healthcare nurses demonstrated significantly better knowledge (S-P:p=0.022;S-T:p=0.010) than primary and tertiary level nurses regarding management of OPD. Overall, secondary level nurses had significantly higher scores (S-P:p=0.044;S-T:p=0.025) than the other levels.

***Conclusions*:** Moderate knowledge of identification and management of stroke-related OPD among nurses across all health care levels was evident. Interdisciplinary collaboration between nurses and SLPs can further improve knowledge and skills in identification and management of stroke-related OPD in LMICs.

Keywords: oropharyngeal dysphagia, dysphagia screening, stroke-related dysphagia, nurse, interdisciplinary approach, lower-middle-income country

Introduction

The global burden of stroke is increasing[1]. More than 80% of strokes worldwide occur in lower-middle-income countries (LMICs)[2,3]. In rural South Africa, strokes result in approximately 30 000 deaths yearly and are the largest cause of disability in the country[2,4,5].

Stroke is one of the leading causes of oropharyngeal dysphagia (OPD)[6–11]. OPD is often underdiagnosed in people with stroke, which may lead to adverse complications[12] including aspiration pneumonia, malnutrition, dehydration, extended hospital stay, and death[6,7,13]. The

prevalence of OPD following stroke varies widely, ranging from 8% to 80%[7]. Early identification of OPD using screening allows for prompt initiation of management plans, which can improve patient outcomes[14].

Nursing staff are most likely to be the first health care professionals to detect early symptoms of OPD as they administer medication and regularly feed patients[15,16]. Patients identified with swallowing difficulties should be referred to a speech-language pathologist (SLP) for comprehensive assessment and management[17–19]. However, only a limited number of SLPs are employed in the public sector in South Africa, therefore they have large caseloads[20,21]. Consequently, not all levels of healthcare have access to SLPs that perform assessments and manage OPD[20]. Nurses are valuable team members and the importance of accurate early identification of stroke-related OPD by nurses is evident, as this may guide initial management of OPD[6,9,16,22,23].

Ideally, nurses should effectively identify OPD and risk for aspiration by screening patients' swallow abilities before patients receive food, liquids, or oral medication[9,11,22–25]. Nurses can implement initial swallowing precautions to prevent unfavourable outcomes until an SLP is able to perform a comprehensive assessment[14,26–28]. If patients fail a swallow screen and OPD is suspected, prompt referral to an SLP for further assessment is imperative[14,27]. However, in LMICs such as South Africa, swallow screenings by nurses or other medical staff are inconsistently conducted due to insufficient screening protocols and inadequate implementation thereof, as well as limited material and human resources[21]. The result is a lack of clarity as to who has the responsibility to refer to SLPs or which patients require further dysphagia assessment following stroke[21].

In South Africa, most people with stroke are managed by various health care professionals and the roles of each professional are not always clearly communicated[29]. Some health care professionals may not have had much experience or training on stroke-related OPD[29]. There is also a shortage of nurses within the public sector in South Africa reducing the amount of time spent with patients[30]. When nurses receive sufficient training and support to perform dysphagia screenings, they may be more likely to use swallow screening protocols and refer to SLPs[31,32]. Yet, international studies report that nurses display difficulty in identifying OPD timeously following a stroke, which may delay appropriate referral for intervention[15,33]. Nursing staff in South Africa demonstrated a lack of awareness of the role of the SLP in OPD management, which could have resulted from a shortage of training in undergraduate studies, as well as minimal interaction with SLPs in practice[30].

Prevention of dysphagia-related complications and the establishment of dysphagia screening protocols to clearly indicate roles and responsibilities of various professionals, within a hospital context, is the role of SLPs[15,17,24,34]. The involvement of SLPs in interdisciplinary teamwork and collaboration with nurses could ensure that team members are informed and adequately prepared for identification of OPD[15,17,24,34]. More regular interaction between nurses and SLPs can allow for sharing of knowledge and expertise between professions[30]. Interdisciplinary collaboration may lead to a reduction in length of hospital stay, lessen the number of patient complications, and decrease mortality rates in people with stroke-related OPD[35]. The study aimed to describe nurses' identification and management practices of stroke-related OPD in a rural province of South Africa, a LMIC, which may identify possible training needs and guide future inter-professional collaboration with SLPs in this setting[32].

Methods

Design

Data were collected using a validated survey in this quantitative descriptive study[36,37]. The survey was distributed by hand to 135 nurses from five sites in a rural province of South Africa[36,37]. Ethical clearance was obtained from the academic institution and the required provincial Department of Health governing bodies, with voluntary participation and informed consent from each participant. Data were collected from July to September 2018. Three surveys were incomplete, and two surveys were not returned; therefore 130 surveys were analysed.

Participants

One hundred and thirty-five participants were recruited using consecutive sampling[37] where participants who met the inclusion criteria were invited to complete the survey. Participants had to be qualified nurses working with people with stroke, and who were proficient in English. Data were collected in a metropolitan area, which provides all levels of health care services.

The socio-demographic characteristics and experience of the participants are presented in Table 1. Most participants (n=66;50.8%) had ten or more years of experience and 86 participants (66.2%) were working in medical wards (Table 1).

Table 1. Participants' socio-demographic characteristics and professional experience (*n* = 130)

Characteristic	*n*	%
Total complete responses	130	–
Level of health care		
Primary	44	33.8
Secondary	50	38.5
Tertiary	36	27.7
Age		
20 – 30 years	21	16.2
31 – 40 years	28	21.5
41 – 50 years	39	30.0
51 – 60 years	41	31.5
More than 60 years	1	0.8
Qualification		
Enrolled nursing assistant	29	22.3
Staff nurse	21	16.2
Professional nurse	80	61.5
Years of nursing experience		
0 – 3 years	17	13.0
4 – 6 years	27	20.8
7 – 9 years	20	15.4
10 – more years	66	50.8
**Current work context*		
Medical ward	86	66.2
Casualty	7	5.4
Out-patient clinic	20	15.4
Day hospital	24	18.5

*Participants may be actively working in more than one context

Materials and data collection procedures

A published survey, the *"Survey about eating and swallowing difficulties"*[34], was used to collect data[38]. The survey was previously validated by five practicing SLPs with experience in dysphagia and the test-retest method was used to ensure reliability[34]. The survey consisted of four sections, including demographic information and level of experience, signs and symptoms of dysphagia, complications of dysphagia, and management of dysphagia. Data were collected by the first author by distributing surveys by hand and being available for clarification.

Participants completed the hard-copy survey independently with minimal clarification of questions required. A pilot study was conducted with 10 participants prior to data collection to ensure clarity of questions and increasing reliability of the findings.

Data analysis

The survey was scored, and results demonstrate the number of correct responses using the guidelines from a previous study [34]. According to Rhoda and Pickel-Voight (2015), the level of knowledge was classified as follows: A score of ≥75% was 'high', 50% - 74% was 'moderate', and a score of ≤50% was 'low'[34]. Data were analysed using the Statistical Package for the Social Sciences (SPSS) version 25 using descriptive and inferential statistics in consultation with a statistician. The Cronbach Alpha coefficient equalled 0.707 demonstrating the reliability of the questionnaire[39]. P-values of <0.05 were considered statistically significant.

Results

Most participants (*n*=118;90.8%) have cared for a patient who has had a stroke, while only 50% (*n*=65) received training on stroke patient care. Majority of participants (n=100;76.9%) have cared for stroke patients with swallowing difficulties, with only 26.9% (*n*=35) having received training on OPD and its management. Interestingly, 81.5% (*n*=106) of participants indicated that they are unsatisfied with their current knowledge of stroke-related OPD and most participants (*n*=125;96.2%) indicated a desire for further training.

Identification of signs and symptoms of oropharyngeal dysphagia

A comparison of participants' understanding of the typical symptoms of OPD is shown in Table 2. In Tables 2 to 4, the p-value labelled 'P-S' (primary and secondary level groups) 'P-T'

(primary and tertiary level groups) and 'S-T' (secondary and tertiary level groups) indicates whether correct responses differed significantly between groups.

