

**KNOWLEDGE OF NURSES REGARDING DYSPHAGIA IN PATIENTS
WITH STROKE, IN NAMIBIA**

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ABSTRACT

Dysphagia is commonly known as a swallowing disorder associated with stroke patients. Between 37% - 78% of stroke patients suffer from it initially. Complications of dysphagia include aspiration leading to chest infection and pneumonia, malnutrition, dehydration, and an increased risk of death. Its early diagnosis and management is an important prerequisite for recovery from stroke during the rehabilitation phase. As healthcare professionals, nurses play an important role in the diagnosis and management of dysphagia in stroke patients. Studies have shown that nurses display a lack of knowledge about dysphagia in stroke patients. The aim of the study was to determine the knowledge of nurses regarding dysphagia in patients with stroke, at an Intermediate Hospital, in Namibia. The objectives of the study were to determine the knowledge of nurses regarding dysphagia, the association between the knowledge and socio demographic factors and to design an intervention program based on the knowledge of the nurses. The study was carried out in a selected hospital in Namibia. All nurses, who were employed at the Intermediate Hospital at the time of the study, were invited to participate. Of the 500 employed nurses, 188 accepted the invitation to participate in the study. The study used a quantitative method consisting of a survey to determine the knowledge of the nurses. Data was collected using a self-administered questionnaire with closed-ended questions which was developed by the researcher. The quantitative data were captured and analysed using SPSS (22.0 version). Descriptive statistics was used to summarize the study findings by using means, standard deviations, frequencies and percentages. To determine the association between the knowledge of dysphagia and the socio-demographic factors, therefore inferential statistics were used to in three levels of analysis. The findings of the study shows that nurses have a moderate knowledge regarding to the signs and symptoms and complications of dysphagia. Poor knowledge was identified in management of dysphagia. Further, the results also indicated that further training and experience in caring for stroke patients was more relevant to

knowledge than the position and qualification of a nurse. Training and experience in the care of dysphagia patients is a stronger predictor of knowledge than the initial qualification or years of experience of a nurse. An intervention program was designed based on the information obtained from the findings of the questionnaire and supporting literature. Permission to conduct this study was obtained from the Senate Research Grants and Study Leave Committee at the University of the Western Cape. Written permission was obtained from the Ministry of Health and Social Services, Office of the Permanent Secretary, as well from the Acting Medical Superintendent of the Intermediate Hospital Oshakati. The aim of the study, confidentiality and the participants' freedom to withdraw from the study was explained. In order to maintain anonymity, nurses were asked to place informed consent forms and questionnaires in separate boxes. The outcomes of the study could be used to offer appropriate training programs to increase nurses' knowledge of dysphagia in stroke patients.



DECLARATION

I hereby declare that “**Knowledge of nurses regarding dysphagia in patients with stroke, in Namibia**” is my own work, that it has not been submitted for any degree for examination in any other university and that all the sources I have used or quoted have been indicated and acknowledged by means of complete references.

Andrea Pickel-Voigt

Signature



November 2014

Witness:

Prof. Anthea Rhoda

DEDICATION

For my children Franziska, Justus and Lothar. You are right: everything is possible if you want it.

You are the most wonderful children.



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ABBREVIATIONS

AIDS:	Acquired Immune Deficiency Syndrome
EN:	Enrolled Nurse
FEES:	Fibre Optic Endoscopy Evaluation of Swallowing
HCA:	Health Care Assistant
HIV:	Human Immune Virus
ICC:	Intra Class Correlation
ICU:	Intensive care unit
MoHSS	Ministry of Health and Social Services
NGT:	Nasogastric Tube
NHS:	National Health Services
RN:	Registered Nurse
SADC	Southern Africa Development Community
SLT:	Speech and Language Therapist
SPSS:	Statistical Package of Social Services
SSA:	Sub-Saharan- Africa
TB:	Tuberculosis
VFS:	Videofluoroscopy
UK:	United Kingdom
USA:	United States of America
WHO:	World Health Organisation

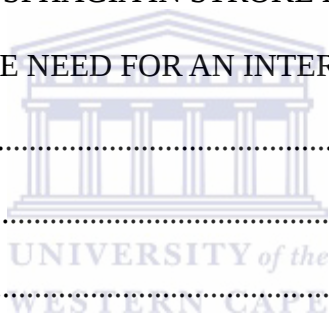


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CHAPTER ONE

INTRODUCTION

1.0 INTRODUCTION

This chapter presents the background of the study, the motivation and statement of the problem. Furthermore, it presents the research question, aim and objectives, as well as providing the definition of key terms used in this study. It ends with an outline of the chapters of the study.

1.1 BACKGROUND

Stroke is the second most common cause of death in the world after heart diseases (World Health Organization [WHO], 2013a). Every year 15 million people are diagnosed with a stroke worldwide. Of these, 5.7 million die, and 87% of these deaths are in low-income and middle-income countries. Without intervention, the number of global deaths is expected to go up to 6,5 million in 2015 and 7.8 million per annum by 2030 (Strong, Mathers, & Bonita, 2007).

A stroke is a loss of cerebral function and is caused by interruption of blood supply to the brain, either through blockage, by a clot (ischaemic stroke) or by rupture of a blood vessel (haemorrhagic stroke). This interruption of oxygen and nutrients supply harms the brain (WHO, 2012; Stroke Association United Kingdom, 2011).

Abilities which were previously controlled from the affected area of brain are lost. Stroke is therefore one of the main causes of long-term physical and mental disabilities in adults. This has a tremendous emotional and socio-economic impact on patients, their families and health services, worldwide (WHO, 2013b; Zorowitz, Gross, & Polinski, 2002).

Generally, 6 months after sustaining a stroke the following activity limitations were still found in

stroke survivors: 30% of patients were unable to walk without assistance, 26% were dependent on others in activities of daily living. Furthermore, the following impairments were found: 50% suffer from hemiparesis, 46% suffer from cognitive deficit, 35% showed depressive symptoms, and 19% developed aphasia (Kelly-Hayes et al., 2003). The impairments and limitations in the ability to perform the normal functions and activities of daily living after a stroke lead to significant changes and far reaching consequences in the life of the survivors. This is often seen by the patient as a personal disaster and also by those in the patient's personal environment (Thompson & Ryan, 2009).

One of the most common impairments after the onset of stroke is neurogenic oro-pharyngeal dysphagia. Dysphagia is the inability to swallow or difficulty to hold food and fluid in the mouth (Hughes, 2011; Nazarko, 2010), and occurs in approximately 50% of stroke patients in the acute phase (Ickenstein et al., 2012)

The normal swallowing process consists of three phases. The oral phase, pharyngeal phase and finally the oesophageal phase (Waugh & Grant, 2006). During a stroke each of these phases may be affected as a result of neurological disease and muscular changes (Sandhaus, Zalon, Valenti, & Harrell, 2009).

Dysphagia has been associated with a high incidence of respiratory complications, increased risk of aspiration pneumonia, as well as malnutrition, dehydration, persistent disabilities and mortality (Langdon & Baker, 2010; Rofes et al., 2010; Morris, 2009; Ramsey, Smithard, & Kalra, 2005).

Dysphagia also incurs higher financial costs, such as prolonged hospital stay, increased nursing time and more physician consultations (Odderson, Keaton, & McKenna, 1995).

Early diagnosis and effective management of dysphagia minimises aspiration pneumonia, and mortality (Hinchey et al., 2005), and improves oral movements as well nutritional status, thus leading to better post stroke outcomes (Rosenvinge & Starke, 2005; Jacobsen, Axelsson, Osterlind, & Norberg, 2000). Effective management will reduce medical and economic costs (Cichero,

Heaton, & Bassett, 2009).

According to Head, Weeks, Stroud and Coll (2007) and the National Institute for Health and Clinical Excellence United Kingdom [NICE] (2008), dysphagia screening should take place in the first 24 hours after admission of stroke patients to hospital to ensure that nutrition and hydration is well managed. The diagnosis of dysphagia is usually made by a speech and language therapist (SLT) (Martino, Pron, & Diamant, 2000).

To screen for dysphagia, Hinchey et al. (2005) recommend a simple bedside testing protocol for all stroke patients before they are given fluid or food. This test could be done by trained personnel such as nurse, if the speech and language therapist is not available.

The literature clearly indicates that diagnosis and management of dysphagia in stroke patients is often inadequate due to the low level of knowledge of nurses concerning signs and symptoms and management of dysphagia. This knowledge could be significantly improved by further training in all aspects of dysphagia (Davies, 2002; Magnus, 2001).

Data about the incidence and prevalence of dysphagia in stroke patients is limited in Sub-Saharan Africa (SSA) (Seedat, 2013). It is also reported by Blackwell and Littlejohns (2010), that the care of patients after stroke in SSA may not be adequate due to limited health-care budgets, insufficient resources, and lack of qualified and knowledgeable healthcare professional.

For that reason, on the African continent, training for the identification and management of stroke, and its complications needs to be developed and implemented on a progressively larger scale. Training of healthcare workers should include knowledge of how to administer a simple screening test, such as the bedside swallow test, as well as the correct positioning of the patient during mealtime and training of home care caregivers (Kolapo & Vento, 2011).

Namibia, a middle income country in SSA, faces similar challenges relating to the outcomes of stroke to other Sub-Sahara countries. Stroke mortality in Namibia accounts for 7,8% of total mortality and therefore ranks third in the top 10 causes of deaths in Namibia (Worldbank, 2013;

WHO, 2011). There has been no systematic research relating to dysphagia or knowledge of dysphagia in Namibia to date.

1.2 MOTIVATION FOR THE STUDY

As a physiotherapist with a special interest in stroke patients, the researcher has worked in the Intermediate Hospital Oshakati, in the north of Namibia. The researcher worked in medical wards where stroke patients were treated. There, the researcher encountered numerous barriers in connection with the rehabilitation of stroke patients. One of the barriers was the presence of dysphagia, which frequently remained undiagnosed and therefore untreated.

It is normally the speech and language therapist's duty to diagnose and manage dysphagia. Unfortunately there is no SLT employed at the said hospital. This deficit is part of a limited-resource setting which is a common occurrence in many rural Sub-Saharan hospitals.

The researcher emphasises the fact that it is very important for health care professionals, and in particular, nurses, to know about the complications of dysphagia in stroke patients. It is important that nurses are able to recognise the signs and symptoms of dysphagia and facilitate proper management of the condition. This could improve the outcome of stroke patients in Namibia.

The researcher was motivated to perform this study by the situation described above.

The researcher investigated the level of knowledge of dysphagia among nurses and will share the results with the relevant speech and language therapists in Windhoek, as well as the Nursing Health Profession Board and Namibia Nursing Association who are in a position to provide further training for the nurses.

As a minimum the training should enable nurses to assess patient's swallowing ability, and to ensure that patients receive nutrition and hydration in suitable form according to their swallowing ability (Royal College of Physicians [RCP], 2007).

1.3 PROBLEM STATEMENT

The continued focus by governments and local healthcare planners on poverty and other health priorities such as infectious diseases (Malaria and AIDS) has resulted in an under-appreciation of the current and future impact of non-communicable diseases, such as stroke, in Africa (Lemogoum, Dagaute, & Bovet, 2005). This could result in a lack of policy and action in training healthcare workers in essential routine tasks, such as performing a simple bedside swallow test, avoiding aspiration, ensuring adequate hydration and nutrition in stroke patients (Kolapo & Vento, 2011).

The high incidence (78%) of dysphagia in patients who suffered from stroke (Martino, et al., 2005) is alarming. Delayed diagnosis of dysphagia and poor management can lead to complications such as malnutrition, dehydration, poorer outcome of patients and aspiration pneumonia, which in turn can increase the rate of mortality of this patient group.

Up to this point, there is no SLT employed at the Oshakati State Hospital. The shortage of qualified human resource is still critical in Namibia, especially at some levels of health sectors. This leads to inadequate care of patient, and thus to poor health outcomes (Ministry of Health and Social Services [MoHSS], 2014).

Therefore, nurses on duty should screen a patient's swallowing ability to ensure that patients receive nutrition and hydration in suitable form according to their swallowing ability (RCP, 2007).

There is currently no information about the knowledge of nurses regarding diagnosis and management of dysphagia in stroke patients in Namibia. A lack of knowledge by these nurses could negatively impact the stroke patients admitted to specific hospitals in this country.

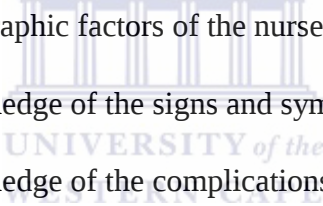
1.4 RESEARCH QUESTION

What is the level of knowledge of nurses regarding diagnosis, complications and management of dysphagia in patients with stroke in the Intermediate Hospital Oshakati, Namibia?

1.5 AIM

The aim of the study is to determine the level of knowledge of nurses regarding dysphagia in patients with stroke in the Intermediate Oshakati Hospital, Namibia.

1.6 OBJECTIVES OF THE STUDY

- 
- 1.5.1. To determine the socio-demographic factors of the nurses.
 - 1.5.2. To determine the nurses' knowledge of the signs and symptoms of dysphagia.
 - 1.5.3. To determine the nurses' knowledge of the complications of dysphagia.
 - 1.5.4. To determine the nurses' knowledge about the management of dysphagia.
 - 1.5.5. To determine association between the knowledge of dysphagia and the socio-demographic factors, such as level of education and years of experience.
 - 1.5.6. To design a knowledge-based intervention program based on the level of knowledge determined by the results of the study and literature.

1.7 DEFINITION OF KEY TERMS USED

Aspiration Pneumonia: in this study is used to refer to the entry of oral secretions and foreign material into the airway below the level of the true vocal folds as a result of swallowing problems, which can lead to pneumonia (Marik & Kaplan, 2003).

Dysphagia: is defined as a difficulty in swallowing or in the process of transporting food and/or liquid from the mouth into the stomach (Corrigan, Escuro, Celestin, & Kirby, 2011).

Enrolled Nurse: means a person who holds at least a Grade 10 certificate and duration of course are two years (Government Gazette of the Republic of Namibia, No 2392 of 2000).

Knowledge: is defined as the capacity to acquire, retain and use information through experience, comprehension, discernment and skill (Mari, 2010).

Malnutrition: occurs when the human body does not get sufficient vitamins, minerals, and other nutrients to maintain healthy tissues and organ function (Medical Dictionary, n.d.).

Registered Nurse: means a person who holds at least a Grade 12 certificate and duration of course are four years. (Government Gazette of the Republic of Namibia, No 2392 of 2000).

Stroke: according to WHO (2012, page 1) stroke “is caused by the interruption of the blood supply to the brain, usually because a blood vessel bursts or is blocked by a clot. This cuts off the supply of oxygen and nutrients, causing damage to the brain tissue“.

1.8 OUTLINE OF THE STUDY

Chapter one: This includes the background of the study, the motivation to conduct the study, statement of the problems as well the aims and objectives of the study. It ends with the definition of the terms which were used in this study.

Chapter two: This chapter presents the literature reviewed for a better understanding of the need for this study. It begins with the term dysphagia in general and continues with dysphagia as a serious problem in stroke patients. It explains the complication regarding dysphagia in stroke patients. It also highlights the urgent need for nurses to be knowledgeable about dysphagia in stroke patients.

Chapter three: In this chapter the methodology used in the current study will be described. It introduces the reader to the research setting, and explains research design, population and sample as well as data collection methods. Furthermore, it describes the procedures used to ensure validity and reliability, and data analysis. Finally the ethical consideration are explained.

Chapter four: This chapter presents the results of the study in respect of the specific objectives. The quantitative results are presented as descriptive and inferential statistics. The descriptive part of the presentation illustrates the participants' socio demographic information, their knowledge regarding the signs and symptoms, complications and management of dysphagia. The inferential statistics demonstrate the association between the participants' socio-demographic characteristics and their knowledge about dysphagia.

Chapter five: This chapter discusses the findings of the present study and provides possible explanations for the findings. Furthermore, it compares and discusses the findings of the present

study with similar studies.

Chapter six: This chapter will summarize the findings of the study. It also provides a conclusion, recommendations and limitations relating to the findings of the present study. Furthermore, based on the results of the present study, an intervention program will be designed and introduced.

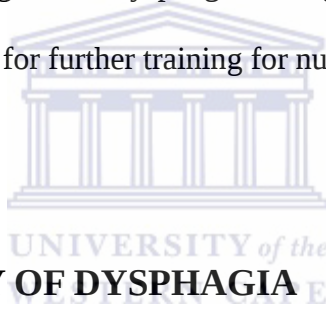


CHAPTER TWO

LITERATURE REVIEW

2.0 INTRODUCTION

This chapter gives an overview of available literature referring to dysphagia in general and dysphagia in stroke patients in particular. Literature concerning the incidence of dysphagia in stroke patients was also studied. The researcher also highlights the possible complications of dysphagia in stroke patients, as well as the importance of being able to recognise the signs and symptoms of dysphagia, and the need to start dysphagia management forthwith. It refers to literature which discusses the importance of knowledge about dysphagia among nurses to ensure early diagnosis and management of dysphagia. The need for further training for nurses in these areas is also referred to.



2.1 THE CLINICAL ENTITY OF DYSPHAGIA

Healthy people can effortlessly swallow 1000 times a day (College of Audiologists & Speech Language Pathologist of Ontario [CASLPO], 2007). While eating and swallowing, both voluntary and involuntary activities of multiple cranial nerves and muscles are involved. The main task of these muscles and nerves is to transport the food from the oral cavity into the stomach and to close the airways during the swallowing act (Matsuo & Palmer, 2008). Eating and drinking provides human beings with nourishment and hydration, and is very important in social settings, such as sitting together or going out with friends for dinner. If the highly synchronized processes of swallowing are lost or impaired it significantly reduces the sufferer's quality of life (CASLPO, 2007).

