University of Kerbala

College of Nursing

Comparing the Effect of Using Super Supraglottic Swallow Maneuver and Hyoid Lift Maneuver on Dysphagia in Patients with Stroke

A Thesis Submitted to the College of Nursing Council/University of Kerbala, in Partial Fulfillment of the Requirements for the Master Degree in Nursing Sciences

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بِسْمِ ٱللَّهِ ٱلرَّحْمَٰنِ ٱلرَّحِيمِ

"علم الانسان مالم يعلم "

صدق الله العلي العظيم

سورة العلق الاية "5"

Supervisor Certification

I certify that this thesis, which entitled (**Comparing the Effect of Using Super Supraglottic Swallow Maneuver and Hyoid Lift Maneuver on Dysphagia in Patients with Stroke**), was prepared under my supervision at College of Nursing, University of Kerbala in partial fulfillment of the requirements for the degree of master in nursing sciences.

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Committee Certification

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Dedication

The journey was not short and the road was not easy, but I did it.

- Praise to Allah, who facilitated the beginnings and made us reach the endings
- To the invisible hand that removed the thorns from my path, supported me, stayed up long nights for my comfort, and woke up at dawn to pray for me, my be loved mother.
- To the one who supported me with all love and provided me with strength, and the place of my leaning in all my stumbles was my dear father
- To the great man who brought out the most beautiful thing in me and encouraged me to reach my ambitions, the companion of my path and the light of my eyes.
- I present to you the end of efforts of two years in nursing sciences, and this was only accomplished with the grace of Allah.

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Abstract

Background: Dysphagia is a common problem among stroke patients. Early management of dysphagia should be used to improve swallowing and to decrease subsequent complications. This study aims to compare the effect of using Super-Supraglottic Swallow and Hyoid Lift Maneuvers on dysphagia in patients with stroke.

Methods: A quasi-experimental study was conducted in medical wards, from 1st October, 2023 to 30th June, 2024. A purposive sample involves 90 patients with stroke, 30 patients for each Super-Supraglottic Swallow maneuver, Hyoid Lift Maneuver and control groups. Super-Supraglottic Swallow and Hyoid Lift Maneuvers was administered three-times a day for seven days and the control group were given conventional care only. The study instrument contains two parts: the first part is socio-demographic and clinical data; the second part was a Gugging Swallow Screen Scale used to investigate swallowing. Both a descriptive and inferential statistics analysis methods were used to analyze the study results (e.g., paired sample t-test, independent sample t-test, and one-way ANOVA); a p-value of <0.05 was determined to be significant result.

Results: the results exposed that 100 % of patients in the control, Super-Supraglottic Swallow maneuver, and Hyoid Lift Maneuver groups, respectively had a severe dysphagia, at pre-test assessment. At the post-test, the same groups found 100%, 0.0 %, and 0.0 % of patients had severe dysphagia, respectively. A significant difference in dysphagia between the pretest and posttest at p-value of 0.000 when these two maneuvers are used. Conversely, no significant difference was observed in the control group at p-value 0.161. Furthermore, non-significant difference was observed between the effect of these Maneuvers on dysphagia at p-value 0.937.

Conclusion: Application of Super-Supraglottic Swallow and Hyoid Lift Maneuvers for three times a day for 7 days significantly enhance swallowing in patients with stroke, these maneuvers have the same effect on dysphagia.

Recommendations: According to the study and conclusion, the researcher recommends the sub sequent recommendations as follow: all patients with stroke can be instructed to perform a super supra glottis swallow maneuver and hyoid lift maneuver post stroke three times a day for 7 days to improve level of dysphagia , further studies can be done to investigate the long-term effects of super supra glottis swallow maneuver and hyoid lift maneuver on dysphagia level, all nursing staff in the neurological wards can be encouraged to implement super supra glottis swallow maneuver and hyoid lift maneuver as a routine care practice to improve swallowing function and decrease dysphagia level. .

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List of Abbreviations and symbols

Items	*Meaning*
ACE	Angiotensin- converting enzyme
AF	Atrial fibrillation
AIS	Acute ischemic stroke
AMI	Acute myocardial infarction
BBB	Blood brain barrier
BMI	Body mass index
CPG	Central pattern generator
CT	Computed Tomography
CTAR	Chin tuck resistence exercise
cTN	Cardiac troponin
CVAs	Cerebrovascular accidents
DALYs	Disability-adjusted life years
df	Degree of freedom
DM	Diabetes meilltus
DVT	Deep venous thrombosis
EMST	Expiratory muscle strengthening Training
ESUS	Embolic stroke of unknown cause
EVT	Endovascular treatment
F	Frequency
FDS	Functional Dysphagia Scale

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FEES	**Flexible Endoscopic Evaluation of Swallowing**
FOIS	**Functional Oral Intake Scale**
GUSS	**Gugging Swallowing Screen Scale**
HF	**Heart failure**
HLE	**Head lift exercise**
HNC	**Head neck cancer**
HT	**Hypertension**
ICH	**Intra cerebral hemorrhage**
I-CVR	**Item level content validity index**
IVT	**Intra venous thrombolysis**
LVO	**Large vascular occlusion**
MASA	**Mann Assessment of swallowing scale**
ME	**Middle East**
MRI	**Magnetic resonance image**
MS	**Mean of score**
MT	**Mechanical thrombectomy**
NMES	**Neuromuscular electrical stimulation**
OD	**Oropharyngeal dysphagia**
PAS	**Penetration-aspiration scale**
PES	**Pharyngeal electrical stimulation**
PSC	**Post stroke constipation**
PS-OD	**Post-stroke oropharyngeal dysphagia**
p-value	**Probability value**
QOL	**Quality of life**
RBHOMS	**Royal Brisbane Hospital Outcomes Measure for Swallowing**
REEs	**Resting energy expenditures**
rtPA	**Recombbinant tissue plasminogen activator**
RTMS	**Repetitive transcranial magnetic stimulation**
S	**Significance**
SAH	**Subarachnoid**
SAI	**Stroke associated infection**
SAP	**Stroke-associate pneumonia**
SASS	**Seizures after stroke study**
SD	**Standard Deviation**
sEMG	**Surface electromyography**
SHS	**Stroke heart syndrome**
SIHI	**Stroke induced heart injury**
sNMES	**Surface neuromuscular electrical stimulationxzxz**
SSA	**Standardized Swallowing Assessment**
SSS	**Super supra glottic swallow maneuver**
TDCS	**Transcranial direct current of stimulation**
tDCS	**Transcranial direct current stimulation**
TIA	**Transit ischemic attack**
TOR-BSST	**Toronto Bedside Swallowing screen test**
UA	**Universal agreement**

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VFSS	**Video fluoroscopic Swallow Study**
WHO	**World Health Organization**
>	**More than**
<	**Less than**
≤	**Equal or less than**
%	**Percent**
&	**And**

Chapter One

Introduction

Chapter one
Introduction

1.1. Introduction:

Stroke is a type of neurological disorder that is defined by a sudden, concentrated loss of function in the central nervous system due to vascular injury (hemorrhage or infarction) (Murphy & Werring, 2020).

Stroke is the leading cause of permanent disability in advanced nations and one of the leading causes of mortality worldwide. Significant progress has been made in the last ten years in terms of the diagnosis and treatment options that are available to reduce the effects of acute ischemic stroke (Phipps & Cronin, 2020).

Globally, Stroke is the second most prevalent cause of death and disability. Stroke is not a single condition, rather it is the product of multiple illnesses, diseases, and causes. Though its effect varies on the subtype, hypertension is the most important modifiable risk factor for stroke. The bulk of ischemic strokes (85%) are caused by large artery athero-thromboembolism, cardioembolism, and small vessel arteriolosclerosis (Murphy & Werring , 2020). After heart disease and cancer, stroke is the most common cause of cerebrovascular diseases in the United States and it is the third greatest cause of death. Stroke causes 8.13% of all deaths in Iraq, were reported in the most current common recent World Health organization (WHO) statistics issued in 2017 (Al-Jubouri & Abd Ali, 2020).

The specific area and extent of brain injury following a stroke determine how the brain is affected. The brain stem, which is located directly above the spinal cord, regulates heart rate, blood pressure, and respiration. It also regulates the movements of eyes, mouth, hearing, and speech. The brain stem is the conduit via which impulses from other areas of the brain are

delivered to different regions of the body. For survival, brain stem activity is essential. A brain stem stroke is a potentially fatal disorder because it compromises essential body functioning (Saber, 2020).

Normal swallow control involves the brain stem, the thalamus base ganglia, limbic system, the cerebellum, and motor and sensory cortices, among other brain regions. Damage to any of these areas following a stroke may result in severe repercussions, including dysphagia. Intra-hemispheric locations may be more predictive of dysphagia severity and aspiration risk than hemisphere or lesion size. Compared to isolated cortical or subcortical lesions, lesions that impair cortical–subcortical connection are more likely to raise the possibility of inhalation in those with stroke (Vose, et al., 2014). Swallowing difficulties are prevalent following a cerebrovascular accident (CVA), affecting 13 to 94 percent of Iraqi patients (Al-Jubouri & Abd Ali, 2020).

The ability to swallow properly without aspirating, as well as the ability to continue eating, are the primary worries when a stroke occurs in its acute stage. Slight, moderate, or serious swallowing difficulties can result following a stroke. These challenges might range from difficulty consuming foods with hard or mixed textures to the need for alternate nutritional intake methods help reduce the possibility of dying, as well as the likelihood of aspiration, malnourishment, and dehydration. Dysphagia following brainstem infarction can present as severe unilateral hypotonic lips and tongue muscles that impede fluid transfer into the oral cavity, bilaterally strokes, trouble motor programming, as in the case of swallowing dyspraxia, or difficulty initiating the reflex stage of swallowing. The part from the effect on an individual's quality of life (QoL), there is a significant financial expense (Fairfield & Smithard, 2020).

Dysphagia is a prevalent condition in stroke patients, affecting 28% to 70% of individuals. It is described as difficulties with any aspect of swallowing or the ingestion of food or liquid from the oral cavity to the stomach. Most people will recover their ability to swallow rapidly, however six months after a stroke, dysphagia still affects 11–50% of patients (Fairfield & Smithard, 2020).

Following a stroke, oropharyngeal dysphagia (OD) is a common consequence. The prevalence of OD is extremely high (37%–78%) during the acute phase of a stroke, but it becomes better after hospital discharge and persists as a chronic disease in more than 50% of patients. In patients with acute and chronic stroke, OD reduces the safety and effectiveness of deglutition. Dehydration, starvation, and tracheobronchial aspiration can result from this, which increases the risk of respiratory infections and pneumonia, which have a 50% fatality rate. At one-year follow-up, aspiration pneumonia and respiratory infections—two well-known consequences of post-stroke OD (PS-OD)—are the leading causes of death for stroke survivors (Marin, et al., 2021).

An individual with dysphagia may have a decline in QoL as well as an increased risk of aspiration and dehydration. Malnutrition results from dysphagia. Many mental and physical problems interfere with functioning, result in disability or reduced activity, and prevent social interaction. Dysphagia and morbidity and death are related. An appropriate swallowing examination and management plan can help prevent these problems. Compulsive tactics exercise improved physical alterations to the function of the larynx muscle (Biswal, 2022).

According to neuroanatomical theory, 40% of unilateral stroke result in dysphagia, and 56% of patients have bilaterally cerebral hemisphere lesions, 67% have brainstem lesions, and 85% have mixed lesions. Two

serious consequences of dysphagia in individuals with stroke are altered deglutition efficacy, which can result in malnourishment and/or dehydration in up to 25% of patients, and compromised swallow safety, which raises the risk of aspiration pneumonia (Rofes, et al., 2013).

Early identification and triage of stroke can provide the necessary treatment as soon as possible are crucial initial steps in the care of patients with stroke (Phipps & Cronin, 2020). Patients with dysphagia following a stroke are treated with a range of various methods. Nurses can make educated projections about post-stroke patients who have the condition and the actions that are needed for aspiration prevention, hydration, and nutrition management. Nursing interventions for post-stroke dysphagia include screening for the condition 24 hours after the stroke, nutritionist-recommended thickening of the food, larynx elevation of fitness, periphery stimuli, postural correction, and education regarding dietary and drinking practices. Nurses with post-stroke dysphagia can educate patients and their families about healthy eating and drinking practices through health promotion initiatives (Syahrun, et al., 2022).

The guidelines for treatment do not contain any medicinal or electrophysiological techniques to improve dysphagia recovery following an acute or subacute stroke, but rather focus on various physical therapy and preventive measures to avoid issues related to dysphagia. Nutritional and dietary therapies, behavioral therapies, dental care, and pharmacological and neurostimulation are examples of therapeutic approaches (Balcerak, et al., 2022).

Classic behavioral approaches with a long history of managing dysphagia are commonly administered by speech therapists. The two primary categories into which scientists divided these methods were compensatory and rehabilitative. Modifications to food and liquid intake, as well as positioning

and swallowing procedures (such the supraglottic maneuver and the hard swallow technique, among others), may be used as compensatory techniques. Sensory and physical stimulations (such hot tactile stimulation, sour stimulation, etc.) may be used in rehabilitation procedures. The cost-effectiveness of these methods is still debatable, despite the encouraging outcomes they have produced. Consequently, in an effort to enhance neuronal plasticity and aid in recovery, researchers have attempted to supplement established methods with novel approaches like non-invasive brain stimulation (NIBS) (Farpour, et al., 2023).

There are several types of exercises that are used in recovery and management of dysphagia such as the Shaker head-lift exercise (HLE) was initially created as a treatment for swallowing issues brought on by limited UES (upper esophagus sphincter) opening. The activity seeks tobolster the neck's suprahyoid muscles,when swallowing, strengthen the forward and upward movement of the larynx and hyoid bone, leading to enhanced access to the UES (Tuomi, et al., 2022).

Therefore, nurses play a crucial role in dysphagia therapies as they are ideally positioned to identify patients who struggle swallowing and initiate measures that can halt further problems until a thorough assessment can be finished. Their role in dysphagia intervention is to identify those patients. This is because nurses work in hospitals around constantly (Syahrun, et al., 2022).

The super-supraglottic swallow (SSS) is a technique that is used to manage dysphagia by blocking the airway before swallowing prevents food or liquid aspiration. This exercise entail holding one's breath to shut the airway before swallowing, then following up with a voluntary cough right away to empty the airway entry of any left over food or fluids (Vose, et al., 2014).

Hyoid lift maneuver is a fun exercise that improves muscle strength and swallowing abilities. The hyoid lift maneuver also helps you regain better control when swallowing saliva and food. This assists the individual with dysphagia because it is an activity-based workout rather than a traditional one (Bansal, 2022).

1.2. Importance of study:

Stroke is a major global health concern because it is a leading cause of death and a significant factor in adult long-term impairment. Stroke is the second most common cause of death globally, after ischemic heart disease, when all cancers combined are considered. A stroke is projected to have killed 5.7 million individuals, with low- and middle-income nations accounting for 87% of these deaths. People in poorer nations accounted for two thirds of all stroke deaths worldwide. The demographic shift—that is, the aging of the population—combined with increased exposure to risk factors (Basee & Lateef, 2018).

Stroke have been significantly more common in Iraq, particularly after 2008. This is indicated by a percent change of 56.91 ($p=0.007$). Comparably impacted were both genders, with the majority of those over 45 year (Hussain & Lafta, 2019).

According to the estimate expert of WHO, Stroke ranks second globally in terms of patient mortality and second in terms of long-term and severe disability. Stroke incidence was 2.6-2.67 per 1000 people (mean 2.61). The prevalence of strokes in the population rises by two to three times for each age group: 0.18 for people aged 25 to 40, 1.2 for people aged 40 to 49, 3.8 for people aged 50 to 59, 10.6 for people aged 60 to 69, and 25.4 for people aged 70 and above per 1000 inhabitants of the corresponding age every year (Самудинова et al., 2021).

A cross-sectional observational study was conducted in Iraq between April and May 2021, from the general population using an anonymous survey by Al-Obaidi et al., (2023) who stated that "Strokes are among the non-communicable diseases that cause 55% of all fatalities. Stroke and coronary heart disease are the most common conditions seen in clinical practice in Iraq, a Middle Eastern nation. According to Global Burden of Disease 2019 Stroke Collaborators, the incidence of stroke in Iraq in 2019 varied from 196.2 to 218.3 per 100,000 people. In addition, it is estimated that 35.8% of Iraqis have hypertension, 14% have diabetes mellitus, 38% smoke, and over 30% are obese. So, a lot of Iraqis have spoken about leading unhealthy lives that include eating high-calorie foods and little exercise".

Post-stroke dysphagia, a term used for swallowing issues related to stroke, is one of the most dreaded consequences of stroke, occurring in 39–81% of patients with stroke. Post-stroke dysphagia frequently results in lengthier hospital stays, a higher death rate, and morbidities such as aspiration pneumonia, malnourishment, and dehydration. Early identification and prompt treatment for post-stroke dysphagia could be viewed as a crucial component of acute stroke care since it lowers the risk of aspiration pneumonia following a stroke and enhances stroke outcome (Khedr, et al., 2021).

Over 50% of patients continue to experience oropharyngeal dysphagia (OD) as a chronic condition after being discharged from the hospital, despite the extremely high frequency of OD during the acute stroke period (37%–78%). Both acute and chronic stroke patients' safety and effectiveness from deglutition are compromised by OD. As a result, there may be 50% chances of respiratory infections and pneumonia, as well as malnourishment, dehydration, and tracheobronchial aspiration. Aspiration pneumonia and respiratory infections are the leading causes of death for stroke survivors at 1-

year follow-up, and they are two well-known consequences of post-stroke OD (Marin, et al., 2021).

The range of therapeutic possibilities includes nutritional and dietary interventions, behavioral therapies, dental care, and neuro- and pharmaceutical stimulation. The emphasis of treatment guidelines is on various forms of physical therapy and preventive efforts to avoid dysphagia-associated difficulties, rather than medication or electrophysiological therapies to promote dysphagia resolution following stroke in the acute or sub-acute environment (Balcerak, et al., 2022).

A formal swallowing assessment is frequently part of the neurological illness diagnosis process in order to prevent or limit these dysphagia-related problems. This can assist in detecting dysphagia before problems arise. Exercises for dysphagia, which are mostly focused on muscle training, can improve both functional and physiological alterations in swallowing ability and are currently employed as therapy for dysphagia in patients with cerebrovascular accidents. The greatest way to strengthen swallowing muscles is, in fact, to exercise them. The following exercises are recommended for people with dysphagia: shaker exercise, postural adjustments (such as head turn and chin tuck postures), tongue exercises, Mendelsohn maneuver, Hyoid Lift Maneuver, Gargling, and Stretch Exercise (Elsaid & Shabaan, 2019).

1.3. Statement of the problem:

Many patients with stroke experience dysphagia, or trouble swallowing, in the early hours and days following their stroke. Dysphagia is a significant medical disease is a serious condition following stroke and that can be fatal. Dysphagia following a stroke can cause issues with the pharyngeal and oral aspects of swallowing. Persistent dysphasia may cause overabundance of drool, saliva, coughing or choking when eating, and even

trouble speaking or a raspy voice. These symbols linked to a poor prognosis and higher death and morbidity rates as a result of dysphasia complications dehydration, starvation, aspiration pneumonia, and mortality. Consequently, regular screening and reassessment swallowing abilities are essential for stroke sufferers (Tuomi, et al., 2022).

Major nutritional and respiratory difficulties in stroke patients are underdiagnosed and underestimated as a result of dysphagia, despite its tremendous influence on survival, QOL , and functional capacity. After a stroke, dysphagia can range in severity from mild swallowing difficulties to total incapacity to swallow, and it can happen with little to no accompanying neurological impairment (Rofes, et al., 2013).

Post-stroke dysphagia (PSD) has a broad impact on swallowing efficacy and safety, which increases the risk of aspiration and pneumonia as well as the risk of dehydration and malnutrition. In addition to these negative physical effects, dysphagia has been connected to depression and bad mood. It also significantly affects the psychological health and degree of independence of those who are affected by dysphagia (Dziewas, et al., 2021).

Kalpana& Maheshwari, (2022) performed a study to examined the effects of swallow therapy including super supraglottic swallow maneuver on patients at Saveetha Medical College and Hospital in Chennai who had suffered cerebrovascular accidents. A quasi-experimental one-group pre- and post-test design was employed in the investigation. Regular assessments of swallowing capacity were conducted using the Mann Assessment of Swallowing Skills (MASA). The results show a substantial difference in swallowing capacity before and after therapy, also showed that the swallowing therapy was among the most effective conventional therapies for enhancing the swallowing abilities of individuals with swallowing issues.

Elsaid & Shabaan, (2019) performed a study to examining the effects of exercise-based dysphagia therapy on swallowing ability in patients with cerebrovascular accident that was the goal of this study. The results revealed that 50% of patients in the intervention group had severe dysphagia and the other 50% had moderate dysphagia in the pre-test assessment of swallowing ability. Following one week of dysphagia exercises, the majority of the intervention group (75% of them) had mild dysphagia, while 79.2% of the control group had moderate dysphagia. Following one week of dysphagia exercises, there was a significant difference between the two groups with respect to the degree of dysphagia following dysphagia exercises. So, dysphagia exercise therapy was a useful intervention for improving swallowing function in CVA patients who had dysphagia.

Based on the previous studies, this problem prevalence related to increase stroke rate, the researcher found that patients with stroke still complains of this complication in spite of the varies type of medication therapy and non-pharmacological interventions that used to relieve this consequence. The researcher suggests to investigate the possibility of involving the non-pharmacological intervention in addition to the pharmacological intervention in the treatment plan for patients with stroke for the purpose of treating and managing dysphagia. Complementary therapies become widely used by people around the world therefore this study will focus on two approaches of these therapy. These include supra superglottic swallow maneuver and hyoid lift maneuver. And therefore to detect which is better for solving the problem of difficulty swallowing.

1.4. Hypotheses Research:

1. H0:There is no significant effect of super supraglottic swallow and hyoid maneuvers on dysphagia in patient with stroke.

2. H1:super supraglottic glottic swallow and hyoid lift maneuvers have a significant effect on swallowing function in patient with stroke.
3. H0: There is no significant difference between the effect of super supra glottic swallow maneuver and hyoid lift maneuver on dysphagia in patients with stroke.
4. H1:There is a significant difference between the effect of supersupra glottic swallow maneuver and hyoid lift maneuver on dysphagia in patients with stroke.

1.5. The study objectives:

1.5.1. To assess the severity of dysphagia in patient with stroke.

1.5.2. To determine the effect of using super supraglottic maneuver on dysphagia in patient with stroke.

1.5.3. To determine the effect of applying the hyoid lift maneuver to a stroke patient who has dysphagia.

1.5.4. To compare the effect of hyoid lift maneuver and the super supraglottic swallow maneuver on dysphagia in patients with stroke.

1.5.5. To find out the association between the effect of super supraglottic swallow maneuver and hyoid lift maneuver upon the severity of dysphagia level with patients' socio-demographic characteristics and clinical data.

1.6. Definition of the terms:

1.6.1 Dysphagia:

1.6.1.a. Theoretical definition:

Inability or discomfort in moving the alimentary bolus from the mouth to the stomach (Carrión, et al, 2019).

1.6.1.b. Operational definition:

Term for a problem that follows a stroke and one that involves swallowing issues. Certain foods or liquids can be difficult for some

dysphagic individuals to swallow, while others are completely incapable of doing so. Dysphagia is the term for any modification of the swallowing mechanism.

1.6.2. Super supraglottic swallow maneuver:

1.6.2.a. Theoretical definition:

Swallowing techniques that include shutting the airway before swallowing in order to avoid aspirating food or liquid. These techniques entail holding one's breath to shut the airway before swallowing, then willingly coughing right away to empty the airway entry of any leftover food or fluids (Fujiwara, et al., 2014).

1.6.2.b. Operational definition:

It is a technique done by patients with stroke who are suffering from dysphagia in Imam Al-hussein medical city and the Imam Al-Hassan Al-Mujtaba Teaching Hospital that performed to enhance difficulty swallowing.

1.6.3. Hyoid lift maneuver

1.6.3.a. Theoretical definition:

This is a fun exercise that improves muscle strength and swallowing abilities. The hyoid lift maneuver also helps regain better control when swallowing saliva and food. This assists the patients with dysphagia because it is an activity-based workout rather than a traditional one (Paik, et al., (2024).

1.6.3.b. Operational definition:

These are strategies to aid the patients with dysphagia in properly swallowing meals and liquids. By blocking the windpipe (airway), these swallowing techniques aid in preventing food or liquid from entering lungs.

Chapter Two
Review of Literature

Chapter Two

Review of Literature

This chapter will present the related previous studies that enable to explain the subject matter of the current study and correspond to the study variables in concerns to the stroke. It is pathophysiology, classifications, effect of stroke on body system, management of stroke including management of dysphagia, in addition to theoretical frame work related to the present study.

2.1. Theoretical Framework:

Hall's care, core, and cure Model is the theory that corresponds with subject of the current thesis. Three components that Hall described for the patient are the person, the body, and the sickness. Her perspective was that the care, cure, and core aspects were overlapping rings that affected each other. Each profession needs to have a specific field of expertise that it practices, develop new processes and theories, and welcome newcomers to its practice in order to qualify as a profession. Everyone in the health professions either ignores or considers any or all of these (Parker and Smith, 2010).

In 1906, Lydia Eloise Williams gave birth to Lydia Hall in New York City on September 21. Her name was inspired by her maternal grandmother, and she was the firstborn child of Louis V. Williams and Anna Ketterman Williams. In 1927, Lydia Hall obtained a diploma in nursing from York Hospital School of Nursing. But she thought she should have received additional training. In 1932, she enrolled in Columbia University's Teacher's College in New York and graduated with a Bachelor of Science in public health nursing. She returned to school after working in a clinical setting for a while, earning a master's degree in natural life sciences education from Columbia University in 1942. She later pursued a doctorate, fulfilling all but the dissertation requirements. In 1945, she married Reginald A. Hall, who was a native of England (Gonzalo, 2024).

Hall's explained the two stages of medical care that were then offered in hospitals. In phase one, the patient requires acute care due to a biological crisis. Phase 2 starts when the patient requires a different kind of medication after the acute crisis has been stabilized. Hall categorized this as a "follow-up." (Goodridge,, 2019).

Nursing is defined by Hall's theory as the "participation in care, core, and cure components of patient care, where the CORE and CURE are shared with other members of the health team, whereas CARE is the primary function of nurses." Building an interpersonal relationship with the person is the main goal of care, as this will help the core develop (Priyadarshini, 2021). The development of the care, cure, and core physiology—which delineates the several aspects of a nurse's duty in providing healthcare to patients who are chronically ill—made Lydia E. Hall a prominent figure in nursing physiology and practice during the 20^{th} century (Alligood, 2018).

2.1.1. Hall's three aspects of nursing:

Lydia Hall developed her idea based on her experiences as a nurse at the Loeb Center and her understanding of psychiatry. The core, the care, and the cure are the three separate but related circles that make up what is also referred to as "the Three Cs of Lydia Hall."(Gonzalo,2024).

Care:

The theory holds that nurses are preoccupied with carrying out the noble responsibility of tending to patients. This circle is dedicated to carrying out the duty of tending to patients, and it only symbolizes the role of nurses. Providing for teaching-learning activities and utilizing the elements that comprise the notion of mothering—the person's comfort and care—are all part of nurturing. The care circle outlines a professional nurse's fundamental responsibilities, which include tending to a patient's physical needs and assisting them with basic daily biological tasks like eating, washing, going

potty, and dressing. The patient's comfort is the nurse's main priority when administering this care (Priyadarshini, 2021).

Core:

The person receiving care—who may be an individual, family, or community—is the center of nursing. The biological, social, and behavioral sciences as well as the humanities are among the academic disciplines that make up the core of nursing. It is the application of social sciences that emphasizes self-knowledge and the therapeutic use of oneself. In order to have a therapeutic effect, the nurse builds relationships and highlights the patient's social, emotional, spiritual, and intellectual needs in relation to their family, society, institution, and the wider world—the core (Cosejo, 2021).