Table 2. Comparison of participants' knowledge of signs and symptoms of OPD (*n*=130)

Signs/symptoms	Correct answer Agree(A)/Disagree(D)	Primary (P): *n*=44 *n* (%)	Secondary (S): *n*=50 *n* (%)	Tertiary (T): *n*=36 *n* (%)	Fisher's exact p-value	Total: *n* = 130 *n* (%)
Coughing whilst eating	A	36 (81.8)	46 (92.0)	32 (88.9)	P-S: 0.215 P-T: 0.532 S-T: 0.715	114 (87.7)
Skin irritations	D	30 (68.2)	33 (66.0)	20 (55.6)	P-S: 1.000 P-T: 0.258 S-T: 0.373	83 (63.8)
Feeling of food getting stuck in throat	A	38 (86.4)	45 (90.0)	29 (80.6)	P-S: 0.750 P-T: 0.551 S-T: 0.227	112 (86.2)
Choking on saliva during non-mealtimes	A	37 (84.1)	44 (88.0)	28 (77.8)	P-S: 0.766 P-T: 0.569 S-T: 0.244	109 (83.8)
Poor movement of tongue	A	41 (93.2)	43 (86.0)	31 (86.1)	P-S: 0.327 P-T: 0.457 S-T: 1.000	115 (88.5)
Food remains in mouth	A	36 (81.8)	47 (94.0)	33 (91.7)	P-S: 0.106 P-T: 0.329 S-T: 0.691	116 (89.2)
Poor chewing	A	37 (84.1)	44 (88.0)	33 (91.7)	P-S: 0.766 P-T: 0.499 S-T: 0.729	114 (87.7)
Patients always cough if they aspirate	D	3 (6.8)	3 (6.0)	1 (2.8)	P-S: 1.000 P-T: 0.623 S-T: 0.637	7 (5.4)
Difficulty closing lips	A	37 (84.1)	33 (66.0)	14 (38.9)	P-S: 0.059 P-T: 0.000* S-T: 0.016*	84 (64.6)
Weight loss	A	32 (72.7)	33 (66.0)	21 (58.3)	P-S: 0.510 P-T: 0.236 S-T: 0.504	86 (66.2)
Frequent throat clearing after swallowing	A	29 (65.9)	31 (62.0)	18 (50.0)	P-S: 0.830 P-T: 0.176 S-T: 0.280	78 (60.0)
Hoarse voice	A	25 (56.8)	31 (62.0)	8 (22.2)	P-S: 0.676 P-T: 0.003* S-T: 0.000*	64 (49.2)
Chest pain	A	11 (25.0)	18 (36.0)	17 (47.2)	P-S: 0.272 P-T: 0.059 S-T: 0.375	46 (35.4)

Results indicate number (%) correct responses.

*Statistically significant difference between number of correct responses between the two groups: P = Primary, S = Secondary, T = Tertiary

As a group, participants performed best in this section with a mean correct response score of 8.7/13 indicating that 66.7% of the symptoms were identified appropriately. However, when asked if patients always cough if they aspirate, only 5.4% (*n*=7) of participants agreed that this was not a correct statement. Two other symptoms also revealed low scores, namely 'hoarse voice' (49.2%;*n*=64) and 'chest pain' (35.4%;*n*=46). More common symptoms such as 'coughing whilst eating' (*n*=114;87.7%), 'poor movement of the tongue' (*n*=115;88.5%), and 'food remaining in the mouth' (*n*=116;89.2%) were accurately identified by most participants. There were no significant differences between the levels of health care based on answers in this section (*p*=0.066). However, when comparing the number of correct responses per item, it was noted that for 'difficulty closing lips', percentage of correct responses differed significantly, with primary level nurses scoring a high correct response rate (84.1%) while tertiary health care level nurses (38.9%) scoring much lower (*p*=0.000). There was also a significant difference on the same item, comparing the secondary level that had the next highest score (66.0%) to the tertiary (38.9%) level group (*p*=0.016). Interestingly, primary health care nurses (56.8%) had significantly more correct responses to the item 'hoarse voice' when compared to the tertiary (22.2%) health care nurses (*p*=0.003). The same trend was seen for this item with the secondary health care nurses (62.0%) demonstrating significantly better responses than the tertiary (22.2%) level nurses (p=0.000).

Complications of oropharyngeal dysphagia

Participants scored the lowest in this section of the survey, with a mean correct score of 4.73/10, revealing that only 47.3% of complications were accurately identified (Table 3).

Table 3. Comparison of participants' knowledge of complications of OPD (*n* = 130)

Complications	Correct answer Agree(A)/Disagree(D)	Primary: *n*=44 *n* (%)	Secondary: *n*=50 *n* (%)	Tertiary: *n*=36 *n* (%)	Fisher's exact p-value	Total: *n*=130 *n* (%)
Increased mortality	A	31 (70.5)	29 (58.0)	11 (30.6)	P-S: 0.282 P-T: 0.001* S-T: 0.016*	71 (54.6)
Pneumonia	A	23 (52.3)	30 (60.0)	15 (41.7)	P-S: 0.533 P-T: 0.376 S-T: 0.126	68 (52.3)
Anaphylactic shock	D	9 (20.5)	12 (24.0)	11 (30.6)	P-S: 0.805 P-T: 0.314 S-T: 0.622	32 (24.6)
General weakness	A	38 (86.4)	41 (82.0)	22 (61.1)	P-S: 0.588 P-T: 0.018* S-T: 0.047*	101 (77.7)
Problems with digestion	D	2 (4.5)	4 (8.0)	5 (13.9)	P-S: 0.681 P-T: 0.234 S-T: 0.482	11 (8.5)
Aspiration	A	42 (95.5)	49 (98.0)	32 (88.9)	P-S: 0.598 P-T: 0.401 S-T: 0.156	123 (94.6)
Dehydration	A	33 (75.0)	44 (88.0)	27 (75.0)	P-S: 0.116 P-T: 1.000 S-T: 0.153	104 (80.0)
Sudden heart attack	D	7 (15.9)	15 (30.0)	14 (38.9)	P-S: 0.144 P-T: 0.013* S-T: 0.489	36 (27.7)
Malnutrition	A	36 (81.8)	39 (78.0)	30 (83.3)	P-S: 0.798 P-T: 1.000 S-T: 0.594	105 (80.8)
Haematemesis (vomiting blood)	D	11 (25.0)	21 (42.0)	20 (55.6)	P-S: 0.126 P-T: 0.006* S-T: 0.275	52 (40.0)

Results indicate the number (%) of correct responses.

*Statistically significant difference between number of correct responses between the two groups P = Primary, S = Secondary, T = Tertiary

Three complications were incorrectly thought to be as a result of a stroke, with only a small percentage of participants identifying them correctly (Table 3). These included 'anaphylactic shock' (*n*=32;24.6%), 'problems with digestion' (*n*=11;8.5%), and 'sudden heart attack' (*n*=36;27.7%). Professional nurses performed better in this section when compared to enrolled nursing assistants (*p*=0.015) and to staff nurses (*p*=0.020). Table 3 shows participants were not familiar with OPD complications that could arise following stroke. For the item 'increased mortality', primary health care nurses demonstrated the best knowledge (70.5%) when compared to tertiary (30.6%) level health care nurses (*p*=0.001). However, the tertiary level

also scored significantly lower on this item compared to the secondary level nurses (58.0%) (p=0.016). A similar result was found for 'general weakness' where both primary (86.4%) and secondary (82.0%) level nurses had high scores demonstrating better knowledge than the tertiary level group (61.1%). The correct response rate for 'sudden heart attack' was low across groups, with the tertiary level nurses having the highest score (38.9%) and primary level the lowest (15.9%). For 'haematemesis' (vomiting blood) the tertiary level nurses had the best knowledge (55.6%) and the primary level had the least correct responses (25.0%).

Management practices of oropharyngeal dysphagia

Participants were required to determine if certain management practices were appropriate or not and findings are shown in Table 4.

Table 4. Comparison of participants' knowledge of the management of OPD (n = 130)

Management practices	Correct answer Agree(A)/Disagree(D)	Primary: n=44 n (%)	Secondary: n=50 n (%)	Tertiary: n=36 n (%)	Fisher's exact p-value	Total: n = 130 n (%)
Patients with a nasogastric tube need daily oral hygiene (mouth washing and brushing of the teeth)	A	42 (95.5)	48 (96.0)	33 (91.7)	P-S: 1.000 P-T: 0.653 S-T: 0.645	123 (94.6)
Thickened liquid should be avoided	D	6 (13.6)	21 (42.0)	5 (13.9)	P-S: 0.003* P-T: 1.000 S-T: 0.008*	32 (24.6)
Watery liquids are the safest to drink	D	2 (4.5)	17 (34.0)	11 (30.6)	P-S: 0.001* P-T: 0.002* S-T: 0.818	30 (23.1)
All patients with difficulty swallowing need a feeding tube	D	19 (43.2)	17 (34.0)	5 (13.9)	P-S: 0.400 P-T: 0.007* S-T: 0.046*	41 (31.5)
The best position while feeding the patient is when the patient lies flat on his back	D	37 (84.1)	46 (92.0)	31 (86.1)	P-S: 0.337 P-T: 1.000 S-T: 0.482	114 (87.7)
The patient can always eat normal hospital food	D	37 (84.1)	40 (80.0)	22 (61.1)	P-S: 0.789 P-T: 0.024* S-T: 0.087	99 (76.2)
A feeding tube is only indicated in a patient with impaired consciousness	D	16 (36.4)	23 (46.0)	15 (41.7)	P-S: 0.404 P-T: 0.652 S-T: 0.826	54 (41.5)

Results indicate the number (%) of correct responses.