Dysphagia defines a deterioration of eating and/or drinking during one or all phases of swallowing

where the transport of solids and liquids from the mouth to the stomach is disturbed (Corrigan et al., 2011).

Dysphagia itself is not a disease, but rather a secondary consequence of an underlying diagnosis (Groher & Crary, 2010), therefore the frequency of swallowing problems depends on various factors such as different kinds of settings, age and diseases. Dysphagia in adults can result from a wide variety of medical conditions including trauma such as brain and spinal cord injury, diseases like various cancers of the oral cavity, throat or oesophagus, or surgery involving the head and neck. Other widespread causes of dysphagia in adults are degenerative neurological or systemic neurological diseases like Parkinson's, Multiple Sclerosis, Amyotrophic Lateral Sclerosis, Muscular Dystrophy, Alzheimer's Disease and stroke. The latter, stroke, is one of the most common causes of dysphagia in adults (American Speech-Language-Hearing Association [ASHA], 2014a; Brady, 2008).

The incidence of dysphagia among older persons living in the community ranges from 16% to 22%, and in nursing homes for the elderly it is as high as 68% (Sura, Madhavan, Carnaby, & Crary, 2012). In acute hospitals the incidence can reach 18% (Sura et al., 2012; Groher & Crary, 2010). Approximately 15% of people aged over 60 years' experience dysphagia (Brady, 2008).

However, dysphagia is not age dependent, it can occur in every age group from premature baby up to old age (ASHA, 2014).

Dysphagia in the paediatric population can occur as a result of prematurity and/or low birth weight, nervous system disorder or development disabilities (e.g., cerebral palsy, encephalopathy), cranio-facial anomalies (e.g., cleft lip and/or palate), complex medical conditions (e.g., heart disease) or medication that may cause lethargy or decreased appetite (ASAH, 2014b; Groher & Crary 2010).

Dysphagia is an increasingly frequent problem and carries a high risk for dehydration, malnutrition, aspiration pneumonia, and mortality. Dysphagia is not always well appreciated by clinicians

(Speyer, 2013; Barczy, Sullivan, & Robbins, 2000). The symptoms are multifarious and include throat clearing, recurrent pneumonia, hoarse voice, non-declutitive cough, weight loss, and choking. More enlightenment is required in patients and health workers, as it is still a huge problem to identify the correlations between respiratory problems and swallowing difficulties (Shaker & Geenen, 2011).

2.2 DYSPHAGIA IN STROKE PATIENTS

The harmful effects of dysphagia after stroke are receiving increasing attention as they are a contributor to morbidity and mortality in these patients (Barnhard, 2011).

Dysphagia is a common problem in stroke patients (Hughes, 2011), and the reported incidence for dysphagia varies from 37% to 78% in different studies. This variation between studies is attributed to the difference in screening methods. Martino et al. (2005) conducted a literature review with 277 articles focused on stroke patients with dysphagia. The authors found that the different figures for the incidences of dysphagia arose from different screening instruments. An incidence of 37% to 45% was found when using a cursory swallowing screening test, 51% to 55% when using a comprehensive swallowing test, and 64% to 78% when using an instrumental test (Videofluoroscopy or Fiberoptic endoscopic). These figures show that the more sophisticated and sensitive instruments are detecting dysphagia in almost double the number of patients who only undergo the simple swallowing test.

One important factor which appears to affect the recorded incidence of dysphagia in stroke patients is how soon after admission a bedside assessment using water-swallowing test is administered. Gosney, Martin, & Wright (2006), in UK conducted a study where a bedside water swallowing test was administered within 24 hours of admission to hospital following a first acute stroke. In this study, 29% of patients were identified as being affected by dysphagia. Smithard, Smeeton and

Wolfe (2007), administered a bed-side water swallowing test to stroke patients, only within the first week after admission and identified that 44% of stroke patients were affected with dysphagia. There is no evidence-based recommendation about a uniform dysphagia screening-tool available. There are no recommendations regarding by whom and at what time after admission a test should be performed (Hinchey et al., 2005).

There is paucity of research studies on dysphagia in Africa and exact prevalence figures for dysphagia in Sub-Saharan Africa including South Africa are not readily available (Seedat, 2013).

In South Africa, several published data exist relating to dysphagia in general. Bladon and Ross (2006), reported on swallowing difficulties in adults infected with HIV/AIDS while Norman, Louw and Kritzinger (2007), conducted a retrospective review of the incidence and description of dysphagia in infants and toddlers with tracheotomies. Blackwell and Littlejohns (2010), measured the prevalence, assessment and management of dysphagia in three private rehabilitation clinics in South Africa and indicated a prevalence of dysphagia in 56% of patients following stroke. This level of presence is similar to a study from Florida (USA) conducted by Crary, Carnaby-Mann, Miller, Anotonios and Silliam (2006), where 52,6% of patients demonstrated dysphagia after onset of stroke.

Dysphagia refers to difficulty in swallowing caused by a neurological disorder, such as stroke. The term dysphagia, in the context of stroke, is defined as a disruption of food or liquid flow through the mouth and pharynx into the stomach (Singh & Hamdy, 2006), due to a delay or impairment of the oral and/or pharyngeal phases (Brady, 2008). The patho-physiology of swallowing in the oral phase can lead to the inability to close the lips tightly. As a consequence, drooling of food or liquids can be seen. Hemiparesis of the tongue leads to poor tongue movement. Furthermore, food can remain within the oral cavity along the tongue or palate after eating. This may be due to the absence or reduction of sensation in the oral cavity (Morris, 2006, Singh & Hamdy, 2006).

Dysphagia in the oropharyngeal phase could be the result of a lack or delay of sensory inferences, with delay in triggering the reflex to close the airway. The consequence can be that the bolus enters into the open airway, and thus causes aspiration (Brady, 2008). Dysphagia in the context of stroke, does not normally refer to any oesophagus abnormality (Singh & Hamdy, 2006).

2.3 SIGNS AND SYMPTOMS OF DYSPHAGIA IN STROKE PATIENTS

There are varieties of symptoms and signs, which indicate dysphagia. Health care professionals should be able to recognize dysphagia from most of these signs and symptoms when interacting with stroke patients.

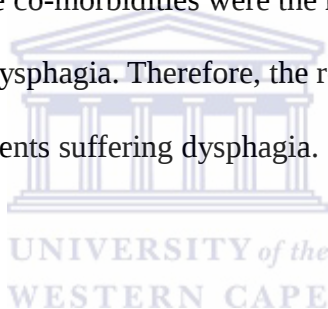
Groeher and Crary (2010), Brandy (2008), and Morris (2006) define the signs and symptoms of dysphagia as including the following: coughing, choking, drooling, breathlessness during meals, impaired jaw and tongue movement, loss of food from the mouth during mealtimes, limited management of the bolus within the oral cavity. Furthermore, pocketing of food in the cheeks or retaining food in the mouth along the tongue or palate after eating. Patients complain about the sensation of food or liquid sticking in the throat during or after a meal, as well as pain on swallowing and chest pain. Another sign is an alteration of the voice, which may sound wet or hoarse. Furthermore patients might show weight loss, malnutrition, dehydration, chest infection, and spiking high-grade temperature or consistently running a low temperature.

To enhance patient safety it is necessary for nurses to have the skills and knowledge to assess and recognize the signs and symptoms of dysphagia (Ho, Liu, & Huang, 2014; Wieseke, Bantz, Siktberg, & Dillard, 2008).

2.4 COMPLICATIONS OF DYSPHAGIA IN STROKE PATIENTS

The findings in the literature studied stated clearly that dysphagia after the onset of stroke is a serious and life-threatening medical condition and is accompanied by many complications such as malnutrition, dehydration, aspiration which may lead to aspiration pneumonia, increased length of hospitalisation, higher hospitalization cost and an increased risk of mortality (Hines, Kynoch, & Munday, 2013; Roden & Altmann, 2013; Speyer, 2013; Ickenstein et al., 2012; Langdon & Blacker, 2010; Luker, Wall, Bernhardt, Edwards, & Grimmer-Somers, 2010; Masiero, Pierobon, Previato, & Gomiero, 2008; Schindler, Ginocchia, & Ruoppolo, 2008).

Aspiration pneumonia, dehydration, malnutrition, and mortality are the main complications in stroke patients with dysphagia. These co-morbidities were the main reason for this investigation into the knowledge of nurses about dysphagia. Therefore, the researcher will further elaborate on the main complications in stroke patients suffering dysphagia.



2.4.1 ASPIRATION PNEUMONIA IN STROKE PATIENTS

A serious complication of dysphagia is pulmonary aspiration, as this can lead to chest infection and aspiration pneumonia (Widdicombe, Addington, Fontana, & Stephens, 2011). In respect of neurogenic disorders, aspiration refers to the entry of oral secretions and foreign material into the airway (Dikeman & Kazandjian, 2003), due to ineffective or even absence of cough.

In a literature review, Hammond and Goldstein (2006), using videofluoroscopic swallow evaluations on stroke patients, found that between 22% and 37% of stroke patients were aspirating food or liquid.

Stimulation of the cough receptors by foreign particles provokes a strong reflex cough. Coughing is

the physiological response to aspiration and therefore, protects the lungs against foreign material (Hammond & Goldstein, 2006). If sensation is impaired, silent aspiration occurs and it is estimated that 2% up to 25% of stroke patients aspirate silently (Ramsey et al., 2005). Silent aspiration means that there is no existing trigger to elicit the cough reflex, or patients show no sign or symptoms of distress. For this reason, aspirating patients frequently do not complain of swallowing difficulties, which puts them at a higher risk from aspiration pneumonia (Bakheit, 2001).

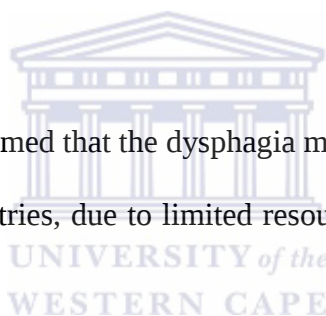
Addington, Stephens, Widdicombe and Rekab (2005) investigated the association between aspiration pneumonia and the cough reflex amongst 818 stroke patients. Of 818 patients, 35 (4.3%) developed pneumonia. Of the 736 (90%) patients who had a normal reflex cough test, 26 (3.5%) developed pneumonia, and of the 82 (10%) patients with an abnormal reflex cough test, 9 (11%) developed pneumonia. The incidence of acute stroke patients who developed aspiration pneumonia and had an abnormal cough reflex test was significantly higher than the patients with a normal cough reflex who developed aspiration pneumonia. In this test, the authors used nebulized tartaric acid to elicit the cough reflex. This appears to be an effective, specific and safe stimulus to laryngeal receptors and testing neurological airway protection. A normal finding indicated that there is a normal function of the laryngeal cough reflex. Patients who failed the reflex cough test, show an absence of coughing, or a diminished (weak) cough. This is due to dysfunction of the laryngeal cough reflex, vagus nerve or the reflex cough system.

Langdon, Lee, & Binns (2007) conducted a cohort study to identify pneumonia within 30 days post stroke. Eighty patients were examined. The presence and severity of dysphagia were measured at day 2 and day 7 post stroke.

Two days post stroke, the prevalence of dysphagia was identified in 50 (62,5%) patients; of those 34(42.5%) patients were given modified diet and/ or thickened fluids while 16 (20%) were “nil by mouth”. At day 7 after stroke the prevalence of dysphagia decreased from 62.5% to 51,25%.

Thirty-one patients (38,75%) obtained diet modifications and 10 patients (12,5%) were kept “nil by mouth”. Patients who were kept “nil by mouth” had a pneumonia incidence rate of 40%. Patients who were able to eat and drink had a pneumonia rate of 12,9%.

The use of nasogastric tubes is prescribed in stroke patients with unsafe oral intake to maintain the nutritional needs (Foley, Martin, Salter, & Teasell, 2009). The application of a feeding tube will cause the salivary flow to be reduced. The decrease of saliva flow results in less natural washing away of mouth bacteria which will change the oropharyngeal colonization (Rofes et al., 2010). Patients who are kept “nil by mouth” are more susceptible to aspirate saliva mixed with gram-negative enteric bacteria which are likely to lead to pneumonia (El-Solh et al., 2004). In-patients who were kept “nil by mouth” during their hospital stay showed a very high pneumonia rate (Hinchey et al., 2005).



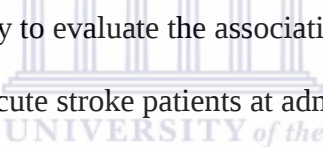
Blackwell and Littlejohn (2010) assumed that the dysphagia mortality rates, in South Africa, may be higher than those in developed countries, due to limited resources. However this cannot be proved due to lack of documentation.

Although dysphagia in stroke patients was not explicitly investigated in publications in SSA, there are publications on stroke which mention swallowing problems amongst other causes of mortality. A study published in Gambia from Walker et al. (2010) reported a correlation between swallowing problems, chest infections and mortality. Of 90 patients who were admitted with acute stroke 28 died within one month after admission. Of those 28 deaths, 24 (86%) had been found to have swallowing problems, and 11 (39%) had chest infections. This report was not investigated further.

2.4.2 MALNUTRITION IN STROKE PATIENTS

Nutrition is vital to the bodies' recovery, and as a consequence of malnutrition there is increased susceptibility to infection, delay in healing, decreased muscle strength and depression (NICE, 2006). Further, malnutrition is common in medical, geriatric and stroke patients, but its treatment in these has received little attention (Sung-Hee et al., 2008).

Among published reports the incidence of malnourishment after stroke varies between 19% (Sung-Hee et al., 2008) up to 35% (Corrigan et al., 2011). Differences in the timing of the swallowing assessment as well as the variety of nutritional assessment tools could explain the discrepancies between studies (Corrigan et al., 2011, Foley, Teasell, Salter, Kruger, & Martino, 2008). If detection of dysphagia is delayed, the patient will not be receiving nutrition until it is detected and management commences.



Crary et al. (2006), conducted a study to evaluate the associations between dysphagia, nutritional status and severity of stroke among acute stroke patients at admission. For the study, 76 patients with acute stroke were recruited and underwent the following assessments: a clinical swallowing evaluation, the Mini Nutritional Assessment (MNA), body mass index (BMI), percentage of body fat, National Institutes of Health's Stroke Scales, modified Rankin Scale, and modified Barthel Index. The findings show that 52.6% of patients demonstrated dysphagia, and 26.3% were identified with poor nutritional status, at admission. These measurement tools (MNA, BMI) cannot show rapid changes in weight or body fat, but reflect malnutrition over an extended period of time. Therefore, the results shows that dysphagia and malnutrition are prevalent in stroke patients, but are not associated with each other at the time of hospital admission.

Foley et al. (2009) conducted a systematic review with the aim of clarifying the association between nutrition status and dysphagia. Five studies were conducted within the first 7 days after onset of

stroke, while 3 were conducted within the rehabilitation phases. The prevalence of dysphagia among stroke patients varies between 24.3% and 52.6%, and the prevalence of malnourishment ranged from 8.2% to 49%. None of the studies used the same assessment method. The probability of being malnourished were significantly higher among patients who suffered from dysphagia compared with patients with intact swallowing. Furthermore, malnutrition was significantly increased during the rehabilitation phase, but not during the first 7 days of hospital admission. The discrepancy between the studies could only be explained by the different assessment methods, the different timing as well as lack of information about the adequate nutritional intake and the severity of dysphagia.

Dysphagia may contribute to the development of malnutrition following stroke. Those who are able to eat orally, may fear eating due to choking, or lack appetite as a result of the reduction of tastiness of texture-modified diets. This can contribute to malnutrition in patients suffering dysphagia (Foley et al., 2009).

In addition, Dysphagia may contribute to the development of malnutrition following stroke, but the increase of malnutrition during hospitalisation and rehabilitation could be an effect of other factors which can accompany dysphagia. Eating can be discouraged by physical impairments, dysphagia, fatigue, loss of appetite, unattractive meals and eating environment, restriction in menu choices, poor quality and presentation of food, lack of assistance during mealtime and the presence of the acute illness (Nip, Perry, McLaren, & Mackenzie, 2011; Perry & Love, 2001).

From the above, it is still not demonstrated that malnutrition could occur in patients with stroke as a result of dysphagia, or at the least that a correlation between dysphagia and malnutrition exists.

Therefore, the relationship between malnutrition and dysphagia following stroke required further investigation (Foley et al., 2009).

2.4.3 DEHYDRATION IN STROKE PATIENTS

Dehydration is another complication which is associated with dysphagia in stroke patients, but other factors concomitant with stroke such as physical and functional problems could be a reason for dehydration (Rowat, 2011).

Impairment of the hydration status in stroke patients can lead to thrombo-embolism, pulmonary embolism, renal disease, it reduces cerebral blood flow with the potential of damaging still viable brain tissue, reducing clinical recovery and increasing the possibility of short-term mortality (Crary et al., 2012; Field & Hill, 2012; Rowat, 2011).