Cure:

This approach explains the cure as the part of nursing that deals with giving treatments and medications. As per Hall's explanation in the model, the nurse shares the cure circle with other medical professionals including doctors and physical therapists. To put it briefly, they are the treatments or activities intended to address the patient's ailment or disease. The nurse actively represents the patient throughout this part of nursing care (Gonzalo, 2023).

2.1.2. Lydia E. Hall theory major concepts:

These are the presumptions of Hall's Care, Cure, and Core Theory: (1) Patients possess the motivation and energy required for healing, not the medical staff. (2) It is important to recognize the interdependence of the three nursing aspects rather than their independent operation. Lastly, (3) The three components interact, and the size of the circles that symbolize them varies based on the patient's overall progress (Gonzalo, 2023).

Individual:

The focus of nursing care in Hall's work is the individual human who is 16 years of age or older and has progressed past the acute stage of a long-

term disease. The patient, not the healthcare provider, is the source of inspiration and energy for healing. Hall highlights the significance of the individual as being distinct, having the capacity for development and learning, and necessitating a whole-person approach (Priyadarshini, 2021).

Health:

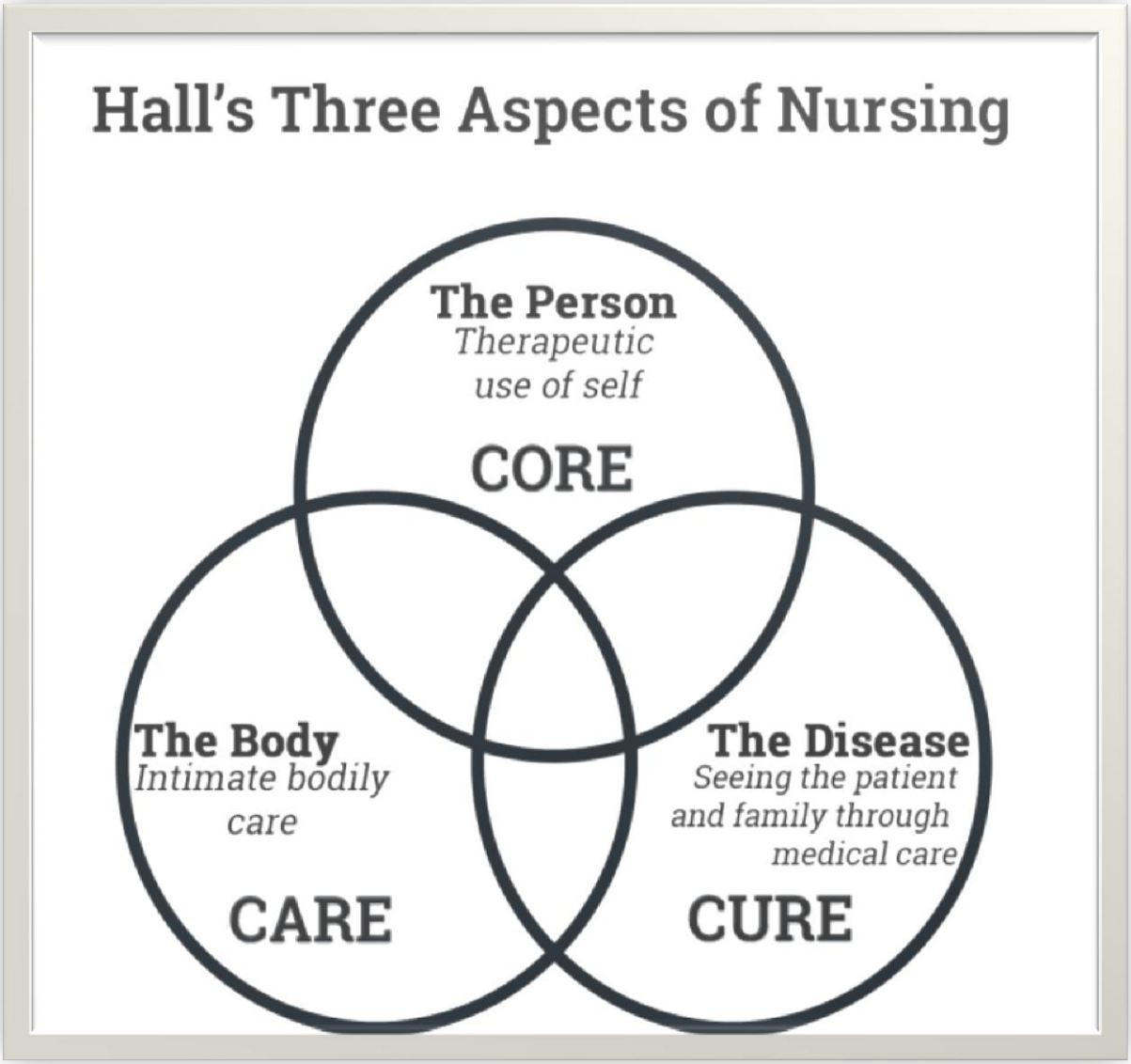
It can be considered to be a self-aware condition in which the person chooses behaviors that are best for them consciously. Hall emphasizes the importance of assisting the individual in understanding the significance of their actions in order to recognize issues and find solutions by growing in maturity and self-awareness (Goodridge,, 2019).

Society and Environment:

The idea of environment or society is discussed in relation to the individual. Hall is credited with creating the Loeb Center concept because she made the assumption that receiving treatment for an acute disease in a hospital provides a challenging psychological experience for the patient. The goal of Loeb Center is to create an atmosphere that supports personal growth. The patient is the center of the nurses' actions in this situation. Every activity performed in relation to the environment or society is done so to help the individual achieve a personal objective (Gonzalo, 2023).

Nursing:

Participation in the care, core, and cure components of patient care is defined as nursing (Priyadarshini, 2021).



Figure(2-1): Lydia E. Hall theory major concepts(Priyadarshini, 2021).

2.1.3. The practical application of Hall's Care, Cure, Core theory in the present study:

- **Care:** Using a seven-day intervention strategy that included the super supraglottic swallow maneuver and the hyoid lift technique, the researcher helped individuals undergoing therapy manage post-stroke issues that affected their dysphagia.

- **Cure:** The researcher determines the post-stroke challenges that patients have, which affect their degree of dysphagia and improve their ability to swallow, and they come up with solutions for these issues.
- **Core:** Through a therapy connection, the researcher attempts to comprehend the patient's feelings and ascertain how dysphagia affects the patient's social, emotional, spiritual, and intellectual status as shown in figure (2-2).

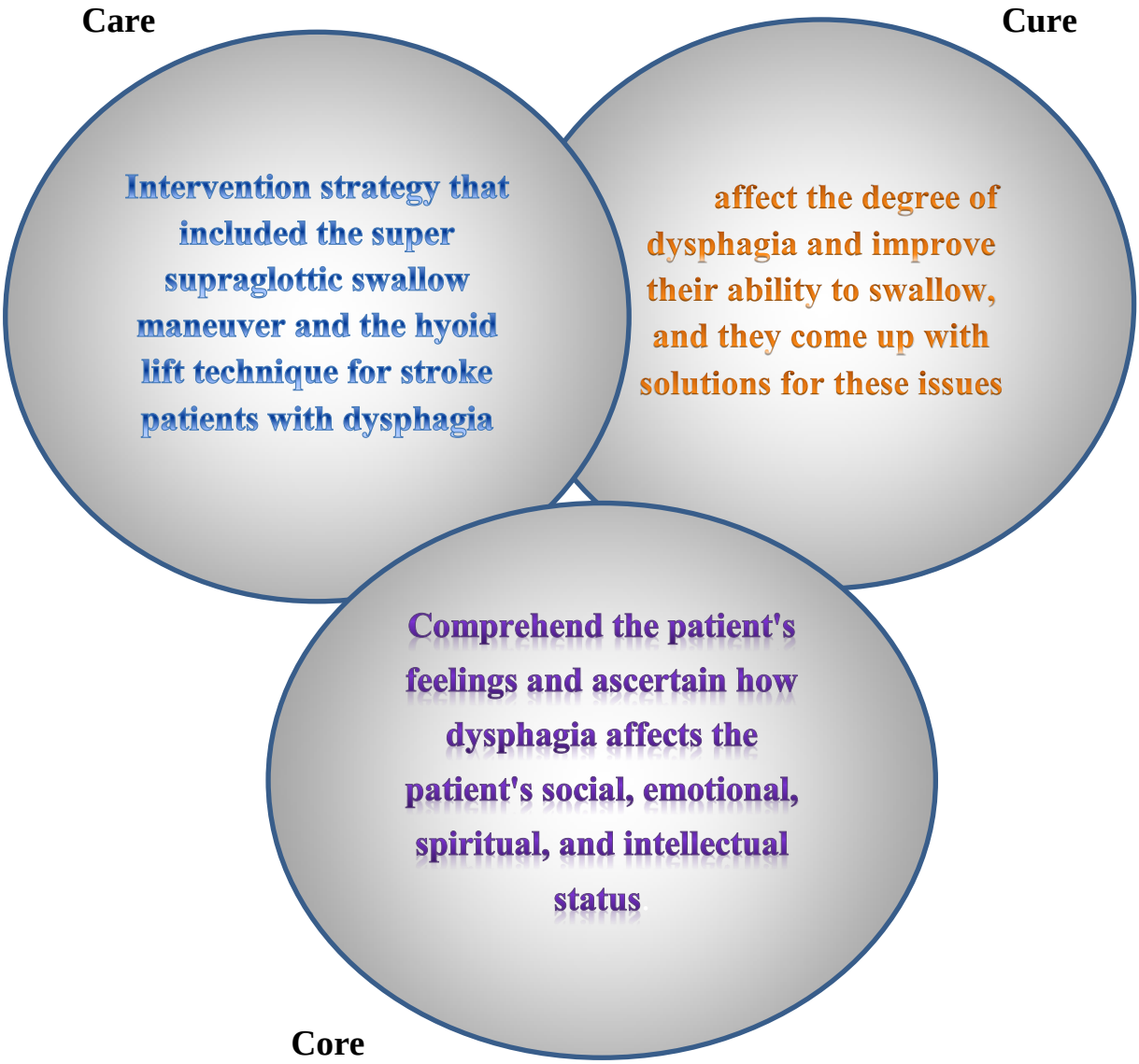


Figure (2-2): The practical application of Hall's Care, Cure, Core theory in the present study.

2.2. Overview about stroke:

Stroke is a neurological condition that is characterized clinically as an immediate, focused loss in function, that is caused by vascular injury to the central nervous system. It is the second most common cause of mortality and disabilities globally. Stroke is a multifactorial disease that can caused by a variety of disease processes, causes, and risk factors (Murphy & Werring, 2020). Hazanah, et al., (2023) documented that stroke occurring when there are problems within blood flow in certain areas of the brain. It was caused by a pathological process like hemorrhagic or blockage (ischemic stroke), which is an obstruction of blood flow. According to the American Heart Association (AHA), 700,000 Americans receive a stroke diagnosis every year. Approximately 4 million individuals in the US currently live with physical limitations, with 15–30% of those being permanently disabled.

In a cross-sectional study conducted by Mirghani, et al., (2022) to assess perception of stroke warning signs and knowledge of potential risk factors among medical students in Tabuk University, specified that stroke arises when the brain does not receive adequate blood from circulation for the reason that of a brain vessel rupturing or a clot blocking an artery, causing bleeding and ischemia of the brain tissues.

Coupland, et al., (2017) in the definition of stroke reported that “The American Heart Association/American Stroke Association revised its approved definition of stroke to include silent hemorrhages as well as silent infarctions, which include cerebral, spinal, and retinal infarctions. The AHA/American Stroke Association continues to use the "conventional" clinical definition of stroke, the addition of "silent" pathology is a noteworthy change. A shift to a radiological proof of infarction or hemorrhage—a tissue-based definition—was the justification for this modification.

Markus, (2016) reported that a variety of diseases and conditions can induce a sudden disruption in blood flow to a specific area of the brain, which can lead to a stroke. About 80% are caused by cerebral hemorrhage, with intracerebral hemorrhage being significantly more prevalent than stroke due to subarachnoid hemorrhage (SAH). The remaining 20% are caused by primary cerebral ischemia, which results in infarction. Murphy and Werring, (2020) documented that “It is crucial to understand that vascular brain damage, which can cause stroke and transient ischemic attack (TIA), as a clinical condition with a variety of underlying mechanisms (linked to various risk factors and disease processes). As a result, "stroke" and "TIA" are not exhaustive or unique diagnoses, but rather the beginning points of logical research and care.

Kuriakose & Xiao (2020), documented that stroke ranks as the second most common cause of death worldwide. It kills over 5.5 million people a year and affects about 13.7 million people. Ischemic strokes account for about 87% of strokes; this frequency increased significantly between 1990 and 2016, which can be linked to lower mortality and better clinical therapies. A large percentage of strokes is caused by primary (first-time) hemorrhages, with secondary (second-time) hemorrhages accounting for an estimated 10-15% of cases. Al-Obaidi, et al., (2023) revealed that “Over 12 million people worldwide experience a stroke each year, and within the past 20 years, the annual death rate has exceeded 5.5 million. Statistics shows that stroke ranks as the second leading cause of death and disables about 5 million individuals permanently”.

2.3. Pathophysiology of stroke:

Stroke is an unexpected neurological eruption brought on by reduced blood vessel perfusion to the brain. Two internal carotid arteries located anteriorly and two vertebral arteries located posteriorly, called the circle of Willis, control blood flow to the brain. Hemorrhagic stroke is brought

on by bleeding or leaky blood vessels, whereas ischemic stroke is caused by insufficient blood and oxygen delivery to the brain. In the brain, ischemic occlusion causes thrombotic and embolic situations. Atherosclerosis-related vascular constriction impairs blood flow in thrombosis. Plaque accumulation eventually causes the vascular chamber to narrow and clot, which results in thrombotic stroke. Reduced blood supply to the brain region results in an embolism in an embolic stroke; this embolism causes extreme stress and premature cell death (necrosis) (Kuriakose & Xiao 2020). Bersano & Gatti (2023) reported that cervical artery dissection is one of the most common causes of stroke in younger people, while other significant mechanisms of stroke include small vessel disease and intracranial atherosclerosis with in situ thrombosis.

Following necrosis, the plasma membrane is disrupted, organelles enlarge and leak cellular contents into extracellular space, and neuronal function is lost. Additional major events that contribute to stroke pathology are inflammation, energy failure, loss of homeostasis, acidosis, elevated intracellular calcium levels, excitotoxicity, free radical-mediated toxicity, cytokine-mediated cytotoxicity, complement activation, disruption of the blood–brain barrier, activation of glial cells, oxidative stress, and leukocyte infiltration (Kuriakose & Xiao 2020). In both the acute and chronic stages, neuro-inflammation has also been recognized as a potential pathophysiological mechanism that may contribute. It may have an impact on tissue healing and repair, damage response, and complications following a stroke (Bersano & Gatti 2023).

2.4. Classification of stroke:

2.4.1. Acute ischemic stroke:

Acute ischemic stroke (AIS), is characterized by an abrupt interruption of blood supply to a specific area of the brain, leading to a decline

in neurological abilities. It is brought on by thrombosis or embolism that blocks a brain artery supplying a particular part of the brain. There is a core region of a vascular occlusion where brain damage is irreversible, and there is a penumbral area where the brain has lost function due to reduced blood flow but is not permanently damaged (Phipps & Cronin, 2020).

Murphy & Werring (2020) reported that large artery athero thrombo embolism, cardio embolism, and small vessel arteriolosclerosis account for the majority of ischemic strokes (85%). Younger people may get ischemic strokes from a variety of causes, including extra cranial dissection. Zhang, et al., (2019) documented that ischemic stroke is the most common type of stroke and can be classified into large-vessel occlusion, cardio embolism, small-vessel occlusion.

Pu, et al., (2023) revealed that the most common kind of stroke is ischemic stroke, which accounted for 62.4% of all stroke incidents globally in 2019. This kind of stroke causes severe health and financial consequences since it causes neuronal death and permanent adult incapacity. In 2019, 77.19 million people worldwide suffered an ischemic stroke; this resulted in 63.48 million DALYs (disability-adjusted life years) and 3.29 million fatalities. El-Hajj, et al, (2016) reported that there were 25.7 million stroke survivors, of whom 71% had an ischemic stroke, 10.3 million new strokes, of which 67% were ischemic strokes, and 6.5 million stroke deaths, of which 51% were ischemic strokes.

2.4.2. Hemorrhagic stroke:

Hemorrhagic stroke occurs when an artery providing blood to a portion of the brain suddenly bleeds (haemorrhagic stroke) (Mohamed & Alshekhani, 2016). This bleeding is due to the rupture of a blood vessel in the brain (Unnithan and Mehta, 2024). This results in a portion of the brain losing

function and may have an impact on functioning (Mohamed & Alshekhani, 2016).

Markus, (2016) documented that cerebral hemorrhage accounts for 20% of all stroke cases; subarachnoid hemorrhage (SAH) accounts for a quarter of these cases. Mohamed & Alshekhani, (2016) conducted a descriptive study to determine the risk factors for stroke in Sulaimaniyah Kurdistan Region-Iraq reported that about 15% of instances of stroke are hemorrhagic strokes.

Markus, (2016) stated that SAH happens when a blood vessel closes to the brain's surface bursts, causing spontaneous blood leaking into the subarachnoid space. Ruptures of saccular aneurysms at the base of the brain account for 85% of SAH cases. The anterior communicating artery, internal carotid artery, and middle cerebral artery are the three aneurysm sites that are most frequently affected. Ziu, et al., (2024) documented that SAH are life-threatening and result from the accumulation of blood between the arachnoid and pia mater.

Most of SAH are idiopathic and develop during life as opposed to being congenital, there is a large hereditary component. They are linked to systemic diseases such as connective tissue abnormalities and polycystic kidney disease in a small percentage of cases. Ten percent of SAH are perimes encephalic, meaning they have normal angiograms with hemorrhage surrounding the ventral midbrain. In this subgroup, the prognosis is excellent but the reason remains unknown. Other causes of the remaining 5% of SAH include fistulas, arterio venous malformations (AVM), and other uncommon causes (Markus, 2016).

The term "intracerebral hemorrhage" (ICH) refers to hemorrhaging into the parenchyma of the brain, which can sometimes spread to the ventricles as well as the subarachnoid and subdural areas (Rocha, et al., 2020).

Murphy &Werring, (2020) reported that anatomically, deep and lobar intra cerebral hemorrhage (ICH) can be distinguished from spontaneous (non-traumatic) ICH. Rocha, et al., (2020) stated that ICH accounted for 10-15% of all stroke causes of and is related to highest mortality rates. Murphy &Werring, (2020) emphasized that about two-thirds of ICH cases are caused by deep hemorrhages, which mostly affect the brainstem (5-10%) or basal ganglia and internal capsule (35-70%). 5–10% of ICHs are located in the cerebellum. The remaining hemorrhages are lobar hemorrhages, which are situated in the cerebral lobes' cortico-subcortical regions and frequently approach or touch the cerebral convexities. The most common cause of deep ICH is hypertensive (deep perforator) arteriopathy, which also plays a role in lobar ICH.

2.4.3. Transit ischemic stroke (TIA):

Murphy & Werring, (2020), reported that a transient episode of focused neurological impairment lasting less than 24 hours and not connected to a permanent brain infarction which is the classic definition of a TIA. With diffusion-weighted magnetic resonance imaging (MRI), cerebral ischaemia or infarction is visible in 30–50% of patients with clinically diagnosed TIAs. Pendlebury & Rothwell, (2019) in a prospective incidence study of all vascular events in a population of 92728 people residing in Oxfordshire, UK. revealed that 30% of the patients with stroke have TIA.

Markus, (2016) stated that TIA are defined similarly to strokes with the exception of symptoms lasting less than 24 hours. Not with standing full clinical recovery, imaging investigations reveal that cerebral infarction frequently occurs in TIA patients, especially when symptoms persist for hours as opposed to minutes. There are suggestions for changing the definition to either exclude these patients and classify this as a stroke or shorten the length

of symptoms in the definition of a TIA due to the indication that there is a pathophysiological continuum associated with stroke.

2.5. Effect of stroke on body system:

Outcome after acute stroke is determined to a large extent by post-stroke complications which include:

2.5.1. Cerebral edema:

Zhang, et al., (2022) mentioned that a typical consequence of acute ischemic stroke is cerebral edema, which raises the mortality rate dramatically and leads to worse functional outcomes. Excess fluid builds up in the brain's extracellular or intracellular spaces during ischemia due to the breakdown of the blood-brain barrier (BBB) and the failure of energy-dependent ion transport. This causes tissue swelling with an increase in intracranial pressure. Within the first few days following the commencement of a stroke, cerebral edema may develop and manifest itself several hours after ischemia. Yao, et al., (2021) stated that one of the main causes of death for stroke victims is the development of cerebral edema. Brain edema poses a serious risk. After a stroke, severe cerebral edema is a major predictor of a bad prognosis and can raise the death rate to 80%.

Gu, et al., (2022) reported that based on its molecular pathogenesis, edema following a stroke can be classified into three categories: vasogenic edema, ionic edema, and cytotoxic edema. Following a stroke, cytotoxic edema develops quickly, and is succeeded by vasogenic, ionic, and mixed edema. Vasogenic edema and cytotoxic edema are interrelated. Vasogenic edema is induced by the extension of cytotoxic edema and vice versa. Cerebral edema and the BBB are tightly associated. Situated between the brain interstitium and the luminal substances of the blood vasculature, it is a highly selective complex of cells.

2.5.2. Post-stroke infection:

Faura, et al., (2021) documented that following a stroke, 30% of individual's experience infections; the most prevalent types are pneumonia and urinary tract infections (UTI), occurring 10% of the time. Of these infections, stroke-associated pneumonia (SAP) often affects functional outcome the poorest and is the most acute form of stroke associated infection (SAI). It lengthens hospital stays, raises mortality, and degrades the functional outcome upon discharge.

Rashid, et al., (2020) reported that globally, post-stroke consequences are highly prevalent, with infection being the most frequent complication. This is the factor that affects stroke patients fatality rate the greatest. Pneumonia and UTI are the most prevalent infections. After a stroke, hyperthermia is linked to worse outcomes and neuronal damage. Infections are also brought on by post-stroke immunosuppression and the activation of inflammatory mediators. Following a stroke, a systemic inflammatory response may result in immunosuppression and an elevated risk of infection.

In a cohort study involving individuals suspected of having an ischemic stroke conducted by Vermeij, et al., (2018) documented that the rate of post-stroke infection after seven days was 15%, which is a much lower incidence than the overall rate of post-stroke infection. Pneumonia prevalence was 7.5%, whereas UTI prevalence was 4.4%.

2.5.3. Hyperthermia:

Rashid, et al., (2020) indicated that in experimental models of focal cerebral ischemia, hyperthermia results in brain damage, and its detrimental effects last even if the ischemia starts days later. The correlation between hyperthermia and elevated mortality and morbidity rates in individuals with stroke. El-Radhi, (2018) reported that hyperthermia in stroke is characterized by a core temperature of more than 40.6 °C, hot, dry skin, and anomalies of

the central nervous system, including delirium, convulsions, and coma. When the temperature climbs above 40.2 °C, cell deaths take place, and the condition has a high mortality rate of 80%. Lower than 40.0 °C core temperature is linked to heat exhaustion.

2.4.4. Cardiac complications:

New-onset cardiovascular problems are a key medical concern following ischemic stroke (Buckley, et al., 2022). Sposato, et al., (2020) reported that stroke-related fatalities accounted for 5.5 million deaths worldwide. It is predicted that among survivors of cerebrovascular events, over 1 million post-stroke cardiovascular deaths occur annually, given that cardiovascular diseases account for one-fifth of fatalities in patients with stroke. Scheitz, et al., (2018) documented that stroke is linked to an increased risk of nonfatal cardiovascular problems, cardiovascular death is mere a tip of the iceberg. The term "stroke heart syndrome" (SHS) refers to a series of clinically related post-stroke cardiac events that are generated by many pathophysiological pathways referred to as "stroke induced heart injury" (SIHI).

Within the acute stroke period, acute coronary syndrome (ACS), heart failure, and arrhythmias are among the new-onset major adverse cardiovascular events that can be identified in up to 20% of patients with ischemic stroke (Buckley, et al., 2022). Sposato, et al., (2020) reported that there are five primary categories into which the SHS falls: ischemic and nonischemic acute myocardial injury presenting with elevated cardiac troponin (cTn), which is usually asymptomatic, post-stroke acute myocardial infarction (AMI), left ventricular dysfunction, and heart failure (HF), electrocardiographic changes and cardiac arrhythmias including post-stroke atrial fibrillation (AF); and post-stroke neurogenic sudden cardiac death.

A retrospective observational study conducted by Buckley, et al., (2022) indicated that among 365 383 patients with ischemic stroke within five-year follow-up. Of which, 11.1% developed ACS, 8.8% AF, 6.4% HF, 1.2% severe ventricular arrythmia, and 0.1% Takotsubo syndrome within 4 weeks after stroke. Sposato, et al., (2020) revealed that acute ECG abnormalities, such as ST-segment elevation, ST-segment depression, unspecified ST-T changes, QT prolongation, T inversion, abnormal T wave morphology, bundle branch block, and pathological Q waves, are common among patients with all types of stroke.

2.5.5. Post-stroke seizures and epilepsy:

Stroke is the primary cause of epilepsy in the elderly (Galovic, et al., 2021; and Bustamante, et al., 2016), and is considered to be one of the main epileptogenic diseases. Acute symptomatic seizures are defined as those that manifest within the first two weeks following a stroke and do not always indicate the onset of epilepsy, should be distinguished (Bustamante, et al., 2016). About 6% of the 3–6 million people who have strokes each year subsequently develop post-stroke epilepsy (Galovic, et al., 2021). It is estimated that the incidence of post-stroke epilepsy is 8.9%, and it is more common following a hemorrhagic or cortical stroke. However, post-stroke epilepsy persists during the chronic phase after the sub-acute phase. After an average follow-up of six months, the seizures after stroke study (SASS) estimated that 2.5% of stroke patients had new-onset epilepsy following their stroke. First seizure occurs later than two weeks of beginning the stroke(Bustamante, et al., 2016).

Following a stroke, seizures may worsen metabolic stress and cell death, increasing the size and lethality of the infarct and impairing functional results (Brondani, et al., 2020). There are two categories of post-stroke seizures: acute and remote symptomatic. Seven days following an infarct,

acute symptomatic seizures, sometimes referred to as "early" seizures, take place (Galovic, et al., 2021). Remote symptomatic seizures, sometimes referred to as "late" seizures, are spontaneous seizures that happen more than a week following a stroke (Fisher, et al., 2014).

There is a greater likelihood of status epilepticus in patients with early-onset seizures, as well as poorer outcomes. Seizures are less likely to reoccur, though. In older adults, 60% of cases of status epilepticus are related to an acute or distant symptomatic stroke. A recurrence incidence over 50% is observed in patients with late-onset seizures. Vascular cognitive impairment is promoted by recurrent seizures after an ischemic stroke (De Reuck, 2020).

2.5.6. Deep venous thrombosis (DVT):

Patients who have had a stroke are at increasing risk for developing deep vein thrombosis (DVT), which can result in a pulmonary embolism (PE) (Khan, et al., 2017). A prospective study that was conducted by Liu, et al., (2020) reported that a common cause of lower extremity DVT is post-stroke paralysis. Lower extremity DVT has the potential to extend to the proximal circulation, and a deadly PE could arise from the thrombus separating. In the lower limbs' deep veins, DVT can be developed at several locations. The incidence of lower-extremity DVT has been reported to range from 8.7-75.0% in post-stroke patients, in this study, it was noted that the incidence of DVT in patients with hemorrhagic stroke (31.1%) was significantly higher than that in patients with ischemic stroke (23.4%).