*Statistically significant difference between number of correct responses between the two groups: P = Primary, S = Secondary, T = Tertiary

Participants had a mean correct score of 3.8/7 resulting in an average of 54.2% for this section, indicating participants had some difficulty identifying ideal management practices for patients with stroke-related OPD. A few misconceptions were evident, indicated by low percentages of correct responses, when it was required to disagree with certain management practices. These included that 'thickened liquids should be avoided' (*n*=32;24.6%), 'watery liquids are the safest to drink' (*n*=30;23.1%), and that 'all patients with difficulty swallowing require a feeding tube' (*n*=41;31.5%). Remarkably, the secondary level nurses had better knowledge on the item 'thickened liquid should be avoided' (42.0%) when compared to both primary (13.6%) and tertiary (13.9%) group nurses. For 'watery liquids are the safest to drink', the secondary (34.0%) and tertiary nurses (30.6%) scored similarly, while the primary level group had a low score (4.5%). On the item 'all patients with difficulty swallowing need a feeding tube', primary level nurses scored the highest (43.2%), followed by secondary nurses (34.0%) and then the tertiary level scored the lowest (13.9%). Finally, a significant difference was found for 'the patient can always eat normal hospital food' between the primary (84.1%) and tertiary (61.1%) groups (*p*=0.024).

Statistically, for the management of OPD section, secondary health care nurses showed significantly better knowledge when compared to primary level nurses (*p*=0.022) as well as tertiary level nurses (*p*=0.010). The same is seen in the overall number of correct responses, with the secondary level group displaying the best knowledge on OPD, when compared to the primary level group (S-P:*p*=0.044) and the tertiary level group (S-T:*p*=0.025). The study revealed moderate scores overall across all levels of health care with a mean correct score of 17.20/30 (57.33%).

Discussion

Despite regularly managing stroke patients, the study revealed that half of the participants had received previous training on stroke, and only 26.9% received training on stroke-related OPD. Although research indicates that OPD occurs in up to 80% of persons who suffered a stroke[7], nurses, who are vital in the management of OPD, receive minimal training on the topic.

In order to manage OPD, it is important for nurses to have a good knowledge base of OPD symptoms for early identification to avoid unfavourable outcomes such as malnutrition, aspiration pneumonia, and death[6,9,23]. Results revealed that nurses employed at all three levels had the best knowledge on the symptoms of OPD. Interestingly, tertiary level participants had the lowest scores for most items in this section, which may be attributed to the South African health care system. Patients first present with a stroke at local clinics and are referred up the levels of health care as necessary; once medically stable, patients are often transferred back to a lower health care level for chronic management[40], therefore tertiary level nurses may only manage acute stroke patients.

Despite good knowledge of symptoms as a group, there was a misconception amongst nurses on coughing as a sign of aspiration. Patients do not always cough when they aspirate[41], however, 83.1% (*n*=108) of participants believed coughing was always present, indicating poor awareness of silent aspiration, a known symptom of stroke-related OPD[42]. Similar results were found by Rhoda and Pickel-Voight (2015) where 80.4% of nurses believed coughing was always present during aspiration[34]. If unidentified, silent aspiration places patients at risk for aspiration pneumonia[43], therefore it is essential for nurses across all levels of health care to be aware of all symptoms of OPD to effectively manage these patients.

Only 52.3% of participants believed pneumonia was a complication of OPD. A recent study indicated that stroke patients diagnosed with OPD are 4.69 times more likely to get aspiration pneumonia than those without OPD[44]. For this reason, it is vital that nurses are aware of the complications associated with mismanaged OPD, and to have knowledge on the importance of appropriate management. Participants had a mean correct score of 4.73/10 for identifying complications associated with stroke-related OPD, indicating that nurses across all levels of health care were unaware of the adverse consequences, which could result from undiagnosed or mismanaged OPD. The responses varied widely between items as well as between levels of health care, which may result from varying caseloads that nurses face. Similarly, primary level nurses were the most accurate in identifying both increased mortality (70.5%) and general weakness (86.4%) followed by secondary (58.0% and 82.0%) and tertiary level with the lowest scores (30.6% and 61.1%) for these complications.

Most of the group (n=89;68.5%) believed that all patients with OPD should be fed using nasogastric tubes, which may be because it is viewed as the predominant management option for stroke-related OPD. Secondary level nurses had the best knowledge of correct management procedures for patients with stroke-related OPD. Overall, the secondary level healthcare nurses had the highest scores across (P=17.80/30;S=18.94/30;T=16.50/30) all sections of the survey and therefore had the best knowledge of stroke-related OPD. Nursing staff will most often be feeding or providing medication to persons with stroke, thus knowledge of the delivery method of food and liquids, food consistency and positioning of patient required is important[15,16]. Most participants (75.4%) were found to be unaware of the value of thickening agents in treatment of OPD. The addition of thickening agents does not improve swallow physiology, however research emphasizes the use of thickeners as a compensatory measure to improve swallow safety and reduce aspiration risk by slowing the flow of the bolus[12,45,46].

A study conducted in two provinces in South Africa found that nurses identified limited staff and time, as well as insufficient knowledge and training on OPD as barriers to appropriate OPD management[30]. Similar results in terms of knowledge and training across all sections of the survey were found by Rhoda and Pickel-Voight (2015). Nurses in the current study as well as the study by Rhoda and Pickel-Voight (2015) demonstrated the best knowledge in the signs and symptoms of stroke-related OPD section of the survey. The previous research found a score of 64.62% compared to 66.7% in this study. In contrast to the previous study where the next best knowledge was of the complications associated with stroke-related OPD (58.15%), nurses in this research had the least correct responses for this section (47.3%). Lastly, nurses in the previous study scored 49.28% for the management of stroke-related OPD in comparison to 54.2% in the current study. According to the classification of the scores, both studies revealed similar overall scores and indicating that nurses had a moderate knowledge base of stroke-related OPD, with the previous research finding a score of 57.34%[34] and the current study finding a score of 57.33%. This finding reiterates that of Rhoda and Pickel-Voight (2015). A need exists for improved training of nurses and opportunities for continued collaboration between nurses and SLPs to improve management of stroke-related OPD and to optimise patient outcomes. It is essential to develop effective training on stroke-related OPD and facilitate regular interaction between team members to improve the quality of patient care[30]. Collaboration between SLPs and nurses, and combining nurses' experience with SLPs knowledge and expertise on stroke-related OPD, can be used to maximise health resources in a constrained environment, in order to improve the interdisciplinary management of stroke patients with OPD in LMICs[35].

Limitations and future recommendations

The research was conducted in one rural municipality, which had all three levels of healthcare. Future research on a larger scale across several provinces or nationwide may provide a representative sample. Further investigation regarding availability of training programs for improved collaboration between team members is warranted. Research efforts should be geared towards improving clinical and theoretical support for teams regarding stroke-related OPD, and furthermore to identify existing resources to implement better stroke-related OPD identification and management in LMICs.

Conclusions

The study revealed that secondary level health care nurses had the best knowledge of symptoms and management of stroke-related OPD. Results indicated misconceptions about possible complications associated with stroke-related OPD such as 'anaphylactic shock' and 'sudden heart attack', and the ideal management of OPD such as the value of using thickened liquids. SLPs need to assist in the development and implementation of sustainable protocols for OPD screening and management within a resource-constrained environment. Integrated work relations with an emphasis on collaboration between nurses and SLPs will optimise the use of limited health resources, promote patient safety, and improve patient outcomes[35].

Acknowledgements

Thank you to the participants who volunteered and institutions who allowed this research. A special thanks to Dr Marien Graham for data analysis. Finally, Dr Stacy Rossouw, you are an inspiration to us all and we are grateful for your support and dedication.

Funding

Kerry Knight received a University of Pretoria scholarship.

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4. IMPLICATIONS AND CONCLUSION

Chapter aim: The chapter provides a summary of the main findings, the clinical and theoretical implications of the study, as well as a critical evaluation on the strengths and limitations of the research. Future research perspectives are provided. The chapter serves as a conclusion and summary of the research.

4.1 Summary of the main findings

The study revealed that secondary level nurses had the best knowledge of symptoms and management of stroke-related OPD. Findings also showed misconceptions among some nurses about the possible complications associated with stroke-related OPD such as 'anaphylactic shock' and 'sudden heart attack', as well as the ideal management of OPD, such as the value of using thickened liquids. The study revealed moderate scores overall across all levels of health care with a mean correct score of 17.20/30 (57.33%), which was in line with the findings by Rhoda and Pickel-Voight (2015) with a moderate score of 57.34%.

Despite regularly managing stroke patients, the study revealed that only half of the participants had received previous training on stroke, with only 26.9% having any training on stroke-related OPD. Even with research indicating that OPD occurs in up to 80% of persons who had a stroke (Takizawa et al., 2016), nurses who are vital team members in the OPD-management team, appear to receive a minimal amount of training on OPD decision-making. Interestingly, the majority of participants (81.5%) felt that they were unsatisfied with their current knowledge of stroke-related OPD and most participants (96.2%) indicated a desire for further training in this field. In order to appropriately manage OPD, it is important for all team members working with stroke, especially nurses, to have a good knowledge base of OPD symptoms for early identification and consequently to avoid unfavourable outcomes (Behera et al., 2018; Joundi et al., 2017; Palli et al., 2017). A summary of the main findings presented as the knowledge strengths and needs for future continued professional development is presented in Table 4.