Crary et al. (2012), conducted a study among acute stroke patients with dysphagia versus patients without dysphagia either at admission or at discharge or 7days later after admission, depending which came first. To evaluate nutrition and hydration status, serum biochemical measures were obtained for nutrition status, and BUN/Cr for hydration status. The results indicated that 37 % were identified as having dysphagia, and 53% showed evidence of dehydration, based on BUN/Cr level, and 32% of patients demonstrated malnutrition, all tested at admission. Using BUN/Cr correlation, deficient hydration status was identified in 53 % of stroke patients at admission and 66 % of patients at discharge. Furthermore, BUN/Cr level was significantly higher in patients with dysphagia than patients without dysphagia, at admission and at discharge. No differences in nutritional status were attributed to dysphagia. Whereas, dehydration is associated with dysphagia during the first week post-stroke.

This finding is similar to a study conducted by Rowat, Graham and Dennis (2012) where the results indicate that 36% of stroke patients were dehydrated at admission and 62% were dehydrated throughout their hospital stay.

It can be seen that dehydration is apparently a common complication in stroke patients, and significantly increases with length of hospital stay. The high incidence of poor nutrition or hydration status of acute stroke patients admitted to the hospital, may have its origin in the person's pre-stroke

lifestyle (Crary et al., 2012).

2.5 MANAGEMENT OF DYSPHAGIA IN STROKE PATIENTS

Dysphagia is a well-recognized, serious consequence in stroke patients, and the literature is in agreement that early identification and effective management of dysphagia, starting at admission, can help to reduce serious complications such as aspiration, pneumonia and death (Edmiaston, Connor, Steger-May, & Ford, 2013; Martino, Martin, & Black, 2012; Bouziana & Tziomalos, 2011; Carnaby-Man, Lenius, & Crary, 2007).

Hinchey et al. (2005) conducted a study among acute care Hospitals. They collected data on all admitted acute stroke patients, during a two years period. Six Hospitals used a formal dysphagia screening and reflected a pneumonia rate of 2.4% versus 5.4% in hospitals without formal dysphagia screening. Therefore, using a formal dysphagia screen can help to reduce subsequent pulmonary complication in stroke patients.

The aim of early swallowing assessment is not only to decrease aspiration-pneumonia and improve treatment outcome, it also facilitates the provision of adequate nutrition in a safe and sufficient way (Carnaby-Man et al., 2007). This is confirmed by Carnaby, Hankey and Pizzi (2005), who state that patients who have participated in an active therapeutic concept, and dietary modification show a positive trend towards a more favourable outcome.

To enable effective management, as well as nurses and doctors, a multi-disciplinary team is required, preferably consisting of the various professionals. A speech and language therapist will assist with making an accurate diagnosis, and assist stroke patient in swallowing safety. A dietician can advise on the nutritional content of food and drink as well give advice on the different texture of foods that will suit the patient's ability to swallow. A physiotherapist can help during mealtimes with appropriate positioning of hemiplegic patients in an upright position while eating and drinking.

An occupational therapist can assist with resumption of eating with the affected arm as well to provide equipment aids such as special feeding cups and non-slip mats and plates designed to keep the food warm. A social worker and psychologist can counsel the stroke patient and family members about adapting to disability, and new roles within the family and workplace (Kerr, 2012; Bryer et al., 2010; Rofes et al., 2010). Nurses are the frontline of the team because they are available on a 24 hour basis, and therefore have an ideal position as organiser, coordinator, and mediator of progress of the patient within the multidisciplinary team (Kerr, 2012; Davies, 2002). Screening and management of dysphagia by nurses does not replace other health professionals, but is an important step in the early detection of dysphagia and thus facilitates the targeted treatment of dysphagia (Barnard, 2011)

Various types of screening tools are in use for identification of dysphagia such as the “bedside swallowing test”, endoscopy, and videofluoroscopy (VFS) (Ickenstein et al., 2012; Martino et al., 2000).

The literature has shown that early detection of dysphagia through a bedside test done by a nurse can significantly reduce the risk of aspiration pneumonia and further complications including death (Edmiaston et al., 2013; Speyer, 2013; Martino et al., 2012; Barnard, 2011; Weinhardt et al., 2008; Hinchey et al., 2005).

The “bedside screening test” is a simple, short, valid and reliable test which consists of a number of elements and can be used by nurses at patient's admission or in a ward environment (Speyer, 2013; Ramsey, Smithard, & Kalra, 2003). Moreover, it is non-invasive, repeatable and can be easily conducted in daily clinical practice by nurses (Martino et al., 2009; Trapl et al., 2007).

Several areas are tested such as consciousness level, postural control, voluntary cough, voice quality and the ability to swallow saliva. Should the results be negative a normal diet and fluid can be given to the patient. Nevertheless, patients should be still be kept under observation for the next 24 hours and if necessary the test should be repeated.

In case the test is positive, or any questions arise, nil by mouth should be considered, as well as a referral to the speech therapist or specialised nurse in dysphagia should be done (Westergren, 2006). Shem et al. (2012) specified one deficiency with the bedside screening test in that it cannot detect silent aspiration. To confirm dysphagia especially when the suspicion of silent-aspiration exists further tests such as videoflouroscopy (VFS) must be performed (Shem et al., 2012).

VFS is often named as the gold standard under the techniques for detection of dysphagia and aspiration. It is able to show the swallowing act, starting from the oral cavity up to the oesophagus. It records minor abnormalities in movement and can show aspiration (Edmiaston et al., 2013; Singh & Hamdy, 2006). It provides a dynamic study by recording the actual path followed by food or liquid of different sizes and consistencies impregnated with barium under x-ray. The SLT and radiologist can see the anatomical structures and the function of the different phases of swallowing (Ramsey, Smithard, & Kalra, 2003). Therefore, the patient has to sit in an upright position to stimulate the typical mealtime posture (Teasell, Foley, Martino, Bhoga, & Speechley, 2013).

Several researchers stated some disadvantages of VFS which includes radiation exposure and the procedure itself. Ideally, the VFS procedure is performed in conditions which do not reflect the ward environment, such as sitting upright in a special chair. The consistency of barium is different to normal food and therefore, its passage does not indicate the aspiration risk, which will occur with normal food. Furthermore, to perform VFS special staff, equipment and facilities are needed (Carnaby-Mann et al., 2007; Singh & Hamdy, 2006).

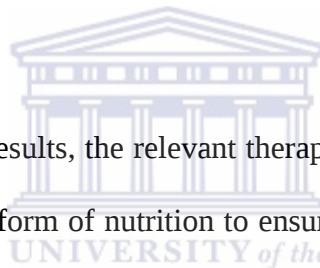
Fibre-optic endoscopic evaluation of swallowing (FEES) is another instrumental option to identify dysphagia. Fibre optic endoscopy is a small tube with a camera and a light on the end, it is flexible and connected to a video or computer screen. This will be inserted through the nose into the throat (ASHA, 2014a). FEES provides information on the swallowing process, it gives an anatomical display of the pharyngeal and larynx mobility, and investigates the sensory component. In addition, it is well tolerated, safe and can be performed at the bedside with normal food (Nacci et al., 2008;

Aviv et al., 2000).

On the other hand, there are disadvantages that must be considered: To conduct the test it requires a skilled physician and technical equipment which is not always available. The method gives no information about the oral control and there is a white out as the bolus passes through the pharynx as the pharyngeal constrictors contract around the lens (Singh & Hamdy, 2006).

Despite the pros and cons of VFS and FEES the finding of pneumonia in stroke patients with the bedside water-swallowing screening test were 37% versus instrumental testing results of 64% to 78% (Martino et al., 2005).

The great benefit of the instrumental testing is that it shows the pathophysiology of swallowing. The instrumental testing is the only test which can detect silent aspiration which occurs in 28%-38% stroke patients (Ramsey et al., 2005).



Based on the evaluation of the test results, the relevant therapeutic action can be taken further. The aim is to find a reasonable and safe form of nutrition to ensure patients have an adequate fluid and diet intake (Hughes, 2011). Depending on the type of the swallowing problem, various therapeutic approaches are available (Shaker & Geenen, 2011) such as, enteral feeding, modifications of dietary consistency, correct posturing during mealtimes, information on safe eating, and oral hygiene, as well as behavioural manoeuvres such as, voluntary airway protection (Beavan, 2013; Carnaby-Mann et al., 2007). Therefore patients are divided in two groups: those in danger of aspiration and those who are not in danger, non-aspiration patients. Patients who are in danger of aspiration are not allowed to eat without special advice. They also receive swallowing therapy, depending on their deficits, to prevent aspiration (Shaker & Geenen, 2011). From the results of the screening test the speech and language therapist will decide which kind of food and liquid consistency the patient can consume safely (Nazarko, 2010), while the dietician is responsible for a balanced diet (Morris, 2006). The speech and language therapist will advise the patient in different techniques including

the Mendelsohn's manoeuvre, which is to hold the breath while swallowing and then to cough after swallowing to clear any residual material from the hypo-pharynx. Change of posture, for instance sitting can be helpful. Vertical positioning is significantly important due to the swallowing related muscles. Gravitational force allows safe passage for the bolus from the mouth to the stomach when sitting, thus reducing the chance of aspiration (Hughes, 2011; Carnaby-Mann et al., 2007).

Severe dysphagia means there is a risk of aspiration of food and fluid during oral intake, which can lead to aspiration pneumonia. Therefore, food consumption via a feeding tube is necessary. The application of a feeding tube has to be seen as a part of the therapy, with the aim of removing the feeding tube as soon as possible, when the swallowing system has recovered (Ickenstein et al., 2012). Nevertheless, the patient will benefit from a nasogastric tube to ensure nutrition and hydration status (Singh & Hamdy, 2006).

However, it should be noted that tube feeding cannot be expected to prevent aspiration of oral secretions. This in turn can lead to aspiration pneumonia, because the oral cavity is rich in bacterial flora and reduction of salivary flow is responsible for colonization of Gram Negative bacteria in oral and pharyngeal flora in nasogastric tube-fed patients. This forms the source of pathogenic organisms which are an independent predictor of chest infection (Gomes, Pisani, Macedo, & Campos, 2003).

This is confirmed by a study done by Nakajoh et al. (2000), who found that the incidence of aspiration pneumonia, in post-stroke patients, with dysphagia was 13,2% with a nasogastric tube. The incidence in bed-ridden patients, who had a nasogastric tube, was significantly higher at 64.3%. These results could be attributed to the reduced cognitive and functional status of the patients.

These findings suggest that the incidence of aspiration pneumonia is connected with oral colonization by respiratory pathogens. To prevent the settlement of bacteria in the oral cavity, regular oral hygiene regime is essential, and should be included in the daily management plan for

stroke patients. Therefore, oral hygiene is very important in preventing further complications, and is usually the responsibility of nurses (Tada & Miura, 2012; Abidia, 2007).

Patients with a mild dysphagia indicate some form of disorder or restriction in the transport of bolus. Therefore, food consumption (diet) should only be done under supervision. (Ickenstein et al., 2012). Patients who do have limited movement of lip, tongue or jaw, will benefit from exercise for each structure (Logemann, 2008).

Some useful exercises are: Licking lollipops or ice-lollies which increase movement of the tongue and reduces the problem of food being pocketed in the cheeks. As well, sucking and blowing through a straw will strengthen the soft palate and make swallowing easier. During mealtime, nurses should provide for a calm environment and if necessary remove interfering noises. Nurses should remind the patient to take only a small amount of food or liquid (at one time). To eat slowly, and to sit upright (Nazarko, 2010; Westergren, Karlsson, Andersson, Ohlsson, & Hallberg, 2001).

Eating is an automatic behaviour and therefore patients should be encouraged to feed themselves. This will allow the patients to take control, and stimulate independence and allow the process of automatic swallowing (Brady, 2008).

It is essential that the nurses be familiar with these methods of managing dysphagia, because they are responsible for the daily care of the patient, and they are available 24 hours a day. Special care should be given by nurses, when SLT are not available. They spend more time with patients than any other health care member does (Davies, 2002), and nurses are in the best position to make referrals to other health care professionals when required (Hines et al., 2013).

Correct management of dysphagia not only minimizes the morbidity and mortality associated with aspiration pneumonia, it also improves nutritional status, as well as providing patients with a return to a normal diet and subsequent improvement of their quality of life (Singh & Hamdy, 2006).

2.6 KNOWLEDGE AND THE NEED FOR AN INTERVENTION PROGRAM

Mari (2010) explained knowledge as a capacity to acquire, retain, and to use information. It is a mixture of comprehension, experience, discernment, and skill.

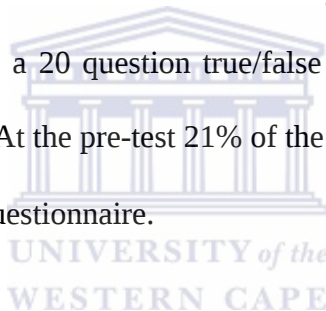
Diagnosis and management of dysphagia are usually done by SLT (Dilworth, 2008). Due to the increasing work of the SLT (Edmiaston et al., 2013) and shortage of SLT, particularly during weekend shifts, nurses should be able to recognize and manage dysphagia (Head et al., 2007). Speech and language therapists are mostly available during standard working hours on weekdays compared to nurses who are providing 24 hour care (Cichero et al., 2009), and nurses have the most prolonged contact with the patient. Therefore, nurses have to observe the patients, and know all available instruments to fully assess patients' needs (Francescato, Cutrupi, Delle Fratte, & Anglani, 2011). Nurses should refer to SLT where necessary, or where the situation is beyond their level of competence. Particularly as O'Loughlin and Shanley (1998) have pointed out, dysphagia screening and management is not a part of nurses' formal training. Currently, there are still no standard guidelines or framework for training nurses to undertake this role (Head et al., 2007) and therefore the task and responsibility of nurses is unclear (Colodny, 2001). The result of this is that the role of nurses within the multi-disciplinary team is still poorly defined and understood (Perry, Brooks, & Hamilton, 2004).

An educational seminar was conducted by Werner (2010) on a sample of 145 registered nurses in United States of America. The aim of this seminar was to assess the intention of nurses to perform dysphagia assessment. The seminar consisted of information, skills and abilities, and knowledge about performing dysphagia assessment. Knowledge and behavioural intent for dysphagia assessment were measured before and after the nurse's exposure to the educational seminar. The analysis showed a significant increase in knowledge of nurses about dysphagia when comparing pre- and post-test results after an intervention programme.

A nursing non-compliance with the SLP dysphagia and feeding recommendations was also studied by Colodny (2001) in United States of America. Colodny (2001), conducted an observation study with 180 nurses who are employed in a nursing home. The aim was to research the reason for non-compliance with recommendation for thickening fluids for dysphagia patients made by the speech and language therapist. The study showed that non-compliance of the recommendation persisted, because of lack of knowledge of dysphagia management, in particular the use of thicken liquid, the positioning of the patient, and feeding techniques.

The effect of nurses training programs was studied by Cichero et al., (2009) in Australia. Thirty-seven nurses took part in a training program which included the following topics: definition of dysphagia, the three phases of swallowing, dysphagia and aspiration, how to use screening tools, populations at risk of dysphagia and clinical indicators of dysphagia as well as safe swallowing strategies. To assess the knowledge, a 20 question true/false pre- and post-test questionnaire was developed by two speech therapists. At the pre-test 21% of the participants failed.

No participants failed the post-test questionnaire.



In the United Kingdom, Magnus (2001) conducted a study with 20 nurses which showed that nurses who underwent dysphagia training are using the dysphagia screening test with confidence, and are able to make the right management decisions.

Effectiveness of education has been demonstrated in a China study by Huang, Zhang, Yao, Xia and Fan (2006). Ninety-six patients who were admitted to the hospital with acute stroke, were assessed within 24 hours of admission and were clinically confirmed as having dysphagia by a physician or a specially trained nurses. Patients were divided in group A and B. Patients in group A: were fed by a family members, who had seen a video of general nursing information.

The patients in group B were fed orally, but by an experienced nurse who had been trained how to manage patients with dysphagia problems. Patients from Group B were also instructed to do special

exercises several times a day and to use the swallowing techniques whenever they ate or drank. The results were significantly different. The incidence of aspiration pneumonia in patients from group A, fed by a family member (unfamiliar with handling dysphagia) was 33,3% compared to 6.3% of patients in group B who were fed by a well-trained nurse.

Therefore, education is a prerequisite in diagnosis and management of dysphagia, as well as continuing education program for upgrading knowledge and introducing new skills (Mari, 2010).

In the literature, various intervention programs are mentioned, all of which clearly show that the knowledge of nurses has improved significantly (Ilott et al., 2014; Tredinnick & Cocks, 2014; Colodny, 2001; Magnus, 2001).

A recent study from England conducted by Tredinnick and Cocks (2014) mentioned that people who have eating and drinking problems need a supporter who has an understanding of the identification and management of persons with dysphagia. The following intervention program was carried out. Thirty-eight participants were divided into two groups. The intervention group of 25 participants attended a 1-day dysphagia training course, and the second group of 13 served as a control group which did not received any training. The training program consisted of the anatomy and physiology of normal and abnormal swallowing, as well as the acute and chronic signs of dysphagia. This was mediated by a PowerPoint presentation. A PowerPoint presentation and group discussion was also used to convey the role to all members of a multi-disciplinary team, in order to understand appropriate referrals.

As well, workshop activities were offered to show different food textures and modified fluid consistencies. To increase positive attitudes of the participants, they also prepared and tasted thickened fluids. To verify the effect of the training program, all 38 participants had to fill in a questionnaire at the beginning and at the end of the day shift. As well as after one month. This was done to see if knowledge and confidence would increase after training, and if these new experiences could be maintained one month after training. The results of the questionnaires showed that both

groups had no differences in knowledge at the beginning of the intervention program. But there was a significant difference between the groups for the second questionnaires. The control group did not show any change compared to the intervention group. In the intervention group the knowledge scores increased significantly between the first and second questionnaires. The third questionnaire, which was designed to show how long the new knowledge would be retained, indicated that the knowledge does decrease slightly, but not significantly.