In immobilized post-stroke patients, the DVT incidences differ from 10%-75%, based on the methods of diagnosis and evaluation time (Soroceanu, et al., 2016). Advanced age, hemiparesis, immobility, female gender, AF, and intravenous or intraarterial tissue plasminogen activator use, all are risk factors for developing DVT in patients with acute stroke (Khan, et al., 2017).

In individuals with SAH or an ICH, venous thromboembolism (VTE) is also extremely common. Individuals with SAH and ICH may potentially have a higher risk of DVT/pulmonary embolism (PE), but the risk with TIA is the lowest (Stecker, et al., 2014). PE is the most prevalent cause of DVT-related mortality following a stroke, accounting for 13-25% of early deaths. In the first few months after a stroke, their incidence typically ranges from 1-3% (Khan, et al., 2017).

2.5.7. Constipation:

Constipation symptoms, which are mostly associated with neurological diseases (Guo, et al., 2022, and Li, et al., 2017), dependency, prolonged hospital stays, and motor, cognitive, and communication impairments, affect between 30% and 60% of stroke patients following the occurrence (Guo, et al., 2022). The incidence of constipation in patients with stroke are varied significantly, ranging from 29-79% (Li, et al., 2017).

Patients who have had strokes suffer greatly from constipation since it can lead to symptoms or diseases like hemorrhoids, sadness, poor breath, and abdominal pain. Furthermore, extended squatting and forced defecation can result in another stroke or other cerebrovascular events, putting the patient's life in risk (Guo, et al., 2022). Constipation following a stroke lowers quality of life and increases the risk of complications for patients because straining too hard to defecate might raise intracranial pressure (Sun, et al., 2022).

Sun, et al., (2023) revealed that post-stroke constipation(PSC) is a frequent consequence that affects 50–70% of stroke victims. PSC has a major impact on stroke rehabilitation and treatment, which raises healthcare expenses, increased hospital stays, and lowers quality of life. In addition to causing or exacerbating post-stroke depression. PSC can result in another

stroke or even death, which would put a significant strain on the country's healthcare system.

2.5.8. Dysphagia:

Dysphagia, which is well-defined as an uneven pattern of swallowing or a disruption in the movement of food from the mouth to the esophagus, is a significant issue in a number of neurological diseases (Alamer, et al., 2020). A significant consequence that most patients experience after an ischemic stroke is dysphagia (Labeit, et al., 2023).

Alamer, et al., (2020), and Cohen, et al., (2016) emphasized that dysphagia is a significant health issue that arises in the first 2-4 weeks following a stroke, with a prevalence ranging from 29–81%. Aspiration, pneumonia, and malnourishment are among the factors contributing to higher rate of death and morbidity in patients with stroke (Cohen, et al., 2016). When patients experience dysphagia, they may not be able to eat or drink, which can lower their quality of life and postpone functional recovery (Alamer, et al., 2020).

Alamer, et al., (2020) reported that at six months, 11–50% of stroke patients still have dysphagia, despite the fact that many of them recover instantly. Institutionalization and unfavorable outcomes are independently predicted by persistent dysphagia. Labeit, et al., (2023) recorded that disruption of a large cortical and subcortical swallowing network is the pathophysiological cause of dysphagia following stroke. Therefore, it is emphasized that all patients after a stroke should be screened as soon possible for dysphagia. More complex multi-consistency protocols or basic bedside water-swallowing tests should be used initially.

2.6. Management of stroke:

2.6.1. Early detection of stroke:

Herpich & Rincon (2020) revealed that ischemic strokes may happen at a hospital or in the community, and healthcare professionals and/or bystanders need to be aware of them. A cascade of survival unique to stroke is triggered by early detection. Stroke is classified as a clinical diagnostic, and individuals can be identified based on numerous aspects of their clinical presentation. Emergency medical systems play a critical role in the identification, evaluation, and transfer of stroke patients to appropriate care settings.

Chugh (2019) reported that in the treatment of acute ischemic stroke, time is the most crucial component. Approximately 14000,000,000 nerve connections are destroyed, 190,0000 brain cells are killed, and 12 km (7.5 miles) of nerve fibers are lost per minute in an ischemic stroke patient. An hourly deprivation of blood circulation causes the brain to age by 3.6 years.

Sharma, et al., (2022) documented that when blood flow to the brain is interrupted, the tissues of the brain are damaged. Injuries to a portion of the nervous system might cause symptoms in the body parts that are under its control. A stroke victim's chances of fully recovering are improved immediately they obtain medical care. For this reason, in order to take immediate action, it is need to be aware of the warning indications of a stroke. These warning indications include pain or numbness in the arm, face, or leg; difficulty responding and communicating; behavioral changes; visual difficulties; difficulty walking; headache; nausea or vomiting.

2.6.2. Intravenous thrombolytic therapy:

Barthels & Das, (2020) revealed that the most common cause of blockages in ischemic strokes is blood clots that become stuck in one of the brain's arteries. For the treatment of ischemic stroke, tissue plasminogen activator (tPA), a thrombolytic medication that disintegrates the clot. On the other hand, this therapy needs to be administered to a stroke patient within 4.5

hours of the onset of symptoms. If tPA is administered beyond this therapeutic window, it may induce a hemorrhagic change that worsens existing brain injury. In the event that the patient cannot reach the hospital in the allotted time frame for tPA treatment, thrombectomy is one of the alternative therapeutic choices in case the clot does not clear up on its own.

Mosconi & Paciaroni, (2022) reported that it is often advised to provide intravenous thrombolysis (IVT) with alteplase, a recombinant tissue plasminogen activator (rtPA), within 4.5 hours of the onset of symptoms. This is the only approved pharmacological systemic therapy for acute illness syndrome (AIS). When treating large vascular occlusion (LVO), IVT can be used either alone or in conjunction with mechanical thrombectomy (MT) and endovascular treatment (EVT). For individuals with LVO, MT should be administered between 4.5 and 6 hours after the onset of symptoms, separately between 4.5 and 6 hours after the onset of symptoms when combined with IVT.

2.6.3. Anti-thrombotic and anti-platelet:

Mac Grory, et al., (2022) reported that antithrombotic treatment is informed by several recent research in the prevention of stroke. Aspirin lowers the rate and severity of early recurrent stroke over the first 6-12 weeks by more than half; however, its effectiveness attenuates with longer-term use. The benefits of aspirin after TIA and ischemic stroke appear greater, but shorter-lived, than previously recognized. According Bhatia, et al., (2021) antiplatelet medication is essential for preventing thrombotic events after a transient ischemic attack or ischemic stroke. While aspirin has a well-established effect in this regard, short-term dual antiplatelet therapy may also be responsible for preventing repeated strokes.

The advantages of combining aspirin with clopidogrel, have now been validated with patients with acute, non cardioembolic TIA and mild

ischemic stroke. Also adding low-dose rivaroxaban (2.5 mg twice daily) to low-dose aspirin (100 mg daily) reduces the risk of stroke more effectively than aspirin alone for patients with stable atherosclerotic peripheral and coronary artery disease, including a subgroup with a history of nonlacunar ischemic stroke. However, this combination also increases the risk of major bleeding (Mac Grory, et al., 2022).

Bhatia, et al., (2021) carried out a meta-analysis and systematic review of randomized controlled trials to compare the effects of aspirin alone versus early initiation of short-term DAPT (aspirin plus P2Y12 inhibitor for up to three months) in patients with acute stroke or TIA. Concluded that a short-term DAPT within 24 hours of high-risk TIA or mild-moderate ischemic stroke decreases the risk of recurrent stroke.

2.6.3. Mechanical thromboectomy:

McCarthy, et al., (2019) reported that for large vascular occlusion (LVO) in acute ischemic stroke, mechanical thrombectomy (MT) has emerged as the accepted protocol. Hasan, et al., (2019) stated that endovascular thrombectomy (EVT), a recent advancement in the treatment of acute ischemic stroke (AIS), has shown considerable reduction in stroke morbidity and death. Albers, et al., (2018) documented that when patients with obstruction of the internal carotid artery or the first segment of the middle cerebral artery receive endovascular thrombectomy within six hours of the onset of symptoms. The procedure has been demonstrated to be successful in treating acute ischemic stroke. It was also mentioned that the volume of brain tissue that is ischemic but has not yet infarcted and the volume of permanently damaged ischemic tissue may both be estimated using computed tomographic (CT) perfusion imaging and the combination of diffusion and perfusion magnetic resonance imaging (MRI).

2.6.4. Anti-hypertensive medications:

Wajngarten & Silva (2019) revealed that blood pressure is a significant factor in determining the risk of ischemic stroke and cerebral hemorrhage. It is emphasized that lowering blood pressure to less than 150/90 mmHg can lower the risk of stroke. The treatment of blood pressure in adult patients with stroke is a complicated and difficult task due to the various causes and effects on hemodynamics. Lowering blood pressure seems to be more crucial than selecting the right agents, and the more initial baseline blood pressure falls, the less effective the BP reduction becomes. Sonawane, et al., (2019) reported that the most often prescribed medications for stroke survivors were angiotensin inhibitors, which were followed by β-blockers, diuretics, angiotensin receptors blockers and calcium channel blockers.

Van Dongen, et al., (2019) indicated a significant difference in the risk of all-cause mortality between patients with young-onset and older-onset causes of stroke. Antihypertensive users with both young-onset and older-onset causes of stroke had lower risks than non-users; this highlighted the role of antihypertensive medication as secondary prevention after stroke. In patients with older-onset causes of stroke, the risk of recurrent TIA or stroke was lower for high usage compared to non-users, but not lower for low-intermediate usage.

2.6.5. Hemostatic therapy:

Xu, et al., (2022) revealed that hemostatic treatment is employed to manage hematoma growth in patients with hemorrhagic stroke. It is advised to use fresh frozen plasma, vitamin K, recombinant active factor VII, and prothrombin complex concentrates. However, in patients without coagulation disease, a Phase III randomized trial did not find any clinical advantage from hemostatic treatment. Consequently, patients with coagulopathy should be the main focus of current hemostasis.

Du, et al., (2023) reported that thrombosis may be developed and treatment adverse effects may result from a decrease in the fibrinolytic system's function. The polysaccharides found in frequently used hemostatic materials have been shown to have antimicrobial, hemostasis-promoting, and wound-healing effects. On the other hand, polysaccharides cannot be used to make hydrogel adhesives due to their lack of mechanical qualities and adhesive strength. Protein-based hydrogels have been extensively researched as useful materials for hemostasis and tissue healing because of the great mechanical strength of protein biomaterials.

2.6.6. Management of increasing intracranial pressure (IICP):

For patients suffering from acute strokes, elevated intracranial pressure (ICP) results in neurological impairment and mortality. Large intracerebral hemorrhage, obstructive or non-obstructive hydrocephalus, and cerebral ischemia worsened by cerebral edema are just a few of the several causes of intracranial hypertension in these patients (Suwatcharangkoon, 2015). Wajngarten & Silva (2019) reported that for individuals suffering from intra cerebral hemorrhage, intracranial pressure is an additional crucial factor to take into account. If there is a suspicion or confirmation of high blood pressure (systolic greater than 180 mmHg), maintained at 61–80 mmHg, cerebral perfusion pressure is advised in cases with increased intracranial pressure. Reducing blood pressure to a moderate 160/90 mmHg is advised if there is no indication or suspicion of high intracerebral pressure. Acute reduction to 140 mmHg is probably safe if the systolic blood pressure is between 150 and 200 mmHg.

Elisabet, (2021) reported that pharmacotherapy and non-pharmacotherapy approaches must be established for the management of elevated ICP. The pharmacotherapy intervention consists of the following: prophylactic use of anticonvulsants, maintenance of normothermia,

coagulation therapy, managing cerebral metabolism (sedation), hyperosmolar therapy, hyperventilation, and optimal oxygenation. In addition, non-pharmacotherapy includes suctioning, posture, control fluid and electrolytes, and nutrition, as well as early trauma assessment (airway, breathing, and circulation).

2.6.7. Surgery:

Xu, et al., (2022) revealed that in order to minimize the bulk effect and secondary harm brought on by hematoma, surgical evacuation is utilized in ICH patients. In patients with ICH, hydrocephalus from ventricular obstruction, brainstem compression, and neurological decline are commonly employed as markers for urgent surgical intervention. Emergency endovascular coiling or surgical clipping is required in SAH patients in order to control the bleeding from a ruptured aneurysm.

Unnithan & Mehta, (2020) revealed that the various surgical procedures used to treat hemorrhagic stroke include stereotactic aspiration, endoscopic aspiration, decompressive craniectomy, and catheter aspiration. Early surgery may be beneficial for those with lesser clinical impairments and lobar hemorrhages located less than 1 centimeter from the brain's surface. In cases of cerebellar hemorrhage accompanied by hydrocephalus or brainstem compression, emergency surgical evacuation is recommended. Patients who have cerebellar hemorrhages larger than three centimeters in diameter will do better after surgery. Suboccipital craniectomy is used to remove the cerebellar hematoma. Brainstem hemorrhages should not be evacuated since it may be dangerous.

2.7. Dysphagia in patients with stroke:

Helldén, et al., (2018) reported that the medical term for the inability to move food, liquids, medicine, or saliva from the mouth to the stomach is dysphagia. Swallowing is commonly classified into three stages:

the oral stage involves chewing and combining with saliva to create a bolus, which is then moved by the tongue backwards to the pharynx; the pharyngeal stage involves the soft palate rising, the hyoid bone rising to bring the larynx up the epiglottisclose, the base of the tongue contacting the pharyngeal wall, and the cricopharyngeal muscles relaxing; and the oesophageal stage involves the bolus passing through the oesophagus. Dysfunction or damage in any of these structures causes dysphagia; oropharyngeal dysphagia affects the first two phases of swallowing.

Jones, et al., (2020) revealed that in order to move a bolus of food or liquid from the mouth to the stomach while maintaining airway protection and reducing residue, swallowing is a complex sensorimotor process requiring the synchronization of several muscle groups. The rostral medulla houses the neuronal circuitry that generates swallowing patterns. Widespread cortical and subcortical activation is linked to movement preparation and sensory processing. Dysphagia, or trouble swallowing, can therefore be caused by stroke-related lesions in the brainstem, subcortical control circuits, or the cortical hemisphere.

Elsaid & Shabaan, (2019) revealed that many stroke patients experience dysphagia, or trouble swallowing, in the early hours and days following their stroke. Dysphagia is a significant medical condition that can be fatal. Dysphagia following a stroke can cause issues with the pharyngeal and oral aspects of swallowing. Estupiñán Artiles, et al., (2022) revealed that a stroke can have a variety of impacts, such as impairing one's capacity to retain food or liquids in the mouth, causing incoordination or paralysis in the tongue or throat, or disrupting the oral and pharyngeal stages of swallowing. Elsaid & Shabaan, (2019) documented that excessive salivation, drooling, coughing or choking during meals, and even trouble speaking or a raspy voice can all be symptoms of persistent dysphasia.

The left hemisphere is primarily involved in processing the oral phase of swallowing, while the right hemisphere is more active during the pharyngeal phase. However, there is still uncertainty regarding the relationship between the location of a stroke and the symptoms of dysphagia. An increased risk of dysphagia and aspiration has been linked to injury to the dominant cerebral hemisphere (Estupiñán Artiles, et al., 2022).

Due to dysphasia consequences such as aspiration pneumonia, dehydration, malnourishment, and death, these indicators are linked to a poor prognosis and an elevated risk of mortality and morbidity. For patients who have had a stroke, routine screening and reevaluation of swallowing abilities are therefore required (Elsaid & Shabaan, 2019).

Across-sectional study of all stroke patients admitted to the stroke unit of hospital by Khedr, et al., (2022) revealed that in addition to dehydration, aspiration pneumonia, and malnourishment, post-stroke dysphagia frequently results in longer hospital stays and a higher death rate. Early detection and prompt intervention for post-stroke dysphagia could be regarded as a crucial component of acute therapy of stroke since it minimizes aspiration pneumonia following a stroke and improves the outcome of the stroke.

Elsaid & Shabaan, (2019) revealed that a formal swallowing assessment is frequently part of the neurological illness diagnosis process in order to prevent or limit these dysphagia-related problems. This can assist in detecting dysphagia before problems arise. Dysphagia exercises, which can enhance the functional and physiological changes in swallowing ability and are centered on strengthening muscles, are being employed as therapy for dysphagia in patients with stroke.

2.8. Assessment of dysphagia:

Eltringham, et al., (2018) reported that early detection of dysphagia following a stroke helps guide dietary management choices and could

minimize pulmonary consequences. According to a number of national and international standards, individuals who have suffered an acute stroke be should have their swallowing examined by a qualified healthcare provider using a validated screening method, and they should not eat or drink anything until the swallow screen is finished.

Lee & Kim, (2015) revealed the muscles in the mouth, throat, and larynx must work in conjunction in order to swallow. Cough reflexes, voice changes after eating, mastication strength and speed, face and tongue sensation, lip sealing, laryngeal elevation, and dysphonia must all be assessed in order to determine the degree of dysphagia.

Eltringham, et al., (2018) reported that the suggested window of time between admission and screening is four hours to twenty-four hours. If dysphagia is suspected, the patient ought to be referred for a specialized assessment to a healthcare provider with knowledge of swallowing disorders. This often includes a cranial nerve examination, dietary and fluid texture experiments, and compensatory techniques. Individuals who exhibit signs of aspiration ought to undergo a new evaluation for instrumental testing, employing methods such patients who exhibit signs of aspiration ought to undergo a reevaluation for instrumental examination, utilizing methods like video fluoroscopic or Flexible Endoscopic Evaluation of Swallowing (FEES). The findings of these evaluations guide management, which could involve compensatory techniques, food or fluid adjustments, no thing per mouth with alternative nutrition if swallowing is dangerous, or muscle strengthening activities.

Lee & Kim, (2015) reported that as a result, numerous dysphagia tests have been created to evaluate stroke patients' risk of aspiration pneumonia. A number of helpful screening instruments available, including the Burke dysphagia screening exam, timed test, 3-oz water swallowing test,

bedside swallowing assessment, and standardized swallowing assessment. Lately, acute stroke dysphagia, the Toronto Bedside Swallowing Screening Test (TOR-BSST), and the Gugging Swallowing Screen (GUSS) have also become well-liked screening instruments. Nonetheless, the screening instruments mentioned above are made to primarily evaluate the degree of aspiration; as a result, obtaining comprehensive knowledge regarding the causes of dysphagia and potential therapies is challenging. To diagnose dysphagia and quantify swallowing function, a videofluoroscopic swallowing study (VFSS) served as the basis for the development of the functional dysphagia scale (FDS).

The key outcome measure, the Functional Oral Intake Scale (FOIS), is a valid and reliable measure that is responsive to variations in functional oral intake in seven levels, (level 1: nothing by mouth, level 2: tube-dependent with a minimal attempt of food or liquid, level 3: tube-dependent with consistent oral intake of food or liquid, level 4: oral diet, single consistency, level 5: oral diet, multiple consistencies, requiring special compensation or preparation, level 6: oral diet, multiple consistencies, no special preparation, specific food limitation, and level 7: total oral diet with no restrictions) are suitable for measuring and recording the changes in the functional eating abilities of stroke patients over time (Bakhtiyari, et al., 2022).

2.9. Complications of dysphagia:

Jones, et al., (2020) revealed that a strong indicator of poor health and psychosocial consequences is dysphagia. The effects of post-stroke dysphagia are similar to those of other dysphagia etiologies, and they include aspiration pneumonia, malnourishment, and dehydration. Moreover, all-cause dysphagia doubles the in-hospital mortality rate. Predicting the impact of post-stroke dysphagia and other patient characteristics on poor outcomes have been the focus of recent stroke research. Post-stroke dysphagia has been linked to

higher death rates, worse overall outcomes, increased dependency, longer hospital stays, lower likelihood of releasing home, and altered diet or tube feeding. So, complications of dysphagia include:

2.9.1. Aspiration Pneumonia:

Helldén, et al., (2018) reported that dysphagia can have a secondary effect on stroke patients' prognosis, nutritional deficiencies, disability, and an elevated risk of pneumonia and death. Early dysphagia screening improves stroke outcomes and lowers the risk of aspiration pneumonia associated with stroke, particularly in cases of recent ischemic stroke. Within the causes of death following a stroke, pneumonia accounts for about 35% of post-stroke deaths. The majority of pneumonia associated to stroke arises from dysphagia and the consequent aspiration of oropharyngeal food particles. Grossmann, et al., (2021) revealed that one of the most serious consequences of a stroke is pneumonia, which affects 4%–10% of patients and is linked to a high death rate. Pneumonia rates were higher in patients with dysphagia than in those without it, and early diagnosis of dysphagia—within 24 hours of admission—seemed to be linked to a decreased risk of pneumonia related to stroke.

A Retrospective Follow Up Study Among Stroke Patients Admitted at Felege Hiwot Compressive Specialized Hospital, Bahir Dar, North West Ethiopia, conducted by Tadios, (2022) reported that aspiration pneumonia is infection of the lung caused by inhaling food particles from the stomach is known as aspiration pneumonia. Worldwide, the incidence of this condition ranges from 5.3-8.3%, and hospital fatality rates can reach 70%.

2.9.2. Malnutrition:

Sabbouh & Torbey, (2018) documented that after an acute stroke, the prevalence of malnutrition ranges greatly, from 6.1 to 62%. Extended hospital stays, worse functional outcomes, and higher mortality rates three to

six months after an acute stroke are all caused by malnutrition. The kind of stroke determines the metabolic needs and resting energy expenditures (REEs), with subarachnoid hemorrhage (SAH) requiring a higher caloric intake than ischemic strokes and intracerebral hemorrhage (ICH).

Yoon, et al., (2023) reported that reduced oral intake due to swallowing difficulties results in malnourishment and dehydration. Reduced deglutition safety leads to pneumonia by tracheobronchial aspiration and choking. So, demonstrated a clear correlation between hunger and the severity of dysphagia and revealed that dysphagia and malnutrition at admission to rehabilitation were found to be substantially correlated. The clinical severity of dysphagia was discovered to be linked with marasmic malnutrition.

Chen, et al., (2019) revealed that the state of malnutrition arises from insufficient intake or absorption of nutrients, which results in changes to the body's cell mass and composition. These changes degrade physical and mental abilities and the way diseases manifest themselves. Because of their neurological and cognitive impairments, stroke patients in clinical practice may become malnourished. In stroke patients, post-stroke malnutrition affects up to 62% of cases.

2.9.3. Dehydration:

In a cross-sectional observational study, which included prospectively and consecutively patients with ischemic and hemorrhagic stroke conducted by Cortés-Vicente, et al., (2019) reported that patients who have had a stroke may be more susceptible to dehydration for a variety of reasons, including decreased oral water intake from dysphagia or a low level of consciousness. Viñas, et al., (2022) revealed that dehydration poses a serious concern to patients with dysphagia and is frequently the reason for morbidity and hospital readmissions. Among other efficacy limitations, dysphagia can result in malnourishment and dehydration. It can also produce

residue in the mouth and throat, impairment of the labial seal, and difficulty forming boluses.

Dehydration raises blood viscosity, hemoconcentration, and blood pressure, all of which can exacerbate the consequences of cerebral ischemia and cause more severe symptoms and brain damage. Additionally, dehydration is linked to an increased risk of side effects such venous thrombosis. The elderly is more likely to suffer from strokes, and they also tend to be dehydrated more frequently (Cortés-Vicente, et al., 2019).

A cohort study that included 86 post-stroke inpatients conducted by Murray, et al., (2015) recorded particular health outcomes, as well as the average amount of beverages consumed and the urea=creatinine ratio as a measure of hydration. The average daily fluid intake of the participants was 1504 ml, or almost 67% of their projected daily needs. In the sample, 44% of subjects had a blood urea nitrogen=creatinine ratio more than 20:1, indicating dehydration. 36%–66% of patients presenting in the acute period after stroke, with or without dysphagia, have been shown to be dehydrated.

2.10. Management of dysphagia:

2.10.1. Acupuncture:

Lu, et al., (2021) reported that the current research had discovered that patients with dysphagia following a stroke can greatly increase their vertebrobasilar artery blood circulation, which in turn improves the latency and amplitude of brainstem auditory evoked potentials. The reason acupuncture therapy works so well for treating dysphagia may be that it reestablishes the connection between the medullary motor nerve cell nucleus and the upper motor neuron, which in turn restores the central nervous system's functionality.

In a systematic review study of a randomized controlled trials (RCTs) of twenty-nine samples conducted by Li, et al., (2018) that compared

traditional acupuncture with non-acupuncture treatments (i.e., rehabilitation or routine medication treatment, meaning routine neurological treatment, including the reduction of intracranial pressure, platelet aggregation, maintenance of water and electrolyte balance, and nutritional support) were included in the trials that evaluated the effectiveness of acupuncture for post-stroke dysphagia. Excluded from consideration were studies on acupuncture-related methods that did not need inserting needles into the skin, such as cupping, auricular seed therapy, laser acupuncture, point injection, acupoint embedding, acupressure, tap-pricking, and moxibustion. Studies that contrasted various acupuncture techniques were also disregarded. Every participant in each of the included RCTs in the current review was randomly assigned to an intervention or control group.

A prospective cohort study conducted by Mao, et al., (2016) included 105 patients who had post-stroke dysphagia and were concurrently admitted to the Affiliated Hospital of Gansu University of Chinese Medicine: Standard swallowing instruction and acupuncture therapy were given to 50 patients from the Department of Neurology and Rehabilitation (the acupuncture group). Standard swallowing instruction was given to 55 patients from the Department of Neurology alone (the control group). For four weeks, participants in both groups received five days of therapy per week. The VFSS and the Standardized Swallowing Assessment (SSA) scores were used as the primary outcome measures, and the Royal Brisbane Hospital Outcome Measure for Swallowing was used as the secondary outcome measure. These assessments were conducted both before and after the 4-week treatment. The results of this study have significant differences as compared with before treatment ($P<0.01$). Comparison between the groups after 4-week treatment showed that the VFSS ($P=0.007$) and SSA scores ($P=0.000$) were more significantly improved in the acupuncture group than the control group.

Acupuncture combined with the standard swallowing training was an effective therapy for post-stroke dysphagia.

2.10.2. Behavioral Intervention:

Speyer, et al., (2022) revealed that behaviors that alter food and drink viscosity, volume, temperature, and/or acidity, motor behavioral techniques or oromotor exercises, general body and head postural adjustments, swallowing maneuvers (such as maneuvers to improve food propulsion into the pharynx and airway protection), and sensory and neurophysiologic stimulation (such as neuromuscular electrical stimulation [NMES]) are examples of behavioral interventions that's help in the management of dysphagia among patients with stroke.

A prospective observational study was conducted by Hien, et al., (2024) and carried out between June 2020 and May 2022 at the Neurological Center of Bach Mai Hospital in Vietnam. Patients with neurological illnesses are gathered and treated at this general hospital, which also houses the Neurological Center. Every day, the behavioral treatment group engaged in swallowing exercises that lasted for approximately sixty minutes. Training for the tongue, palate, face muscles, and mouth movements was part of these workouts. Every workout was customized with precise timings and timetables based on the patient's needs. Exercises for the tongue required fifteen minutes, those for the palate five minutes, those for the face fifteen minutes, those for the maxillofacial ten minutes, and those for the pharynx and larynx fifteen minutes. The purpose of tongue workouts is to improve tongue coordination and strength. The muscles of the palate, which are involved in closing down the nasal passages during swallowing to keep food or fluids from entering the nose, can be strengthened and coordinated with the aid of palate exercises. Exercises for the face focus on the muscles. The results show that behavioral

therapy significantly reduced the percentage of severe dysphagia in acute ischemic stroke patients.