Table 4 Summary of strengths and needs identified in the study

Primary level of health care		Secondary level of health care		Tertiary level of health care	
Knowledge of signs and symptoms of OPD					
Strengths identified	**Needs for continued professional development**	**Strengths identified**	**Needs for continued professional development**	**Strengths identified**	**Needs for continued professional development**
• Highest score of all health care levels for 6/13 items. • Highest correct response rate for item 'patients always cough if they aspirate'. • Generally moderate awareness of the typical signs and symptoms.	• Lowest score for 4/13 items, which demonstrates inconsistencies in knowledge. • Recommendations based on this section: training on silent aspiration.	• Highest score for 5/13 items. • Generally moderate awareness of typical signs and symptoms.	• Lowest score on only one item, 'poor movement of the tongue'. • Recommendations based on this section: training on silent aspiration.	• Highest score in only two items, but 8/13 symptoms were correctly identified by most of the group. • Moderate awareness of the typical signs and symptoms.	• The other levels performed significantly better on the item 'hoarse voice'. • Recommendations based on this section: collaboration with SLTs and training on silent aspiration.
Knowledge of complications of OPD					
Strengths identified	**Needs for continued professional development**	**Strengths identified**	**Needs for continued professional development**	**Strengths identified**	**Needs for continued professional development**
• Best knowledge demonstrated on the item 'increased mortality'. • Scored the highest for 2/10 items in this section.	• Lowest score for 4/10 items, with a significantly lower response rate than the tertiary level on 'haematemesis'. • Did not demonstrate adequate knowledge in this section compared to other levels particularly for items: 'anaphylactic shock', 'problems with digestion', and 'sudden heart attack', which aren't complications associated with OPD.	• Moderate response rate on 'increased mortality' scoring significantly better than tertiary level. • Highest score for 3/10 items, with the best performance out of the 3 levels in this section.	• Only scored the lowest on 1 item, 'malnutrition' in this section, but both levels were within 6% of this result. • Recommendations based on this section: collaboration between nursing staff and SLTs regarding potential consequences of undiagnosed or mismanaged OPD.	• Overall the highest scores for 5/10 items. • The correct response rate for 'sudden heart attack' was low across all levels, but tertiary level performed significantly better than primary level in this item. • Tertiary level scored significantly higher on 'haematemesis' when compared to primary level.	• Lowest score for 4/10 items. • Significantly lower score on 'increased mortality' and 'general weakness'. • Recommendations based on this section: collaboration between nursing staff and SLTs regarding potential consequences of undiagnosed or mismanaged OPD.

	• Recommendations based on this section: collaboration between nursing staff and SLTs regarding potential consequences of undiagnosed or mismanaged OPD.				
Management practices of OPD					
Strengths identified	**Needs for continued professional development**	**Strengths identified**	**Needs for continued professional development**	**Strengths identified**	**Needs for continued professional development**
• Correct response rate of 51.57%. • Highest correct response rate for 2/7 items in this section. • Primary level performed significantly better than the tertiary level on the item 'the patient can always eat normal hospital food'.	• Inadequate knowledge on the item 'watery liquids are the safest to drink' with only 4.5% correctly disagreeing with this statement. • Recommendations based on this section: training on ideal/safe consistencies and methods of feeding after stroke.	• Significantly better knowledge in the management section compared to both primary and tertiary levels. • Correct response rate of 60.57%. • Highest score for 5/7 items. • Secondary level performed significantly better on the item 'thickened liquids should be avoided' indicating a better understanding of the use of thickening agents in OPD.	• Recommendations based on this section: training on ideal/safe consistencies and methods of feeding after stroke.	• Tertiary level performed well on the items: 'patients with a nasogastric tube need daily oral hygiene' and most were able to indicate that 'the best position while feeding the patient is when they are lying on his back' was not a correct statement. • This indicates basic knowledge on appropriate OPD management.	• Lowest score on 4/7 items in this section. • Lowest correct response rate out of all three levels with 48.43%. • Recommendations based on this section: training on ideal/safe consistencies and methods of feeding after stroke.

4.2 Clinical and theoretical implications

The study highlighted the limitations in nurses' knowledge and practices regarding stroke-related OPD, which in turn supports continued training and collaboration between SLTs and nurses in order to optimise patient outcomes. According to ASHA and the HPCSA, in line with the principles of collaboration, prevention, screening and training, the SLT should develop appropriate OPD screening tools for their working context. The SLT should also collaborate with nurses to educate the entire team on the implementation of these tools for stroke patients and SLTs should advise on appropriate management procedures (ASHA, 2016; HPCSA, 2009). It is essential that the responsibilities of all health professionals within the stroke management team are clear, and this includes established referral pathways to ensure the SLT is involved if required.

In South Africa, the SLT is considered to be an expert on OPD, for both assessment and management (SASLHA, 2011). However, due to human resource constraints, which are often found in LMICs, many public health institutions have few or no SLTs to conduct assessments and provide management recommendations for persons with stroke-related OPD (Ostrofsky & Seedat, 2016). Interprofessional collaboration between SLTs and nurses may pose a solution to the shortage of SLTs in the public health care sector as well as assist in addressing the needs of patients, which may enhance service delivery. Hospital stakeholders may invest in team members such as nurses, who are the first responders to people who have stroke-related OPD, by providing more in-service training opportunities and collaborative learning experiences. Improved learning opportunities and educational resources compiled in consultation with SLTs for other team members could provide a preliminary solution to the challenge of initial identification and early management of OPD in persons with stroke to avoid unfavourable patient outcomes. Further research is warranted.

The results of this study revealed that nurses across all three levels of healthcare have a moderate level of knowledge on stroke-related OPD. However, certain key areas, such as potential consequences of unidentified or mismanaged stroke-related OPD, lacked sufficient understanding, which may put patients at risk. In some cases, there

were misconceptions about the symptoms of stroke-related OPD. The inconsistencies and inaccuracies between institutions as well as questions within the survey indicate that information or training that nurses receive may not be adequate or appropriate and should be adapted to meet the needs of their working environment. SLT-implemented training should be fine-tuned to the knowledge needs of each institution, with user-friendly training materials and visual aids, and more regular contact time between nurses and SLTs, to ensure understanding and carry-over into the clinical setting (Robbertse, 2018). Further research is required to investigate the possibility of implementing training programmes for nurses in this regard.

Improving interdisciplinary collaboration between nurses and SLTs with an emphasis on effective integrated work relations can aid in the early identification and management of stroke-related OPD, potentially reducing the length of hospital stay. A shorter hospital stay results in more functional long-term outcomes for patients and assists in cost saving for both the patient and the hospital (Campbell et al., 2016; Rofes, Vilardell, & Casado, 2018). Improved interdisciplinary collaboration will allow for optimal use of limited health resources, promote patient safety, and improve patient outcomes (Dondorf et al., 2015). SLTs need to take on the responsibility of setting up protocols for OPD screening and management, considering existing protocols within their hospitals and clinics, in order to streamline the decision-making process and support nurses who are also busy and overburdened.

SLT students should be exposed to interdisciplinary collaboration and training of other health care professionals on an undergraduate level. This training should provide them with the knowledge and skills to compile and present short in-service workshops to staff members such as nurses, to improve interdisciplinary work relations and optimise patient care.

4.3 Critical evaluation of the study

A critical evaluation is necessary to evaluate the study in terms of its strengths and weaknesses.

Strengths of the study

The research was conducted in one municipality, which encompassed all three levels of healthcare, allowing for a review of the full scope of services available within the public sector of this specific geographical area. A direct comparison of results could be made between the levels of healthcare, identifying strengths and weaknesses in each level. Findings may be used to structure appropriate training for team members based on the needs of each level and the services they offer. The study obtained valuable information about a rural setting in a LMIC, which can be compared with other areas to determine any similarities or differences in factors such as location i.e. urban verses rural settings.

All participants who were approached agreed to partake in the research, and only five of 135 surveys could not be used for analysis. The high response and return rate showed that the survey was user-friendly and did not require too much of the participants' time.

Another strength of the study was the use of a published survey as the outcomes measure to collect data. This increased the validity and reliability of the research findings.

Weaknesses of the study

The setting for the research was a rural province and therefore the survey had to be completed by hand, which limited the number of participants to those who were available on the days that data were collected. Electronic surveys may have been valuable to reach a larger geographical area, however this method would not have been appropriate for the participants and the rural context in which the research was conducted. The survey was only available in English, and it would have been valuable to have the assessment tool available in other languages in order to meet the diverse language needs of the South African population.

4.4 Future research

It is recommended that further investigation be conducted regarding the availability of existing training programs and support in the field of stroke-related OPD for team members such as nurses. Research exploring potential areas for expansions within nurses' curricula and resources available to team members for continued professional development will be of value, in order to ultimately implement better stroke-related OPD identification and management. SLTs need to take responsibility for developing and implementing training and providing support to team members on stroke-related OPD assessment and management across all levels of healthcare. The onus should be on the SLT to initiate collaborative interdisciplinary teamwork with nurses for better, more integrated work relations, and learning experiences for both parties, to consequently improve patient outcomes. Training provided by SLTs should be targeted to address the specific knowledge and resource barriers within the hospital in order to be effective, appropriate and sustainable (Robbertse, 2018).