Ilott et al. (2014) used a new approach to improve dysphagia management by using a workplace-based, blended e-learning. A single group consisting of twenty-two registered nurses (RNs), and ten healthcare assistants (HCAs) working on a stroke rehabilitation ward were chosen to participate in the study during their shift. The intervention program consisted of three e-learning programs using the STARS program from the Internet and a dysphagia module from the NHS Skills for Health Core Learning Unit. The first two programs were about swallowing, feeding, hydration and nutrition after stroke. The third program was a NHS skills for Health Care Learning Unit which is only available to NHS employees. All the sessions were held in a room, with computer access to the Internet, close to the rehabilitation ward. The overall time for RNs for the e-learning session was four hours, and for the HCAs was two hours. The two hour program consisted only of the program for swallowing and the NHS skills program. Each session was attended by one to three nurses at a time, accompanied by an experienced nurse. The experienced nurse was responsible to transfer learning into practical skills such as modifying fluids, oral hygiene, management and medications. To evaluate the training effect pre- and post-training questionnaires were completed. Furthermore, a 16 hour pre-intervention observation focused on practice, barriers and facilitators was given. After the training program an 18 hour post-intervention observation was done. The same observation method was used as in the pre-intervention observation. Additionally members of the stroke team were asked if they observed any changes in practice since the dysphagia intervention program.

Questionnaires and observations both highlighted significant improvement in knowledge and in clinical practice.

One should take into consideration, that computer programs are not always usable. Many people still have no access to computers and are therefore not familiar with e-learning. Whereas others believe that e-learning is not their way of learning (Wakefield, Carlisle, Hall, & Attree, 2008). In addition, many hospitals still face the problem of providing enough computers (Moule, Ward, & Lockyer, 2010).

Another kind of intervention program was conducted by Mockiene et al. (2011). The aim of the study was to describe the effect of an intervention program about HIV knowledge and attitudes by nurses by using different learning methods such as a 2 day's workshop combined with written material and only written material without a workshop.

The participants were divided into three groups. Group 1 received a two-day workshop combined with written material, the second group received an intervention program only in the form of written material, and group three acted as a control group and did not receive any intervention program. Baseline data were collected before the intervention program took place, and the follow up was completed three months later. The two day's workshop (13 hours) was supported by the AIDS centre. A physician from the AIDS centre provided lectures, and a nurse scholar led the discussion. Training techniques such as lectures, Video about HIV, group discussion, conversation with people living with HIV, and written materials were used. The content of the intervention program consisted of HIV epidemiology and history, transmission, prevention, treatment, and counselling of HIV as well ethical considerations. Group one and two received the same written material which consisted of academic articles and two pages about the new statistics of the HIV in the world.

Participants from group one, who received a two day workshop and written material showed a significant improvement in knowledge (60% more correct answer) compared to group two, who only received written material. This group did not show significant improvement (9% more correct

answers). Group three, which did not receive any intervention program, no significant changes in knowledge were reported.

This study showed, that the use of written material only, is insufficient to increase nurses knowledge levels compared to an intervention program containing different teaching methods (Moeckiene et al., 2011).

When reviewing the literature, it becomes apparent that blended learning is becoming more prevalent compared to the traditional classroom learning method. Blended learning is defined as a learning method, where more than one learning medium is used. Actually it is nothing new, but in the past blended teaching was limited to lectures, books and hand-outs. Nowadays we find countless new learning approaches such as, synchronous physical formats, synchronous online formats, self-paced, and asynchronous formats which have become enabled by the new technology (Singh & Reed, 2001). For years, we have known that people learn in various ways. Therefore, one should consider offering different learning styles. Blended learning allows for consideration of individuals. In order to provide a suitable learning program, one must not only know its specific target groups but also what goal has to be achieved. The following points should be considered when planning a training program.

- What is the problem, and how should education and training be addressed?
 - Who is my target group, and what kind of learning modalities make the most sense?
 - What financial issues are expected, and what kind of infrastructure and environment do I have?
- (Finn & Bucci, 2004).

Blended learning as a pedagogical tool has the potential to improve nursing practice through their learning and application to practice (Smyth, Houghton, Cooney, & Casey, 2012).

2.7 SUMMARY

From reviewing the literature, it is clear that dysphagia is a common problem in stroke patients, worldwide. There is a high awareness about the complications related to dysphagia.

The incident of aspiration pneumonia in stroke patients suffering dysphagia is well documented. There are a substantial number of stroke patients who demonstrate poor nutrition and hydration status. This is known, but sufficient available information relating to the association between dysphagia, nutrition and hydration in acute stroke is still limited and conflicted.

The main clinical complications and the need for early identification and prompt management of dysphagia patients have been well established in many studies. This chapter highlighted that the knowledge about identification and management among nurses is still lacking, in developed as well in developing countries. The literature review also indicated that assessments of swallowing and management are not consistently carried out by nursing staff due to lack of knowledge, and there are still unclear lines of the role of the nurses in the management of dysphagia.

Many authors indicated that further training among nurses has a positive effect on the outcome of stroke patients suffering dysphagia. The information and various possibilities given by the literature on how to design an intervention program, as well the results from the survey, will help the researcher to develop an outline for an intervention program.

CHAPTER THREE

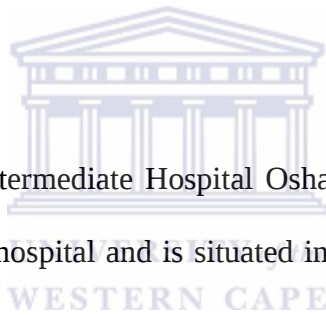
METHODOLOGY

3.0 INTRODUCTION

In chapter three, the researcher provided a description of the quantitative study. It described the design, introduced the population and the instrumentation of the current study. The researcher explained to the reader about data collection and how data analysis was carried out. Finally, the ethical consideration pertaining to the current study was given.

3.1 RESEARCH SETTING

The study was carried out in the Intermediate Hospital Oshakati (IHO) in the Oshana Region of Namibia. The IHO is an acute care hospital and is situated in a catchment area of 190 000 people (Kakungulu, 2011).

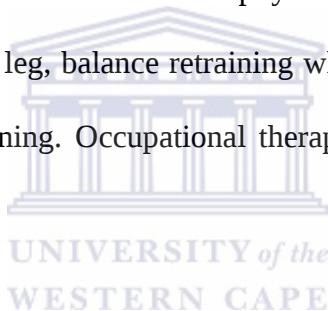


Namibia with its 824 292 square kilometres is situated in South Western Africa and shares borders with Angola to the north, Botswana to the east, South Africa to the south and has the Atlantic Ocean to the west. The country is divided into 13 regions of which the Oshana Region is the smallest with an area of 5290 square kilometres. The latest house to house census carried out in 2011 estimates that the country had a population of about 2,259 million people.

The economy of the region is centred mostly in Oshakati, where many companies and industries are established. The rural community relies on subsistence agriculture, such as cattle farming, millet growing and small business enterprises (Government of the Republic of Namibia, 2014; Losskam, 2010).

The Intermediate Hospital Oshakati is the largest referral hospital in the North of Namibia. The

hospital currently employs a total staff of 60 doctors and 500 nurses (Kakungulu, 2011). The rehabilitation professional's consists of four physiotherapists and three occupational therapists. There are no speech-language therapist working in the hospital. The hospital has a bed capacity of 792 beds and offers specialized tertiary healthcare services including; General Surgery, Ophthalmology, Ear Nose Throat Surgery, Dental Services, Orthopaedic Surgery, Internal medicine, Paediatrics, Obstetric and Gynaecological Services, HAART (Highly Active Anti-Retroviral Treatment) program and mental health services (Kakungulu, 2011). However, the hospital does not provide a specialized stroke unit or specially trained staff with stroke or dysphagia skills. All stroke patients are initially admitted to casualty, where they are examined by a physician and then admitted to the internal medicine ward. On the internal medicine ward stroke patients do not have a separate room or special care from the side of the nurses. The physiotherapist treatment consist of passive movement of the hemiplegic arm or leg, balance retraining while the patients sits over the edge of the bed and when possible gait training. Occupational therapists manage wheelchair queries and educate families.



3.2 RESEARCH DESIGN

A quantitative, descriptive, non-experimental survey was used to collect the data.

The purpose of quantitative research is to describe, explain or predict phenomena. This is done under the systematic collection of numerical data, and analysed with the help of statistical methods (Polit & Hungler, 1995). Quantitative research designs can have experimental, quasi-experimental and non-experimental design features (Domholdt, 2000). In the experimental and quasi-experimental designs the researcher is an active agent, meaning, that the researcher interferes during the research work, for example through an intervention program. Whereas in non-experimental design the researcher is a passive observer and does not interfere during the research work. A non-

experimental study is descriptive. The researcher observes, describes and documents the various aspects of the research situation, taking care not to influence the situation in any way. Such a study is useful in providing information as an initial point for development of a theory or hypothesis (Polit & Hungler, 1995). The current study was non-experimental, as it did not involve the manipulation of an independent variable. Surveys are an ideal method for collection of information, consideration of which allows the researcher to describe, compare and predict attitudes, opinions and knowledge of the subjects. The researcher may need to use creativity and initiative to determine the area to be surveyed and the most appropriate method to use to extract all the facts (Domholdt, 2000).

In the current study, “the phenomenon”, refers to the determination of the level of knowledge of nurses regarding dysphagia. The design describes a phenomenon without interfering with the current knowledge of the nurses. The researcher had to design a questionnaire suitable to the actual situation in order to establish the level of knowledge. Therefore the design was appropriate for this study as it enabled the researcher to collect data relating to the knowledge of the nurses regarding dysphagia at a certain point in time, without changing their behaviour or condition.

3.3 POPULATION AND SAMPLING

The target population of the study consists of 500 nurses who are employed at the Intermediate State Hospital of Oshakati. Of these 500 nurses, 254 are enrolled nurses (EN) and 246 are registered nurses (RN) (Kakungulu, 2011).

All nurses who are employed by the Intermediate Hospital of Oshakati, at the time of the study, were invited to participate in the study. All nurses who were willing to participate were included in the study. A convenience sampling is a non-probability sampling technique where samples are selected because of their convenient accessibility (Polit & Hungler, 1995). In the current study the participants were chosen purely on the basis of availability.

3.3.1 EXCLUSION CRITERIA

Undergraduate student nurses who are conducting their intern-ship at the hospital at the time of the study were not selected for the study. Student nurses are still in training and therefore, the knowledge about dysphagia in stroke patients is not clear.

3.4 DATA COLLECTION METHODS

3.4.1 DATA COLLECTION INSTRUMENTS

No standardized questionnaire about the knowledge of dysphagia in stroke patients among nurses relevant to the research setting and pertinent to the research question was found in existing literature. Therefore, the design of the structured, self-administered questionnaire was guided by the objectives of the study. The questionnaire contained closed ended questions with several options as answers. The following options were offered: “Disagree” - “Unable to decide” - “Agree”. Closed ended questionnaires can contain several fixed responses from which to choose and are therefore easy to administer and produce easily quantified data (Polti & Hungler, 1995).

The questionnaire (Appendix F) was divided into two sections: Section A and Section B

Section A included questions relating to socio-demographic characteristics of the study participants.

The socio-demographic section asked for information pertaining to the respondent's age, position as a nurse, qualifications, years of experience in nursing, and experience with stroke.

This section is intended to provide a better understanding of the participants' background and allow the researcher to interpret their responses more reliably (Neumann, 2005). This section addressed one of the objectives in the current study, and will be used to determine the association between the knowledge of dysphagia and socio-demographic factors, for instance education experience, of the

nurses.

Section B focuses on the facts which the participants know about dysphagia. This section is divided into 3 sub-sections.

Sub-Section 1 contains questions about the signs and symptoms of dysphagia.

Sub-Section 2 focuses on the complications of dysphagia such as aspiration pneumonia, malnutrition, dehydration or mortality of stroke patients.

Sub-Section 3 includes questions based on the management of dysphagia in stroke patients.

To determine the knowledge of the participants, relating to their knowledge of dysphagia, the responses were scored as follows: a correct response resulted in 1 point, an incorrect response resulted in 0 point, and an unsure response were counted as 0 point (C, Basuayi, personal communication with the statistic tutor, August 2012). The scoring of 0 for an unsure response on the assumption that nurses who were “unsure” were also “unaware” of the correct response at the time of the data collection (Park et al., 2011).

Each section was scored independently.

The points were then combined to obtain a total score for each section. As an example, Section B1 scored a total of 13 points, section B2 a total of 10 points, and section B3 a total of 7 points. The total score of all sections was 30. The level of knowledge was classified as follows: a score of 75% and above was classified as “high”, from 74% to 50% was classified as “moderate”, and a score from 50% and below was classified as “low” (C.Basuayi, personal communication, August 2012).

This was applied for overall score as well for each section.

3.4.2 VALIDITY AND RELIABILITY

In order to ensure face and content validity of the survey the questionnaire was given to 5 health professions experts (speech and language therapists) with experience in the field. One is employed by the Ministry of Health and Social Services and working at Windhoek Central Hospital, two are working in a private practice in Windhoek, and two are working in a Stroke Unit, in Germany. All of them agree that the questionnaire sufficiently covered all aspects of dysphagia.

The test-retest method was used to determine reliability of the questionnaire. Fifteen nurses, from the same population, were recruited to participate and complete the questionnaires twice with a two week period between the first and second completion of the questionnaires.

Therefore, test-retest reliability was assessed using the Intra Class Correlation (ICC) coefficient comparing scores from two measurements.

The ICC were classified as follows (Singh et al., 2011): Poor if the ICC is less than 0.40. Moderate if the ICC is between 0.41 and 0.60. Good if the ICC is between 0.61 and 0.80, and excellent when the ICC is 0.81 or higher.



ICC was calculated for section B as follow:

- The ICC calculated for Section B1, Signs and Symptoms of Dysphagia, was 0.626.
- The ICC calculated for Section B2, Complications of Dysphagia, was 0.697.
- The ICC calculated for Section B3, Management of Dysphagia, was 0.528.

Kline (1993) recommends a minimum requirement for internal consistency by 0.7.

The result of the ICC was therefore unsatisfactory. This could not be explained by the researcher. The questionnaire had been analysed and modified with the expert group. The pilot group had unanimously agreed with the questions. The researcher decided to remove all questions with poor and moderate results from the questionnaire. In section B1, signs and symptoms of dysphagia, the

following eight questions were removed: eating fast, neck stiffness, coughing 20min after a meal, neck swelling, tooth ache, difficulty in smelling, contracting herpes simplex, and severe headache. In section B2 complications of Dysphagia one question was removed, which was: “delay of recovery”. In section B3, management of Dysphagia, the following three questions were removed: “All stroke patients should be screened before being given food or drink for the first time”, and “There are not reliable tests for difficulty in eating and swallowing problems”, and “The best way to find out if the patient has eating or swallowing difficulties, is to ask the patient”.

After removing these questions, an ICC value of > 0.7 could be achieved.

The researcher still decided to evaluate the matter further, and invited the participants who participated in the test-retest for a discussion round. Four out of fifteen followed the invitation. The researcher represented the questionnaire with emphasis on the poor and moderate questions. She asked whether the Likert-type answers possibilities “strongly agree”, “agree”, “unable to decide”, “disagree” and “strongly disagree” has been misunderstood or had led to confusion. This was negated by the group. There were however several comments made which in the opinion of the researcher are important. Some participants admitted that they did not concentrate sufficiently during re-testing. Some participants admitted that as they were aware that their knowledge about dysphagia was generally weak, they had guessed the answer the first time, but could not remember their guess the second time.

After the discussion, the researcher asked the participants to complete the questionnaire again, to make sure that the questionnaire was understood. Again, the answer options "agree" and "disagree" were elected. Out of interest, the researcher asked the participants why they had chosen this type of response. One of the participants said, that you cannot always find all the signs and symptoms mentioned in the questions in all patients. This was confirmed by the other participants. It thereby becomes clear that the participants had not understood the Likert-type answers. The researcher explained once again the meaning of the Likert-type answers. At the end, the participants agreed,

that this type of answer possibilities could lead to more confusion. It was then decided that the Likert-type is to be changed, in a simpler way for example, agree - disagree - unable to decide.

As a result of the discussion the Likert-type answer options were reduced to “agree”, “unable to decide” and “disagree”. Two questions: “The best position for feeding is lying flat on the back” was changed into: “The best position while feeding the patients is when the patient lies flat on his back”, as well the questions: “Coughing during eating” and “Coughing after eating” was changed to “Coughing while eating”. The researcher removed all poor and moderately answered questions from the questionnaire until the minimal requirements according to Kline (1993) of 0.7 were met.

After these adjustments, the following reliability levels were achieved: Section B1, Signs and Symptoms 0.716. Section B2, Complications, 0.704. Section B3, Management, 0.714. The instrument was therefore deemed reliable and could be used in the study.



3.5 PILOT STUDY

A pilot study was carried out prior to the actual study. The piloting was conducted among five nurses of the hospital (from the target population) whose results were not included later in the final study.

A pilot study will allow the researcher to identify whether respondents understand the questionnaire, and whether the meaning of questions is the same for all respondents (Kelley, Clark, Brown, & Sitzia, 2003). It should also allow the researcher to determine the amount of time needed to complete the questionnaire (Domholdt, 2000). The researcher requested that the nurses peruse the questionnaire carefully and thoroughly, and to report any ambiguities.