A randomized clinical trial implementing behavioral therapies with new technologies such as transcranial direct current of stimulation (TDCS) conducted by Farpour, et al., (2023). Forty-four patients completed the research. Patients with strokes (> 24 hours after the stroke began) admitted to the neurology wards and stroke units of the hospitals affiliated with Shiraz University of Medical Sciences between February 2021 and November 2021 and administered the behavioral treatment of the patients in 5 sessions. Upon completion of treatment, 59.10% of the patients in the actual group achieved level 6 or 7. The majority of them (72.70%) had improvements that were noticeably greater than those in the control group following a one-month follow-up.

2.10.2.1. Compensatory strategies:

Compensatory techniques for dysphagia were designed to enhance swallowing safety by adjusting food texture, liquid consistency, and/or feeding posture. Cheng, et al., (2022) indicated that bolus volume and viscosity affect swallow biomechanics in a number of ways, including bolus flow dynamics and the length, scope, and timing of motions of oropharyngeal structures during swallowing. Thus suggested that altering the bolus's texture could lower the possibility that it will be swallowed incorrectly. It has been suggested that altering one's posture during swallowing can increase swallowing safety in addition to bolus changes. For instance, chin tuck posture offers superior airway protection than head neutral posture since it has been shown to constrict the airway entrance and lengthen the time that the laryngeal vestibule closes during swallowing.

A quasi-experimental study was conducted by Awad, et al., (2023) and carried out in the neurology outpatient clinic and the critical care unit of

the New Surgery Hospital, which is connected to the Zagazig University Hospitals, to assess how compensatory techniques affected the degree and functional result of oropharyngeal dysphagia in stroke patients. A purposeful sample of sixty adult hospitalized stroke victims was gathered. Tools include the GUSS, the Swallow Function Scoring System (SFSS), the Structured Interview Questionnaire and the Swallowing Disturbance Questionnaire. Through the post- and follow-up phases, two thirds (66.7%) and the majority (90.0%) of the patients in the study group, respectively, were able to feed themselves independently. During the three phases of the study, there were highly statistically significant differences between the patients in the study group regarding the physical, functional, and emotional symptoms of dysphagia, with $\bar{X}$S. D (161.6 ± 8.2, 82.5 ± 29.2, & 57.8 ± 26.5 respectively) at p=0.000 and F=41.91. Based on the study's findings, it can be said that using compensatory techniques had a statistically significant.

2.10.2.2. Rehabilitative intervention:

Cheng, et al., (2022) revealed that one of the most popular forms of treatment that speech therapists suggest for people with dysphagia is rehabilitation exercise. Depending on the patient's limitations, the goal of these exercises is to increase the efficiency and safety of swallowing by strengthening, coordinating, and/or increasing the motility of the structures involved in swallowing, such as the lips, tongue, and pharynx. Patients who struggle with food propulsion or bolus clearance from the oral cavity, for instance, might benefit from lingual strengthening and range-of-motion exercises.

Bakhtiyari, et al., (2015) reported that the majority of studies either did not specify the onset time of swallowing therapy after a stroke or provided extremely variable data. Several studies have started therapies 4–6 weeks, even 3–6 months, or even as soon as 7 days or 24 hours after the stroke.

However, other studies have only looked at early intervention, ignoring the best time to start swallowing rehabilitation for a full recovery. Oral motor exercises, the airway-protecting maneuver, thermal-tactile stimulation, and Shaker exercise are examples of rehabilitation techniques. In recent times, current swallowing therapy techniques have included the use of neuromuscular electrical stimulation, biofeedback, and transcranial magnetic stimulation. Recently, a number of new rehabilitative exercise programs supported by a relatively high level of evidence, such as:

2.10.2.2.1. Expiratory muscle strengthening training (EMST):

A randomized, controlled study conducted by Park, et al., (2016) reported that patients with dysphagia may benefit from respiratory muscle strength training (EMST), with several encouraging results noted. With an EMST device, one can change the resistance while blowing forcefully to achieve high expiratory pressures. The activation of suprahyoid muscles produces and transfers the expiratory pressure needed to perform endoscopic suction therapy via the upper airway and into the EMST apparatus. Primary results of EMST include improved ventilation through the development of forceful, oral expiratory activity, which strengthens the respiratory muscles. Also, it is somewhat relevant to the non-ventilatory system, which includes speaking, swallowing, and coughing. Activating a number of common anatomical structures is necessary for both secondary functions (especially swallowing) and breathing.

Another study was conducted by Eom, et al., (2017) to examine how resistance EMST affects the ability of stroke patients with oropharyngeal dysphagia to swallow. The experimental group (n = 13) and the placebo group (n = 13) were randomly assigned to 42 stroke patients with dysphagia. In contrast to the placebo group, which used a sham EMST device without any loading, the experimental group conducted EMST utilizing a portable EMST

equipment. Five sets of five breaths were taken through the device each day for a total of twenty-five breaths each day during the four-week intervention. For four weeks, both groups received 30 minutes a day, five days a week, of traditional dysphagia therapy. The oropharyngeal dysphagia scale (VDS) and penetration-aspiration scale (PAS), which are based on a VFSS, were evaluated. In comparison to the placebo group ($p = 0.014$), the experimental group demonstrated greater improvement in the pharyngeal phase of the VDS ($p = 0.018$ and 0.006, respectively) and PAS.

2.10.2.2.2. Chin tuck against resistance (CTAR) exercise:

Park & Hwang (2021) revealed that patients with dysphagia may benefit from an alternative therapeutic exercise technique called chin tuck against resistance (CTAR) that helps enhance swallowing function. An elastic rubber ball beneath the subject's chin before attempting chin tucking against the ball's elasticity. A possible therapeutic training technique for strengthening the suprahyoid muscle is chin tucking against an elastic rubber ball, which has been shown to produce high isotonic and isometric muscular activation in the suprahyoid muscle.

An experimental study that conducted by Park, et al., (2018) to investigate the impact of CTAR on patients' ability to swallow after a subacute stroke was examined. In this study, the impact of CTAR on patients' ability to swallow after a subacute stroke was examined. At random, the patients were assigned to be in either the control group ($n = 11$) or the experimental group ($n = 11$). The CTAR apparatus was used by the experimental group to carry out CTAR. Only standard dysphagia treatment was given to the control group. After four weeks, both groups experienced five days a week of training. Based on a VFSS, the swallowing function was assessed using the FDS and the PAS. Compared to the control group, the experimental group shown greater improvements in the oral cavity, laryngeal elevation/epiglottic closure, residue

in valleculae, and residue in pyriform sinuses of FDS and PAS ($p < 0.05$, all). This study showed that CTAR is useful in helping stroke patients with dysphagia to improve their pharyngeal swallowing function.

2.10.2.2.3. Swallowing Exercise:

Langmore & Pisegna, (2015) reported that patients with dysphagia have long been treated with exercise rehabilitation. There are numerous exercises available, ranging from mixed to solitary, direct to indirect and those that include activities that include swallowing or not. Unlike compensatory therapies, which are intended to have a short-term effect, rehabilitation exercises aim to alter and improve the swallowing physiology in terms of force, speed, or timing. In order to achieve neuroplasticity, rehabilitation exercises also entail retraining the neuromuscular systems. This is because repeatedly and intensely pressing any muscle system will alter neuronal innervation and movement patterns.

Byeon, (2020) reported that the muscles involved in laryngeal elevation can be efficiently strengthened by the Mendelsohn maneuver, which targets the submandibular hyolaryngeal muscles. When pharyngeal swallowing is developing, the Mendelsohn maneuver is intended to enhance the larynx's and hyoid bone's voluntary movement. Additionally, after making contact with the larynx and lifting it to its greatest height, it is a technique to voluntarily hold the position for a few seconds. According to reports, it helps people with swallowing difficulties and regains their ability to swallow during the pharyngeal stage.

Kusumaningsih, et al., (2019) conducted a study to evaluate the effects of swallowing practice, hyolaryngeal complex range of motion exercise, and pharyngeal strengthening exercise on swallowing performance in ischemic stroke patients with neurogenic dysphagia. The PAS and the FOIS, which are based on the Flexible Endoscopic Evaluation of Swallowing,

were used to measure swallowing function both before and after therapies. For four weeks, the interventions were administered once a day for thirty to forty-five minutes. The PAS was 6.00±1.79 prior to the interventions and 1.67±0.82 following them (P=0.003). In the meantime, the FOIS score was 3 (1–5) prior to the interventions and 5.00±2.10 (P=0.041). Following the procedures, PAS and FOIS both improved.

Poorjavad, et al., (2019) reported that the head lift exercise (HLE), often referred to as the Shaker exercise, is one of the most well-known methods in this field. It was developed to help dysphagic patients improve their supra-hyoid muscles. According to earlier studies, following 6 weeks of the HLE, individuals with dysphagia as well as asymptomatic older adults exhibit a considerable increase in anterior laryngeal and hyoid bone extrusion. After the workout plan is finished, post-swallow aspiration has also been reported to be greatly reduced.

2.10.3. Neuromedulation treatment:

Cheng, et al., (2022) revealed that over the previous 20 years, there has been a lot of interest in the therapeutic use of neuromodulation approaches for neurogenic dysphagia. These methods work to increase neuroplasticity, the nervous system's ability to adapt to external or internal stimuli. Neuroplasticity is important for functional recovery after brain loss. They also regulate the neurological control of swallowing. Based on the routes of administration, these approaches can be categorized as either centrally or peripherally driven neuromodulation.

Cheng, et al., (2021) reported that two noninvasive brain stimulation (NIBS) techniques that alter brain activity and cause long-lasting alterations in synaptic plasticity are repetitive transcranial magnetic stimulation (RTMS) and transcranial direct current stimulation (tDCS). While tDCS polarizes nerve cells by direct electrical current, RTMS uses electromagnetic induction

to depolarize postsynaptic connections. Although the majority of reviews have concentrated on acute and subacute stroke patients, a number of systematic reviews have demonstrated that both approaches can restore swallowing capabilities after stroke.

A randomized controlled trials conducted by Wang, et al., (2021) revealed that noninvasive neurostimulation therapies (transcranial direct current stimulation (tDCS), surface neuromuscular electrical stimulation (sNMES), pharyngeal electrical stimulation (PES), and repetitive transcranial magnetic stimulation (rTMS) had a better effect than the control group $P < 0.000$.

2.10.4. Pharmacological therapy:

Cheng, et al., (2022) reported that pharmacological medications are a potentially useful management option for dysphagia; however, in comparison to other treatments, they have not gotten much attention, which is significant for this sector. These substances either directly alter muscle function or activate swallowing-related neuronal circuits in the central or peripheral nervous systems. The drug classes that have been investigated thus far in the field of swallowing and oropharyngeal dysphagia include levodopa, other dopaminergic agents, calcium blocking agents, dopamine D2 receptor antagonists, angiotensin-converting enzyme (ACE) inhibitors, beta blockers, nitric oxide donors, and acetylcholine esterase inhibitors. These medications might help dysphagic patients' swallowing reflex or lower their risk of aspiration pneumonia.

2.11. Effect of Super Supra Glottic Swallow Maneuver and Hyoid Lift Maneuver on dysphagia:

Sasegbon, et al., (2024) reported that the brainstem is thought to serve as the swallowing command center. It takes in afferent information from the cerebral cortex and peripheral nerves, integrates and processes it, and then

produces efferent motor impulses that are used to carry out the swallowing motor sequence. It has been shown that swallowing neurones, such as motor neurones and interneurones, are found in the medulla oblongata, which is at the base of the brainstem. These neurones come together to form the swallowing central pattern generator (CPG), a complicated unit that controls the development of the swallowing motor sequence.

Langmore & Pisegna, (2015) reported that exercises intended to improve and modify the force, speed, or timing of swallowing physiology with the intention of producing a long-term benefit are known as rehabilitation exercises. Since straining any muscle system to a high degree of intensity and persistence will alter neuronal innervation and movement patterns, rehabilitation exercises also entail retraining the neuromuscular systems to induce neuroplasticity.

Howle, et al., (2014) reported that in individuals with decreased airway closure and/or delayed pharyngeal swallowing, super-supraglottic swallows are recommended. Langmore & Pisegna, (2015) documented that when performing the super-supraglottic swallow maneuver, the patient holds their breath, keeps their airway closed, swallows, and then coughs right away. It is commonly taught to assist reduce aspiration and has clear compensatory benefits by keeping the airway closed longer, although the immediate consequences of this maneuver on laryngeal and hyoid excursion are known.

Prather, (2010) reported that the super-supraglottic swallow is a more strenuous breath-hold technique in which the patient must bear down and hold their breath extremely tightly at the same time. Bearing down closes the false vocal folds, tilts the arytenoid cartilages forward, and protects the airway more. The patient is told to cough voluntarily after swallowing to assist clear any pharyngeal residue. It is indicated that when the super-supraglottic maneuver was used, airway protective mechanisms like hyoid excursion, and

laryngeal elevation. Curiously, yet, not much research has been done to examine the efficacy of a voluntary cough that occurs right after a super-supraglottic swallow; therefore, more investigation is necessary. So, using the method as an indirect swallowing exercise can help to increase the strength and range of motion in the muscles that are attached to the hyoid bone.

Strengthening and controlling the swallowing muscles will be aided by hyoid lift maneuver. So, performing this maneuver increases the control and strength of the swallowing muscles (Murphy, 2018).

2.12. Effect of socio-demographic characteristics and clinical data on the severity of dysphagia in patients with stroke:

Studies have shown that even in normal individuals of advanced age, the ability to swallow decreases, therefore age is regarded as a significant criterion in dysphagia. Elderly adults experience difficulty swallowing as a result of inadequate respiratory patterns and decreased tidal volume. As a result, the age group was divided into three categories for this study's investigation of the age factor: under 50, 50 to 70, and over 70. The results of the investigation demonstrated a significant correlation between post-stroke dysphagia severity and age. Compared to the other two groups, those under 50 had a less severe form of post-stroke dysphagia, suggesting that older individuals are more susceptible (Wirth, et al., 2016).

Huang, et al., (2023) reported that a mixed type of cerebellar stroke, multiple lesions in the cerebellum, and age greater than 85 were associated with an increased risk of dysphagia. A significant correlation between chronic brain damage and an increased risk of dysphagia and worsening symptoms in stroke survivors.

Yang, et al., (2023) reported that based on the worldwide burden of disease study estimates, potentially modifiable environmental and occupational risk factors accounted for 33.4% of the worldwide stroke burden

(measured in disability-adjusted life-years, DALY). Psychological workplace expectations and control, and the ways in which these impact the lifestyle and health of employees. Time restraints, mental strain, and multitasking obligations increased the risk of stroke, especially among women. By triggering the neuroendocrine stress response and disrupting the hypothalamic-pituitary-adrenal axis, or metabolic syndrome, job stress can have a direct impact on the cardiovascular system. Additionally, it may have an indirect impact on the cardiovascular system by promoting bad habits like smoking, sitting still, and eating poorly, all of which are significant risk factors for stroke.

Huang, et al., (2023) reported the swallowing process was more significantly regulated by the left cerebellum than the right. Numerous prior research studies have indicated that the development of swallowing difficulties, including delayed swallow initiation, decreased laryngeal closure, oral and hypo pharyngeal residue, and aspiration, were associated with an isolated lesion in the left cerebellum.

Yang & Pan, (2022) documented that diabetes and hypertension not only increase the risk of stroke, but they also increase the chance of dysphagia in stroke victims. The findings of this study indicate that patients with ischemic stroke who also have diabetes and hypertension have a significantly higher incidence of dysphagia than patients who do not have these conditions. This finding may be related to the way that chronic illnesses impair patients' overall function, which raises the risk of dysphagia.

Wilmskoetter, et al., (2018) reported that there is a difference in how lesion location affects swallow physiology following a stroke, however dysphagia after a stroke may be affected differently by lesions in the right and left hemispheres. Left hemisphere lesions are the primary cause of dysphagia following a stroke. Pharyngeal-stage dysfunction, or severe and prolonged

dysphagia involving aspiration, is more frequently linked to right hemisphere lesions.

2.13. Previous related studies:

First Study:

Biswal, (2022) conducted a study to evaluate the effect of Chin Tuck against Resistance (CTAR) exercise on 60 samples were used in the experimental investigation; 30 samples were from the experimental group and 30 from the control group. The samples were chosen via purposive sampling. To monitor the dysphagia score, use the GUSS. By means of interviews and observation, pre-test data was gathered from both groups. Following that, the control group with dysphagia received usual treatment, whereas the experimental group underwent CTAR Exercise three times a day for eight consecutive days. According to the study results, the experimental group had a pre-test mean score of 5.40±0.814 and a post-test mean score of 15.23±2.285 at the end of the eighth day, indicating that they had advanced to no dysphagia. Therefore, chin tucks in opposition to resistance exercises helped individuals with dysphagia due to neurological diseases swallow more easily.

Second study:

Kalpana and Maheshwari, (2022) conducted a quasi-experimental study to assess the impact of swallow therapy on swallowing ability on 30 patients with stroke in Chennai, Tamil Nadu, India. An individual group pre- and post-test design was employed. Periodically, swallowing abilities was assessed using the Mann Assessment of Swallowing Skills (MASA). By applying descriptive and interferential statistical methods, the results show a substantial change in the ability to swallow before and after therapy. Swallowing ability was assessed on average 155.0±16.34 before swallow therapy, and 170.87±11.12 after swallow therapy. T = 7.171, the estimated paired "t" test value, was deemed statistically highly significant at the $p<0.001$

level. Clearly, this suggests, rather obviously, that improving post-test swallowing abilities was demonstrated to be a benefit of providing swallow therapy to patients who had stroke. The results showed that one of the most effective conventional therapies for enhancing the swallowing abilities of individuals with swallowing difficulties was swallowing therapy.

Third study:

A quasi-experimental study done by El Sayed & Ewees (2020), it was conducted at Neurology Ward, Stroke ICU and Intermediate Neurological ICU affiliated to Ain Shams University Hospital, Cairo. There were 68 patients in a purposive sample. The Structured Interviewing Questionnaire, the Clinical Data Tool, and the GUSS scale were the three instruments used to gather the data. The GUSS score of dysphagia level among patients before and after the Shaker exercise was implemented differed significantly ($P<0.001$). In conclusion, patients with stroke-induced dysphagia found that improving their capacity to swallow was possible with the use of dysphagia exercise therapy, namely Shaker exercise.

Fourth study:

Sonawane & Singaravelan, (2019) implemented an experimental study to evaluate the effects of lingual exercise, swallowing manoeuvre along with conventional therapy on improving swallowing function and quality of life in stroke patient with dysphagia on age group 55-65 years in Loni, Maharashtra.10 participants were selected randomly divided in to two groups. Group A was given conventional therapy which includes medical management, diet modification and positioning. In group B was given lingual exercises, swallowing manoeuvres along with conventional therapy. therapy session for both groups was 2 sessions per day, each session lasting for 30 minutes for 4 days per week for total a period of 4 weeks. The swallowing function and quality of life assess using dysphagia handicap index and

functional oral intake scale. Group A received conventional therapy the pre and post mean values of dysphagia handicap index was 167.2 + 2.95, 147 + 7.483. The functional oral intake scale's pre- and post-mean values were 1 + 0, 2.6 + 0.5477 (p=0.0077).

Fifth study:

Park, et al, (2019) implanted a double-blind, randomized controlled trial to examine effect of effortful swallowing training on tongue strength and oropharyngeal swallowing function in stroke patients with dysphagia. This study was designed as a 4-week, double-blind, two-group, block randomized controlled trial. An occupational therapist randomly assigned participants to either the experimental group (n=15) or the control group (n=15) using a randomly. For four weeks, both groups received standard dysphagia treatment for thirty minutes per day, five days per week. A measure of tongue strength called the Iowa Oral Performance Instrument was used. Oropharyngeal swallowing function was examined using the VDS, which was developed based on a videofluoroscopic swallowing study. In comparison to the control group, the experimental group improved more in the oral phases of the VDS (p = 0.017) and anterior and posterior tongue strength (p = 0.046 and 0.042, respectively).

Sixth study:

Elsaid & Shabaan, (2019) conducted a quasi-experimental study to examine the effectiveness of exercises based dysphagia therapy on swallowing ability for patients with cerebrovascular accident in Egypt. This study was conducted at neurology ward at Mansoura University Hospital. The collection of data lasted for a period of three months, starting from December 2018 to March 2019. A purposive sample composed of 48 adult patients with stroke from both sex, aged 18-65 years old, who had dysphagia. They were divided into two groups equally, first group (intervention group) who agree to

participate in the study had demonstration of dysphagia exercises which included swallowing exercises such as Shaker Exercise, Hyoid Lift Maneuver, Mendelsohn Maneuver, Tongue Exercises, Stretch Exercise and Masako Maneuver. The second group (control group) who refused to participate in the study placed in the control group with hospital routine care only. Data collection tools: GUSS and Functional Oral Intake Scale (FOIS). Before beginning the dysphagia exercises, where in the intervention group patients are in total nasogastric-tube feeding with a mean score of 1.833 ±1.090. Then after dysphagia exercise, the majority of patients (87.5%) gradually are progressed to total oral diet with single or multiple consistencies with a mean score of 4.500 ±0.834. While 37.5% of patients in the control group remain on nasogastric-tube feeding after one week with a mean score 3.833 ±0.761. There is a significant difference between two groups after one week of dysphagia exercises. It can be inferred that dysphagia exercise is effective in improving the functional oral intake assessment among stroke patients.

Seventh study:

Cho, (2017) implemented a pilot study in Korea to investigate the effects of self-exercise at the bedside on oropharyngeal swallowing function in those with stroke who have dysphagia. Nine stroke victims who had dysphagia were enlisted. For four weeks, self-exercise was done five times a week and included shaker exercise, tongue strengthening, and difficult swallowing. Based on a videofluoroscopic swallowing study, the VDS was used to assess swallowing function. Both the oral and pharyngeal stages of the VDS before and after the intervention showed substantial variations. According to this study, bedside self-exercise helps patients with dysphagia regain better oropharyngeal swallowing function.

Eighth study:

Park, et al., (2016) implanted a randomized controlled trial to examine the effects of expiratory muscle strength training on oropharyngeal dysphagia in subacute stroke patients in Gimhae, Korea. In total, 33 patients were randomly divided into two groups, using randomly selected. The study was planned as a 4-week, randomized, controlled, single-blind experiment. Participants were chosen from the Inje University Busan Paik Hospital's rehabilitation center. The intervention was carried out five days a week, utilizing the device to take five sets of five breaths, for a daily total of twenty-five breaths. Surface electromyography (sEMG) was utilized to quantify the activity in the suprahyoid muscle group. To further evaluate the findings of the VFSS, the PAS was employed. Furthermore, the FOIS was utilized to assess the various stages of diet. When compared to the placebo group, the experimental group showed better PAS outcomes and suprahyoid muscle group activation. After the intervention, statistical analysis revealed significant variations in the outcomes of liquid PAS and assessed suprahyoid muscle activity (P = 001), liquid PAS outcomes (P = 003), and FOIS results (P = 006), but not in terms of semisolid type PAS outcomes (P = 032). This study demonstrates that EMST is a useful treatment for individuals with stroke who have dysphagia and are starting to exhibit suprahyoid muscle activity. Furthermore, advancements in aspiration and penetration results were noted.

2.14. Literature Synthesis:

Summary of literature, which is proof from the earlier investigations shows that annual stroke death rates have exceeds 5.5 million during the past 20 years, affecting more than 12 million individuals worldwide. After age 55, the chance of incident stroke doubles every 10 years, and aging is the most significant non-modifiable risk factor. Dysphagia was determined as one of the most significant problems that are effecting patients with stroke, it can lead to serious complications among this type of patients

such as aspiration pneumonia, malnutrition and dehydration. It is very important to manage dysphagia in patients with stroke, so the performing the super supraglottic swallow maneuver has a positive effect in managing dysphagia. So, using the method as an indirect swallowing exercise can help to increase the strength and range of motion in the muscles that are attached to the hyoid bone. It is commonly taught to assist reducing aspiration and has clear compensatory benefits by keeping the airway closed longer. On the other hand, from this studies revision, it was found that hyoid lift maneuver strengthening and controlling the swallowing muscles will be aided by this exercise.

Chapter Three

Methodology

Chapter Three
Methodology

This chapter will present all the methodological procedures that were applied in this study in detail for the purpose of achieving the set goals. These procedures were including the design of the study, administrative agreements, ethical consideration, setting of the study, method of sample selecting, steps of the study, inclusion and exclusion criteria, the study instruments methods of data collection, and data analysis.

3.1. Design of the study:

A quasi-experimental design was used in the current study, to compare the effect of Super Supra-Glottis Swallow Maneuver, and Hyoid Lift Maneuver on the severity dysphagia among patient with stroke. This study design was chosen because the researcher need to determine the casual relationship between intervention and study outcomes in situation where is the participants do not randomly selected to both study and control groups. The study was conducted at Imam Al-Hussain Medical city and Imam Al-Hassan Al-Mujtaba Teaching hospital at Holy Karbala; from the period of 1st October, 2023 to 30th June, 2024.

3.2. Administrative agreements:

Formal administrates approvals to conduct the study were obtained from the following institutions prior to actual data collection:

- Arrangement from “University of Kerbala / Collage of Nursing”, at 15/11/2023 with number of 358 (Appendix AI).
- Arrangement from “Ministry of Health/Karbala Health Directorate/Center of Training and Human Development” at 21 /11/2023 with number of 3304 (Appendix AII).

3.3. Ethical Consideration:

The research ethical committee at the University of Kerbala/College of nursing provided ethical permission for the secrecy and anonymity of the participants identifies (Appendix B). Additionally, the study was verified in the Iranian Registry of Clinical Trials (code: IRCT20240130060853N1) (Appendix C). The participants were thoroughly informed of the present study and its objectives, and it was made clear to them that had the right to withdraw from the study at any moment, thus they gave their voluntarily oral and written to participate in this study (Appendix D). In addition to that, the researcher considered the confidentiality of the gathered data.

3.4. Settings of the study:

This study was conducted in the medical wards in Imam Al-Hussain Medical City, it is the largest health institution in the Karbala city. It initially opened in 1972 and offers medical services to patients from both inside and outside the government of Karbala. Which contain surgical, and medical department, and contain more than six handed beds for inpatients. The medical unit has 164 beds available for wards with neurologic, cardiac, and other disorders in both male and female patients. Numerous illnesses, including stroke, are the main reason for patient admissions. This study also carried out at the medical wards of Imam Al-Hassan Al-Mujtaba Teaching Hospital in Kerbala Governorate, which officially opened in 2020.

3.5. Sample Size:

Obtaining the correct number of samples requires calculating an expected effect size along with a power analysis (Schmidt, 2018). The total number of participants was ascertained using the G*Power calculator (Faul, et al., 2009) was used to establish the suitable sample size for multiple regression analysis, a statistical power of 0.80, a confidence level of 95%, and a

probability level of 0.05. The number of patients with stroke admitted to the Imam Al-Hussian Medical City and Imam Al-Hassan Al-Mujtaba Teaching hospital during January, February, and March (2022) was 149. A minimum sample of 108 participants was needed for a confidence level of 95%, power of 80% and a p (degree of variability) = 0.05. Therefore, the final number of 108 participants was sufficient and additional participants were not recruited.

3.6. Sample of the study:

The selected sample contained 108 patients with stroke who suffer from dysphagia, nine patients were excluded because they refused to participated in the study and they are not meeting the study criteria. Therefore, 99 patients were distributed between the three groups as follow; 33 patients were enrolled in the control group, 34 patients were assigned in super supra glottic swallow maneuver, and 32 patients were assigned in hyoid lift maneuver group. The participants were chosen using a purposive sampling method, in which the researcher uses his or her own discretion to choose individuals of the population to take part in the study. Every patients of the intervention groups had been subjected to apply super supra glottic swallow maneuver, or hyoid lift maneuver, while the control group only received usual care. Many patients have been dropped from the studied sample(3 patients in the control group, 4 patients in the super supraglottic swallow group and 2 patients in the hyoid lift group) due to many reasons such as unable to sitting position, loss of consciousness, and unable to communicate. The studied sample in the post-test period after 7 days of interventions were 30 patients for each super supra glottic swallow maneuver group, hyoid lift maneuver group, and control group (Figure 3-1). The selected criteria were established as follow:

3.6.1. Inclusion criteria:

- Patients who diagnosed with stroke and experiencing dysphagia.
- Those who have voluntarily agreement to take part in this study.
- Patients who can mimic the nurse and who are aware, familiar, and obedient to directions.
- More than eighteen years old.