The current study may be replicated on a larger scale across several provinces or nationwide to obtain a representative sample of the diverse population in South Africa where further conclusions may be made regarding nurses' knowledge and practices regarding OPD management. Geographical areas vary greatly in terms of the workforce as well as the population they serve. Differences can include various languages, ages, training, levels of unemployment and education, rural verses urban populations and accessibility to health care, as well as many other factors. If the research can be conducted using focus groups, a larger group of participants may be accessed, however it is essential that the method of data collection is appropriate for the context in which it is collected. Based on the research findings, there appears to be a need to determine nurses' training and educational needs to tailor SLTs' proposed training programmes to team members' working contexts. This could allow for more structured and appropriate training to be developed, which can then be applied within a resource-constrained environment.

4.5 Conclusion

The study shows that health care professionals within stroke management teams require support from one another in terms of training and skills development in order to provide the best possible care for their patients and achieve the most favourable outcomes within their context. Improved communication, with more regular interaction and good interprofessional collaboration, where SLTs and nurses compliment one another's roles in stroke management, will lead to better outcomes for patients presenting with stroke-related OPD. Continued research is required in LMICs, as effective training in OPD can have a positive impact on stroke patients' outcomes.

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6. APPENDICES

APPENDIX A – Faculty of Humanities ethical approval

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Faculty of Humanities
Research Ethics Committee

15 February 2018

Dear Ms Knight

Project:	**Nurses' management of dysphagia in stroke patients in Buffalo City Metropolitan, Eastern Cape**
Researcher:	**K Knight**
Supervisor:	**Ms E Kruger and Dr J van der Linde**
Department:	**Sheech-Language Pathology and Audiology**
Reference:	**11051354 (GW20180105HS)**

Thank you for the application that was submitted for ethical consideration.

I am pleased to inform you that the above application was **conditionally approved** by the **Research Ethics Committee** on 1 February 2018, as written permission must be granted by the necessary governing body(s)

Please note that data collection may not commence prior to the above permission being submitted and subject to final approval by this committee. To facilitate the administrative process, please respond to Ms Tracey Andrew at tracey.andrew@up.ac.za or Room HB 7-27, at your earliest possible convenience.

Sincerely

Prof Maxi Schoeman
Deputy Dean: Postgraduate Studies and Ethics
Faculty of Humanities
UNIVERSITY OF PRETORIA
e-mail: tracey.andrew@up.ac.za

cc: Ms E Kruger (Supervisor)
Dr J van der Linde (HoD)

APPENDIX B – Faculty of Health Sciences ethical approval

The Research Ethics Committee, Faculty Health Sciences, University of Pretoria complies with ICH-GCP guidelines and has US Federal wide Assurance.
- FWA 00002567, Approved dd 22 May 2002 and Expires 03/20/2022.
- IRB 0000 2235 IORG0001762 Approved dd 22/04/2014 and Expires 03/14/2020.

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Faculty of Health Sciences Research Ethics Committee

12/04/2018

Approval Certificate
New Application

Ethics Reference No: GW20180105HS

Title: Nurses' management of dysphagia in stroke patients in Buffalo City Metropolitan, Eastern Cape.

Dear Kerry Knight

The **New Application** as supported by documents specified in your cover letter dated 2/04/2018 for your research received on the 5/04/2018, was approved by the Faculty of Health Sciences Research Ethics Committee on its quorate meeting of 11/04/2018.

Please note the following about your ethics approval:
- Ethics Approval is valid for 2 years
- Please remember to use your protocol number (**GW20180105HS**) on any documents or correspondence with the Research Ethics Committee regarding your research.
- Please note that the Research Ethics Committee may ask further questions, seek additional information, require further modification, or monitor the conduct of your research.

Ethics approval is subject to the following:
- The ethics approval is conditional on the receipt of **6 monthly written Progress Reports**, and
- The ethics approval is conditional on the research being conducted as stipulated by the details of all documents submitted to the Committee. In the event that a further need arises to change who the investigators are, the methods or any other aspect, such changes must be submitted as an Amendment for approval by the Committee.

We wish you the best with your research.

Yours sincerely

Dr R Sommers; MBChB; MMed (Int); MPharMed,PhD
Deputy Chairperson of the Faculty of Health Sciences Research Ethics Committee, University of Pretoria

The Faculty of Health Sciences Research Ethics Committee complies with the SA National Act 61 of 2003 as it pertains to health research and the United States Code of Federal Regulations Title 45 and 46. This committee abides by the ethical norms and principles for research, established by the Declaration of Helsinki, the South African Medical Research Council Guidelines as well as the Guidelines for Ethical Research: Principles Structures and Processes, Second Edition 2015 (Department of Health).

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APPENDIX C – Provincial permission

Province of the
EASTERN CAPE
HEALTH

Enquiries: Zonwabele Merile
Tel no: 083 378 1202
Email: Zonwabele.Merile@echealth.gov.za
Fax no: 043 642 1409

Date: 03 May 2018

RE: NURSES' MANAGEMENT OF DYSPHAGIA IN STROKE PATIENTS IN BUFFALO CITY METROPOLITAN, EASTERN CAPE. (EC_201804_013)

Dear Kerry Knight

The department would like to inform you that your application for the abovementioned research topic has been approved based on the following conditions:

1. During your study, you will follow the submitted amended protocol with ethical approval and can only deviate from it after having a written approval from the Department of Health in writing.

2. You are advised to ensure, observe and respect the rights and culture of your research participants and maintain confidentiality of their identities and shall remove or not collect any information which can be used to link the participants.

3. The Department of Health expects you to provide a progress on your study every 3 months (from date you received this letter) in writing.

4. At the end of your study, you will be expected to send a full written report with your findings and implementable recommendations to the Eastern Cape Health Research Committee secretariat. You may also be invited to the department to come and present your research findings with your implementable recommendations.

5. Your results on the Eastern Cape will not be presented anywhere unless you have shared them with the Department of Health as indicated above.

Your compliance in this regard will be highly appreciated.

SECRETARIAT: EASTERN CAPE HEALTH RESEARCH COMMITTEE

APPENDIX D – District permission

Province of the
EASTERN CAPE
HEALTH

BUFFALO CITY METRO HEALTH DISTRICT
OFFICE OF THE DISTRICT MANAGER
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Tel.: +27 (0)43 708 1797 • Fax: +27 (0)43 708 1836/ 086 245 5023 • Website: www.ecdoh.gov.za
Enquiries: Ms Z Mntuyedwa

INTERNAL MEMORANDUM

To:	Acting Sub-District Manager DVDH Facility Manager Empilweni Gompo CHC Facility Manager Nontyatyambo CHC Facility Manager
From:	District Manager
Subject:	Permission to conduct Research Study: Dr Kerry Knight
Date:	31 May 2018

Purpose
The purpose of this memorandum is to inform relevant Buffalo City Health District staff and patients of permission granted on research study to be conducted by Dr Kerry Knight towards a Masters in Speech-Language Pathology Degree with the University of Pretoria.

Background and Exposition of Facts
Dr Kerry Knight is currently studying towards a Masters in Speech-Language Pathology Degree with the University of Pretoria. The title of her research study is "**Nurses' Management of Dysphagia in Stroke Patients in Buffalo City Metropolitan, East Cape**".

She has requested for permission to do research in Buffalo City Metro Health District at DVDH, Empilweni Gompo & Nontyatyambo CHCs. Dr Knight has submitted all the required documents for a research study in the Eastern Cape Department of Health facilities and as such permission has been granted to her by the Research unit to conduct the study in terms of her research protocol and methodology.

PERMISSION TO CONDUCT RESEARCH STUDY: Dr K Knight

Approval by the District

1. Kindly note that this memorandum serves as an approval at district level for Dr K Knight to conduct her research study in terms of the approved research protocol, ethical clearance and permission letter from the research unit subject to producing all necessary supporting documentation on request to prospective participants in the research study and management of the district;

2. All posters advertising the research must first be tabled with Sub-District Manager to ensure compliance with departmental policies;

3. Patient details and addresses will only be provided to the researcher on those who have consented to participate in the research subject to the terms and condition of the letter of approval from the Research Unit of the Eastern Cape Department of Health.

APPROVED

ADV BA MZIMBA
ACTING DISTRICT MANAGER
BUFFALO CITY METROHEALTH DISTRICT

05/06/2018
DATE

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Faculty of Humanities
Department of Speech-Language Pathology and Audiology

To: EC DOH BCM district representative
Eastern Cape
~~Dr/Mr/Mrs/Ms~~ Adv. Beniswa Mzimba

From: The Investigator
Cecilia Makiwane Hospital
(SLT) Kerry Knight

Re: Permission to conduct research in Buffalo City Municipality health care facilities

I am a masters student from the University of Pretoria undertaking a research study entitled **"Nurses' management of dysphagia in stroke patients in Buffalo City Metropolitan, Eastern Cape"** as part of my master's degree.