The nurses gave the advice to separate: Registered Nurse / Enrolled Nurse from “What is your qualification as a nurse” into an extra heading like: “What is your position as a nurse”.

They also recommended that two questions regarding “Drooling” be deleted as the word was not

known, and therefore the questions could not be understood without explanation. Drooling is one aspect of a sign in dysphagia (Brady, 2008), but the nurses and the researcher could not find a synonym which could replace the word “drooling”.

The questions were “Is drooling during non-mealtimes a sign of dysphagia” and “Is drooling while drinking a sign of dysphagia”.

The nurses needed 10 to 20 minutes to complete the questionnaire and the rest of the questionnaire was clear and understandable for them.

3.6 PROCEDURE

Ethical clearance and permission was obtained from relevant institutions (see 3.9. ethical considerations).

After receiving approval from the above-mentioned authorities, the questionnaire was tested for validity and reliability. Afterwards, all nurses were invited to participate in the study. The participants were recruited through invitation letter (Appendix D) distributed throughout the Hospital, either through personal invitation by the researcher, or by informing the supervisor of each ward, and mentioning the study at nursing staff meetings. Invitation letters requesting for nurses to participate in the study were also posted on the General Staff Notice Blackboards provided on each of the wards for the information of the nursing staff.

Data collection was done during March 2014 in the Intermediate Hospital Oshakati, Namibia.

The nurses were given the opportunity to complete the survey questionnaire during a 2 week period, between 11h00 and 14h00. For that purpose a dedicated room in the Administration Block of the hospital was provided and equipped with sufficient tables and chairs.

The time was chosen, so that nurses could come during their lunchtime if necessary. The researcher was present in the room over this entire period.

Before the participants filled out the questionnaire, the researcher explained the purpose of the study to the participants and answered queries about the questionnaire. Each participant was then asked to sign a consent form saying that they have understood the purpose of the study and their participation is voluntarily. After completing the consent forms and the questionnaires, the nurses were asked to place the consent forms and the questionnaires in separate boxes. Afterwards, consent forms and questionnaires were locked separately in a cabinet to ensure anonymity.

In order to allow the nurses on night shift to participate in the study, the questionnaires were delivered personally by the researcher, on the wards, between 19h30 and 22h00. Available and volunteer nursing staff were asked if they would like to participate in the study. Nurses who agreed to participate, had to read and sign the consent form, before completing the questionnaire.

At the end of the 2 week period only 77 nurses had participated in the study. When the researcher discussed the low participations with the supervisors of various wards, the supervisors stated that many nurses, on the day shift, would like to participate, but did not have the time to leave the ward. The researcher was asked to extend the data collection period and to go personally to each of the wards. It was agreed that the time between 12h00 and 14h00 was most suitable.

Therefore, the researcher extended the data collection period by a further 2 weeks. Supervisors were encouraged to inform their staff on the wards. During the following two weeks the researcher visited the wards during both day and night shifts.

During the last 3 days of the second week, there were no more voluntary participants available.

Data collection lasted thus a total of 4 weeks and 188 participants took part.

3.7 DATA ANALYSIS

The statistical analysis is a procedure for providing quantitative information in a useful and understandable way (Polit & Hungler, 1995). Not having the help of statistics, the quantitative data, collected in a research project, would be hardly more than a chaotic mass of numbers (Polit & Hungler, 1995).

Therefore, all questionnaires were numerically coded, captured and analysed by using the statistical package for social sciences (SPSS) 22.0 version. Descriptive statistics have been used to describe the dependent variable (knowledge) and independent variables (socio-demographic characteristics of participants and experience with stroke). One of the objectives was to determine the association between the knowledge of dysphagia and the socio-demographic factors, therefore inferential statistics were used in three levels of analysis:

Level 1: A correlation matrix (Appendix H) was computed to determine whether there were significant associations between the demographic variables and knowledge of the symptoms of dysphagia, complications of dysphagia and management of dysphagia. Significant associations were tested at a 0.05 alpha level. Correlation was appropriate to determine the association between the stated variables since it is a mathematical index of the association between two sets of data (Pretorius, 2007). The usefulness of a correlation matrix is that it allows one to identify which demographic variables might be significantly associated with the predictor and outcome variables such that they constitute covariates that need to be controlled for or accounted for in subsequent analyses (Kaplan, 1987).

Level 2: Coefficients of determination were calculated to determine the percentage of the variance on a particular variable that is explained as a function of knowledge about another variable (Balvanes & Caputi, 2001).

Level 3: Regression analyses were performed to test the predictive relationship between identified predictor variables and knowledge of the symptoms, complication and management of dysphagia

respectively. Regression analyses attempt to find the best fitting line through the data set so that the distance between the furthest points from the regression line and the regression line are minimized (Howell, 2007). This is called the principle of least squares and it enables us to set a regression line that can be used to forecast performance on one variable based on knowledge of another (Kranzler, 2010). The type regression analysis (parametric versus non-parametric) used will depend on whether all the assumptions have been met e.g. normal distribution, homogeneity of variance and a linear relationship (Terre Blanche & Durrheim, 1999). In this instance all assumptions were met and the parametric version of the test could be used. Furthermore, the sample size must support the proposed analysis and for the purposes of this study, a threshold criteria of 15 participants per predictor variable was used to determine whether proposed models were supported in terms of sample size (Howell, 2007). The largest number of predictors used was six which meant that the sample had to include at least 90 participants. As mentioned before the sample consisted of 184 participants that satisfied the threshold criterion. The ensuing multiple regression analyses tested three models for significance. Model 1 regressed position at work, qualifications and training caring for patients with eating problems onto knowledge of the symptoms of dysphagia. The second model regressed position at work, qualifications, experience caring for a patient with dysphagia, and training in caring for patients with eating problems onto knowledge of the complications of dysphagia. The third model regressed position at work, qualifications, experience caring for a patient with dysphagia, training in caring for patients with eating problems, knowledge of the symptoms of dysphagia and knowledge of the complications of dysphagia onto knowledge of complications of dysphagia.

Multiple regression is appropriate for testing the strength of predictors against one another (Kranzler, 2010). Such analyses partial out the shared variance or joint explanation and then tests the unique contributions of each predictor for significance at a 0.05 alpha level. The unique contribution is evidenced by the semi-partial regression coefficient that is tested for significance

whilst controlling for all other variables in the model. The status of a predictor is tested in the context of a model and it is only interpreted if the overall model tested significant at a 0.05 alpha level. In other words, the combination of predictors in a given model must contribute significantly more to the explanation of variance on the outcome variable than the default or constant model that only consists of the mean of the outcome variable (Clark-Carter, 2004; Kranzler, 2010).

The results of this study have been presented in the form of tables.

3.8 DESIGN OF THE KNOWLEDGE-BASED INTERVENTION

A knowledge-based intervention program was designed based on the information obtained from the responses to the questionnaire. The information that was obtained was used to formulate the actual content which was included in the knowledge-based intervention program. This would then assist program facilitators in using different methods to teach knowledge related to the outcomes of a knowledge-based intervention.

Donnelly and Fritzmaus (2005) suggest, that before designing an intervention program two aspects should be considered such as: why is the subject matter important and what the educational goal is.

According to Martino et al. (2012), early identification and correct management can reduce aspiration pneumonia and even death, therefore, this subject is important for the intervention program. Properly informed nurses play a vital role in the recognition and management of dysphagia (Hines et al, 2013). Therefore, the goal of the intervention program is to increase nurses' skills and knowledge to perform better in this area. Furthermore, Donnelly and Fritzmaus (2005) stated, that it is important to take into account that there is no universal way of learning, because people learn in different ways (Procter, 2003). For instance, some people are visual learners, some are auditory learners, and some people are practical learners ("learning by doing") (Bersin, 2004). To address the different ways to learn, the researcher will use a blended learning approach as this

will give the researcher the opportunity to combine different kinds of teaching techniques (Bersin, 2004).

When designing each module of the intervention program the principles highlighted by Donnelly and Frizmaurice (2005) were considered. Table 3.1 below presents an outline of the design principles.

Table 3.1: Outline of design principles

Learning Outcomes	Teaching Strategy	Learner Activity	Assessment of learner
What kind of learning are you trying to achieve?	How will the content be delivered?	What learning activities can be organised to meet the outcome?	How will the outcomes be evaluated?

The intervention program was developed based on design principles, together with a speech and language therapist and a nurse from the training administration unit of Oshakati. Each principle was discussed on the ability to conduct, in the given setting.

3.9 ETHICAL CONSIDERATIONS

The Senate Research Grants and Study Leave Committee at the University of the Western Cape (Appendix A), as well as the Ministry of Health and Social Services (Appendix B) in Namibia were contacted for permission, and ethical approval to perform the study. Thereafter, the superintendent (Appendix C) of the Intermediate Hospital of Oshakati was asked for permission to conduct the study.

Before the survey took place, the aim and purpose of the study was explained to the nurses. The participants signed a consent form (Appendix E) stating that their participation in this study is voluntary, and all information will remain anonymous and confidential. The participants have the right to withdraw from the study at any time without any consequences. In order to maintain anonymity and confidentiality, no names appeared on the questionnaires, and all consent forms as well as questionnaires were collected in separate boxes and stored in different cabinets.

A final copy of the results of the study was submitted to the University of Western Cape, as well as the Ministry of Health and Social Services, in Namibia

3.10 SUMMARY

Chapter three informed the reader about the setting, Oshana Intermediate Hospital in the Oshana region of northern Namibia, where the current study was conducted. The researcher highlighted the research design, the instrument, as well as population and sample of the current study. Further methodological issues of the quantitative study such as validity and reliability were introduced. It also described the procedure of data collection and data analysis. At the end of the chapter the researcher introduced the design of the knowledge-based intervention program. The outline of the data analysis will be presented in Chapter four.

CHAPTER FOUR

RESULTS

4.0. INTRODUCTION

This chapter presents the results of the study. All of 500 nurses working at the hospital who met the inclusion criteria were invited to participate in the study. One hundred and eighty-eight (188) nurses accepted the invitation, completed and returned the questionnaires. Four questionnaires were excluded from the study, because certain sections of the questionnaire were not completed. Bennett (2001) suggested that when more than 10% of data is missing, statistical analyses are likely to be biased. Therefore, the final sample consists of one hundred and eighty-four (184) questionnaires.

The results are presented in the form of descriptive statistics, and are shown in tables according to the objectives.

This chapter firstly describes the socio-demographic characteristics of the participants, which include age, position of the nurse, qualification of the nurse, years of work experience, the current ward of practice, as well as experience with managing stroke patients.

Secondly the chapter describes the participants' knowledge of dysphagia presented under subsections such as the knowledge of signs and symptoms, the knowledge of complications, and the knowledge of management.

4.1 SOCIO-DEMOGRAPHIC CHARACTERISTICS OF PARTICIPANTS

The age of the study sample ranged from 21 to 66 years with a mean age of 43.88 years (Standard Deviation = 13.12). The majority of the respondents were in the age category between 41-50 years (n = 54, 29.7%). Of the one hundred and eighty-four nurses, 103 (56%) were registered nurses and 81 (44%) were enrolled nurses. Eighty-one (44%) of nurses had gained a Certificate, which also represents the majority. More than half of the participants (64.7%, n= 119) had 10 and more years of experience while those with the lowest years of experience are represented with 16.3% (n = 30). Nurses from internal medicine were the main group of participants (21.2%; n = 39), followed by 23 nurses (12.5%) from the paediatrics ward, and 21 nurses (11.4%) from the surgery ward, the remaining wards were represented on average by 4.5% of the participants. Some participants omitted some demographic questions, leaving missing values in age, qualification and years of experience variables. Two participants did not mention their age. One participant made no disclosures about their qualifications, and one participant gave no information on years of experience. These results are presented in the Table 4.1 below.

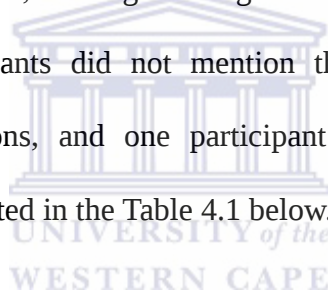


Table 4.1: Socio-demographic characteristics of participants

Demographic variables	Characteristics	Frequency n	Percentage %
Age (years) (n=182)	21-30	48	26.4
	31-40	21	11.5
	41-50	54	29.7
	51-60	46	25.3
	61 and above	9	4.9
Position (n=184)	Registered nurse	103	56.0
	Enrolled nurse	81	44.0

Qualification (n=183))	Certificate	81	44.0
	Diploma	61	33.2
	Bachelor of Science	39	21.2
	Master of Science	2	1.1
Years of experiences (n=183)	0-3	30	16.3
	4-6	27	14.7
	7-9	7	3.8
	10 and above	119	64.7
Ward of practice (n=184)	Medical	39	21.1
	Orthopaedic	13	7.1
	Surgery	21	11.4
	Outpatient Department	9	4.9
	Maternity	12	6.5
	Gynaecology	9	4.9
	Psychiatric	9	4.9
	Paediatric	23	12.5
	TB-Ward	10	5.4
	Ophthalmology	7	3.8
	ICU	8	4.3
	Operating Theatre	8	4.3
	X-ray	1	0.5
	Casualty	8	4.3
	Administration	7	3.8

4.2 PARTICIPANTS EXPERIENCE WITH STROKE

Table 4.2 below, illustrates that the majority (n = 153, 83.2%) of participants reported that they had cared for stroke patients, and 119 (64.7%) stated that they had cared for stroke-patients with eating and/or swallowing difficulties. With regard to the participants with training in eating and/ or swallowing difficulties it is shown that the majority of the participants 134 (71.2%) did not receive any formal training. Further, 72.8% nurses indicated that they are not satisfied with their knowledge regarding eating and swallowing difficulties, and 93.5% (n = 172) of nurses stated, that they would like to have further formal training.

Table 4.2: Experience with stroke variables frequency table (n = 184)

Variables	Characteristics	Frequency n (%)
Have you ever cared for a patient who had a stroke?	Yes	153 (83.2)
	No	31 (16.8)
Have you received training in nursing stroke patients?	Yes	98 (53.3)
	No	86 (47.7)
Have you ever cared for a stroke-patient with eating and/or swallowing difficulties?	Yes	119 (64.7)
	No	45 (24.5)
	Not sure	20 (10.9)
Have you received formal training on eating and/or swallowing difficulties in stroke-patient?	Yes	53 (28.8)
	No	131 (71.2)
Are you satisfied with your knowledge about eating and swallowing difficulties?	Yes	50 (27.2)
	No	134 (72.8)
Would you like to receive further formal training and information about eating and swallowing disorder in stroke patients?	Yes	172 (93.5)
	No	12 (6.5)

4.3 KNOWLEDGE OF NURSES REGARDING DYSPHAGIA

4.3.1 KNOWLEDGE OF DYSPHAGIA

The aim of the study was to determine the knowledge of the nurses about dysphagia. This information was determined using a Likert type scale. The level of knowledge was ranked. A score of 75% and above was classified as “high”, 74% to 50% was classified as “moderate”, and score from 50% and below was classified as “low”.

4.3.2.1 PARTICIPANTS' KNOWLEDGE OF SIGNS AND SYMPTOMS OF DYSPHAGIA

For this section, a total score of 13 points could be achieved. The average correct response score was 8.4 points (64.62%). The achieved overall percentage of 64.62%, indicates a moderate knowledge.

Table 4.3 below illustrates the knowledge of nurses concerning the signs and symptoms of dysphagia. The majority of participants (82%) agreed that coughing while eating is a sign of dysphagia. While only 9% of the participants knew that patients do not always cough when they aspirate.

More than 80% of the participants indicated correctly that food remains in the mouth after eating is a sign of dysphagia (85.9%; n=158), but only 51.6 % realise that difficulty closing lips is also a sign of dysphagia.

Table 4.3: Participants' knowledge about the signs and symptoms (n = 184)

Variables	Disagree n (%)	Unable to decide n (%)	Agree n (%)	Total score per variable
Coughing while eating	20 (10.9)	12 (6.5)	152 (82.6) *	1
Skin irritations	128 (69.6) *	34 (18.5)	22 (12)	1
Feeling of food getting stuck in the throat.	8 (4.3)	7 (3.8)	169 (91.8) *	1
Choking on saliva during non- mealtimes.	38 (20.7)	36 (19.6)	110 (59.8) *	1
Poor movement of the tongue	17 (9.2)	17 (9.2)	150 (81.5) *	1
Food remains in the mouth	17 (9.2)	9 (4.9)	158 (85.9) *	1
Poor chewing	25 (13.6)	24 (13)	135 (73.4) *	1
Patients <u>always</u> cough if they aspirate.	17 (9.2) *	19 (10.3)	148 (80.4)	1
Difficulty closing lips	58 (31.5)	31 (16.8)	95 (51.6) *	1
Weight loss	53 (28.8)	17 (9.2)	114 (62) *	1
Frequent throat clearing after swallowing.	50 (27.2)	25 (13.6)	109 (59.2) *	1
Hoarse voice	28 (15.2)	24 (13.0)	132 (71.7) *	1
Chest pain	88 (47.8)	48 (26.0)	48 (26.1) *	1
Total of score				13

* correct answer

4.3.2.2 PARTICIPANTS' KNOWLEDGE OF COMPLICATIONS OF DYSPHAGIA

For the section relating to knowledge of complications, a total score of 10 points could be achieved. As seen in Table 4.4 below, the average correct response score was 5.81 point. The overall achieved percentage of 58.15%, indicates a moderate knowledge.