3.6.2. Exclusion criteria:

- Patients with stroke who do not have dysphagia.
- Those suffering from additional neurological conditions such as Alzehimer disease.
- Patients requiring tracheostomy and endotracheal intubation.
- Patients who have pneumonia.

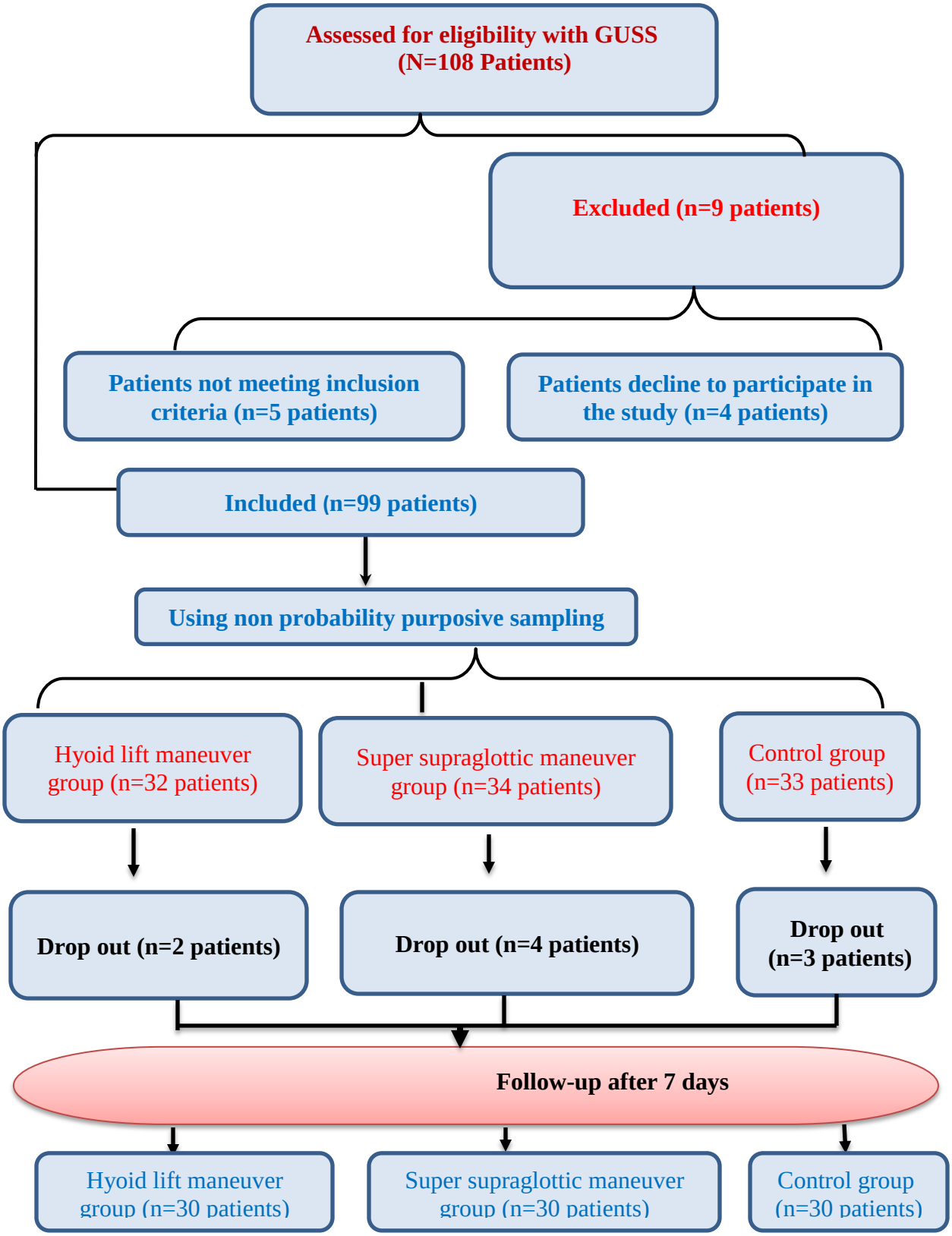


Figure (3-1): Flowchart of the eligibility criteria

3.7. Steps of the study:

The researcher relies on the following steps in the study:

3.7.1. Interventional strategy:

The interventional strategy was established by the researcher after going over the scientific literature and previous studies, as well as the researcher's experience. The goal of this interventional technique is to decrease the severity of dysphagia in patients with stroke who complain from dysphagia, through the application of super supra glottic swallow maneuver and on the other hand hyoid lift maneuver. Consequently, all patients were instructed and trained about how to perform the super supra glottic swallow maneuver and hyoid lift maneuver.

3.7.1.A. Super supra glottis swallow maneuver:

This maneuver entails holding one's breath hard, swallowing while maintaining a closed airway, and then coughing right away. It is frequently instructed to aid in the prevention of aspiration and has the evident compensating effects of maintaining the airway closed longer. While it is known that this maneuver has immediate impacts on laryngeal and hyoid excursion, no research has looked into the maneuver’s long-term implications. When it comes to swallowing exercises, there are other neuroplasticity principles—like repetition and time—that need further proof (Appendix EI).

3.7.1.B. Hyoid lift maneuver:

Strengthening and controlling the swallowing muscles will be aided by this exercise. Cover a blanket or towel with a few tiny pieces of paper, each measuring about 1 inch in diameter. Next, insert a straw into the patients' mouth and push a piece of paper all the way to the tip. To keep the paper attached, keep sucking on the straw. Then, bring it over a cup or other similar container and stop. The paper will be released into the container as a result.

putting five to ten pieces of paper into the container is the aim for each session (Appendix EII).

3.7.2. The study instruments:

The researcher selected a suitable instrument with two separated components to accomplish the study's objectives (Appendix FI, FII):

3.7.2.1. First section: Socio-demographic and clinical information:

This part of instrument contains the patient's socio-demographic and clinical data, including age, sex, marital status, educational level, occupation, residency , chronic diseases, type of stroke, stroke location, previous history of stroke, height and weight {Body Mass Index (BMI)}, and smoking.

3.7.2.2. Second section: Gugging swallowing Screen:

This section of the instrument focused on assessing swallowing, which is developed by Trap, et al., (2007), it was used to assess the participant severity of dysphagia.

Gugging swallowing screen English version was used, it is included two part, part one is the preliminary investigation that is called the (Indirect Swallowing Test), it contains three main tests that are alertness, coughing and/or throat clearing, and swallowing saliva (Swallowing successful, drooling, and voice change after swallowing). Each test has two responses: yes or no. Part two is the direct swallowing test, including three order, semisolid, liquid, and solid. This part contains four main tests that are deglutition, coughing (involuntary), drooling, and voice change. The total score of the indirect swallowing test and direct swallowing test is 20. Instructions about how to use the Gugging Swallowing Screen (GUSS) are listed in Appendix (N, N1, N2, N3, N4, N5,N6, N7, N8).

3.8. Testing of instrument validity:

The capacity to carry out aprecise appropriate circumstances and

with the appropriate instruments to create acceptable and repeatable data is known research validity (Taherdoost, 2016). For accurate measurements, the researcher depends on precisely calibrated instruments. Thirteen experts from the scientific field review the employed interventions and the instruments and made a number of modifications. Each expert member was suggested by the researcher to evaluate the study instrument for content, clearness, suitability and design. Each expert gives a recommendation about the instrument based on background, knowledge, information flow, and suitability for the objective of obtaining samples. Thus, the instrument was modified in accordance with advice from experts.

Thirteen experts were given the study instrument by the researcher, these experts are:

- Two experts from the university of Baghdad/ College of Nursing.
- Four experts from Kerbala University/ College of Nursing.
- Two experts from Kufa University / College of Nursing.
- One expert from Al-Safwa University College / Nursing Department.
- One expert from the Warith Al-Anbiyaa University /College of Nursing.
- One expert from the University of Al-Ameed/ College of Nursing.
- Two experts from Imam Al-Hussain Medical city.

3.8.1. The content validation:

Content validity defined as the degree to which elements of a measurement tool is indicative of and directly related to the intended design for and the desired assessment outcomes (Almanasreh, et al., 2018). The following steps were taken to apply the content validity process:

1. The researcher prepared the instrument to be reviewed by experts to ensure validity.
2. The researcher takes into consideration the specialized expert ’s opinions; these specialized experts are:

- One expert from the University of Baghdad/ College of Nursing.
- One expert from the Kerbala University/College of Nursing.
- One experts from the Kufa University/College of Nursing.
- One expert from Al-Ameed University/ College of Nursing.
- One expert from Warith Al-Anbeaa University /College of Nursing.
- One expert from Imam Al-Hussain Medical city.

3. Face to face is the method by which content validity was conducted through the researcher meeting with experts.
4. In order to determine the content of the scale's internal validity by measure the relationship degree of each paragraph to the phenomenon under study, each scale item scored as follow:
   - ✓ 1 =The paragraph is not relevant to the phenomenon under study.
   - ✓ 2 = The paragraph is somewhat relevant to the phenomenon under study.
   - ✓ 3= The paragraph is relevant to the phenomenon under study.
   - ✓ 4= The paragraph closely related to the phenomenon under study.
5. Items were studied and clearly offered to the experts.
6. Finally, the researcher calculates the content validity.

The gugging swallow screen scale consists of ten items and reviewed by six experts. Experts in agreement for each question was (6,6,6,5,6,6,6,6,6,6). Universal agreement (UA) for each item was (1, 1, 1, 0, 1, 1, 1, 1, 1, and 1). I- CVR (item level content validity index) for each item was (1, 1, 1, 0.83, 1, 1, 1, 1, 1, and 1). S-CVI\ Ave (the scales\levels of content validation index based on an average method) of this scale was (0.98) and this value is acceptable for CVI (Yusoff, 2019a). Yusoff, (2019b) explains the term of S-CVI\UA as "scale-level content validity index based on the universal agreement method", It was (0.9) (Appendix H).

3.8.2. Face validity:

It indicates how much respondents find the test questions and content to be relevant to the situation in which they are being implemented (Taherdoost, 2016). Six steps for validating response processes that include:

1. The first step was to generate answers to the validity form, so that the reviewer who understood the process and had clear expectations, could use them.
2. Seven professionals with extensive experience in their field were provided with study instrument from the researcher, who have at least thirteen years of experience in the fields they specialized, including:
   - One expert from the University of Baghdad/ College of Nursing.
   - Three experts from the Kerbala University/College of Nursing.
   - One expert from Al-Safwa University College / Nursing Departement.
   - One expert from the Kufa University/College of Nursing.
   - One expert from Imam Al-Hussain Medical city.
3. The validating process conducted face to face manner through interview.
4. This step included offering the domains of the items to the panel of raters. Before submitting their evaluation of these items, reviewers were asked to review the items completely. Reviewers were asked to submit a written comment to enhance comprehending and simplicity of each item.
5. The experts were requested to provide the scores for all items after thoroughly reviewing each item. The reviewers then gave the researcher scores in their responses.
6. The Face Validity Index (FVI) originated in two distinct forms, Scales Levels of FVI (S-FVI) for scale and items, and Item Level Face Validity Index (I-FVI) for the items. Percentage of scale that receives three or four

on the clarity scale from each reviewer (S-FVI/UA). The Face Validity Index (FVI) was computed in this final stage.

The using I-FVI (item face validity index) for each item was (1,1,1,1,1, 0.85,1,1,1,1). S-FVI\Ave of this scale was (0.98) and this value acceptable for FVI (Yusoff, 2019b). S-FVI\.UA was (0.9). Proportion average of the items judgment as comprehension and the clarity across the seven experts was (0.97) (Appendices I).

3.9. Pilot study:

A pilot study included ten patients admitted to the Imam Al-Hussein Medical City in Holy Kerbala, those who were fit the criteria for the study. The pilot study was performed from 3^{ed} to 10th January 2024. The sample of pilot study wasn't part of the study's initial sample and was obtained using a non-probability purposive sampling technique.

3.9.1. The purpose of pilot study:

1. To assess the instrument’s feasibility and clarity.
2. To calculate the total time needed for each patient.

3.9.2. Pilot study results:

1. The study instrument was feasible, clear and understandable.
2. The socio-demographic and clinical information sections, along with scale, took 20 minutes to complete for each patient.

3.10. Reliability of questionnaire format items:

When an instrument maintains its dependability over time or through repeated administrations, it will consistently reflect the construct, it is measuring by assigning a score. All other factors must be equal for scores to remain stable over time (Al Jaghsi., et al., 2021). Reliability is the degree to which outcomes are accurate representations of the entire population being studied and ongoing across time. Stated differently, a research instrument is

deemed trusted if the study's findings can be replicated using a comparable approach (Yusoff,. (2019b).

In elderly individuals in good health without recurrent dysphagia, the GUSS test is a valid and reliable way to determine a prospective risk of oropharyngeal dysphagia. It works well for clinical practice as a screen test (Umay, et al., 2019).

Troll, et al.,(2023) reported that the sensitivity was 91.7% (95% CI 77.5–98.3%) and 94.4% (95% CI 81.3–99.3%); the specificity was 88.9% (51.8–99.7%) and 66.7% (29.9–92.5%); the positive predictive values were 97.1% (83.8–99.5%) and 91.9% (81.7–96.6%), and the negative predictive values were 72.7% (46.8–89%) and 75% (41.9–92.6%) for the first and second rater pairs, respectively. Dysphagia severity classification according to FEES and GUSS-ICU correlated strongly (Spearman's rho: 0.61 for rater 1 and 0.60 for rater 2, $p < 0.001$). Agreement by all testers was good (Krippendorffs Alpha: 0.73). The interrater reliability showed good agreement (Cohen`s Kappa: 0.84, $p < 0.001$).

3.11. Data collection and follow up method:

The data collection process was carried out through the use of the question-and-answer format. The researcher created the interventional procedure for this investigation after looking over similar earlier research. All members of the both intervention groups received instruction on how to apply the super supra glottic swallow maneuver and hyoid lift maneuver during their hospital stay, and afterward, three times a day for seven days at home. The investigator took 20-25 minutes to complete each questionnaire accurately and to gather information. The period of data collecting was from 17th January, 2024, to 16th March, 2024.

The researcher follows up the patients by reminding them three times a day to complete the exercises and giving them instructions on the procedure. In addition to setting up discussion rooms on social media sites like Whats-App and calling patients (using a SIM card), the follow-up approach was carried out in the hospital. In the follow-up investigation, the researcher monitored the patient's compliance and reaction to the treatment. All patients in the trial setting got the same routine care, including those in the control group. Before the intervention and within seven days of its conclusion, the degree of dysphagia was assessed for each patient in the control and both intervention groups; all participants persisted in to receive routine care of stroke (figure 3-2).

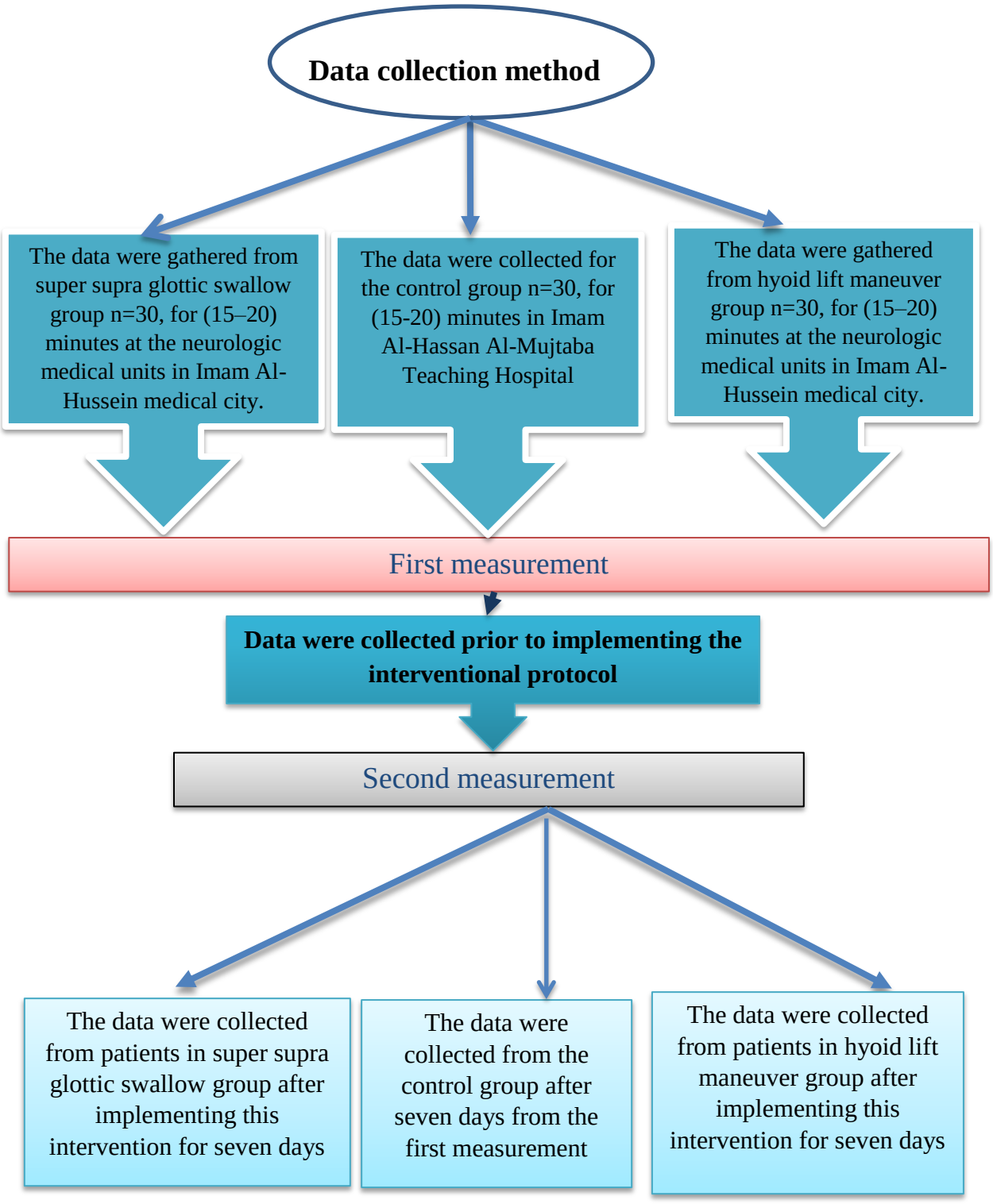


Figure (3-2): Flowchart for the process of data collection.

3.12. Rating and scoring:

The items have been examined and graded using the following directions:

3.12.1. Rating and scoring for body mass index (BMI): Body mass index was measured by measuring weight and height and applying the following formula:

BMI = weight in kilograms / (height in meters)^2. According to Hughes, et al., (2022), BMI was categorized as follow:

- "Underweight= less than18.5".
- "Normal weight =between 18.5–24.9".
- "Overweight =about 25.0–29.9".
- "Obese class I =between 30.0–34.9".
- "Obese class II =about 35.0–39.9".
- "Class III => 40".

3.12.2. Rating and scoring for Gugging Swallow Screen Scale (Guss):

Trapl, et al. (2007) developed the Gugging Swallow Screen Scale, or GUSS. Two components are involved in the GUSS that's are: part 1 (indirect swallow test) also called the preliminary assessment, and part 2 (the direct swallow test). A point system was chosen, with a maximum of five points that can be scored in indirect swallow test. To move on to the direct swallow test, every test item has a value of either one point (physiologic) or zero points (pathologic). We employed new rating inside the direct swallowing test's scoring criteria for "deglutition." Pathologic swallowing receives 0 points, delayed swallowing receives 1 point, and normal deglutition receives 2 points. To receive the maximum score of five points on the subtest, patients must successfully complete all repeats. The test has to end if a subtest yields less than five points. The highest possible score for a patient is twenty, which indicates normal swallowing skills without aspiration risk. Additionally, there are three subtests that make up the direct swallowing test: the semisolid diet, the liquid diet, and the solid textures diet. These subtests are conducted in order. The GUSS scores give up four categories of severity.

- 0-9 (Preliminary investigation unsuccessful or swallowing semisolids unsuccessful), points are rated as a severe dysphagia with high risk of aspiration.
- 10-14 (Swallowing semisolids successful, swallowing liquids deficient), points are considered as moderate dysphagia with aspiration risk.
- 15-19 (Swallowing semisolids successful, swallowing liquids can be deficient, solids can be deficient), points are determined as slight dysphagia with aspiration risk.
- 20 (Swallowing semisolids, liquids and solid textures successful), points are rated as no dysphagia with no or minimal risk of aspiration.

3.13. Statistical data analysis:

Using the most recent version 26 of the Statistical Package of Social Sciences program (SPSS) version. 26, the data analytic process used in this study is to assess the study's results and conclusions by using the following procedures:

3.13.1. Descriptive statistical data analysis:

It includes standard deviation, percentage (%), frequency (f), and mean of score (MS) that have been utilized through tables to obtain the overall findings of the study's participants and compare the variables. The percentage were calculated according to the following formula:

$$\% = \frac{\text{frequencies}}{sample\ size} \times 100 = \% = \text{Percentage}$$

3.12.2. Inferential statistical analysis:

Apply the chi-square test (x^2) to examine differences in patient demographic information between the different groups.

- The differences in the mean degree of dysphagia within the same group before and after the intervention procedure were examined using the paired sample t-test.

- An independent sample t-test was used to compare the dysphagia levels between the three different groups prior to and following the procedures.
- The analysis of variance (ANOVA) was used to see if the mean differed amongst groups.
- "Statistical significance was defined as a p-value of 0.05 or less."

3.14. Limitations of the study:

There are a few essential limitations to take into account:

1. One of the primary limitations of this study was that the patients self-administered the Super Supra-Glottis Swallow Maneuver, and Hyoid Lift Maneuver at home. This may have led to possible lack of adherence to the intervention closely due to medical or psychological conditions.
2. Lack of hospital facilities that enable the use of intervention protocols, such as location and privacy.
3. The requirement for individuals with dysphagia to have lengthier follow-up is a further limitation. Determining how long the benefits would last was impossible due to a lack of follow-up following the intervention.

Chapter Four

Results of the study

Chapter Four

Study Results

The results of data analysis that correspond with the early specified objectives of this study are presented in this chapter. These results are arranged as follows:

Table (4-1): Distribution of patients in three groups according to their socio-demographic characteristics:

Characteristics		Groups						X^2 P-value
		Super supraglottic swallow		Hyoid lift maneuver		Control		
		f	%	f	%	f	%	
Age groups	40-60	6	20.0	9	30.0	8	26.7	0.21 NS
	61-80	19	63.3	12	40.0	19	63.3	
	>80	5	16.7	9	30.0	3	10.0	
	MS ± SD	70.13±10.153		69.73±14.047		67.57±11.434		
	Total	30	100.0	30	100.0	30	100.0	
Sex	Male	14	53.3	15	50.0	21	70.0	0.14 NS
	Female	16	46.7	15	50.0	9	30.0	
	Total	30	100.0	30	100	30	100.0	
Marital status	Married	19	63.3	24	80.0	24	80.0	0.23 NS
	Widow/ separated	11	36.7	6	20.0	6	20.0	
	Total	30	100.0	30	100.0	30	100.0	
Educational level	No read and write	14	46.7	15	50.0	15	50.0	0.79 NS
	Read and write	6	20.0	6	20.0	5	16.7	
	Primary school	4	13.3	4	13.3	6	20.0	
	Secondary school	3	10.0	0	0.0	1	3.3	
	Institute	2	6.7	2	6.7	0	0.0	
	College and above	1	3.3	3	10.0	3	10.0	
	Total	30	100.0	30	100.0	30	100	

Table (4-1): Continue …….

Characteristics		Groups						X^2 P-value
		Super supraglottic swallow		Hyoid lift maneuver		Control		
		f	%	F	%	f	%	
Occupation	Does not work	11	36.7	9	30.0	14	46.7	0.42 NS
	Retired	5	16.7	7	23.3	7	23.3	
	Housewife	14	46.7	14	46.7	9	30.0	
	Total	30	1qz\\\200.0	`	100	30	100.0	
Residency	Rural area	12	40.0	15	50.0	11	36.7	0.53 NS
	Urban area	18	60.0	15	50.0	19	63.3	
	Total	30	100.0	30	100.0	30	100.0	

f= frequencies; %=Percentages, NS= Non significance.

Table 4-1 indicates that two thirds of patients in the super supraglottic swallow group and control group were within age group (>60-80) years old, and accounted of (63.3%), and more than one third in the hyoid lift maneuver group within the same age group and accounted of (40%).Approximately one half (53.3% and 50%) of patients in the super supraglottic swallow group and hyoid lift maneuver group and more than two-thirds (70%) of patients in the control group were males. Regarding the marital status, the majority of the patients in the two experimental and control groups were married and accounted (63.3%), (80.0 %) and (80.0%) for the super supraglottic swallow group, hyoid lift maneuver group and control groups respectively. In concern to the education level less than one-half (46.7%) of patients in the super supraglottic swallow group and one half of patients (50%) of patients in the hyoid lift maneuver group and control group were neither read nor write. Regarding occupation, 46.7% of patients in the super supraglottic swallow group and hyoid lift maneuver group were house wife, and 46.7% of patients in the control group were not work. This table also exposed that 60%, 60%, and 63.3% of patients in the super supra glottic swallow maneuver group, hyoid lift maneuver group, and control group lived in urban area. Furthermore,

by using the chi-square test the result in this table exposed that a non significant differences between the three groups with regard to the socio demographic data at p-value >0.05.

Table (4-2): Distribution of patients in three groups according to their clinical data:

Variables		Groups						X^2 P-value
		Super supra glottis swallow		Hyoid lift maneuver		Control		
		f	%	f	%	f	%	
Chronic disease	HTN	8	26.7	8	26.7	9	30.0	0.97 NS
	DM, HF & HTN	2	6.7	1	3.3	1	3.3	
	CKD, HTN & DM	4	13.3	4	13.3	4	13.3	
	IHD, HTN & DM	1	3.3	2	6.7	1	3.3	
	HTN & IHD	4	13.3	2	6.7	1	3.3	
	HTN & CKD	4	13.3	4	13.3	4	13.3	
	HTN & DM	7	23.3	9	30.0	9	30.0	
	HF	8	26.7	8	26.7	1	3.3	
	Total	30	100.0	30	100.0	30	100.0	
Previous stroke	No	12	40.0	13	43.3	11	36.7	0.87 NS
	Yes	18	60.0	17	56.7	19	63.3	
	Total	30	100.0	30	100.0	30	100.0	
Number of previous stroke	No	12	40.0	13	43.3	11	36.7	0.30 NS
	1-2	14	46.7	17	56.7	15	50.0	
	>2	4	13.3	0	0.0	4	13.3	
	Total	30	100.0	30	100.0	30	100.0	
Type of stroke	Ischemic	25	83.3	20	66.7	21	70.0	0.53 NS
	Hemorrhagic	5	16.7	10	33.3	9	30.0	
	Total	30	100.0	30	100.0	30	100.0	
Location of stroke	Left side	10	33.3	12	40.0	10	33.3	0.72 NS
	Right side	14	46.7	10	33.3	15	50.0	
	Both sides	6	20.0	8	26.7	5	16.7	
	Total	30	100.0	30	100.0	30	100.0	
Smoking History	Yes	6	20.0	11	36.7	9	30.0	0.44 NS
	Previously	10	33.3	6	20.0	11	36.7	

	No	14	46.7	13	43.3	10	33.3	
	Total	30	100.0	30	100.0	30	100.0	

f= frequencies; %=Percentages; NS= Non significance.