I am requesting permission to conduct a study with nurses that will require the participation of nursing staff from your province to partake in a brief once-off survey. Nurses will be recruited from Frere Hospital, Cecilia Makiwane Hospital, Empilweni Gompo CHC, Nontyatyambo Clinic and Duncan Village Day Hospital in order to have a representative sample from all levels of health care within the Buffalo City Municipality. The research study aims to describe the current dysphagia assessment and management practices of nurses. This knowledge will help identify areas of dysphagia screening and management that may require further training amongst staff members.

I intend to publish the findings of the study in a scientific journal and at professional meetings such as symposia, congresses, or other meetings of such a nature. The personal identity of the participants and their institutions' identities will be kept confidential by assigning each nurse and institution a random code number. The survey will take approximately 10 minutes to complete, and nurses will be approached during a rest period, which will not interfere with their daily tasks. Participation is completely voluntary, and participants are able to withdraw from the study at any point during the research process.

Upon completion of the study, the researcher will provide the Eastern Cape Department of Health with feedback on the results. Data from this study may be used for future research purposes.

I undertake not to proceed with the study until I have received approval from the Faculty of Health Sciences Research Ethics Committee, University of Pretoria.

Yours sincerely

Kerry Knight – Investigator
082 928 5136
kerryknight30@gmail.com

PP

Mrs Esedra Krüger – Supervisor

Mrs Bhavani Pillay – Supervisor

Dr Jeannie van der Linde – Supervisor
Acting HOD of the Department of
Speech-Language Therapy and Audiology

Permission to conduct this research study at Buffalo City Municipality's hospitals and clinics and to access the nursing staff at this institution, is hereby approved.

EC DOH BCM district representative

Official Stamp

BCMHD Hospitals and Clinics

Dr Adv. Boniswa Mzimba

Signature of the EC DOH BCM district representative

Faculty of Humanities
Department of Speech Language Pathology and Audiology
Fakulteit Geesteswetenskappe
Departement Spraak-Taalpatologie en Oudiologie
Lefapha la Bomotho
Kgoro ya Phatholotši ya Polelo-Maleme le Go kwa

APPENDIX E – Institutional permission

Province of the
EASTERN CAPE
HEALTH

Office of the Chief Executive Officer : Cecilia Makiwane Hospital
Billie Road, Mdantsane, 5219. Private Bag X9047: East London, 5200
Tel: 043 708 2300. E-mail: yoliswa.ngcanga@echealth.gov.za: Website: www.ecdoh.gov.za

18 May 2018

Miss K. Knight
Clinical Support: Rehabilitation Division
Cecilia Makiwane Hospital
Mdantsane, 5219
Eastern Cape Province

Dear Miss Knight

RE: REQUEST FOR PERMISSION TO CONDUCT RESEARCH STUDY AT CECILIA MAKIWANE HOSPITAL – NURSES' MANAGEMENT OF DYSPHAGIA IN STROKE PATIENTS IN THE BUFFALO CITY METROPOLITAN- EASTERN CAPE (EC-201804-013)

Permission is hereby granted for you to conduct the abovementioned research study at Cecilia Makiwane Hospital subject to the following provisions:

1. Complying with the provisions of the permission letter from the Eastern Cape Health Research Committee dated 03 May 2018.
2. Complying with your Research Methodology Plan as approved by the relevant Ethics Committee.
3. Introducing yourself to the relevant management division of the hospital and providing necessary documentation showing permission and approval of your research study to be conducted at the hospital.
4. Ensuring minimal disturbance to the day to day operations of the relevant department of the hospital.
5. Observe the confidentiality of participants and their rights not to participate in the research study should they choose so.

Your compliance in this regard will be highly appreciated and wishing you all the best in your research study.

Dr M. V. Nkohla
Acting Chief Executive Officer

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Faculty of Humanities
Department of Speech Language Pathology and Audiology

To: Chief Executive Officer/Information Officer
Cecilia Makiwane Hospital
Dr Ntsohla

From: The Investigator
Cecilia Makiwane Hospital
(SLT) Kerry Knight

Re: Permission to conduct research at Cecilia Makiwane Hospital

I am a masters student from the University of Pretoria undertaking a research study entitled **"Nurses' management of dysphagia in stroke patients in Buffalo City Metropolitan, Eastern Cape"** as part of my master's degree.

I am requesting permission to conduct a study with nurses that will require the participation of nursing staff from your institution to partake in a brief once-off survey. Nurses will be recruited from Frere Hospital, Cecilia Makiwane Hospital, Empilweni Gompo CHC, Nontyatyambo Clinic and Duncan Village Day Hospital in order to have a representative sample from all levels of health care within the Buffalo City Municipality. The research study aims to describe the current dysphagia assessment and management practices of nurses. This knowledge will help identify areas of dysphagia screening and management that may require further training amongst staff members.

I intend to publish the findings of the study in a scientific journal and at professional meetings such as symposia, congresses, or other meetings of such a nature. The personal identity of the participants and their institutions' identities will be kept confidential by assigning each nurse and institution a random code number. The survey will take approximately 10 minutes to complete, and nurses will be approached during a rest period, which will not interfere with their daily tasks. Participation is completely voluntary, and participants are able to withdraw from the study at any point during the research process.

Upon completion of the study, the researcher will provide the Eastern Cape Department of Health with feedback on the results. Data from this study may be used for future research purposes.

I undertake not to proceed with the study until I have received approval from the Faculty of Health Sciences Research Ethics Committee, University of Pretoria.

Yours sincerely

Kerry Knight – Investigator
082 928 5136
kerryknight30@gmail.com

pp

Mrs Esedra Krüger – Supervisor

Mrs Bhavani Pillay – Supervisor

Dr Jeannie van der Linde – Supervisor
Acting HOD of the Department of
Speech-Language Therapy and Audiology

Permission to conduct this research study at Cecilia Makiwane Hospital/Clinic and to access the nursing staff at this institution, is hereby approved.

Chief Executive Officer

CECILIA MAKIWANE Hospital/~~Clinic~~

Dr M.V. NKOMLA

Signature of the CEO

CECILIA MAKIWANE HOSPITAL
PRIVATE BAG X13003
Official Stamp
18 MAY 2018
CAMBRIDGE 5207
CECILIA MAKIWANE HOSPITAL

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Faculty of Humanities
Department of Speech-Language Pathology and Audiology

To: Chief Executive Officer/Information Officer
Frere Hospital
Dr Rolene Wagner

From: The Investigator
Cecilia Makiwane Hospital
(SLT) Kerry Knight

Re: Permission to conduct research at Frere Hospital

I am a masters student from the University of Pretoria undertaking a research study entitled **"Nurses' management of dysphagia in stroke patients in Buffalo City Metropolitan, Eastern Cape"** as part of my master's degree.

I am requesting permission to conduct a study with nurses that will require the participation of nursing staff from your institution to partake in a brief once-off survey. Nurses will be recruited from Frere Hospital, Cecilia Makiwane Hospital, Empilweni Gompo CHC, Nontyatyambo Clinic and Duncan Village Day Hospital in order to have a representative sample from all levels of health care within the Buffalo City Municipality. The research study aims to describe the current dysphagia assessment and management practices of nurses. This knowledge will help identify areas of dysphagia screening and management that may require further training amongst staff members.

I intend to publish the findings of the study in a scientific journal and at professional meetings such as symposia, congresses, or other meetings of such a nature. The personal identity of the participants and their institutions' identities will be kept confidential by assigning each nurse and institution a random code number. The survey will take approximately 10 minutes to complete, and nurses will be approached during a rest period, which will not interfere with their daily tasks. Participation is completely voluntary, and participants are able to withdraw from the study at any point during the research process.

Upon completion of the study, the researcher will provide the Eastern Cape Department of Health with feedback on the results. Data from this study may be used for future research purposes.

I undertake not to proceed with the study until I have received approval from the Faculty of Health Sciences Research Ethics Committee, University of Pretoria.

Yours sincerely

Kerry Knight – Investigator
082 928 5136
kerryknight30@gmail.com

pp

Mrs Esedra Krüger – Supervisor

Mrs Bhavani Pillay – Supervisor

Dr Jeannie van der Linde – Supervisor
Acting HOD of the Department of
Speech-Language Therapy and Audiology

Permission to conduct this research study at FRERE (Hospital)/Clinic and to access the nursing staff at this institution, is hereby approved.

Chief Executive Officer

FRERE Hospital/~~Clinic~~

Dr WAGNER

Signature of the CEO

CHIEF EXECUTIVE OFFICER
FRERE HOSPITAL
Official Stamp
2018 -05- 25
SIGNATURE.....

Faculty of Humanities
Department of Speech-Language Pathology and Audiology
Fakulteit Geesteswetenskappe
Departement Spraak-Taalpatologie en Oudiologie
Lefapha la Bomotho
Kgoro ya Phatholotši ya Polelo-Maleme le Go kwa

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Faculty of Humanities
Department of Speech-Language Pathology and Audiology

To: Facility Manager
~~Chief Executive Officer/Information Officer~~
Duncan Village Day Hospital
~~Dr~~ Mrs Ntuku.