Nearly half (47.8%) of the participants did not know that pneumonia is a complication of dysphagia. While 89.1% responded correctly, that aspiration is a complication of dysphagia, whereas only 60.3% knew that complications from dysphagia greatly increase the chance of mortality.

Table 4.4: Participants' responses on their knowledge of the complications (n = 184)

Variables	Disagree n (%)	Unable to decide n (%)	Agree n (%)	Total score per variable
Increased mortality	48 (25)	27 (14.7)	111 (60.3) *	1
Pneumonia	58 (31.5)	30 (16.3)	96 (52.2) *	1
Anaphylactic Shock	65 (35.3) *	29 (15.8)	90 (48.9)	1
General weakness	22 (12.0)	10 (5.4)	152 (82.6) *	1
Problems with digestion	27 (14.7) *	28 (15.2)	128 (69.6)	1
Aspiration	16 (8.7)	4 (2.2)	164 (89.1) *	1
Dehydration	18 (9.8)	7 (3.8)	159 (86.4) *	1
Sudden heart attack	48 (26.1) *	50 (27.2)	86 (46.7)	1
Malnutrition	24 (13.0)	2 (1.1)	158 (85.9) *	1
Haematemesis (vomiting blood)	90 (48.9) *	49 (26.6)	45 (24.5)	1
Total of score				10

* correct answer

4.3.2.3 PARTICIPANTS' KNOWLEDGE OF MANAGEMENT OF DYSPHAGIA

As shown in table 4.5 below, for this section, a total score of 7 points could be achieved. The average correct response score was 3.45 points. The attained percentage of 49.28%, indicates a poor knowledge.

A very high percentage (91.8 %) knew that patients with a feeding tube need daily oral hygiene. Furthermore, 72.3% of nurses knew that feeding the patient while he is lying flat on his back is not correct. Only 4.9 % (n = 9) of nurses knew that watery liquids are not the safest substances to drink.

Table 4.5: Participants' responses on their knowledge of management (n = 184)

Variables	Disagree n (%)	Unable to decide n (%)	Agree n (%)	Total score per variable
Patients with a feeding tube need daily oral hygiene (mouth washing and brushing of the teeth).	9 (4.9)	6 (3.3)	169 (91.8) *	1
Thickened liquid should be avoided.	34 (18.5) *	13 (7.1)	138 (74.5)	1
Watery liquids are the safest substances to drink.	9 (4.9) *	4 (2.2)	171 (92.9)	1
All patients with difficulty in swallowing need a feeding tube.	46 (25) *	13 (7.1)	125 (67.9)	1
The best position while feeding the patient is when the	133 (72.3) *	15 (8.2)	36 (19.6)	1

patient lies flat on his back.				
The patient can always eat normal hospital food.	146 (79.3) *	13 (7.1)	25 (13.6)	1
Feeding tube is only indicated in patients with impaired consciousness.	97 (52.7) *	19 (10.3)	68 (37)	1
Total of scores				7

* correct answer

4.3.2.4 PARTICIPANTS' OVERALL KNOWLEDGE OF DYSPHAGIA

The correct response rate for all three knowledge sub-sections (sign and symptoms., complication and management of dysphagia) combined was 57.34%, this results in an average of 17.65 points, out of 30 points which could be achieved. This demonstrates a moderate overall knowledge level.

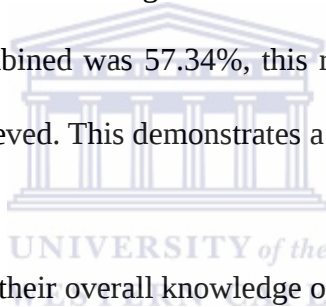


Table 4.6: Participants' responses on their overall knowledge of dysphagia (n = 184).

Variables	Highest possible score (%)	Achieved points (%)	Level of knowledge
Section of knowledge of sign and symptoms	13 (100%)	8.4 (64.62%)	Moderate
Section of knowledge of complications	10 (100%)	5.8 (58.15%)	Moderate
Section of knowledge of management	7 (100%)	3.45 (49.28%)	Poor
Total of all sections	30 (100%)	17.65 (57.34%)	Moderate

4.4 ASSOCIATION BETWEEN POSITION, QUALIFICATION, TRAINING AND EXPERIENCE OF PARTICIPANTS' KNOWLEDGE OF DYSPHAGIA

4.4.1 ASSOCIATION BETWEEN VARIABLE

From the correlation matrix it becomes evident that Position as a nurse practitioner, Qualification of the nurse practitioner, and Training in caring for patients with eating problems and Experience in caring for patients with eating problems were the four variables that were significantly correlated with different aspects of the knowledge of dysphagia. Thus these variables were included in the regression models to test for the predictive relationship with knowledge about the signs and symptoms, complications and management of dysphagia.

Knowledge of signs and symptoms and complications were thought to be related to knowledge of management at a theoretical level and thus they were included in the third regression model that addressed knowledge of management. Knowledge of complications was also significantly correlated with knowledge of management at a .01 alpha level.

4.4.2 REGRESSION ANALYSIS

Table 4.7: Regression analysis of variables regressed onto participants' knowledge of dysphagia

Model	Predictors	Outcome	R2	<i>b</i>
1	Training in caring for patient	Knowledge of symptoms	.043*	-.022
	Position			-.298*
	Qualifications			-.128
	Caring for pt (excluded)			
2	Training in caring for patient	Knowledge of	.070**	-.148*

	Position	complications		.026
	Qualifications			.044
	Cared for patient with eating problem			-.184*
3	Training in caring for patient	Knowledge of	.073**	.168*
	Position	management		-.169
	Qualifications			.095
	Cared for patient with eating problem			-.012
	Knowledge of symptoms			.003
	Knowledge of complications			.002

From the above Table 4.7 it becomes evident that all three models tested significant. Model 1 explained 4,3% of the variance on knowledge of signs and symptoms. Model 2 explained 7% of the variance on knowledge of complications and model 3 explained 7.3% of the variance on management.

Having received training in the care of a patient with dysphagia could significantly predict knowledge of the signs and symptoms of dysphagia controlling for the qualifications and position of the nurse practitioner at a.05 alpha level. For every one unit change in exposure to such patients, knowledge of symptoms decreased by .298 units. The signage suggests an inverse relationship, but that is actually a function of the way in which the variable was coded. Thus a decrease actually signifies an increase. Thus training provided significantly more explanation on the knowledge of symptoms of dysphagia controlling for the qualification and position of the nurse practitioner.

Training in caring for a patient with dysphagia was a significant predictor of the management of dysphagia controlling for the qualifications and position of the nurse practitioner, experience in having provided care for a patient with eating problem, as well as knowledge of the symptoms

and complications of dysphagia at a.05 alpha level. For every one unit change in training on caring for such patients, knowledge of management decreased by .168 units in knowledge of complications controlling for the other variables in the model. The signage suggests an inverse relationship, but that is actually a function of the way in which the variable was coded. Increased training provided a significant explanation in the knowledge of management of patients with dysphagia controlling for the other variables in the model

In short, training has consistently emerged as a significant predictor over and above the position and qualification of the nurse practitioner when predicting knowledge of signs and symptoms, complications and management of dysphagia controlling for specific other variables. Even though the effect sizes were small for the models tested, the clinical significance of additional or diagnosis specific training cannot be underestimated.



4.5 KNOWLEDGE-BASED INTERVENTION PROGRAM

The results of the questionnaire indicated that there is an existing lack of knowledge among the nurses regarding dysphagia. The results in the section “signs and symptoms of dysphagia”, as well the section with “complications of dysphagia” were moderate. However the section “management of dysphagia” indicated poor knowledge. According to the results, the researcher will focus her intervention program on all sections, with emphasis on the management of dysphagia. Based on all the above information a knowledge-based intervention (Appendix G) was designed according to the design principles mentioned in chapter 3.8. Included in the knowledge-based intervention would be the outcomes, teaching strategy, activity and evaluation strategy. In Table 4.6 below, a summary of the design principles is presented. To implement an intervention program the researcher will use a blended learning approach, because people learn in different ways, and blended learning gives an opportunity for an effective combination of various learning techniques (Procter, 2003). There are


visual learners, those learners relate most effectively to written information such as diagrams, images, and pictures. Such can be introduced through PowerPoint, a whiteboard as well as watching videos. Auditory learners prefer to listen to lectures, discussions, and audio and to take notes later. Another way to learn is “learning by doing”, that is experiential learning. Experiential learning requires the highest level of learning skills. This kind of learning creates a high level of understanding, context, and memory of something new. Therefore, training techniques such as simulations, exercises at the workplace, labs, web interactive, scenarios, and role-play are best suited to this kind of learning (Bersin, 2004).

The intervention program will be run over a three day training program. Therefore, two nurses from each ward 7, 8, and 1, all of them are managing stroke patients, will be invited and excused from their duties. One of the administration nurses will assist the researcher to conduct the workshop.



Table 4.8: Intervention Program for a 3 day training course in dysphagia

Learning Outcomes	Teaching Strategy	Learner Activity	Assessment of Learner
What kind of learning are you trying to achieve	How will the content be delivered?	What learning activities can be organised to meet the outcomes	How will the outcomes be evaluated
Knowledge: Inform Anatomy and physiology of normal swallowing Definition of Dysphagia	Power Point Video Power Point Video	Question and answer session to clarify and expand newly acquired knowledge.	Questionnaire post intervention

<p>Sign and Symptoms of Dysphagia in stroke Patients</p>	<p>Power Point Picture Group work</p>		
<p>Management of Dysphagia in stroke patient: The role of the nurses and other health care professionals in stroke patients suffering dysphagia</p>	<p>Power Point</p>		
<p>-Introduction of various screening methods</p>	<p>Power Point written material</p>		
<p>-Different kinds of food consistency.</p>	<p>Power Point, illustrative food material</p>		
<p>-Mealtime environments</p>	<p>Power Point</p>		
<p>-Oral care</p>	<p>Power Point , illustrative oral care material</p>		

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Skills: through practice			
Management of dysphagia	Power Point		
Screening of stroke patient	Group work Role play	Administer Screening protocol on each other Question and answer session to clarify and expand newly acquired knowledge and case studies.	
Different consistencies of food and liquid	Group work Illustrative Material	Taste different consistency of food and liquid and discuss the experience.	
Mealtime environment	Group work Role play	How to use adjustable bed Positioning of Patient (lying or sitting) and then feed each other with different consistencies in different positions. Discuss the experience.	

Oral care	Group work Role play	Oral care with illustrative material, practicing on each other. Discuss the experience.	
Application	In the hospitals wards on selected patients, also discussions around case studies.	Apply: Screening of patients Ordering correct consistencies of food and liquid for each dysphagia stroke patient. Prepare the mealtime environment for the patient. Oral care after meals	



Reinforcement of experiences	Whiteboard Group discussion lead by the researcher	Each participant gives feedback on their ward experience from the day before, using the whiteboard to summarise the experience. Encourage participants to collaborate in finding solutions to difficulties experienced.	
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		Feedback is an important component of the educational process, and offers learners an opportunity to compare their performance and experience with the educational aim.	
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Training day 1 will include the following content areas: definition and incidence of dysphagia, physiology and pathophysiology of swallowing, session about the signs and symptoms of dysphagia, screening and care with specific focus for risk factors and suitable diets and textures of food, as well as a session about oral care, and environment during mealtime with focus on the correct position of the patient during mealtimes.

The afternoon session will focus on practical training such as:

- Taste different consistency of food, to feel the difference between liquid and solid food.
- Explain and try out the various function of the beds.
- Is there a difference between lying and sitting during eating.

Learning in groups is important, because learners can help each other to understand the material (Peters, 2002). Therefore, participants will divide into groups to practice what they have learned in theory during the morning.

Training day 2 will be held on the ward. Peters (2002) stated, that learning is best by having experiences and reflecting on them, because learners want to know how what they learn will apply at their workplace. Therefore, participants are given the opportunity to transfer what they have learned from the previous day, into practice on patients. The researcher will be available throughout the day at the ward to answer questions that arise, and to observe whether any specific barriers are

encountered. Specific issues will be discussed during feedback the following day.

Training day 3 consists of feedback and conclusions. Branch and Paranjape (2002) identified feedback as a gap between the current and intended performance. Feedback is an important component of the educational process, and offers learners to compare their performance and experience with the educational aim. In addition it helps the learner to improve and to achieve their learning goal (Schartel, 2012). If the feedback should be successful teacher and learner have to work together in a positive way taking care to use non-judgemental language. Discussions should be specific, based on direct observation, and the focus should be on the performance and not on the individual (Kaul, Gong, & Guiton, 2014). Both the participants and the researcher, will benefit from the opportunity to talk about the experience from the previous day, and where it may be necessary to make changes.



4.6 SUMMARY

The aim of the current study was to determine the knowledge of nurses regarding dysphagia in stroke patients. The results therefore indicated that there is a higher knowledge level in the sections of the signs and symptoms as well as complications, compared to the management of dysphagia section, where the knowledge level was poor. The statistics show very clearly that training and experience in the care of dysphagia patients is a stronger predictor of knowledge than the initial qualification or years of experience of a nurse

These findings will therefore be further discussed in Chapter Five.

CHAPTER FIVE

DISCUSSION

5.0 INTRODUCTION

This is the first survey carried out in Namibia to determine nurses' knowledge about dysphagia in stroke patients. These findings demonstrate that nurses have moderate to poor knowledge about the sign and symptoms, complications and management of dysphagia. Therefore, the main findings of the current study will be discussed in relation to the aim and objectives of the study. The results are discussed with reference to the literature. This chapter also indicated some limitations of this study.



5.1 DEMOGRAPHIC STATUS OF THE PARTICIPANTS

The respondent's age ranged from 21 to 66 years, and included younger and older nurses. There are relatively few participants in the age range of 31-40 years. In an interview with the human resource officer of IHO (2014) one possible reason given for the low number of nurses in this age group, could be that nurses are obliged to stop working as a result of family responsibilities. A study done by Nooney, Unruh and Yore (2010) confirmed that early separation from employment in the age group of 30 to 40 years due to marriage, maternity leave, caring for young children and the elderly was common. The majority of the participants come from the age group 41 to 50 years with a percentage of 29.7% (n = 54). An explanation for this high number could be that nurses in the age group 41-50 have returned from their period of leave, such as maternity leave (Nowak, Naude, & Thomas, 2013). Thereafter, in the age group 51 to 60 years the numbers drop slightly to 25.3 % (n = 46). The physical demands of the job, no further financial incentive as well as less need for income in 2-worker families with adult children, lead to entering into early retirement. Losing these

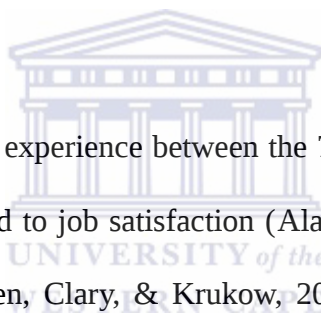
experienced nurses, deprives newer nurses of the opportunity to learn valuable skills and knowledge from older nurses (Berliner & Ginzberg, 2002). From 61 years (4.9%, n = 9) the number of participants drops significantly, this is to be expected as most nurses retire completely from employment at this age (Nooney et al., 2010).

The majority of participants were registered nurses with 56% (n = 103) compared to the enrolled nurses with 44% (n = 81). This was interesting as there are more enrolled nurses employed than registered nurses. As mentioned earlier, the Intermediate State Hospital of Oshakati employs a total of 500 nurses, 254 are enrolled nurses and 246 are registered nurses (Kakungulu, 2011). During data collection the researcher realized that registered nurses were more willing to participate than enrolled nurses. The researcher observed that registered nurses explained to enrolled nurses, that this study is not only for the benefit of the researcher's post graduate degree, it is for the benefit of all nurses and gives all nurses an opportunity to participate in the provision of better care of patients, and to contribute to moving nursing science forward (National Institutes of Health, Bethesda, Maryland, USA, 2014). Another reason could be also, that 38 of registered nurses have a Bachelor of Science and 2 have a Master of Science, therefore these nurses are more familiar with research work than enrolled nurses.

The information about the years of experiences among the participants shows unevenness.

The low participation of nurses with 3 and less years of experiences corresponds with the low number of young nurses employed by the hospital and reflects the falling interest of young people in nursing as a career (personal communication with human resource officer of the hospital, September, 2014). This seems to be a worldwide problem. Berliner and Ginzberg (2002) from the United State, state that 30 -40 years ago young women who wanted to enter a profession had two choices, either to be a teacher or a nurse. Today, up to half of the students studying medicine are

women and numerous women enter law and business classes. This is a great boom for women to qualify, but on the other hand, it is of disadvantage for the profession of nursing. Neilson and McNally (2013) from Scotland found out, that at schools, pupils are strongly influenced by their parents and teachers when it comes to choosing a career. If pupils achieve good grades they are advised not to choose nursing as a career, because it will be a waste of the pupils' good results. Dockey and Bams (2005) from Australien, as well Andrew (2005) from New Zealand have also experienced a decline in the number of young people applying for nursing as a career. Yun et al. (2010) from China, state that a factor of shortage in nursing as a career is because of the low status and the negative image. Therefore better ways have to be found to make nursing more attractive to prospective students, emphasising the advantages of nursing as a career at the bedside and science (Berliner & Ginzberg, 2002).