Table 4-2 indicates that the most of the patients in two experimental groups and control group had DM and HTN. 60%, 56.6% and 63.3% of patients in the super supraglottic swallow maneuver group, hyoid lift maneuver group and control group were exposure to stroke previously. Regarding the times of exposure to previous stroke, 46.7% of patients in super supraglottis swallow maneuver group, and more than one half (56.7%) in the hyoid lift maneuver group and one half (50 %) of patients in the control group have exposed 1-2 times previously to stroke. The majority of patients in the super supraglottic swallow maneuver group, hyoid lift maneuver group and control group had ischemic stroke, and accounted (83.3%, 66.7% and 70%) respectively. With regard to location of stroke, 46.7% of patients in the super supraglottic swallow maneuver group, and one half (50%) of patients in the control group were had right side stroke, and 40% of patients in the control group were had left side stroke. This table also exposed that 46.7%, 43.3% and 33.3% of the patients enrolled in two experimental and control group were non-smokers. Furthermore, by using the chi-square test the result in this table exposed that a non significant differences between the three groups with regard to the clinical data at p-value >0.05.

Table (4-3): Distribution of patients in three groups according to their body mass index (BMI):

BMI Categories	**Groups**						**X^2 P-value**
	Super supra glotic swallow		**Hyoid lift maneuver**		**Control**		
	f	%	f	%	f	%	
Normal	9	30.0	7	23.3	10	33.3	
Overweight	17	56.7	19	63.3	20	66.7	

Obesity class I	4	13.3	4	13.3	0	0.0	
Total	30	100.0	30	100.0	30	100.0	

f= frequencies; %=Percentages; NS= Non significance.

In table (4-3) the result shows that 56.7%, 63.3% and 66.7% of patients enrolled in the two experimental groups and control group were overweighed. Furthermore, by using the chi-square test the result in this table exposed that a non significant differences between the three groups with regard to BMI at p-value > 0.310.

Table 4-4: Comparison the statistical result of dysphagia (indirect swallow test) for the control, super supra glottic swallow maneuver, and hyoid lift maneuver groups at pre-test and post-test period:

Items	Responses	Control group				Super supra glottic swallow maneuver				Hyoid lift maneuver group			
		Pre-test		Post-test		Pre-test		Post-test		Pre-test		Post-test	
		f	%	f	%	f	%	f	%	f	%	f	%
Conscious: (The patient must Alert at least15 minutes)	Yes	30	100.0	30	100.0	30	100.0	30	100.0	30	100.0	30	100.0
	No	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Cough/throat clearing:	No	0	0	0	0.0	0	0.0	0	0.0	0.0	0	0	0.0
Voluntary cough (Patient must cough or clear his/her throat)	Yes	30	100	30	100.0	30	100.0	30	100.0	100.0	30	30	100.0
Swallow saliva:	Yes	30	100	30	100.0	30	100.0	30	100.0	100.0	30	30	100.0
(can swallow saliva)	No	0	0	0	0	0	0	0	0	0	0	0	0.0
Drooling:	Yes	0	0	0	0	0	0	0	0	0	0	0	0
(drooling severe saliva and continuous)	No	30	100.0	30	100.0	30	100.0	30	100.0	100.0	30	100.0	30
Change sound:	Yes	0	0	0	0	0	0	0	0	0	0	0	0
(voice change after swallowing)	No	30	100	30	100	30	100	30	100	100	30	100	30

f= frequencies; %=Percentages;

Table 4-4 exposes the frequency and percentage of direct swallow test of dysphagia by using the Gugging swallowing screen among patients in the control, Super supraglottic swallow and Hyoid lift maneuver groups at pre-test and post-test period. The indirect Gugging swallowing screen including conscious, Cough/throat clearing, Swallow saliva, Drooling, Change sound among patients with dysphagia, the result of this table reveal a meaningful differences pre and post implementation of Super supraglottic swallow and Hyoid lift maneuver in all Gugging swallowing screen items.

Table (4-5): Comparison the statistical result of dysphagia (direct swallow test) for the control, super supra glottic swallow maneuver, and hyoid lift maneuver groups at pre-test and post-test period:

Items	Responses	Control group				Super supra glottis swallow group				Hyoid lift maneuver group			
		Pre-test		Post-test		Pre-test		Post-test		Pre-test		Post-test	
		f	%	f	%	f	%	f	%	f	%	f	%
Deglutition:													
Semisolid diet	Swallowing not possible	30	100	30	100	30	100	0	0.0	30	100	0	0.0
	Swallowing delayed (semisolids, fluids > 2 sec. solids > 10 sec.)	0	0	0	0	0	0	1	3.3	0	0	0	0.0
	Swallowing successful	0	0	0	0	0	0	29	96.7	0	0	30	100.0
Liquid diet	Swallowing not possible	30	100	30	100	30	100	0	0	30	100	0	0.0
	Swallowing delayed (semisolids, fluids > 2 sec. solids > 10 sec.)	0	0	0	0	0	0	4	13.3	0	0	1	3.3
	Swallowing successful	0	0	0	0	0	0	26	86.7	0	0	29	96.7
Solid diet	Swallowing not possible	30	100	30	100	30	100	0	0.0	30	100	0	0.0
	Swallowing delayed (semisolids, fluids > 2 sec. solids > 10 sec.)	0	0	0	0	0	0	18	60.0	0	0	14	46.7
	Swallowing successful	0	0	0	0	0	0	12	40.0	0	0	16	53.3
Coughing involuntary: (before, during and after swallowing- until 3 minutes later)													
Semisolid diet	Yes	30	100	30	100	30	100	1	3.3	30	100	0	0.0
	No	0	0	0	0	0	0	29	96.7	0	0	30	100.0
Liquid diet	Yes	30	100	30	100	30	100	9	30.0	30	100	4	13.3
	No	0	0	0	0	0	0	21	70.0	0	0	26	86.7
Solid diet	Yes	30	100	30	100	30	100	10	33.3	30	100	7	23.3
	No	0	0	0	0	0	0	20	66.7	0	0	23	76.7

Table (4-5): Continue…….

Items	Responses	Control group				Super supra glottis swallow group				Hyoid lift maneuver group			
		Pre-test		Post-test		Pre-test		Post-test		Pre-test		Post-test	
		f	%	f	%	f	%	f	%	f	%	f	%
Drooling:													
Semisolid diet	Yes	30	100	30	100	30	100	2	6.7	30	100	1	3.3
	No	0	0	0	0	0	0	28	93.3	0	0	29	96.7
Liquid diet	Yes	30	100	30	100	30	100	7	23.3	30	100	11	36.7
	No	0	0	0	0	0	0	23	76.7	0	0	19	63.3
Solid diet	Yes	30	100	30	100	30	100	8	26.7	30	100	12	40.0
	No	0	0	0	0	0	0	22	73.3	0	0	18	60.0
Voice Change: (Listen to the voice before and after swallowing -Patient should say "Ohhh")													
Semisolid diet	Yes	30	100	30	100	30	100	0	0	30	100	0	0.0
	No	0	0	0	0	0	0	30	100.0	0	0	30	100.0
Liquid diet	Yes	30	100	30	100	30	100	8	26.7	30	100	18	60.0
	No	0	0	0	0	0	0	22	73.3	0	0	12	40.0
Solid diet	Yes	30	100	30	100	30	100	12	40.0	30	100	15	50.0
	No	0	0	0	0	0	0	18	60.0	0	0	15	50.0

f= frequencies; %=Percentages;

Table 4-5 exposes the frequency and percentage of direct swallow test of dysphagia by using the Gugging swallowing screen among patients in the control, Super supraglottic swallow and Hyoid lift maneuver groups at pre-test and post-test period. The direct Gugging swallowing screen including deglutition, coughing, drooling, and voice change using the semisolid, liquid, and solid diet among patients with dysphagia, the result of this table reveal a meaningful differences

pre and post implementation of Super supraglottic swallow and Hyoid lift maneuver in all Gugging swallowing screen items.

Table 4-6: Comparison the statistical result of dysphagia severity in three groups at pre-test and post-test period:

Dysphagia Level	Groups											
	Control				Super supraglottic swallow group				Hyoid lift maneuver group			
	Pre-test		Post-test		Pre-test		Post-test		Pre-test		Post-test	
	f	%	f	%	f	%	f	%	f	%	f	%
No dysphagia	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	3.3
Slight dysphagia	0	0.0	0	0.0	0	0.0	28	93.3	0	0.0	26	86.6
Moderate dysphagia	0	0.0	0	0.0	0	0.0	2	6.6	0	0.0	3	10.0
Severe dysphagia	30	100.0	30	100.0	30	100.0	0	0.0	30	100.0	0	0.0
Total	30	100.0	30	100.0	30	100.0	30	100.0	30	100.0	30	100.0

f= frequency; %=Percentages

Table 4-6 exposes the frequency and percentage of dysphagia level in the control, Super supraglottic swallow and Hyoid lift maneuver groups. It is evident that the Super supraglottic swallow maneuver and Hyoid lift maneuver groups have an effect on improving the level of dysphagia when compared to control group.

Table 4-7: Comparison significant the severity of dysphagia in three groups at pre-test and post-test period:

Groups	Test	MS	SD	t-value	df	p- value	Sig.
Control group	**Pre-test**	0.29	0.000	1.439	29	0.161	NS
	Post-test	0.29	0.000				
Super supraglottic swallow group	**Pre-test**	0.29	.00000	-41.984	29	0.000	S
	Post-test	1.003	.09260				
Hyoid lift maneuver group	**Pre-test**	0.29	0.137	-20.991	29	0.000	S
	Post-test	1.002	0.098				

MS=Mean of score; SD=Standard deviation; df=Degree of Freedom; P-value= Probability value; NS= Non Significant (p-value > 0.05); S= Significant (p-value ≤ 0.05).

Using the paired sample t-test, the result in table (4-7): exposed the mean score of dysphagia in the control group. It was 0.49 at pretest period and 0.53 at post-test period, there is a non-significant difference in the severity of dysphagia between the first and second measurement at p-value =0.161. The mean score of dysphagia in the Super supraglottic swallow group and Hyoid lift maneuver group was 0.29, 0.29 respectively before implementing the interventional protocol and 1.003, 1.002 after implementing the interventions for these two-intervention groups respectively. There is a statistically significant difference in the severity of dysphagia between the first and second measurement at p-value =0.000 for the super supraglottic swallow and hyoid lift maneuver groups. Therefore, implementing the intervention protocol was significantly reducing the severity of dysphagia in patients with stroke.

Table 4-8: Comparison significant the severity of dysphagia in pre-test and post-test period between the three groups:

Groups	Pre-test						Post-test					
	MS	S.D.	t-value	Df	p-value	Sig.	MS	S.D.	t-value	df	p-value	Sig.
Control group	.2941	.00000	.000	58	1.000	NS	.2941	.00000	-41.984	58	.000	S
Super supra glottis swallow group	.2941	.00000					1.0039	.09260				
Control group	.2941	.00000	.000	58	1.000	NS	.2941	.00000	-39.445	58	.000	S
Hyoid lift group	.2941	.00000					1.0020	.09829				
Super supra glottis swallow group	.2941	.00000	.000	58	1.000	NS	1.0039	.09260	.080	58	.937	NS
Hyoid lift group	.2941	.00000					1.0020	.09829				

MS=Mean of score; SD=Standard deviation; df=Degree of Freedom; P-value= Probability value; NS= Non Significant (p-value > 0.05); S= Significant (p-value ≤ 0.05).

Using the independent sample t-test, the result in table(4-8): indicates that at pre-test period, there were no statistically significant difference in the severity of dysphagia between control group and Super supra glottis swallow maneuver group at P=value of 1.000, and between control group and hyoid lift maneuver group at P=value of 1.000, and

Super supra glottis swallow maneuver group and hyoid lift maneuver group at P=value of 1.000. In the post-test period there is a statistically significant difference in the severity of dysphagia between control group and Super supraglottic swallow maneuver group at P=value of 0.000, and between control group and hyoid lift group maneuver at P=value of 0.000. In addition to that a non-significant difference in the severity of dysphagia between the Super supraglottic swallow maneuver group and hyoid lift maneuver group at P=value of 0.937.

Table 4-9: The differences between the effect of super supraglottic swallow maneuver and hyoid lift maneuver on the severity of dysphagia with patients' socio-demographic data:

Socio-demographic data	Comparative patterns	Super supraglottic swallow maneuver group				Hyoid lift maneuver group			
		Df	F-value	P-value	Sig.	df	F-value	P-value	Sig.
Age groups	Between groups	6	2.410	0.059	S	7	2.013	0.09	NS
	Within groups	23				22			
Marital status	Between groups	6	1.237	0.324	NS	7	1.715	0.15	NS
	Within groups	23				22			
Educational level	Between groups	6	1.640	0.181	NS	7	1.708	0.15	NS
	Within groups	23				22			
Occupation	Between groups	6	1.014	0.441	NS	7	4.451	0.003	S
	Within groups	23				22			

df=Degree of Freedom; F=statistics P-value= Probability value; NS=Non-significant (p-value > 0.05); S=Significant (p-value < 0.05

By using one way ANOVA test, the result in table 4-9: shows non-significant statistical differences were found between the effect of super supraglottic swallow maneuver on the severity of dysphagia with patient's marital status, education level, and occupation at p-value >0.05. Conversely, a significant statistical differences was found between the effect of super supraglottic swallow maneuver on the severity of dysphagia with patient's age at p-value 0.059. Furthermore, non-significant statistical differences were found between the effect of hyoid lift maneuver on the severity of dysphagia with patient's age, marital status, and education level at p-value >0.05. Conversely, a significant statistical difference was found between the effect of hyoid lift maneuver on the severity of dysphagia with patient's occupation at p-value 0.003.

Table 4-10: Association between the effect of super supraglottic swallow maneuver, and hyoid lift maneuver on the severity of dysphagia with patient's clinical data:

Clinical data	Comparative patterns	Super supraglottic swallow maneuver group				Hyoid lift maneuver group			
		df	F-value	p-value	Sig.	Df	F-value	p-value	Sig.
Location of stroke	Between groups	6	1.27	0.30	NS	7	1.67	0.16	NS
	Within groups	23				22			
Chronic illness	Between groups	6	2.08	0.09	NS	7	1.02	0.44	NS
	Within groups	23				22			
Number of previous stroke	Between groups	6	1.04	0.42	NS	7	0.93	0.49	NS
	Within groups	23				22			
Smoking	Between groups	6	1.58	0.19	NS	7	1.89	0.11	NS
	Within groups	23				22			
BMI	Between groups	6	1.78	0.14	NS	7	1.68	0.16	NS
	Within groups	23				22			

df=Degree of Freedom; F=Frequency , P-value= Probability value; NS=Non-significant (p-value > 0.05).

Table 4-10 shows a non-significant statistical association was found between the effect of super supra glottic swallow maneuver and hyoid lift maneuver on the severity of dysphagia with patient's clinical data such as location of stroke, chronic illness, number of previous stroke, smoking, BMI at p-value >0.05.

Table 4-11: Association between the effect of the Super supraglottic swallow and hyoid lift maneuver on the severity of dysphagia with patient's gender, address, type of stroke and exposure to previous stroke:

Variables	Classes	Super supraglottic swallow group						Hyoid lift maneuver group					
		F	MS	SD	df.	p-value	Sig.	F	MS	SD	df.	p-value	Sig.
Gender	Male	16	1.47	.507	12	0.663	NS	15	1.50	0.509	7	0.486	NS
	Female	14						15					
Address	Rural	12	1.60	.498	6	0.526	NS	16	1.47	0.507	7	0.033	S
	City	18						14					
Type of stroke	Ischemic	25	1.17	.379	6	0.068	NS	20	1.33	0.479	7	0.320	NS
	Hemorrhagic	5						10					
Exposure to previous stroke	No	12	1.60	.498	6	0.442	NS	13	1.57	0.504	7	0.439	NS
	Yes	18						17					

f=Frequency; MS=Mean of score; SD=Standard deviation; df=Degree of Freedom; P-value= Probability value; NS=Non-Significant (P-value > 0.05).

Table 4-11: shows a non-significant statistical association was found between the effect of super supraglottic swallow group and hyoid lift maneuver group on the severity of dysphagia with patient's gender, address, type of stroke and exposure to previous stroke at p-value >0.05. A significant association was found between the effect of hyoid lift maneuver and address at p-value 0.033.

Chapter Five

Discussion of Results, Conclusion and Recommendations

Chapter Five

Discussion, Conclusion and Recommendations

Post stroke-dysphagia still a trouble problem have effects patients' health status and QOL in spite of the different type of management that used. It is possible to control and reduce the severity of these problems to improve patients' health condition, their QOL. Ninety patients with post stroke-dysphagia enrolled in the present study to compare the effect of the super supra glottic swallow maneuver verses hyoid lift maneuver upon the severity of dysphagia among patients with stroke.

5.1.Discussion of socio-demographic data of patients :

Regarding the socio-demographic data as listed in table (4-1), exposed that are among the participants taking a part in the super supraglottic swallow group and control group, approximately two thirds of them were within the age group (61-80) years old, and accounted (63.3**%**). The mean age of patients in the super supra glottic swallow maneuver group and control group were (70.1±10.1& 67.5±11.4) respectively , while more than one third of patients in the hyoid lift maneuver group within the same age group and accounted (40**%**) , the mean age of patients in the hyoid lift maneuver group was 69.7±14.04.

This result was corresponding with a quasi-experimental study that was conducted by Yousef, et al., (2020) to determine how patients with stroke experienced swallowing difficulties and the degree of dysphagia were modified by a swallowing education rehabilitation approach treated in Alexandria University Hospital's/neurology inpatient wards. Based on eligibility criteria, 60 adult hospitalized patients with stroke were chosen as purposeful samples. Thirty were split equally between the experimental group and the group serving as a control; as a result, indicated that are over half

(53.3%) of patients in the control group and 63.3% of patients in the study group were over 50 years old.

Feng, et al., (2019) conducted a study to look at aspiration pneumonia and Taiwan's mortality rate for patients with stroke who have dysphagia. Therefore, groups of 1220 stroke patients with and without dysphagia were selected, that achieved results that mean age of the dysphagia group was (71.78± 11.7).

The researcher's opinion about these results was attributed to the fact that as age increased, the risk of stroke increased. Yousufuddin & Young (2019), revealed that over 65-year-olds account for almost 75% of all stroke cases. An increase in older adult stroke incidents is anticipated due to the projected growth in the population aged 65 and above. Being older is associated with a higher prevalence of cerebrovascular illness.

Regarding the patient`s gender as shown in table (4-1), the results demonstrated that 53.3**%**, 50**%** and 70% of patients in the super supraglottic swallow group, hyoid lift maneuver group and control group were males. A similar pattern of results was obtained through a quasi-experimental approach that was conducted by Elsaid & Shabaan (2019), to examined the impact of exercise-based dysphagia therapy on patients' ability to swallow after a cerebrovascular accident, 48 adult patients, aged 18–65, of both sexes, who had been recognized as post-stroke dysphagia, were deemed eligible for participation in this study. Two equal groups were randomly assigned to them, that revealed the majority of the sample under research was male (75.0 in the study group and 58.3 in the control group).

The researcher's opinion about these results was attributed that males are more risky to stroke through their habits and lifestyle such as smoking, drinking alcohol and types of food intake. So, also genetics and anatomic factors. Abdu and Seyoum, (2022), revealed that the stroke rates are higher in

men than women. Variations in lifestyle factors, including levels of physical activity, food consumption, social interactions, and cigarette smoking, may either alone or jointly increase the risk of stroke. The sex-related variations in the epidemiology of stroke may also be attributed to anatomical and genetic variables. There are differences in blood vessel diameters between males and women. Women's heart and artery diameters are smaller. When compared to females, males have larger bodies. This results in an enlarged left atrium and raises the possibility that a stroke may occur.

Concerning to the marital status of patients enrolled in this study, the majority of the patients in the two experimental and control groups were married, and accounted 63.3%, 80.0 % and 80.0% for patients in the super supraglottic swallow group, hyoid lift maneuver group and control group respectively. A similar result was obtained in previous study that was carried out by Andersen & Olsen, (2018), who reported that the majority of participants are marriage, It's uncertain if this also applies to stroke patients. They also reported that studies' findings have been contradictory and inconsistent. Which stated that 51.9% of stroke patients were married and concluded that the one-week and one-month case fatalities from stroke were lower among the single, divorced and stroke patients.

Furthermore, approximately one half (46.7 %) of patients in the super supraglottic swallow group and one half (50%) of patients in hyoid lift maneuver and control groups were no read and write. This study's findings are consistent with those of a prospective cohort study conducted by Jackson, et al., (2018), to find out whether age and sex differences exist in the relationship between stroke and the greatest level of education, as well as whether there are any sex-specific potential mediators of the observations, found that higher incidence of stroke is linked with reduced educational levels. So, the researcher opinion about these results, low education level associated with

increased risk of stroke and that may be related to reduced awareness about risk factors, treatment and healthy life styles to avoid exposure to stroke. Lima, et al., (2018), reported that many researches conducted in both developed and developing nations have shown a clear correlation between education level and stroke awareness. Insufficient education hinders the maintenance of a healthy lifestyle and treatment compliance.

Regarding the participants occupation, the result in table (4-1), exposed 46.7% of patients in the super supraglottic swallow and hyoid lift maneuver groups were house wife, and 46.7% of patients in the control group were not work. These findings are directly in line with the results of a previous study descriptive cross - sectional study that done by Talib & Baiee (2023), to investigate the epidemiologic features found in patients with stroke who have been confirmed and admitted to Al Sadiq reference hospital in Babil governorate, Iraq. It was reported that most of of the participants were unemployed, 20.3% were retired and only 7.6% were employed.

The researcher ’s opinion about these results was attributed to the fact that as occupation impacts on healthy lifestyle, so the stress and long hours of work which are risk factors for stroke. Yang, et al., (2023) reported that the findings demonstrated a 20% increase in the incidence of acute ischemic stroke associated with job pressure. Long hours can lead to increased job stress and a sedentary lifestyle, both of which are risk factors for cerebral infarction. Extended work hours are associated with a higher likelihood of harmful habits, including smoking, drinking, eating poorly, and not exercising enough. Stroke risk is further elevated by sleep difficulties brought on by extended work hours and insufficient recuperation time. Psychological workplace expectations and control, and the ways in which these impact the lifestyle and health of employees. Time restraints, mental strain, and

multitasking obligations increased the risk of stroke, especially among women.

Morever, more than one half (60% and 63.3%) of patients in the super supra glottic swallow maneuver group and control group respectively were lived in urban area, and 50 % of patients in the hyoid lift maneuver group were lived in urban area. This result agree with a quasi-experimental study that conducted in the Neurology Ward, Stroke ICU, and Intermediate Neurological ICU at the Ain Shams University Hospital in Cairo by El Sayed & Ewees (2020), to assess how Shaker exercise affected patients' levels of dysphagia after stroke. 68 patients made up the purposive sample, that revealed 64.1% of the patients were lived in urban area.

The researcher ’s opinion about these results was relevant to the high prevalence of high blood pressure, overweight, dyslipidemia and diabetes in urban area. Li, et al., (2019), reported that urban areas have higher rates of diabetes, dyslipidemia, alcoholism, and overt obesity/weight gain. So, that increases risk for ischemic stroke.

5.2.Discussion of patients clinical data:

Regarding the patient’s clinical data as listed in the table(4-2), the results indicate that 30% of participants within the hyoid lift group and control groups had diabetes mellitus and hypertension and 26.7% of the patients in the super supra glottic swallow group had hypertension. The findings of this investigation align with the findings of the Chang, et al., (2021), reported that during a 1-year follow-up, it was found that individuals with type 2 diabetes mellitus and hypertension had a higher rate of new strokes and recurrences, with 51% of participants having hypertension and 37.3% having both hypertension and diabetes. The researcher ’s opinion about these results was attributed to the general function of patients with chronic illnesses such as hypertension and diabetes mellitus is impaired. So, that makes it risky for

stroke. This study conducted by Yang & Pan (2022) shows that patients with ischemic stroke who also have diabetes and hypertension have a significantly higher incidence of dysphagia than patients who do not have these conditions. This finding may be related to the way that chronic illnesses impair patients' overall function, which raises the risk of dysphagia. Diabetes and hypertension not only increase the risk of stroke, but they also increase the chance of dysphagia in stroke victims.

Approximately more than one half (60**%**,56.7 **%**and 63.3**%**) in the super supra glottic swallow maneuver group, hyoid lift maneuver group, and control group were exposure to previous stroke in the past and numbers of previous stroke (1-2) times represent the half in the hyoid lift maneuver and control groups were (53%,50%) and 46.7% in the super supraglottic swallow maneuver group. This result agrees with a quasi-experimental study conducted by Gamal, et al., (2020), to assess how well dysphagic individuals with strokes can swallow after doing Shaker exercise. The investigation was carried out at the Main Mansoura University Hospital's neurological department (A-B), located in the Al-batina private building. A purposeful sample of fifty hospitalized adult patients with cerebrovascular accident were included in the study. So, it was observed that (66.0%) of them were having previous stroke. Also, our results come in agreement with the results of the study conducted by Ibrahim & Athbi, (2023), used a quasi-experimental design including sixty acute stroke patients. The newly enrolled patients were split into 30 patients each for the experimental and control groups, that reported that approximately three-quarters (76.7%), and (73.3%) of patients in the experimental and control groups respectively have the first time exposed to stroke, with less than 12 days' duration. Huang, et al., (2023), reported dysphagia and worsening of symptoms in post-stroke patients were more likely to result from cumulative brain injury.

Regarding the type of stroke, the result in table (4-2), exposed the majority of patients in the super supraglottic swallow maneuver group, hyoid lift maneuver group and control group had ischemic stroke and accounted (83.3% , 66.7% and 70%) respectively. These finding are directly in line with results of a previous study done by by Yousef, et al., (2020), to ascertain how swallowed trials and the degree of difficulty in those with stroke were impacted by a swallowing exercise rehabilitative approach. A quasi-experimental study design was used with a pretest-posttest control group. The investigation was carried out at Alexandria University Hospital's neurological inpatient wards. A purposeful sample of sixty adult hospitalized CVA patients was chosen based on qualifying standards. Thirty patients were placed in each of the two equal groups— study group and control group. So, this study reported majority of the study and control groups (86.7% and 83.3% respectively) had ischemic stroke.

Concerning to the location of stroke, the present study confirmed that about 46.7% in the super supra glottic swallow maneuver group and one half (50%) of patients in the control group were had right brain lobe stroke. A similar pattern of results was obtained through quasi-experimental study, examining how sitting balancing exercises affect stroke patients' fall risk, conducted by Ibrahim & Athbi, (2023), on sixty patients with stroke, reported that about 63.3%of the experimental group were affected in the right lobe of the brain while control group were accounted about 50%. Wilmskoetter, et al., (2018), reported that lesions in the right and left hemispheres may have different effects on dysphagia after a stroke. However there is a difference in how lesion site affects swallow physiology after a stroke. Lesions in the right hemisphere are more often associated with pharyngeal-stage dysfunction, which is defined as severe and protracted dysphagia with aspiration.

Regarding the patients BMI as shown in table (4-3), the results exposed that there is no discernible difference was seen between intervention and control groups with relation to patient BMI at p-value of > 0.310. About more than one-half (56.7%, 63.3% and 66.7%) of patients enrolled in the super supraglottic swallow, hyoid lift maneuver and control groups were overweight. The obesity class1 accounts 13.3% in the both intervention groups. These results go beyond the previous study conducted by Lim, et al., (2018), shows that 61.8% & 58.8% of the patients who were classified into 4 groups based on classifications of BMI with the normal BMI were overweight.