From: The Investigator
Cecilia Makiwane Hospital
(SLT) Kerry Knight

Re: Permission to conduct research at Duncan Village Day Hospital

I am a masters student from the University of Pretoria undertaking a research study entitled **"Nurses' management of dysphagia in stroke patients in Buffalo City Metropolitan, Eastern Cape"** as part of my master's degree.

I am requesting permission to conduct a study with nurses that will require the participation of nursing staff from your institution to partake in a brief once-off survey. Nurses will be recruited from Frere Hospital, Cecilia Makiwane Hospital, Empilweni Gompo CHC, Nontyatyambo Clinic and Duncan Village Day Hospital in order to have a representative sample from all levels of health care within the Buffalo City Municipality. The research study aims to describe the current dysphagia assessment and management practices of nurses. This knowledge will help identify areas of dysphagia screening and management that may require further training amongst staff members.

I intend to publish the findings of the study in a scientific journal and at professional meetings such as symposia, congresses, or other meetings of such a nature. The personal identity of the participants and their institutions' identities will be kept confidential by assigning each nurse and institution a random code number. The survey will take approximately 10 minutes to complete, and nurses will be approached during a rest period, which will not interfere with their daily tasks. Participation is completely voluntary, and participants are able to withdraw from the study at any point during the research process.

Upon completion of the study, the researcher will provide the Eastern Cape Department of Health with feedback on the results. Data from this study may be used for future research purposes.

I undertake not to proceed with the study until I have received approval from the Faculty of Health Sciences Research Ethics Committee, University of Pretoria.

Yours sincerely

Kerry Knight – Investigator
082 928 5136
kerryknight30@gmail.com

pp

Mrs Esedra Krüger – Supervisor

Mrs Bhavani Pillay – Supervisor

Dr Jeannie van der Linde – Supervisor
Acting HOD of the Department of
Speech-Language Therapy and Audiology

Permission to conduct this research study at Duncan Village Hospital/Clinic and to access the nursing staff at this institution, is hereby approved.

Chief Executive Officer

Duncan Village Hospital/Clinic

Dr Mrs N.S. Ntuku

Official Stamp

Signature of the CEO Facility Manager

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Faculty of Humanities
Department of Speech-Language Pathology and Audiology

To: Facility Manager
~~Chief Executive Officer/Information Officer~~
Nontyatyambo Clinic
Dr Mr Maki

From: The Investigator
Cecilia Makiwane Hospital
(SLT) Kerry Knight

Re: Permission to conduct research at Nontyatyambo Clinic

I am a masters student from the University of Pretoria undertaking a research study entitled **"Nurses' management of dysphagia in stroke patients in Buffalo City Metropolitan, Eastern Cape"** as part of my master's degree.

I am requesting permission to conduct a study with nurses that will require the participation of nursing staff from your institution to partake in a brief once-off survey. Nurses will be recruited from Frere Hospital, Cecilia Makiwane Hospital, Empilweni Gompo CHC, Nontyatyambo Clinic and Duncan Village Day Hospital in order to have a representative sample from all levels of health care within the Buffalo City Municipality. The research study aims to describe the current dysphagia assessment and management practices of nurses. This knowledge will help identify areas of dysphagia screening and management that may require further training amongst staff members.

I intend to publish the findings of the study in a scientific journal and at professional meetings such as symposia, congresses, or other meetings of such a nature. The personal identity of the participants and their institutions' identities will be kept confidential by assigning each nurse and institution a random code number. The survey will take approximately 10 minutes to complete, and nurses will be approached during a rest period, which will not interfere with their daily tasks. Participation is completely voluntary, and participants are able to withdraw from the study at any point during the research process.

Upon completion of the study, the researcher will provide the Eastern Cape Department of Health with feedback on the results. Data from this study may be used for future research purposes.

I undertake not to proceed with the study until I have received approval from the Faculty of Health Sciences Research Ethics Committee, University of Pretoria.

Yours sincerely

Kerry Knight – Investigator
082 928 5136
kerryknight30@gmail.com

pp

Mrs Esedra Krüger – Supervisor

Mrs Bhavani Pillay – Supervisor

Dr Jeannie van der Linde – Supervisor
Acting HOD of the Department of
Speech-Language Therapy and Audiology

Permission to conduct this research study at Nontyatyambo ~~Hospital~~/Clinic and to access the nursing staff at this institution, is hereby approved.

~~Chief Executive Officer~~ Facility Manager

NONTYATYAMBO Hospital/Clinic
DR MR MAKI

Signature of the CEO

Official Stamp

NONTYATYAMBO COMMUNITY
HEALTH CENTRE
P.O. Box 363, Mdantsane
Tel: 043 760 0420
Fax: 043 760 0105
APPROVED CERTIFIED
CEO: ~~MR VD MAKI~~
Sign:
Date:

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Faculty of Humanities
Department of Speech-Language Pathology and Audiology

To: Operational Manager
~~Chief Executive Officer/Information Officer~~
Empilweni Gompo Health Centre
~~Dr~~ Mrs Booysen

From: The Investigator
Cecilia Makiwane Hospital
(SLT) Kerry Knight

Re: Permission to conduct research at Empilweni Gompo Health Centre

I am a masters student from the University of Pretoria undertaking a research study entitled **"Nurses' management of dysphagia in stroke patients in Buffalo City Metropolitan, Eastern Cape"** as part of my master's degree.

I am requesting permission to conduct a study with nurses that will require the participation of nursing staff from your institution to partake in a brief once-off survey. Nurses will be recruited from Frere Hospital, Cecilia Makiwane Hospital, Empilweni Gompo CHC, Nontyatyambo Clinic and Duncan Village Day Hospital in order to have a representative sample from all levels of health care within the Buffalo City Municipality. The research study aims to describe the current dysphagia assessment and management practices of nurses. This knowledge will help identify areas of dysphagia screening and management that may require further training amongst staff members.

I intend to publish the findings of the study in a scientific journal and at professional meetings such as symposia, congresses, or other meetings of such a nature. The personal identity of the participants and their institutions' identities will be kept confidential by assigning each nurse and institution a random code number. The survey will take approximately 10 minutes to complete, and nurses will be approached during a rest period, which will not interfere with their daily tasks. Participation is completely voluntary, and participants are able to withdraw from the study at any point during the research process.

Upon completion of the study, the researcher will provide the Eastern Cape Department of Health with feedback on the results. Data from this study may be used for future research purposes.

I undertake not to proceed with the study until I have received approval from the Faculty of Health Sciences Research Ethics Committee, University of Pretoria.

Yours sincerely

Kerry Knight – Investigator
082 928 5136
kerryknight30@gmail.com

pp

Mrs Esedra Krüger – Supervisor

Mrs Bhavani Pillay – Supervisor

Dr Jeannie van der Linde – Supervisor
Acting HOD of the Department of
Speech-Language Therapy and Audiology

Permission to conduct this research study at Empilweni Gompo ~~Hospital~~/Clinic and to access the nursing staff at this institution, is hereby approved.

Chief Executive Officer

Official Stamp

Empilweni Gompo Hospital/Clinic

~~Dr~~ Mrs. C. M. Booysen

Signature of the ~~CEO~~ Operational Manager.

APPENDIX F – Participant information leaflet and informed consent document

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Faculty of Humanities
Department of Speech-Language Pathology and Audiology

PARTICIPANT'S INFORMATION & INFORMED CONSENT DOCUMENT

Researcher's name: Kerry Knight

Contact number: 082 928 5136

Email address: kerryknight30@gmail.com

Student number: 11051354

Faculty of Humanities

Department of Speech-Language Pathology and Audiology

University of Pretoria

Dear Participant

Title of study: Nurses' management of dysphagia in stroke patients in Buffalo City Metropolitan, Eastern Cape

INTRODUCTION

I am a Postgraduate student in Speech-Language Pathology in the Department of Speech-Language Pathology and Audiology, University of Pretoria. You are invited to volunteer to participate in my research project on nurses' identification and management of dysphagia in stroke patients in the Buffalo City Metropolitan (BCM).

This letter gives information to help you to decide if you want to take part in this study. Before you agree you should fully understand what is involved. If you do not understand the information or have any other questions, do not hesitate to ask me. You should not agree to take part unless you are completely comfortable.

PURPOSE OF THIS STUDY

The purpose of the study is to determine how nurses in various health care facilities are identifying and managing dysphagia in patients who have suffered from a stroke.

PROCEDURES

I would like you to complete a survey. This may take about 10-15 minutes. I with an understanding of swallowing difficulties will give you the survey to complete while you are at work and will again collect the survey from you before you leave the ward / the clinic. The survey will be kept in a safe place to ensure confidentiality. Please do not write your name on the questionnaire. This will ensure the confidentiality of your name and that of your institution. I will be available to help you with the questionnaire and provide clarity where necessary and answer questions you may have.