There is a sharp drop in the years of experience between the 7th and 9th year. The literature shows that nurse retention is directly related to job satisfaction (Alameddine, Baumann, Onate, & Deber, 2011; Strachota, Normandin, O'Brien, Clary, & Krukow, 2003). Nurses are leaving the hospital either for further training or changing their type of employment completely (personnel communication with human recourse officer, September, 2014). There is a movement of nurses towards private hospitals, better jobs abroad or non-governmental organizations. Reasons given for resignation are the pressure of poor working conditions and low salary (Iiping, Hofnie, van der Westhuizen, & Pendukeni, 2006). The consequence of the loss of trained, experienced nurses is that the quality of patient care declines. Novice nurses cannot be expected to have the ability, intuition and confidence of an experienced nurse. Novice nurses may not display the commitment to the organization which develops over years of shared experiences (Strachota et al., 2003).

The high representation of nurses with more than 10 years of experience is explained by Iiping et al. (2006), for example that salaries of qualified nurses, who stay with the Ministry of Health of

Social Services (MoHSS) are competitive in comparison to salaries in other SADC countries.

Furthermore, the MoHSS provides a good medical aid, as well as housing subsidies. Nurses also stay with the government due to their loyalty and a sense of patriotism, as well to care for patients.

The question relating to “ward of practice” shows a significantly high participation of nurses who deal with the possibility of dysphagia in their daily practice. Participants from the medical ward made up 21.1% (n = 39) of the total participants. The medical ward cares for patients with neurogenic diseases, and stroke is one of the diseases that has a high incidence of dysphagia (Altmann, Richards, Goldberg, Frucht, & McCabe, 2013). Nurses from the Children's ward made up 12.5% (n = 23) of participants. Nurses on this ward care for children with neurological impairment, who commonly experience dysphagia. These children might suffer from cerebral palsy, traumatic brain injury, stroke, and Down's syndrome (Morgan, Dodrill, & Ward, 2012). From the General Surgery 11.4% (n = 21) participants came. Dysphagia can occur in traumatic brain injury, as well as in head and neck cancer (Brady, 2008) and these patients are nursed on General Surgery wards. The University of California, Davis (2014), stated that the reasons for willingness to participate in a study are diverse and may include wishing to help other who are sick, to find a cure for an illness, to help to find ways to provide better quality of life, and to help scientists to find out more about how the human body and mind work. The “others” wards were represented on average by 4.5% of participants. In general we can say that these wards have little contact with dysphagia, and thus the motivation of the nurses was not strong enough to awake their interest to participate in a study concerning dysphagia.

5.2 KNOWLEDGE OF SIGNS AND SYMPTOMS

Nurses need to be aware of the signs and symptoms of dysphagia so that they are able to identify patients with dysphagia. Early identification of dysphagia and initiation of intervention can help sustain nutrition intake and reduce further complications (Bouziana & Tziomalos, 2011).

In the current study the majority of the participants were sure of their answers when questions were asked concerning the generally visible signs and symptoms of dysphagia, such as coughing while eating, feeling of food getting stuck in the throat, poor movement of the tongue, food remains in the mouth, poor chewing, hoarse voice, and weight loss.

The questions which related primarily to the more subtle symptoms and signs of dysphagia in stroke patients were poorly answered, such as choking on saliva during non-mealtimes, frequent throat clearing after swallowing, chest pain and patients always cough if they aspirate. These results are similar to a study done by Robertson (2008), among caregivers about the awareness in signs and symptoms of patients with dysphagia. Robertson's study showed that caregivers are more aware of visible signs than of the subtle symptoms.

Participants agreed with 80.4% (n = 148) that “patients always cough if they aspirate”, which is an incorrect answer, only 9.2% (n = 17) of the participants answered this question correctly. According to Masiero and colleagues (2008) 64.2% of stroke patients presented aspiration and from these 20.8% aspirated silently. Therefore, if silent aspiration is not diagnosed because it does not show any clear signs of aspiration pneumonia, the result can be an increase in morbidity and mortality (Leder & Suiter, 2014). This result would be consistent with the results of Robertson (2008) and Smith (2006) where caregivers and nurses showed less awareness of the signs and symptoms of silent aspiration. It can be shown, that participants have a moderate knowledge about the general and visible signs and symptoms of dysphagia, but in-depth knowledge which is needed to manage the condition is deficient.

5.3 KNOWLEDGE OF COMPLICATIONS

The overall correct average response rate for knowledge of complications was 58.15%, which indicates a moderate level of knowledge.

The good results of the participants about malnutrition (85.9%, n = 158), dehydration (86.4%, n=159), aspiration (89.1%, n = 164), as well as general weakness (82.6%, n = 152) in dysphagia could be explained by the fact that dysphagia is a part of the University of Namibia curriculum. The curriculum consists of the definition of dysphagia, factors which affect nutrition, linked to HIV/AIDS, thyroid conditions, as well as a complication of cancer such as throat cancer. Dysphagia in connection with neurological diseases are not a part of the curriculum (personal communication with the Dean of the University of Namibia, Oshakati Campus, September 2014). This could explain the poor results in the question relating to pneumonia (52.2%, n = 96) as a complication in stroke patients suffering dysphagia. Robertson (2008) found a similar result in her study, where the participants were less aware about recurrent pneumonia among dysphagia patients.

Aspiration pneumonia is a widespread complication among dysphagia patients, and it is associated with significant morbidity and mortality. Nurses need to be aware of the possibility of complication pneumonia caused by aspiration, and therefore it is important for them to identify dysphagia and to manage it correctly (Eisenstadt, 2010).

The moderate result in the question about mortality (60.3 %, n = 111), indicates that nurses are aware of the complication of mortality among stroke patients. Katzan, Cebul, Husak, Dawson and Baker (2003) found that the mortality rate among stroke patients with pneumonia was six times higher than for those without pneumonia. The researcher hypothesizes that participants really considered the complication of mortality as being directly related to damage caused by the stroke and not as a result of pneumonia or other symptoms of dysphagia. This point has to be examined more closely in future investigations.

Regarding the poor result of the answer "patient always cough when they aspirate" it can be

assumed, that there is no awareness of the link between silent aspiration, pneumonia and consequent mortality. This is confirmed by Garon, Sierzant, & Ormiston (2009), who found that patients with silent aspiration are more at risk for development of pneumonia. Coughing is a very obvious warning to the patient and hospital staff that aspiration is occurring. The lack of a cough reflex means that no warning of dysphagia is given, therefore the problem is not managed, and the patient continues to ingest food and liquids into the lungs, elevating the risk for development of complications.

5.4 KNOWLEDGE OF MANAGEMENT

Dysphagia is a well-known disorder in stroke patients, and can lead to serious complications such as pneumonia and even death. It is known that early and effective treatment can decrease these complications (Martino et al., 2012). The management of dysphagia can help to prevent aspiration pneumonia, improve eating, oral movements and nutritional status (Jacobsson et al., 2000).

Only half of the nurses (52.7%; n = 97) participating in this study recognized the statement "Feeding tube is only indicated in patients with impaired consciousness" as incorrect. There are many reasons other than impaired consciousness that would require a feeding tube for the patient to get safe and sufficient nutrition. Conditions such as aspiration of food or liquid, fatigue, motor impairment, visual spatial perception disorder, depression, and cognitive deficits can be the inducement for the use of non-oral feeding strategies, such as a feeding tube (Rowat, 2012).

With regard to the different degrees of severity of dysphagia, different treatment approaches are offered such as diet modification and thickened fluid.

The majority of the participants (92.9 % n = 171) agreed with the statement that "Watery liquids are the safest substances to drink". In contrast, the literature recommends to avoid thin liquids, because many patients with dysphagia are unable to drink thin liquids safely, and therefore have a higher

risk for penetration and aspiration of thin liquid while swallowing (Ney, Weiss, Kind, & Robbins, 2009). Also the majority of participants, 74.5 % (n = 138) agreed that "Thickened liquid should be avoided". This is also incorrect as thickeners increase the viscosity of liquids. Using thickener decreases the rate of flow through the mouth and pharynx and allows patients more time to initiate airway protection, thereby decreasing the risk of aspiration (Cichero et al., 2009; Brady, 2008; Clavé et al., 2006). Rosenvinge and Starke (2005), investigated the persistent lack of compliance of nursing staff with the SLT recommendations for the use of thickeners for feeding dysphagia patients. Their findings show that 38% of nurses did not comply with SLT recommendations for thickening food for dysphagia patients. This shows a lack of awareness among a large proportion of nurses of the potentially harmful consequences of their handling.



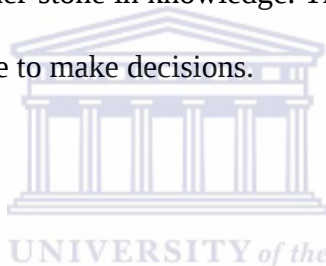
5.5 CORRELATION BETWEEN DEMOGRAPHIC FACTORS AND PARTICIPANTS' KNOWLEDGE OF DYSPHAGIA

The aim of the study was to determine the knowledge of nurses regarding dysphagia in stroke patients. Another aspect of the study was to correlate the knowledge of nurses with their demographic factors in an attempt to find out, how nurses gain their knowledge. Therefore, the knowledge of the nurses was correlated to their position as a nurse (registered or enrolled nurse), their qualification (Degree, Diploma, Bachelor or Master), their specific work experience in having cared for stroke patients with or without swallowing difficulties, as well as whether they have received specialised training in nursing stroke patients or training on eating and swallowing difficulties.

The results of the study indicated that nurses generally exhibit a suboptimal level of dysphagia knowledge, particularly in management of dysphagia. The nurse's qualification and position was not the relevant factor in this situation. If nurses had received training in the care of a patient with

dysphagia they could more reliably identify the signs and symptoms of dysphagia than nurses who had not received any specialised training in the area. This also applies to the management of dysphagia in stroke patients. Various studies conducted by Ilott et al. (2013) in England, Cichero et al. (2009) in Australia, Huang et al. (2006) in China, and Colodny (2001) in the USA all of them confirmed that training can significantly improve knowledge of dysphagia. In addition Schaller et al. (2010) and Harper (2007) reported, that nurses with more experience have a statistically significant higher knowledge score than nurses with less experience. This is confirmed by the recent study, which shows that not only nurses with training in caring for stroke patients show a higher level of knowledge of complications, but experience of caring for stroke patients is also an important factor regarding knowledge of complications.

It can be said that training is the corner-stone in knowledge. Therefore, well trained nurses are more confident in their work and more able to make decisions.



5.6 DEVELOPMENT OF THE HEALTH EDUCATION PROGRAM

The intervention program was designed based on the information obtained from the findings of the questionnaire and supporting literature. It was identified in this study that nurses lack knowledge regarding dysphagia, especially in the management of dysphagia in stroke patients. One reason for this could be that there is still no guidelines for training nurses in this field (Head et al., 2007) and this in turn leads to the effect that the role of nurses of managing dysphagia remains unclear (Colodny, 2001). The Namibia University's Nursing curriculum content only links dysphagia with HIV and throat cancer. Dysphagia as a disorder in stroke patient is not a part of the University of Namibia's curriculum, nor is dysphagia in general a subject in the curriculum in the nursing schools of Namibia. Blackwell and Littlejohns (2010) stated that the knowledge of nursing staff on the detection of swallowing difficulties could have a direct impact on stroke patient outcomes. Training

for nurses demonstrate high improvements in knowledge and in the ability to recognize and treat dysphagia in stroke patients (Ilott et al., 2014). Furthermore, nurses with knowledge are more self-confident and therefore more willing to make decisions regarding the management of patients (Magnus, 2001).

The findings of the study indicated that nurses who had received training in treatment of stroke patients and/or training in swallowing difficulties in stroke patients have a higher knowledge score compared to other nurses without training. These results confirm that training does influence knowledge, and therefore training should be offered.

5.7 LIMITATIONS OF THE STUDY

Following limitations to the study were found:

- The sample size in this study (n = 188) is relatively small in proportion to the amount of 500 invited nurses in that setting. This could lead to a lack of representation of all the nurses at the hospital. This is a convenience sample.
- The current study was only carried out in one hospital within the country. Hence, the results may not exactly reflect the knowledge of all nurses in the country.
- Another limitation of the study is that other health care professionals and care givers, who also manage stroke patients, were excluded from the study.

5.8 SUMMARY

This chapter summarises the major findings of the study in line with the study aim and objectives and related to similar findings by other studies in the literature. No other study was found especially with regard to the knowledge of nurses regarding dysphagia in stroke patients.

The researcher also highlighted that further training for nurses is very important, to improve the care of stroke patients and particularly the management of stroke patients suffering dysphagia.

Better informed nurses, will be more likely to pre-empt complications which occur in stroke patients. Chapter six will present a summary of the conclusion and recommendations.



CHAPTER SIX

CONCLUSION AND RECOMMENDATIONS

6.0 INTRODUCTION

This final chapter will present the conclusion and recommendations for future actions.

6.1 SUMMARY OF THE STUDY

The motivation to start this research work was that the researcher, working as a physiotherapist in this current research setting, encountered numerous barriers in connection with the rehabilitation of stroke patients. One of the barriers was the high incidence of dysphagia in stroke patients. The researcher proceeded to investigate this problem and try to establish the causes.

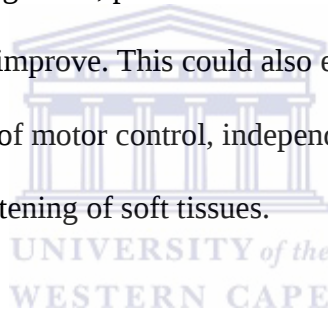
The detection and treatment of dysphagia lies in the scope of a speech and language therapist.

However, owing to the shortage of speech-language therapists in general, and in particular outside normal working hours, nurses become involved in all aspects of the problem of dysphagia. This is supported by the 24 hour presence of a nurse. Also, because nurses have the most contact with the patient, they are most likely to observe the signs and symptoms of dysphagia. The current hospital does not have a speech and language therapist and observations of the researcher found that awareness of nurses regarding dysphagia is weak. Also, literature consulted by the researcher showed that knowledge of the link between dysphagia and stroke patients in SSA is limited. The literature highlighted that the role of the nurse within the management of stroke patients in dysphagia is still unclear.

Therefore, the researcher developed a questionnaire to determine the knowledge of the nurses regarding dysphagia in stroke patients. The findings of the questionnaire showed that the knowledge

of nurses regarding the signs and symptoms, and the complications of dysphagia is moderate, but in the field of management the knowledge of nurses was poor. This was indicated through the poor answers to questions such as “tube feeding is only indicated in impaired consciousness patients”, “watery liquids” are the safest way to swallow, as well “thickened liquids” should be avoided. Based on these results, the researcher has designed an intervention program. The basis of the program came from referring to literature which showed how training of nurses in screening and management of dysphagia in stroke patients, can be very successful. Trained nurses show more confidence in dealing with dysphagia and pay more attention to the nutritional needs of their patients.

As a consequence of increasing the nurses' knowledge, stroke patients with dysphagia, will benefit from early diagnosis and better management, pneumonia rates will decrease, malnutrition will be eliminated, and motor recovery will improve. This could also enhance physiotherapy treatment, which aims to promote the recovery of motor control, independence in functional tasks, optimise sensory stimulation and prevent shortening of soft tissues.



6.2 CONCLUSION

The results of the present study show that participants have moderate knowledge regarding the signs and symptoms, and complications of dysphagia, but poor knowledge about management of dysphagia. It also established that nurses with further training have a higher knowledge score compared to other nurses without further training, regardless of the main educational background of the nurse. Therefore it is important that nurses be trained in the basic of principles of dysphagia management.

The idea of this study was to develop a training program based on the existing knowledge of the nurses. The aim of this study was not to examine to what extent the knowledge of nurses is

improved by a training program. No studies were found that investigated a comparative goal. The researcher believes that a training program which conveys basic knowledge (“why I'm doing something”) is better than a training program in which it is shown how a condition is managed, but without teaching the fundamentals. Therefore, the researcher developed a questionnaire first to determine the knowledge of the nurses, in order to then design a training program which would build on existing knowledge.

There is a need for more research into the role of nurses in diagnosis and management of dysphagia. As mentioned before, this usually falls under the responsibilities of a speech and language therapist, but in the absence of such a professional, the burden falls to the nurses.

Nurses who have direct interactions with stroke patients suffering dysphagia during hospitalization are in a good position to detect signs and symptoms of dysphagia and manage these patients correctly.



6.3 RECOMMENDATIONS

This deficit in knowledge can have a devastating effect on stroke patients suffering dysphagia, therefore, the researcher would like to make the following recommendations to improve the outcome of stroke patients suffering dysphagia.

-The Ministry of Health's department of speech and language therapy, in Windhoek, should be asked (by the researcher) to help with the following issues:

- A guideline for nurses should be developed and implemented at all hospitals. This will encourage the nurses to ensure that each stroke patient receives the correct treatment for dysphagia from the time of admission.

-An information booklet about dysphagia in stroke patients aimed at nurses and health professionals, should be developed and implemented on wards where the nurses are most likely to deal with dysphagia. The booklet should contain information about dysphagia, the signs and symptoms, possible complications and how to manage these patients.

-A bedside swallowing test which can be administered by nurses at the patient's bedside should be developed and implemented at all hospitals, to ensure that each stroke patient is screened for dysphagia on admission, before being given food, liquid or medication. Early screening for dysphagia can help to decrease aspiration-pneumonia, as well as to facilitate the provision of adequate nutrition in a safe and sufficient way.

-The monthly medical meeting, which is held in IHO hospital, can be used as a platform to present the guideline, the booklet, as well as the bedside-test to nurses, doctors and other health care workers at this hospital.