5.3. Discussion the severity of dysphagia for patients in three groups:

Concerning the patients' degree of dysphagia in the two groups receiving intervention and the control group as shown in table (4-5) and (4-6), the current study's findings indicate by using GUSS scale in the control group before performing exercises, 100% of patients belong to the group of severe dysphagia, the GUSS score ranges from 0 to 9. While in the super supra glottic swallow maneuver and hyoid lift maneuver groups, the all of patients 100% were having severe dysphagia. After one week of performing exercise, the most of patients in the super supra glottic swallow maneuver group have slight dysphagia affected 93.3% of respondents, the GUSS score ranges from 15 to 19, 86.6% of patients the hyoid lift maneuver group have slight dysphagia. In contrast, 100% of patients in the control group suffered from severe dysphagia.

The control group's mean dysphagia score was 0.29 during the pretest and 0.539 during the post-test. Patients in the Super supra glottic swallow and hyoid lift technique, had mean dysphagia scores of 0.29, prior to the implementation of the interventional protocol and 1.003 and 1.002 following it. For the super supra glottic swallow and the hyoid lift maneuver groups, a statistically significant variation exists in the degree of dysphagia between the

first and second assessment, with a p-value of =0.000. These results agree with the results of a quasi-experimental approach was employed consist of 48 adult patients that conducted by Elsaid & Shabaan, (2019), to investigate the effects of exercise-based dysphagia therapy on patients' capacity to swallow following stroke in the neurology unit at Mansoura University Hospital. Prior to starting the dysphagia exercises, patients in the group receiving the intervention possess a mean score of 1.833 ±1.090, indicating that they are in a total nasogastric (NG) feeding state. Following dysphagia exercise, almost 87.5% of patients with a mean score of 4.500 ±0.834 are then progressively moved to a whole oral meal with single or multiple consistencies. After a week, 37.5% of patients in the control group (mean score of 3.833 ±0.761) are still receiving NG feedings. Following one week of dysphagia exercises, there is a substantial difference between the two groups. The results suggest that dysphagia exercise can help stroke patients' functional oral intake assessment.

An experimental study was conducted by Biswal, (2022), purposive sampling was used to choose 60 patients, of which 30 were assigned to the experimental group and 30 to the control group. Gugging Swallowing Screen Scale (GUSS) was utilized to monitor the dysphagia rating. The findings of the study showed that the experimental group had a pre-test mean score of 5.40±0.814 and a post-test mean score of 15.23±2.285 at the end of the eighth day, indicating that they had no dysphagia. Therefore, chin tucks resistance exercises helped individuals with dysphagia due to neurological diseases swallow more easily.

Study participants were 48 adult patients of both sexes who had been diagnosed with dysphagia following a stroke and were part of a quasi-experimental design. Researchers Elsaid & Shabaan, (2019), randomly divided the patients into two equal groups. The results of the study revealed that 50% of patients in the intervention group had severe dysphagia and the

other 50% had moderate dysphagia in the pre-test assessment of swallowing ability for stroke patients. Within the intervention group, 75% of participants exhibited mild dysphagia after one week of dysphagia exercises. In contrast, after one week, 79.2% of the control group experienced mild dysphagia. The degree of dysphagia following swallowing exercises differed significantly between the two groups.

The researcher's opinion about these results was attributed to swallow exercises stimulating and strengthening the swallow-related muscles, so repetition of these maneuvers can lead to the strength of swallowing muscles and may be effective on the recovery of swallowing. A study conducted by Liu, et al., (2023), revealed that the suprahyoid muscle complex (SHM) is crucial during the pharyngeal phase of swallowing as it controls the movement of the larynx, hyoid bone, and epiglottis to protect the airway, and the opening of upper esophageal sphincter to facilitate bolus transfer into the esophageal. So, swallow exercise performed on a regular and repetitive basis helps strengthen the swallowing muscles and help the swallowing sensorimotor control system recover.

5.4. Discussion comparison the effect of super supraglottic swallow maneuver and hyoid lift maneuver on the severity of dysphagia:

The severity of dysphagia did not differ significantly between the control group and the Super supra glottic swallow group at P=1.000, between the control group and the hyoid lift group at P=1.000, and between the Super supra glottis swallow group and the hyoid lift group at P=1.000, during the pre-test period. Conversly after seven days of the application of super supraglottic swallow maneuver and hyoid lift maneuver groups so, when compare between the control group and the Super supra glottic swallow maneuver group a significant differences in the severity of dysphagia show at P-value of (0.000) and between the control group and the hyoid lift group

(P=value of 0.000).There is a statistically significant difference in the severity of dysphagia throughout the post-test period. Park, et al., (2019), conducted a double-blind, randomized controlled trial to examine effect of effortful swallowing training on tongue strength and oropharyngeal swallowing function in stroke patients with dysphagia. In comparison to the control group, the experimental group improved more in the oral phases of the VDS (p = 0.017) and anterior and posterior tongue strength (p = 0.046 and 0.042, respectively).

Sonawane & Singaravelan, (2019), implanted an experimental study that assessed how well swallowing maneuvers and lingual exercise, in addition to traditional therapy, improved the general state of life and swallowing ability in patients suffering from stroke with dysphagia.The dysphagia handicap index and functional oral intake scale significantly differed between the two groups, according to the results at p-value 0.001.

When comparing between super supraglottic swallow maneuver and hyoid lift maneuver groups, there were the result in table (4-8) exposed a non significant difference in the severity of dysphagia throughout the post-test period at P-value of (0.937). Kılınç, et al,. (2020), performed a study on thirty six with the assistance of the Hacettepe University Swallowing Disorders Research and Application Center, the research study was carried out at the university's faculty of physical therapy and rehabilitation. This study aimed to assess the effects three distinct exercises—chin tuck against resistance (CTAR), Shaker exercises, and chin tuck exercise—over the course of eight weeks of training on the levels of anterior tongue pressure, suprahyoid muscle activation, and dysphagia limit. Three groups' dysphagia limitations did not differ statistically significantly before or after exercise training at p>0.05.

The researcher's opinion about these results was attributed to that swallow exercise developed the width and duration of upper esophageal sphincter opening. A quasi-experimental design conducted by El Sayed & Ewees, (2020) to evaluate the effect of Shaker exercise on dysphagia level among patients with cerebral vascular stroke reported shaker exercise, commonly referred to as the head lift, was developed to increase the breadth and duration of the opening of the upper esophageal sphincter.

5.5. Discussion the difference between the effect of super supraglottic swallow maneuver, and hyoid lift maneuver on the severity of dysphagia with patient's socio-demographic and clinical data:

As shown in table (4-9), (4-10) and (4-11), our results shown a non-significant statistical difference was found between the effect of super supra glottic swallow maneuver on the severity of dysphagia with patient's marital status, education level, and occupation at p >0.05. This result shows a notable statistical variation among the effect of super supra glottis swallow maneuver on the severity of dysphagia with patient's age at p-value >0.05.Furthermore, a non significant difference was found between the effect of hyoid lift maneuver on the severity of dysphagia with with patient's age, marital status, and educational level at p-value >0.05. Conversly, a significant difference was found between the effect of hyoid lift maneuver on the severity of dysphagia with patient's occupation at p-value 0.003.

These results disagree with study that conducted by Yang & Pan, (2022), to carry out a comprehensive review and meta-analysis to assess the contributing factors associated with dysphagia in patients with ischemic stroke, which revealed that older stroke patients had a higher risk of dysphagia at (P<.001), so that significant statistical association was found between age and dysphagia. A cohort study that conducted by Rofes, et al., (2018), to assess the risk factors, related comorbidities, and prevalence of OD following

stroke, so they investigate that significant association was found between age, marital status and dysphagia in patients with stroke at p-value <0.001.

This result also shows non-significant statistical difference was found between the effect of super supra glottic swallow maneuver and hyoid lift maneuver on the severity of dysphagia with patient's clinical data such as location of stroke, chronic illness, number of previous stroke, smoking , and BMI at p-value >0.05. This results disagrees with a cross-sectional study of stroke patients that conducted by Khedr, et al., (2021), for quantify the occurrence and risk variables, and neuroradiological linkage to dysphagia following one's first ischemic or hemorrhagic stroke, reported that DM and HTN as were found to be substantially linked to dysphagia in patients with ischemia. Also, demonstrated a correlation between the stroke patient's degree of dysphagia and the site of the stroke.

Furthermore, a non-significant statistical association was found between the effect of Super supra glottic swallow and hyoid lift maneuver group on the severity of dysphagia with patient's gender, resedency , type of stroke and exposure to previous stroke at p>0.05. A significant association was found between the patients resedency and the effect of hyoid lift maneuver at p-value <0.033. This results agrees with the results of the study that conducted by Yang & Pan, (2022), to carry out a systematic review and meta-analysis in order to assess the risk factors for dysphagia in ischemic stroke patients and offer guidance on the nursing and clinical management of dysphagia, demonstrated the fact that there was no discernible gender difference between those with dysphagia and those dose not have it at (P = 0.40). A study conducted by Yanti, et al., (2022), to ascertain and elucidate the association between the swallowing capacity ratings and responder characteristics obtained by the GUSS method in patients with stroke. This study used a sample size of 20 participants and was descriptive in nature.

Consecutive sampling was the sampling method employed, so that the majority of respondents (75%) fell into the category of severe dysphagia based on the results of the swallowing ability screening test conducted using the GUSS method. Dysphagia showed significant correlations with gender ($p = 0.000$), stroke type ($p < 0.001$), and the incidence of stroke episodes ($p < 0.001$). This study indicates that the swallowing skill score of stroke patients is correlated with responder characteristics, such as gender, type of stroke, and frequency of previous attacks.

Ehsaan, et al., (2016), carried out a cross-sectional study in three hospitals in Lahore over six months. A convenient sampling technique was used to obtain a sample size of 150 patients of both genders and any age, to find out how often dysphagia is following a stroke and what factors are linked to it. Consequently, it was found that variables such as the type of stroke and smoking history were highly correlated with dysphagic people. However, there was no association in gender with study participants' dysphagia.

5.6. Conclusions:

This item will summarize an important point which discuss and interprets discussion of results. The present study concluded that :

1) Most of patients with stroke have a severe level of dysphagia.
2) Performing super supra glottic swallow maneuver and hyoid lift maneuver three times a day for 7 days was effective in improving swallowing function in patients with stroke.
3) Super supra glottic swallow and hyoid lift maneuvers on dysphagia was not affected by sociodemographic factors or clinical data.
4) The super supra glottic swallow maneuver and hyoid lift maneuver have the same effect on the severity of dysphagia in patients with stroke. So, this study accepted null hypothesis, that includes a non significant

difference between the effect of super supra glottic swallow maneuver and hyoid lift maneuver on dysphagia in patients with stroke.

5.7. Recommendations:

According to the study and conclusion, the researcher recommends the sub sequent recommendations as follow:

1. All patients with stroke can be instructed to perform a super supra glottis swallow maneuver and hyoid lift maneuver post stroke three times a day for 7 days to improve level of dysphagia .
2. Further studies can be done to investigate the long-term effects of super supra glottis swallow maneuver and hyoid lift maneuver on dysphagia level.
3. All nursing staff in the neurological wards can be encouraged to implement super supra glottis swallow maneuver and hyoid lift maneuver as a routine care practice to improve swallowing function and decrease dysphagia level.

5.8. Implications:

Nursing practice:

In order to avoid more severe dysphagia-related nutritional issues, early stroke treatment is crucial. A healthy dietary status has been found to influence the proportion of successful therapeutic outcomes. Optimizing the swallowing process, promoting a safe swallowing technique, and offering liquid meals with the right texture are essential to controlling dysphagia. Instructions on proper eating and drinking posture include: eating and drinking while sitting up straight, avoid eating and drinking right before bending over or sleeping, eat a small amount of food and drink a small amount of fluid, avoid swallowing drinks, eat slowly and chew food thoroughly before swallowing. Food and liquids should not be mixed together. Finally, patients should avoid speaking while eating. So,

there are various programs available for improving swallowing function, including swallowing rehabilitation programs. These treatments have been shown to improve functional deglutition and enhance defective swallowing physiology. Furthermore, following these rehabilitation sessions, there was a notable improvement in the risk of ambition.

Nursing education:

Swallowing exercise should be accomplished by patients who have swallowing problems to improve swallowing and eating capability, continues health education programs for patients and relatives to increase practices and knowledge on swallowing exercises. Also, manual log book about care of dysphagia and stroke patient should be available to nurses at Neurological Intensive Care Units as a teaching guide for patients with neurogenic dysphagia. Educating nurses about dysphagia involves every member of the workforce. In order to detect those who have trouble swallowing, it is necessary to take appropriate action, and this involves ongoing innovation in accordance with national quality norms and standards. Patients can be taught by nurses how to evaluate their needs for food and drink.

Nursing researches:

Review the different factors that contribute to the higher prevalence of dysphagia in stroke patients. Numerous studies have focused on improving swallowing function may be conducted. However, it is imperative to establish a technique to improve swallowing after stroke, especially in the sub-acute phase, when there is the greatest chance of healing and improvement. Numerous studies in this field might be carried out to enhance patients' recuperation.

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Appendices

Appendices

Appendix AI

Ethical Consideration

Ministry of Higher Education and Scientific Research
University of Karbala / College of Nursing
Scientific Research Ethics Committee

UOK.CON.23.08
Ethical Committee Code:
Date: 13 / 11 /2023

Research Ethical Approval Form

Title of the research project	
In the English language	**In the Arabic language**
Comparing the Effect of Using Super Supraglottic Swallow Maneuver and Hyoid Lift Maneuver on Dysphagia in Patients with Stroke	مقارنة أثر استخدام مناورة البلع فوق المزمار ومناورة الرفع اللامي في عسر البلع لدى المرضى المصابين بالجلطة الدماغية

Data About the Main Researcher /Student:

Full Name	Scientific Title	Mobile Number	Email
Hawraa Abd Al-Zahraa	Master student	07814780017	hawraaalhesnawi6@gmail.com

Data About the Co-author /Supervisor:

Full Name	Scientific Title	Mobile Number	Email
Dr. Hasan Abdullah Athbi	Assistant Professor	07721902514	hasan.abdallh@uokerbala.edu.iq

Study objectives

1. To assess the severity of dysphagia in patient with stroke.
2. To determine the effect of using super supraglottic swallow maneuver on dysphagia in patient with stroke.
3. To determine the effect of using hyoid lift maneuver on dysphagia in patient with stroke.
4. To compare the effect of using super supraglottic swallow maneuver and hyoid lift maneuver on dysphagia in patients with stroke.

Time and Setting of the Study

October 2023-Augest 2024/Imam Al-Hussian Medical City, Imam Al-Hassan Al-Mujtaba Hospital

Study Design

Study design: Quasi-experimental design.

Sampling method and sample size

Sampling method: Probability (randomize) sampling/ Seventy-five patients will participate in this study, the participants will be assigned randomly into three groups: 1) Super supraglottic swallow maneuver group 2)Hyoid lift maneuver group 3)Control group.

Statement of Ethical Commitment

The study will be conducted in accordance with what was mentioned in the protocol above and to commitment that all rules set by the ethical committee are followed in present research process. The researcher also makes a commitment to abide by ethical principles, moral values, law and instruction of the institutions. There is no bias will be during collecting the data, gender, regional aspects and is totally impartial and objective. The researcher will have taken an informed consent from the participants, and provide clarifications and information about the study to the sample members. The researcher deals with the data of the sample members in complete confidentiality

حوراء عبد الزهرة

Name and signature of the researcher

Recommendation of the College's Research Ethical Committee

☒ **Agreement to conduct the study** ☐ **Disagreement to conduct the study**

Instructor Dr. Sajidah Saadoon Oleiwi
Member

Ass. Prof. Dr. Zeki Sabah Musihb
Member

Ass. Prof. Dr. Ghazwan Abdalhussein
Member

Ass. Prof. Dr. Hassan Abdullah Athbi
Chairman of the Committee

Appendices

Appendix AII

Administrative arrangement of Ministry of Health / Kerbala Health Department / Training and Human Development Center

Republic of Iraq
Ministry of higher education & scientific research
University of Karbala
College of Nursing
Graduate studies Division

جمهورية العراق
وزارة التعليم العالي والبحث العلمي
جامعة كربلاء
كلية التمريض
شعبة الدراسات العليا

العدد : د.ع/ 358 التاريخ: ١٥/ ١١ / 2023

الى / دائرة صحة كربلاء المقدسة – مركز التدريب و التنمية البشرية

م/ تسهيل مهمة

تحية طيبة...

يرجى التفضل بالموافقة على تسهيل مهمة طالبة الدراسات العليا / الماجستير (حوراء عبد الزهرة خليوي) في كليتنا للعام الدراسي (2023-2024) لغرض جمع العينات الخاصة برسالتها الموسومة :

"مقارنة أثر استخدام مناورة البلع فوق المزمار ومناورة الرفع اللامي في عسر البلع لدى المرضى المصابين بالجلطة الدماغية"

"Comparing the effect of using super supraglottic swallow maneuver and hyoid lift maneuver on dysphagia in patients with stroke"

** مع التقدير **

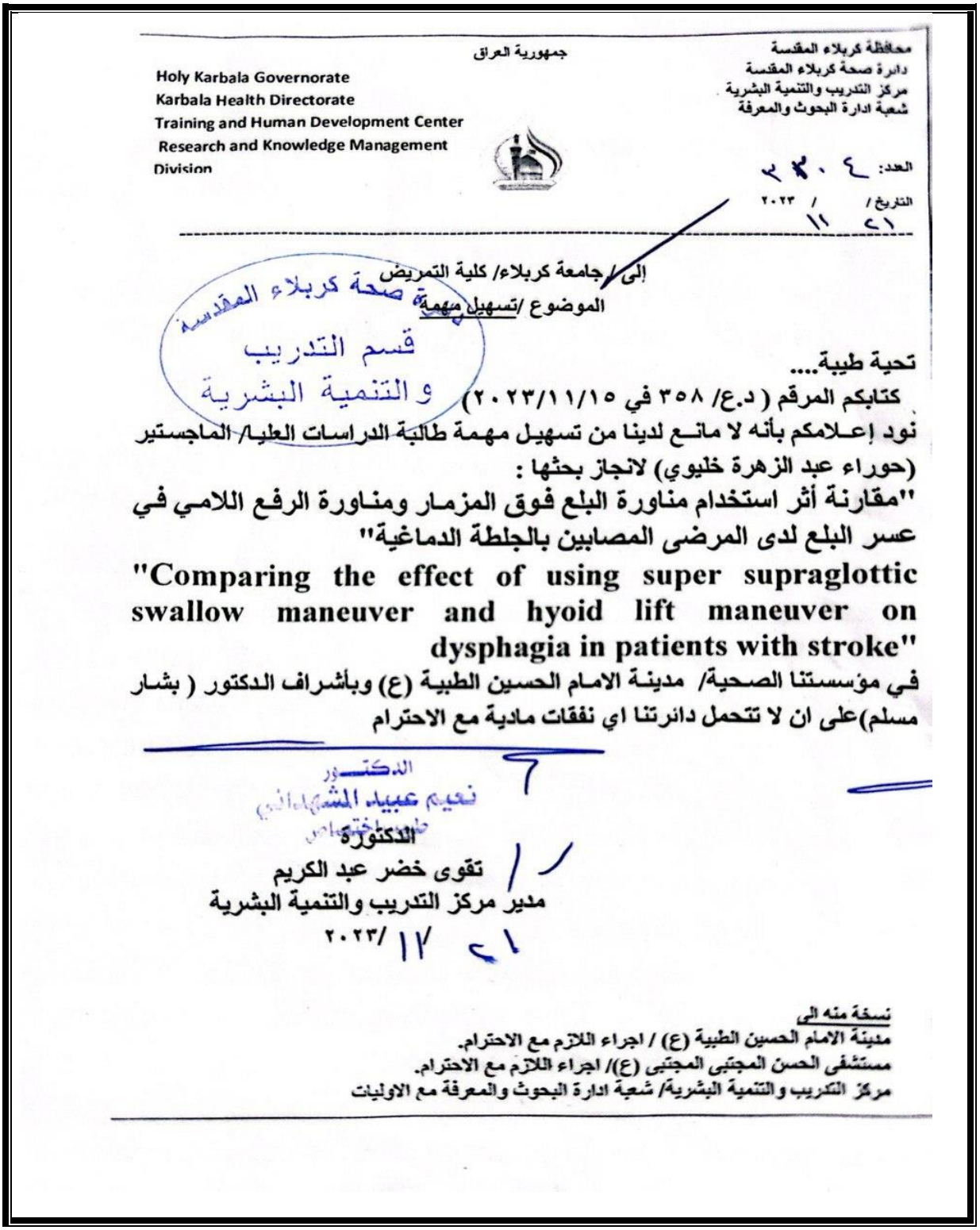
أ.م.د. سلمان حسين فارس الكريطي
معاون العميد للشؤون العلمية و الدراسات العليا
2023 /١١/ ١٥

المحترم.

العنوان : العراق - محافظة كربلاء المقدسة – حي الموظفين - جامعة كربلاء
Mail: nursing@uokerbala.edu.iq website:

Appendix B

Administrative arrangement of University of Kerbala \ collage of nursing



جمهورية العراق

Holy Karbala Governorate
Karbala Health Directorate
Training and Human Development Center
Research and Knowledge Management
Division

محافظة كربلاء المقدسة
دائرة صحة كربلاء المقدسة
مركز التدريب والتنمية البشرية
شعبة ادارة البحوث والمعرفة

العدد: ٤٠٢٧
التاريخ / ١١ / ٢٠٢٣

إلى / جامعة كربلاء/ كلية التمريض
الموضوع /تسهيل مهمة

دائرة صحة كربلاء المقدسة
قسم التدريب
والتنمية البشرية

تحية طيبة....
كتابكم المرقم (د.ع/ ٣٥٨ في ٢٠٢٣/١١/١٥)
نود إعلامكم بأنه لا مانع لدينا من تسهيل مهمة طالبة الدراسات العليا/ الماجستير (حوراء عبد الزهرة خليوي) لانجاز بحثها :
"مقارنة أثر استخدام مناورة البلع فوق المزمار ومناورة الرفع اللامي في عسر البلع لدى المرضى المصابين بالجلطة الدماغية"
"Comparing the effect of using super supraglottic swallow maneuver and hyoid lift maneuver on dysphagia in patients with stroke"
في مؤسستنا الصحية/ مدينة الامام الحسين الطبية (ع) وبأشراف الدكتور (بشار مسلم)على ان لا تتحمل دائرتنا اي نفقات مادية مع الاحترام

الدكتور
نعيم عبيد المشهداني

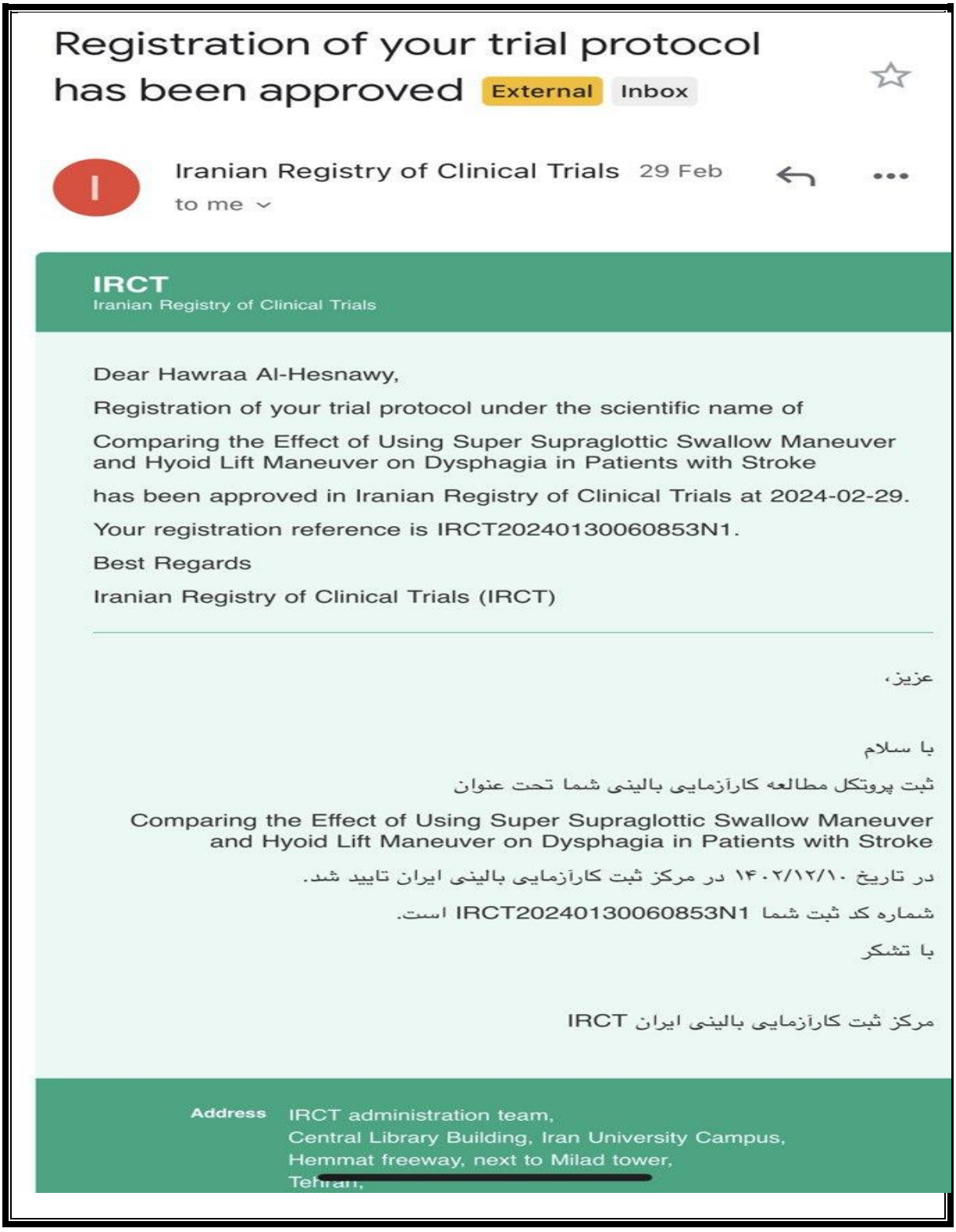
الدكتورة
تقوى خضر عبد الكريم
مدير مركز التدريب والتنمية البشرية
٢٠٢٣/ ١١ / ١٧

نسخة منه الى
مدينة الامام الحسين الطبية (ع) / اجراء اللازم مع الاحترام.
مستشفى الحسن المجتبى المجتبى (ع)/ اجراء اللازم مع الاحترام.
مركز التدريب والتنمية البشرية/ شعبة ادارة البحوث والمعرفة مع الاوليات

Appendices

Appendix C

Iranian Registry of Critical Trials



Registration of your trial protocol has been approved External Inbox

Iranian Registry of Clinical Trials 29 Feb

to me

IRCT
Iranian Registry of Clinical Trials

Dear Hawraa Al-Hesnawy,

Registration of your trial protocol under the scientific name of

Comparing the Effect of Using Super Supraglottic Swallow Maneuver and Hyoid Lift Maneuver on Dysphagia in Patients with Stroke

has been approved in Iranian Registry of Clinical Trials at 2024-02-29.

Your registration reference is IRCT20240130060853N1.

Best Regards

Iranian Registry of Clinical Trials (IRCT)

عزیز،

با سلام

ثبت پروتکل مطالعه کارآزمایی بالینی شما تحت عنوان

Comparing the Effect of Using Super Supraglottic Swallow Maneuver and Hyoid Lift Maneuver on Dysphagia in Patients with Stroke

در تاریخ ۱۴۰۲/۱۲/۱۰ در مرکز ثبت کارآزمایی بالینی ایران تایید شد.

شماره کد ثبت شما IRCT20240130060853N1 است.