HAS THE STUDY RECEIVED ETHICAL APPROVAL?

Your institution, the Department of Health, and the Faculty of Humanities at the University of Pretoria, granted written approval for this study.

PARTICIPATION IN THIS RESEARCH

Your participation in this study is voluntary, and no remuneration will be provided. You can refuse to participate or stop at any time without giving any reason. You are also allowed to withdraw consent at any point during the research process.

CONFIDENTIALITY

As you do not write your name on the survey, you give us the information confidentially and a number will be assigned to you for data capture purposes. If you wish to withdraw your consent, you may use the number assigned to you to identify your survey from the data collected. You will not be identified as a participant in any publication that comes from this study.

BENEFITS

By partaking in this research, you will help to gather information about the management of dysphagia that will guide further training within the interdisciplinary team to improve patient care.

CONSENT TO PARTICIPATE IN THIS STUDY

Note: The implication of completing the questionnaire is that informed consent has been obtained from you. Thus, any information derived from your form (which will be completely confidential) may be used for e.g. publication, by the researchers and future researchers in the field. Data will be archived for 15 years at the Department of Speech-Language Pathology and Audiology at the University of Pretoria.

Please indicate whether your data may be used for future research in this field of study.
(please circle) YES / NO

I sincerely appreciate your help and participation.

Yours sincerely

Kerry Knight – Investigator
082 928 5136
kerryknight30@gmail.com

pp

Mrs Esedra Krüger – Supervisor

Dr Jeannie van der Linde – Supervisor
Acting HOD of the Department of Speech-Language Therapy and Audiology

APPENDIX G – Survey

Survey about eating and swallowing difficulties

Rhoda, A., & Pickel-Voight, A. (2015). Knowledge of nurses regarding dysphagia in patients post stroke in Namibia. *Curationis*, *38*(2), 1564. http://doi.org/10.4102/curationis.v38i2.1564

Dear Participant

Thank you for taking part in this research study. As a participant, you are asked to complete a survey. Please take note that this survey is used to gather information on your current identification and management practices in patients with swallowing difficulties. This is not a test of your knowledge and any answers you give are confidential, therefore you can answer the questions honestly. In order for your information to remain confidential, please do not write your name on this survey. Your participation is voluntary, and you may withdraw your participation at any time without any questions. If you have any questions about the survey or terminology used, please feel free to ask for clarification or assistance. Please fill out this survey as an individual. If you are unsure of an answer, please tick the “unable to decide” option rather than guessing the appropriate response.

The following sections are surveyed:

Section A: Socio-demographic information and personal experience in stroke patients with OPD.

Section B-1: Identification of the **signs** and **symptoms** of eating and swallowing difficulties.

Section B-2: Knowledge about **complication** of eating and swallowing difficulties.

Section B-3: **Management** practices of eating and swallowing difficulties.

Section A: Socio-demographic characteristics and experience

Please, tick in the appropriate box.

			Office use only	
A1	**What is your age?**			
	Less than 25 years old	1	**V1**	
	25 – 30 years old	2		
	31 – 35 years old	3		
	36 – 40 years old	4		
	41 – 45 years old	5		
	46 – 50 years old	6		
	51 – 55 years old	7		
	56 – 60 years old	8		
	More than 60 years old	9		
A2	**What is your position as a nurse?**			
	Enrolled nursing assistant	1	**V2**	
	Staff nurse	2		
	Professional nurse	3		
A3	**What is your highest qualification as a nurse?**			
	Certificate	1	**V3**	
	Diploma	2		
	BSc	3		
	MSc	4		
	PhD	5		
	Other	6		
A4	**The total years of experience in nursing**			
	0 – 3 years	1	**V4**	
	4 – 6 years	2		
	7 – 9 years	3		
	10 – more years	4		
A5	**What is your current area (ward) of practice? You may select more than one option.**			
	Internal medicine ward		**V5.1**	
	Casualty		**V5.2**	
	Out-patient clinic		**V5.3**	
	Day hospital		**V5.4**	

Your experience with stroke:

A6	**Have you ever cared for a patient who had a stroke?**			
	Yes	1	**V6**	
	No	2		
A7	**Have you received training in nursing patients with stroke?**			
	Yes	1	**V7**	
	No	2		
A8	**Have you ever cared for a patient with a stroke with eating and/or swallowing difficulties?**			
	Yes	1	**V8**	
	No	2		
	Not sure	3		

Please turn over

A9	**Have you received formal training on eating/swallowing difficulties in patients with stroke?**			
	Yes	1	**V9**	
	No	2		
A10	**If yes, where was formal training on eating and/or swallowing difficulties in patients with stroke received? You may select more than one option.**			
	Training during your studies		**V10.1**	
	In-service training at your institution		**V10.2**	
	Course		**V10.3**	
A11	**Are you satisfied with your knowledge about eating and swallowing difficulties?**			
	Yes	1	**V11**	
	No	2		
A12	**Would you like to receive further formal training and information about eating and swallowing disorder in patients with stroke?**			
	Yes	1	**V12**	
	No	2		

Section B-1: SIGNS and **SYMPTOMS** of eating and swallowing difficulties

Please read carefully before you select an answer.
Choose only one answer, mark with an "x".
Please do not leave any blank.

	Do you agree/disagree that the following statements are **signs or symptoms** of eating and swallowing difficulties?	**Strongly disagree**	**Disagree**	**Unable to decide**	**Agree**	**Strongly agree**	***Office use only***	
B1-1	Coughing while eating	1	2	3	4	5	**V13**	
B1-2	Skin irritations	1	2	3	4	5	**V14**	
B1-3	Feeling of food getting stuck in the throat	1	2	3	4	5	**V15**	
B1-4	Choking on saliva during non-mealtimes	1	2	3	4	5	**V16**	
B1-5	Poor movement of the tongue	1	2	3	4	5	**V17**	
B1-6	Food remains in the mouth	1	2	3	4	5	**V18**	
B1-7	Poor chewing	1	2	3	4	5	**V19**	
B1-8	Patients **always** cough if they aspirate	1	2	3	4	5	**V20**	
B1-9	Difficulty closing lips	1	2	3	4	5	**V21**	
B1-10	Weight loss	1	2	3	4	5	**V22**	
B1-11	Frequent throat clearing after swallowing	1	2	3	4	5	**V23**	
B1-12	Hoarse voice	1	2	3	4	5	**V24**	
B1-13	Chest pain	1	2	3	4	5	**V25**	

Please turn over

Section B-2: COMPLICATIONS of eating and swallowing difficulties.

Please read carefully before you select an answer.
Choose only one answer, mark with an "x".
Please do not leave any blank.

	Do you agree/disagree that the following statements are **complications** of eating and swallowing difficulties?	Strongly disagree	Disagree	Unable to decide	Agree	Strongly agree	*Office use only*	
B2-1	Increased mortality	1	2	3	4	5	**V26**	
B2-2	Pneumonia	1	2	3	4	5	**V27**	
B2-3	Anaphylactic Shock	1	2	3	4	5	**V28**	
B2-4	General weakness	1	2	3	4	5	**V29**	
B2-5	Problems with digestion	1	2	3	4	5	**V30**	
B2-6	Aspiration	1	2	3	4	5	**V31**	
B2-7	Dehydration	1	2	3	4	5	**V32**	
B2-8	Sudden heart attack	1	2	3	4	5	**V33**	
B2-9	Malnutrition	1	2	3	4	5	**V34**	
B2-10	Haematemesis (vomiting blood)	1	2	3	4	5	**V35**	

Section B-3: MANAGEMENT of eating and swallowing difficulties.

Please read carefully before you select an answer.
Choose only one answer, mark with an "x".
Please do not leave any blank.

	Do you agree/disagree with the following statements about **management** of eating and swallowing difficulties?	Strongly disagree	Disagree	Unable to decide	Agree	Strongly agree	*Office use only*	
B3-1	Patients with a nasogastric tube need daily oral hygiene (mouth washing and brushing of the teeth)	1	2	3	4	5	**V36**	
B3-2	Thickened liquid should be avoided	1	2	3	4	5	**V37**	
B3-3	Watery liquids are the safest to drink	1	2	3	4	5	**V38**	
B3-4	**All** patients with difficulty swallowing need a feeding tube	1	2	3	4	5	**V39**	
B3-5	The best position while feeding the patient is when the patient lies flat on his back.	1	2	3	4	5	**V40**	
B3-6	The patient can always eat normal hospital food	1	2	3	4	5	**V41**	
B3-7	A feeding tube is only indicated in a patient with impaired consciousness	1	2	3	4	5	**V42**	

Thank you, your participation is much appreciated.

APPENDIX H – Proof of submission to Topics in Stroke Rehabilitation

Submissions Being Processed for Author Esedra Krüger

Page: 1 of 1 (1 total submissions) Display 10 results per page.

Action	Manuscript Number	Title	Initial Date Submitted	Status Date	Current Status
Action Links	TSR1377	Nurses' management of stroke-related oropharyngeal dysphagia in a rural province of South Africa	09 Sep 2019	09 Sep 2019	Submitted to Journal

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