-The training division of nurses at IHO will be contacted and a copy of this document will be handed to them. The researcher will request the Head of the program to take notice of the importance of ongoing training of the handling of stroke patients with dysphagia. This could be done in the form of CPD courses.

- The Nursing Health Profession Board and Namibia Nursing Association will be informed through a copy of this document as well as at a meeting. As these two groups, are key stakeholders in the training of nurses, it is their prerogative to suggest that the University of Namibia, Nursing Department extends the existing dysphagia curriculum as well recommending that the nursing

schools implement a curriculum relating to dysphagia. The curriculum should address the three main areas of dysphagia, such as signs and symptoms, complications and management of dysphagia. It is therefore important that training of nurses should include theoretical as well practical aspects, for example how to assess dysphagia using a bedside swallowing test. This will give the nurses a good basic knowledge of dysphagia from the beginning of their careers.



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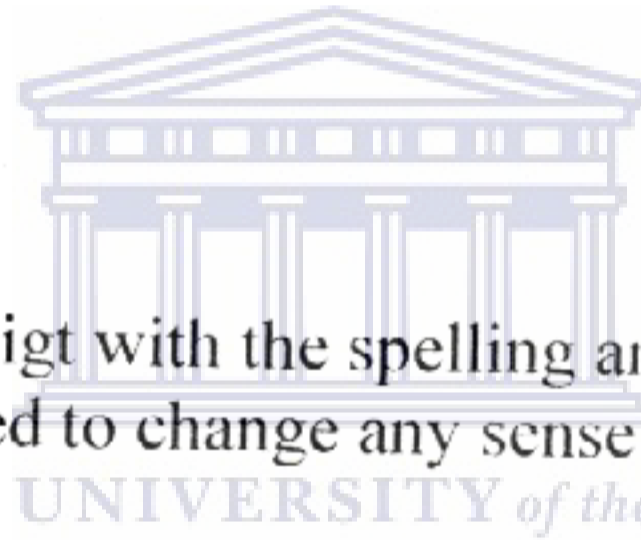
APPENDIX I

DEBORAH BRUNE
P O Box 2395
OSHAKATI
Namibia

13 November 2014

TO WHOM IT MAY CONCERN

ANDREA PICKEL-VOIGT – MASTER THESIS :
KNOWLEDGE OF NURSES REGARDING DYSPHAGIA IN PATIENTS WITH
STROKE, IN NAMIBIA



I have assisted Ms A. Pickel-Voigt with the spelling and grammar in her thesis.
I have however carefully avoided to change any sense or meaning of the text.

If you have any queries, please contact me on +264 811 272931

Yours sincerely



DEBORAH BRUNE

APPENDIX A



OFFICE OF THE DEAN DEPARTMENT OF RESEARCH DEVELOPMENT

11 March 2013

To Whom It May Concern

I hereby certify that the Senate Research Committee of the University of the Western Cape has approved the methodology and ethics of the following research project by:
Ms A Pickel-Voigt (Physiotherapy)

Research Project: Knowledge of nurse regarding dysphagia in patients with stroke, in N Namibia.

Registration no: 13/2/28

Any amendments, extension or other modifications to the protocol must be submitted to the Ethics Committee for approval.

The Committee must be informed of any serious adverse event and/or termination of the study.

A handwritten signature in black ink, appearing to read 'Patricia Josias'.

*Ms Patricia Josias
Research Ethics Committee Officer
University of the Western Cape*

Private Bag X17, Bellville 7535, South Africa
T: +27 21 959 2988/2948 . F: +27 21 959 3170
E: pjosias@uwc.ac.za
www.uwc.ac.za

A place of quality,
a place to grow, from hope
to action through knowledge

APPENDIX B



REPUBLIC OF NAMIBIA

Ministry of Health and Social Services

Private Bag 13198
Windhoek
Namibia

Ministerial Building
Harvey Street
Windhoek
Ref: 17/3/3

Tel: (061) 2032560
Fax: (061) 222558
E-mail: tkakili@mhss.gov.na
Date: 18 July 2013

OFFICE OF THE PERMANENT SECRETARY

Ms. A. Voigt
P.O. Box 37
Oshakati

Dear Ms. Voigt

Re: Knowledge of nurses regarding dysphagia in patients with stroke in Namibia.

1. Reference is made to your application to conduct the above-mentioned study.
2. The proposal has been evaluated and found to have merit. However, some issues in the proposal need to be revisited. Please find the attached comments for consideration.
3. **Kindly be informed that permission to conduct the study has been granted under the following conditions:**
 - 3.1 The data to be collected must only be used for completion of your master's degree in physiotherapy;
 - 3.2 No other data should be collected other than the data stated in the proposal;
 - 3.3 A quarterly report to be submitted to the Ministry's Research Unit;
 - 3.4 Preliminary findings to be submitted upon completion of study;
 - 3.5 Final report to be submitted upon completion of the study;
 - 3.6 Separate permission should be sought from the Ministry for the publication of the findings.
 - 3.7 Please forward the revised protocol to the Ministry upon addressing the raised concerns.

Yours sincerely,


MR. ANDREW NDISHISHI
PERMANENT SECRETARY

OFFICE OF THE PERMANENT SECRETARY
MINISTRY OF HEALTH AND SOCIAL SERVICES

APPENDIX C



REPUBLIC OF NAMIBIA
MINISTRY OF HEALTH & SOCIAL SERVICES
OSHANA REGION DIRECTORATE OF HEALTH

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INTERMEDIATE HOSPITAL OSHAKATI

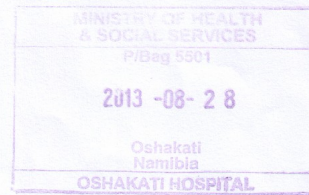
Enquiries:

Ref: Ref: 7/3

Andrea Pickel-Voigt

PO Box 37

OSHAKATI



APPLICATION TO CONDUCT RESEARCH ON KNOWLEDGE OF NURSES ON DYS-PHAGIE AT INTERMEDIATE HOSPITAL OSHAKATI.

Your letter on the above issue refers.

The Intermediate Hospital Oshakati Management granted you a permission to conduct your research on condition that you must adhere to the rules and regulations of the institution and the Ministry.

During your study period, you must be under the supervision of the Medical Officers and Registered Nurse in charge of the sections concern.

You are however required to sign an indemnity and attachment agreement with the MoHSS therefore you should report to the Human Resource Management office in the hospital for this purpose before your attachment.

Yours Sincerely

DR J AUGUSTINUS

ACTING MEDICAL SUPERINTENDENT

Cc: Drs Nakangombe

Dennar

Ms Dumeni

Registered Nurses-in-charge

Medical Superintendent:

Chief Control Registered Nurse: Ms S Dumeni

Chief Control Officer:

APPENDIX D

UNIVERSITY OF THE WESTERN CAPE

Private Bag X 17, Bellville 7535, South Africa
Tel: + 27 21-959, Fax: +27 21-959

Andrea Pickel-Voigt BSc(Hons)

Physiotherapy

PO Box 37, Oshakati, Namibia

Tel: +264 81 648 11 82

E-mail: anpickel@gmail.com

Invitation to participate to a study

Dear Participant,

I carry out a survey for my master's thesis. Your personally participation would be appreciated.

The filling of the questionnaire will be possible from the 3rd of March up to the 14th of march.

For this purpose the "Nursing Admin" room on the 2nd floor of the Administration building will be open from 11.00 o'clock until 14.00 o'clock.

It would be nice if everybody could attend in this study.

Thank you very much.

INFORMATION SHEET

Project Title: Knowledge of nurses regarding dysphagia in patients with stroke, in Namibia

What is the study about?

This is a research project being conducted by **Andrea Pickel-Voigt** from the department of physiotherapy at the University of the Western Cape. We are inviting you to participate in this research project because you are working at the Oshakati Intermediate Hospital as a nurse and therefore suitable for this study. The purpose of this research project is to determine the nurses knowledge of dysphagia (difficulty in swallowing) and to design an intervention based on the knowledge of the nurses. The information will be useful for the improvement of the care and the rehabilitation of stroke patients.

What will I be asked to do if I agree to participate?

You will be asked to sign a written informed consent before participating in the study. As a nurse working at the Oshakati Intermediate Hospital you will be asked to complete a questionnaire regarding dysphagia (difficulty in swallowing) in stroke patients.

It is expected that completion of the survey will take about 20-30 minutes.

Would my participation in this study be kept confidential?

We will do our best to keep your personal information confidential.

To help protect your confidentiality the survey will be anonymous. From the beginning the consent form which will have your signature will be kept separately from the questionnaire. The consent form as well as the survey will be locked in a safe place where only the researcher will have access to.

What are the risks of this research?

There are no known risks associated with participating in this research project.

What are the benefits of this research?

The researcher hopes that the outcomes of this study will improve nursing practice regarding dysphagia in stroke patients.

It is hoped that in the event of a positive result of the intervention programme the subject will be a part of the Continuous Professional Development (CPD) activity of Oshakati Hospital and other hospitals, nationwide.

In future it should improve the outcome of stroke patients treatment as a consequence of the knowledge gained.

Science will benefit from the information gained from this study and from its specific Namibian setting. This study will underline Oshakati Intermediate Hospital's standing as a teaching and research institution.

Do I have to be in this research and may I stop participating at any time?

Your participation in this research is completely voluntary. You may choose not to take part at all. If you decide to participate in this research, you may stop participating at any time. If you decide not to participate in this study or if you stop participating at any time, you will not be penalized or lose any benefits to which you otherwise qualify.

What if I have questions?

This research is being conducted by Andrea Pickel-Voigt from the physiotherapy department at the University of the Western Cape, South Africa. If you have any questions about the research study itself, please contact Andrea Pickel-Voigt at Oshakati Intermediate Hospital, Oshakati, Namibia. Phone: +264 81 648 11 82, e-mail: anpickel@gmail.com

Should you have any questions regarding this study and your rights as a research participant or if you wish to report any problems you have experienced related to the study, please contact:

Head of Department: Prof A. Rhoda

Phone: + 27 21 9592542

arhoda@uwc.ac.za

Dean of the Faculty of Community and Health Sciences: Prof J. Frantz

jfrantz@uwc.ac.za

Phone: +27 21 959 2631

University of the Western Cape

Private Bag X 17

Bellville 7535

This research has been approved by the University of the Western Cape's Senate Research Committee and Ethics Committee.

Appendix E

CONSENT FORM

Title of Research Project: Knowledge of nurses regarding dysphagia in patients with stroke, in Namibia

The study has been described to me in language that I understand and I freely and voluntarily agree to participate. My questions about the study have been answered. I understand that my identity will not be disclosed and that I may withdraw from the study without giving a reason at any time and this will not negatively affect me in any way.



Participant's name..... **Witness**.....

Participant's signature.....

Date.....

Study Coordinator's Name: Prof Anthea Rhoda

Tel: 021 9592542

Email: arhoda@uwc.ac.za

Students name: Andrea Pickel-Voigt

University of the Western Cape

Private Bag X17, Belville 7535

Telephone: (021)959- 2542

Cellphone: +264816481182

Fax: (021)959- 1217

APPENDIX F

SURVEY ABOUT EATING AND SWALLOWING DIFFICULTIES

Developed by Andrea Pickel-Voigt, 2013

Dear participants,

I thank you for your agreeing to participate in the study. This is a survey and **not** a test.

You are encouraged to ask questions if you need further clarification and understanding regarding the questions in the questionnaire.

Your answer will remain anonymous and you can withdraw your participation any time without any consequences. To ensure your privacy and anonymity **DO NOT** write your name on this questionnaire.

It is very important that you complete the questionnaire by yourself. If you do not know the correct answer, tick “unable to decide” rather than guess.

Your answers will help to identify the knowledge of nurses about swallowing difficulties in stroke patients at the State Hospital Oshakati.

The following sections are surveyed:

Section A: will enquire about your socio demographic information and experience in stroke patients with dysphagia.

Section B-1: intend to identify the sources of your knowledge about **signs** and **symptoms** of eating and swallowing difficulties.

Section B-2 intend to identify the sources of your knowledge about **complication** of eating and swallowing difficulties.

Section B-3: intend to identify the sources of your knowledge about the **management** of eating and swallowing difficulties.

Section A: Socio-demographic characteristics

Please, tick in the appropriate.

A1: What is your age -----

A2: What is your position as a nurse.

Registered Nurse
Enrolled Nurse

A3: What is your highest qualification as a nurse.

Certificate
Diploma
B Sc
M Sc
Ph D
Other _____



A4: The total years of experience in nursing.

0-3
4-6
7-9
10-above

A5: What is the current area (ward) of practice at the moment.

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.	Disagree	Unable to decide	Agree
B1-1	Coughing while eating			
B1-2	Skin irritations			
B1-3	Feeling of food getting stuck in the throat.			
B1-4	Choking on saliva during non-meal times.			
B1-5	Poor movement of the tongue			
B1-6	Food remains in the mouth			
B1-7	Poor chewing			
B1-8	Patients always cough if they aspirate.			
B1-9	Difficulty closing lips			
B1-10	Weight loss			
B1-11	Frequent throat clearing after swallowing			
B1-12	Hoarse voice			
B1-13	Chest pain			

Section B-2:

COMPLICATION 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.	Disagree	Unable to decide	Agree
B2-1	Increased mortality			
B2-2	Pneumonia			
B2-3	Anaphylactic Shock			
B2-4	General weakness.			
B2-5	Problems with digestion			
B2-6	Aspiration			
B2-7	Dehydration			
B2-8	Sudden heart attack			
B2-9	Malnutrition			
B2-10	Haematemesis (vomiting blood)			

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.	Disagree	Unable to decide	Agree
B3-1	Patients with a feeding tube need daily oral hygiene (mouth washing and brushing of the teeth)			
B3-2	Thickened liquid should be avoided			
B3-3	Watery liquids are the safest substances to drink			
B3-4	All patients with difficulty in swallowing need a feeding tube.			
B3-5	The best position while feeding the patient is when the patient lies flat on his back.			
B3-6	The Patient can always eat normal hospital food.			
B3-7	Feeding tube is only indicated in patients with impaired consciousness.			

Your experience with stroke

A6: Have you ever cared for a patient who had a stroke?

Yes
No

A7: Have you received training in nursing stroke patients?

Yes
No

A8: Have you ever cared for a stroke-patient with eating and/or swallowing difficulties?

Yes
No
Not sure

A9: Have you received formal training on eating and/or swallowing difficulties in stroke patients?

Yes
No



A10: Are you satisfied with your knowledge about eating and swallowing difficulties?

Yes
No

A11: Would you like to receive further formal training and information about eating and swallowing disorder in stroke patients?

Yes
No

Thank you

Your cooperation is much appreciated.

Appendix G

Timetable of the intervention program

DAY 1

MORNING SESSION: THEORETICAL PART

TIME	TOPIC	INSTRUMENTS
8h00- 10H30	Anatomy and Physiology of normal swallowing	Power point
	Definition of dysphagia and Incidence	
	Pathophysiology of swallowing in stroke patients.	Written material, Power-point, Video
	Sign and Symptoms of Dysphagia in stroke patients	Power point, pictures
	Complications of Dysphagia in stroke patients.	Power point
10h30-11h00	TEA BREAK	
11h00-13h00	Management of Dysphagia in stroke patients: - The role of the nurses and other health care professionals in stroke patients suffering dysphagia - Introduction of various screening methods. - Different kinds of food consistency. - Mealtime environment - Oral Care	Power point Power point, written material Power point, illustrative Food material Power point Power point, illustrative oral care material

13h00 – 14h00 LUNCH

AFTERNOON SESSION: PRACTICAL PART

14h00 - 17h00	- Introduction of adjustable bed.	Bed
	- How to use a Bedside screening test.	Written material, role-play
	- How to create a mealtime environment.	Bed, bedside table, eating utensils
	- Correct feeding of a stroke patient	Bed, bedside table, eating utensils, role-play
	- Correct oral care	Bed, bedside table, oral care utensils, role-play
	Feedback	

DAY 2

WARD BASE PRACTICAL SESSION

TIME	TOBIC	INSTRUMENT
8h00 - 17h00	Implement theory/ practical part from previous day in Ward based environment.	Real life ward based environment.

DAY 3

TIME	TOBIC	INSTRUMENTS
8h00 - 13h00	- Feedback from experiences of day 2.	Whiteboard
	- Conclusion	

APPENDIX H

Table 2: Correlation Matrix (n=184)

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
1. Age	--											
2. Position	-.09	--										
3. Qualifications	-.08	-.80**	--									
4. Experience	.43**	.02	-.10	--								
5. Ward of practice	.04	.15*	-.10	.07	--							
6. Exposure to stroke patient	-.26	.08	-.05	-.08	.12	--						
7. Training in Stroke	-.18*	.11	-.13	.04	-.06	.19**	--					
8. Cared for patient with eating problems	-.19*	.14	-.04	-.10	.26**	.40**	.21**	--				
9. Training in caring for patient with eating problems	-.19	.14	-.16	.01	.09	.16*	.45**	.29**	--			
10. Knowledge of symptoms	.04	-.02	.02	.08	.08	.04	-.14	-.22**	-.20**	--		
11. Knowledge of complications	-.01	.11	-.20**	.12	.02	.04	-.02	-.09	.01	.05	--	
12. Knowledge of management	-.11	.25**	-.27**	.05	.05	.11	.12	.06	.20**	-.03	.23**	--

*. Correlation is significant at the 0.05 level (2-tailed).

** . Correlation is significant at the 0.01 level (2-tailed).



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