با تشکر

مرکز ثبت کارآزمایی بالینی ایران IRCT

Address IRCT administration team,
Central Library Building, Iran University Campus,
Hemmat freeway, next to Milad tower,
Tehran,

Appendix D

Informed Consent

استمارة الموافقة الخطية على البحث

الرجاء التوقيع اسفل الصفحة كي تشهد ان:

بعد ان قامت طالبة الماجستير(حوراء عبدالزهرة خليوي) بشرح وتوضيح جميع التساؤلات حول بحثها الموسوم **(مقارنة أثر استخدام مناورة البلع فوق المزمار ومناورة الرفع اللامي في عسر البلع لدى المرضى المصابين بالجلطة الدماغية)** حيث اطلعني صاحب البحث على اهمية فائدته العلمية كما واطلعني ان هذه مشاركتي تطوع مني و بمحض ارادتي **وان** بامكاني رفض المشاركة وسحبها متى شئت ولاي كان او ان ارفض الاجابة على أي سؤال كما وان مشاركتي بالبحث لن تحملني أي نفقات او مسائلة من شانها الضرر بمهنتي او بشخصيتي كما ان المعلومات الناتجة عن مشاركتي سوف تعامل بسرية تامة ولن يطلع عليها أي شخص وان هذه المعلومات ونتائجها هي للاغراض العلمية فقط ولن تكون هناك أي اشارة الى شخصي او عائلتي في أي منشور عن هذه الدراسة

ولاجل هذا فاني اوقع على المشاركة في هذا البحث :

يرجى كتابة التاريخ بجانب التوقيع

توقيع المشارك: _____ **التاريخ:** 12 / 2 / 2024

توقيع الباحث: _____ **التاريخ:** 12 / 2 / 2024

Appendix EI

Applying Super supraglottic swallow maneuver

Appendix EII

Applying hyoid lift maneuver

Appendix FI

The study instrument

Socio-demographic characteristics & medical information

رقم الاستبيان ☐

الاستبانة في ادناه هي جزء من دراسة بعنوان"مقارنة أثر استخدام مناورة البلع فوق المزمار ومناورة الرفع اللامي في عسر البلع لدى المرضى المصابين بالجلطة الدماغية"أن كافة الاجابات ستعامل بسرية تامة ضمن إطار البحث العلمي فقط.

نوع التداخل: مناورة البلع فوق المزمار ☐ مناورة الرفع اللامي ☐

استبانه رقم (1)

البيانات الديموغرافية - الاجتماعية:

1. العمر: ..... سنة
2. الجنس:
   - ذكر
   - انثى
3. الحالة الاجتماعية:

أعزب/ باكر ☐ متزوج/ة ☐ أرمل/ة ☐

مطلق/ة ☐ منفصل/ة ☐

4. المستوى التعليمي:

لا يقرأ ولا يكتب ☐ يقرأ ويكتب ☐ ابتدائية ☐ متوسطة ☐

اعدادية ☐ معهد ☐ كلية فما فوق ☐

5. -الإقامة: الريف ☐ المدينة ☐
6. المهنة: .....

البيانات الصحية:						
1. الامراض المزمنة:						
2. هل تعرضت الى جلطة دماغية سابقا:	نعم		لا			
اذا كانت الإجابة نعم (كم عدد مرات الإصابة بالجلطة الدماغية سابقا):						
3. نوع الجلطة الدماغية:	جلطة نازفة		جلطة نقص التروية			
4. موقع الجلطة الدماغية:	الفص الايمن		الفص الايسر			
	كلاهما					
5. حالة التدخين	نعم		سابقا		لا	
6. الطول	..... سم					
7. الوزن	..... كغم					

Appendix FII

The study instrument (Gugging Swallow Screen Scale)

GUSS

(Gugging Swallowing Screen)[1]

Patient	Date:
	Time:
	Investigator:

1. Preliminary Investigation / Indirect Swallowing Test

	YES	NO
VIGILANCE *(The patient must be alert for at least 15 minutes)*	1 ☐	0 ☐
COUGH and/or THROAT CLEARING *(Voluntary cough! Patient should cough or clear his or her throat twice)*	1 ☐	0 ☐
SALIVA SWALLOW • **SWALLOWING SUCCESSFUL**	1 ☐	0 ☐
• **Drooling** *(Herausrinnen von Speichel aus dem Mund)*	0 ☐	1 ☐
• **VOICE CHANGE** *(hoarse, gurgely, coated, weak , choke on own saliva)*	0 ☐	1 ☐
SUM:		(5)
	1 – 4 = Investigate further[2] 5 = Continue with „Direct Swallowing Test"	

2. Direct Swallowing Test

(Material: Aqua bi, flat teaspoon, food thickener, bread)

In the following order:	1 → SEMISOLID*	2 → LIQUID**	3 → SOLID ***
DEGLUTITION:			
▪ **Swallowing not possible**	0 ☐	0 ☐	0 ☐
▪ **Swallowing delayed** *(> 2 sec.) (Solid textures > 10 sec.)*	1 ☐	1 ☐	1 ☐
▪ **Swallowing successful**	2 ☐	2 ☐	2 ☐
COUGH (involuntary): *(before, during or after swallowing – until 3 minutes later)*			
▪ **Yes**	0 ☐	0 ☐	0 ☐
▪ **No**	1 ☐	1 ☐	1 ☐
DROOLING:			
▪ **Yes**	0 ☐	0 ☐	0 ☐
▪ **No**	1 ☐	1 ☐	1 ☐
VOICE CHANGE: *(listen tot he voice before and after swalloing- patient should speak „Oh")*			
▪ **Yes**	0 ☐	0 ☐	0 ☐
▪ **No**	1 ☐	1 ☐	1 ☐
SUM:	(5)	(5)	(5)
	1 – 4 = Investigate further[2] 5 = Continue „LIQUID"	1 – 4 = Investigate further[2] 5 = Continue „SOLID"	1 – 4 = Investigate further[2] 5 = NORMAL

Appendix G

Experts list

ت	اسم الخبير	اللقب العلمي	التخصص	سنوات الخبرة	مكان العمل	الغرض
.1	د. هدى باقر حسن	استاذ	تمريض صحة البالغين	37 سنة	كلية التمريض / جامعة بغداد	Content validity
.2	د. حسام عباس داود	استاذ مساعد	تمريض صحة البالغين	22 سنة	كلية التمريض /جامعة كربلاء	
.3	د. ضياء كريم عبد علي	استاذ مساعد	تمريض صحة البالغين	17 سنة	كلية التمريض / جامعة العميد	
.4	د. محمد عبد الكريم مصطفى	استاذ مساعد	تمريض صحة البالغين	16 سنة	كلية التمريض / جامعة الكوفه	
.5	د. نسيم سمير علي	استاذ مساعد	تمريض صحة البالغين	13 سنة	كلية التمريض / جامعة وارث الانبياء	
.6	د. بشار مسلم دهش	طبيب	طب جملة عصبية	10سنوات	دائرة صحة كربلاء/ مدينه الامام الحسين الطبيه	
.7	د. علي كريم خضير	استاذ	تمريض صحة نفسية وعقلية	32 سنة	كلية التمريض / جامعة كربلاء	Face validity
.8	د. فاطمة مكي محمود	استاذ	تمريض صحة البالغين	28 سنة	كلية التمريض /جامعة كربلاء	
.9	د. سلمان حسين فارس	استاذ مساعد	تمريض صحة مجتمع	32 سنة	كلية التمريض / جامعة كربلاء	
.10	د. ابراهيم علوان كاظم	استاذ مساعد	تمريض صحة البالغين	18 سنة	كلية التمريض /جامعة الكوفه	
.11	د. صادق عبد الحسين حسن	استاذ مساعد	تمريض صحة البالغين	14 سنة	كلية التمريض/ جامعة بغداد	
.12	د. عامر محمد غبيش	مدرس	تمريض صحة البالغين	25 سنة	كلية الصفوة الجامعه /قسم التمريض	
.13	د. عمار كردي عبد الشهيد	طبيب	طب جملة عصبية	4 سنوات	دائرة صحة كربلاء/مدينة الامام الحسين الطبية	

Appendix H

Content validity of Gugging swallow screen scale

Items	Ex1	Ex2	Ex3	Ex4	Ex5	Ex6	UA	ne	n	Icvi
Q1	1	1	1	1	1	1	1	6	6	1
Q2	1	1	1	1	1	1	1	6	6	1
Q3	1	1	1	1	1	1	1	6	6	1
Q4	1	1	1	0	1	1	0	5	6	0.83
Q5	1	1	1	1	1	1	1	6	6	1
Q6	1	1	1	1	1	1	1	6	6	1
Q7	1	1	1	1	1	1	1	6	6	1
Q8	1	1	1	1	1	1	1	6	6	1
Q9	1	1	1	1	1	1	1	6	6	1
Q10	1	1	1	1	1	1	1	6	6	1
Proportion relevance	1	1	1	0.9	1	1	0.9			0.98
S-CVI/AU										0.9
S-CVI/Ave										0.98
Average proportion of items judged as relevance across six experts										0.9

I-CVI = CVR=(ne – N/2) / (N/2), S- CVI/Ave=(□CVR/ N) , UA = Universal agreement, Content Validity Ratio CVR= I- CVI (item level content validity index), S-CVI\Ave =scale-level content validity index, ne= number of experts in agreement , ne = The number of experts who rated anitem as "essential" , N = the total number of experts.

Appendices

Appendix I

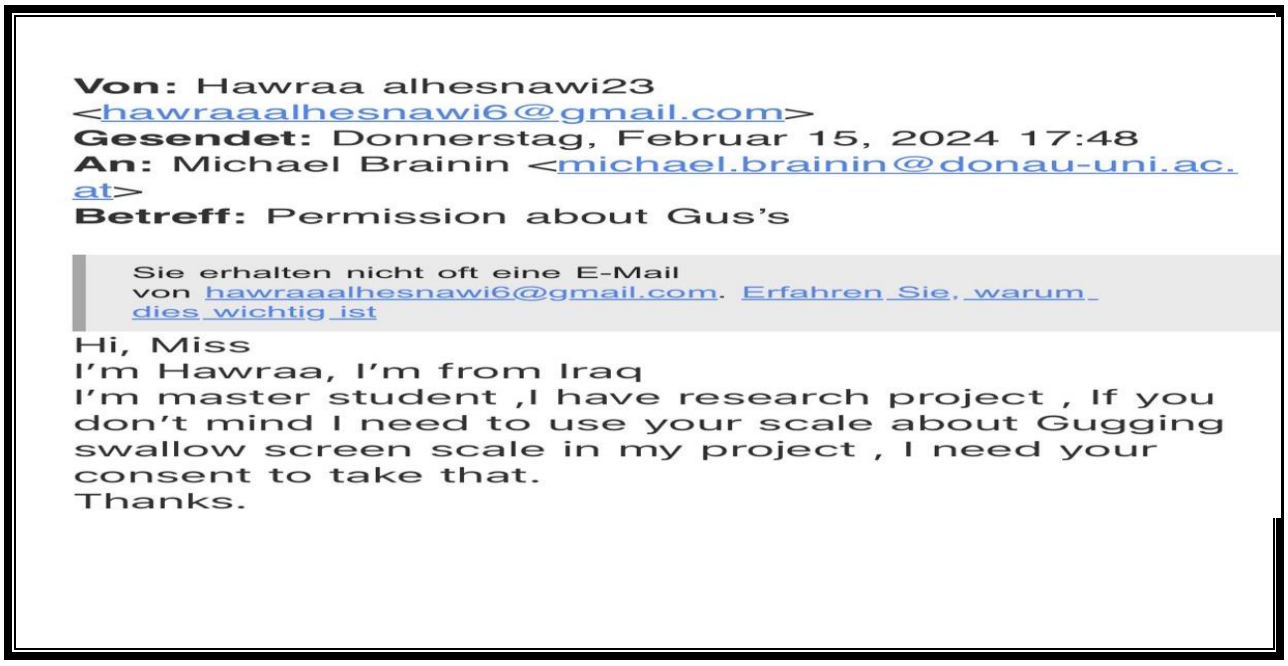
Face validity of Gugging swallow screen scale

Items	Ex1	Ex2	Ex3	Ex4	Ex5	Ex6	Ex7	NE	N	I-fVI	UA
Q1	1	1	1	1	1	1	1	7	7	1	1
Q2	1	1	1	1	1	1	1	7	7	1	1
Q3	1	1	1	1	1	1	1	7	7	1	1
Q4	1	1	1	1	1	1	1	7	7	1	1
Q5	1	1	1	1	1	1	1	7	7	1	1
Q6	1	1	1	1	1	0	1	6	7	0.85	0
Q7	1	1	1	1	1	1	1	7	7	1	1
Q8	1	1	1	1	1	1	1	7	7	1	1
Q9	1	1	1	1	1	1	1	7	7	1	1
Q10	1	1	1	1	1	1	1	7	7	1	1
Proportion revelance	1	1	1	1	1	0.9	1			0.98	0.9
S-fVI/AU											0.9
S-fVI/Ave											0.98
Average proportion of items judged as relevance across the seven experts											0.9

I-FVI = (agreed item)/ (number of rater), S-FVI/Ave = (sum of I-FVI scores)/(number of item),S-FVI/UA = (sum of UA scores)/(number of item), UA = Universal agreement = raters in agreement, I-FVI = item face validity, S-FVI =scale face validity.

Appendix L

Permission of Gugging swallow screen scale



Von: Hawraa alhesnawi23 <hawraaalhesnawi6@gmail.com>
Gesendet: Donnerstag, Februar 15, 2024 17:48
An: Michael Brainin <michael.brainin@donau-uni.ac.at>
Betreff: Permission about Gus's

Sie erhalten nicht oft eine E-Mail von hawraaalhesnawi6@gmail.com. Erfahren Sie, warum dies wichtig ist

Hi, Miss
I'm Hawraa, I'm from Iraq
I'm master student ,I have research project , If you don't mind I need to use your scale about Gugging swallow screen scale in my project , I need your consent to take that.
Thanks.

2:51

Gugging Swallowing Screen – Permission for project Inbox

Michaela Trapl-Grundsc... 17 Feb
to me, Yvonne

Dear Hawraa,

thanks for reaching out to us. We'd love to know more about you and your project. Could you kindly share some details with us?

What is the aim and title of your project?
On which university do you study?
What is your profession?

Thanks in advance
On behalf of the GUSS team
Michaela Trapl-Grundschober

PhDr. Michaela Trapl-Grundschober, MAS, MSc
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University Clinic Tulln
Alter Ziegelweg 10
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Department of Clinical Neurosciences
and Preventive Medicine
Danube-University Krems,
Karl-Dorrek Strasse 30
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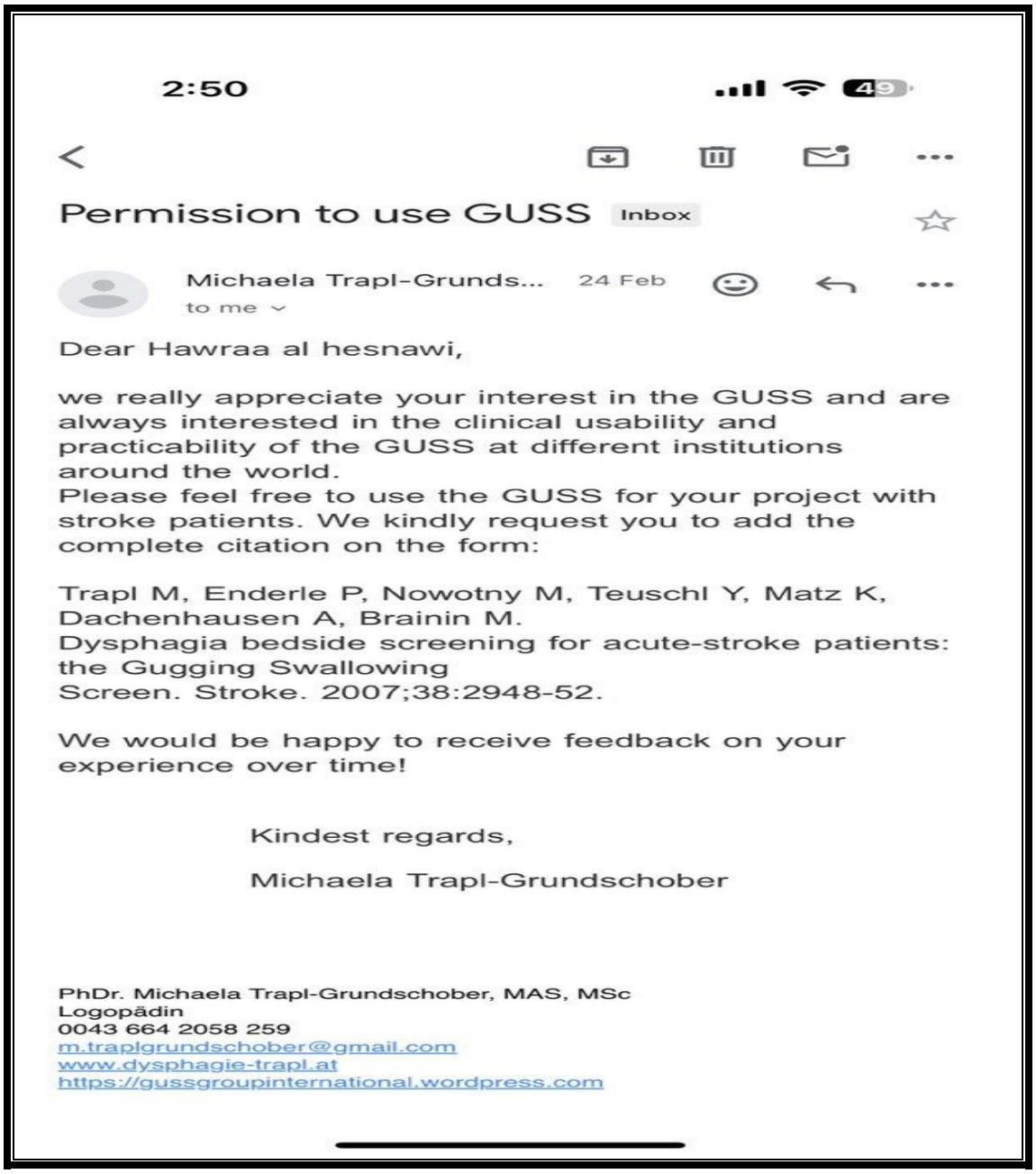
Austria
https://gussgroupinternational.wordpress.com

Appendices

Appendix L

Permission of Gugging swallow screen scale



2:50

Permission to use GUSS Inbox

Michaela Trapl-Grunds... 24 Feb
to me

Dear Hawraa al hesnawi,

we really appreciate your interest in the GUSS and are always interested in the clinical usability and practicability of the GUSS at different institutions around the world.
Please feel free to use the GUSS for your project with stroke patients. We kindly request you to add the complete citation on the form:

Trapl M, Enderle P, Nowotny M, Teuschl Y, Matz K, Dachenhausen A, Brainin M.
Dysphagia bedside screening for acute-stroke patients: the Gugging Swallowing
Screen. Stroke. 2007;38:2948-52.

We would be happy to receive feedback on your experience over time!

Kindest regards,

Michaela Trapl-Grundschober

PhDr. Michaela Trapl-Grundschober, MAS, MSc
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Appendices

Appendix K

Patient ’s follow up method

Appendix N

Instruction on how to use the gugging swallow screen scale

Instruction on how to use the gugging swallowing screen (Guss):

- Materials required for the indirect swallowing test : Cup, Teaspoon, Water (still mineral water or sterile water), Stethoscope
- Materials required for the direct swallowing test (only if the indirect swallowing attempt was successful): Syringe (20ml), Food Thickener, One piece of bread (1,5 x 1,5cm).

Preliminary Investigation / Indirect Swallowing Test:

Vigilance:

• The patient must be sufficiently awake (minimum of 15 minutes), Place the patient in an upright sitting position ,Tick "Yes" on the GUSS sheet (= 1 point) if the above criteria apply.

Coughing and/or throat clearing:

- Ask the patient to cough hard OR clear his throat
- Only a cough OR throat clearing strong enough to (technically) transport a foreign body from the throat is scored with one point (=”Yes”).

Swallowing saliva :

- Ask the patient to swallow his own saliva. If a swallow can be observed, this can be evaluated with 1 point
- If a patient coughs in the process of swallowing saliva, rate this with 0 points ("swallowing not possible").

Drooling:

- Observe, whether the patient exhibits signs of drooling. Drooling is defined as saliva, food or fluid leaking out of the mouth unintentionally.

Appendix N1

Instruction on how to use the gugging swallow screen scale

- The patient scores 0 points if there is drooling beyond the corner of the mouth and he does not sense it.

Voice Change after the saliva swallow:

- Ask the patient to say "Aah" or try to listen to the patients' voice during a short conversation.
- If the patient has a gargly, moist voice or breathes as if mucus has accumulated in the pharnyx or larynx area and has not been transported away, tick "Yes" (= 0 points).
- If the patient has had a hoarse voice since the onset of the first stroke symptoms, then also choose "Yes" (= 0 points).
- If it is not possible for the patient to vocalise, then use the stethoscope
- instead and listen for breath sounds in the neck area.

Now add up all the points of the preliminary examination and write the number in the field "SUM". If the patient reaches 5 points, continue with the direct swallowing attempt. If the patient has scored less than 5 points the examination must be stopped and the patient is given an NPO diet.

Swallow attempt „semisolid"

- Mix approx. 50ml of water with a food thickener to achieve a pudding-like consistency.
- Tell the patient he will receive a small amount of thickened water.
- Administer half a teaspoon of the thickened water to the patient.

Deglutition:

Appendix N2

Instruction on how to use the gugging swallow screen scale

- If the patient does not swallow, or if the bolus has to be removed orally, the patient receives 0 points ("Swallowing not possible") and the examination must be stopped.
- The bolus should be swallowed within 2 seconds, n case of a prolonged oral phase, "Swallowing delayed" (=1 point) is ticked and the examination must be stopped.
- A successful swallow should be completed within 2 seconds, as soon as the bolus is removed from the spoon.
- The size of the boli for the subsequent teaspoons should increase. The first teaspoon should be half, the second a whole teaspoon, and the third a heaped teaspoon. It is up to the examiner whether he tests 3, 4 or 5 teaspoons, depending on how conclusive the examination is.
- If all 3-5 teaspoons are inconspicuous, then this is marked with "Swallow successful" (= 2 points).

Coughing:

- If the patient coughs involuntarily (because of bolus delivery) before, during or after swallowing, the patient is evaluated with "Yes" (=0 points) and the examination is cancelled.
- "Coughing up to 3 minutes later" means that at the end of the subtest "Semisolid" the examiner is advised to wait up to 3 minutes to determine whether coughing follows the swallows.
- If the patient does not cough, then, even if the other aspiration signs (deglutition, drooling, voice change) are inconspicuous, it is permissible to continue with another teaspoon.
- If the patient does not cough after 3-5 teaspoons, "No" (=1 point) is marked.

Appendix N3

Instruction on how to use the gugging swallow screen scale

Drooling:

- If food is drooling visibly out of the mouth, it is evaluated with "Yes" (=0 points).
- If there is no drooling, then, if the other 3 signs of aspiration (deglutition ,coughing, voice change) are inconspicuous, continue with another teaspoon.
- If there is no drooling after 3-5 teaspoons, then you can rate it with "No" (= 1point).

Voice Change:

- In order to be able to identify a change of voice after swallowing, the patient must be capable of giving voice (=phonating). Ask the patient to speak a long "ohhh" first.
- If the voice sounds gargly, husky or changed, as if saliva, mucus or a bolus has accumulated in the throat, a "yes" (=0 points) must be checked and the examination must be stopped. If you are not sure if the voice has changed, let the patient speak a long "Ahhhhh".
- If the patient is unable to produce a voice, please use a stethoscope to monitor the breathing sounds.
- If a change of voice (or gurgled breathing) is audible, the examination must be stopped.
- If the voice is the same as before the bolus swallow, then if the other 3 sign of aspiration (deglutition, drooling, coughing) are inconspicuous, it is permissable to continue with another teaspoon.
- If the voice is inconspicuous even after 3-5 teaspoons, then score "No" (=1point).
- Add up all the points of the sub-test "SEMISOLID" and write the number in the field "Sum".

Appendix N4

Instruction on how to use the gugging swallow screen scale

- ❖ If the patient has reached 5 points, the subtest "LIQUID" may be continued.
- ❖ If the patient has less than 5 points in the sub-test "SEMISOLID", the examination must be stopped. The points of the preliminary examination are added together with the points of the SEMISOLID subtest and are entered as a total in the bottom line of the evaluation sheet (SUM: Indirect Swallowing Test AND Direct Swallowing Test).

Swallow attempt „liquid“

• Fill a glass or cup with approx. 100 ml of water. Prepare a 20 ml syringe and a large-diameter cup.

• First, 3ml of water are drawn up with the syringe and poured into the cup.

• Offer the patient the cup and tell him that he will only receive a small amount of water and that he should try not to put his head backwards while drinking.

Deglutition:

o If the patient does not swallow, or if the bolus even has to be removed orally, the patient receives 0 points ("Swallowing not possible") and the examination must be stopped.

o The water must be swallowed within 1-2 seconds after being placed in the mouth. In the case of a prolonged oral phase, "Swallowing delayed" (=1 point) is marked and the examination must be stopped.

o If the patient can swallow the water bolus within 1-2 seconds, then, even if the other signs of aspiration (coughing, drooling, voice change) are inconspicuous, continue with 5ml of water administered in the cup.

Appendix N5

Instruction on how to use the gugging swallow screen scale

Coughing:

- If the patient coughs involuntarily (due to the swallowing of water) before, during or after swallowing, the examination is evaluated with "Yes" (=0 points) and the examination has to be interrupted or suspended
- "Coughing up to 3 minutes later" does not mean to wait 3 minutes after each swallow, but at the end of the subtest "Liquid" the examiner should wait for aperiod of up to 3 minutes to determine whether coughing follows.
- If the patient does not cough, it is permissible to
- continue with 5ml (10ml, 20ml and 50ml).
- o If the patient does not even cough after 50ml, "No" (=1 point) is ticked.

Drooling:

- If there are any signs of visible drooling, evaluate with “Yes” (=0 points).
- If there is no drooling, then, if the other 3 signs of aspiration (deglutition, coughing, voice change) are inconspicuous, continue with 5ml (10ml, 20ml and 50ml).
- If there is no drooling, even after 50ml, then you can score "No" (= 1 point).

Voice change:

- The patient must be capable of giving a voice (=phonating). Ask the patient to speak a long "ohhh" first. If the voice sounds gargly husky or changed, as if saliva, mucus or bolus has accumulated in the throat, "yes" (=0 points) must be marked and the examination must be stopped.
- If patient cannot produce a voice, listen to the respiratory sounds using a stethoscope.

Appendix N6

Instruction on how to use the gugging swallow screen scale

- Add up all the points of the "LIQUID" sub-test and write the number in the "Sum" field.
- If the patient scores 5 points or more, the subtest "SOLID" may be continued.
- f the patient scores less than 5 points in the sub-test "LIQUID", then the examination must be stopped.

Swallow attempt „solid“

- For this swallowing test, offer the patient a piece of dry bread in the size of 1.5 x 1.5 cm.
- Please also prepare water for drinking.
- Before giving the piece of bread to the patient, Before giving the piece of bread to the patient, please determine his dental status (is there a prosthesis in the mouth, and does it fit well? Is there a denture at all? Is the patient accustomed to eating without a prosthesis? Does he have it at home? Has it been lost? Is a dentist visit imminent? Does the patient have toothache, tooth gaps...? ...).

Deglutition:

- If the patient does not swallow, or if the bolus has to be removed from the patient’s mouth, he receives 0 points ("Swallowing not possible") and the examination must be stopped.
- The bread swallow must be chewed and swallowed within 23 seconds. In case of a prolonged oral phase, the box "delayed act of swallowing" (=1 point) should be ticked and the examination is stopped.
- If the patient succeeds in swallowing bread within the period of 23 seconds, another test bolus may be administered if the other 3 aspiration signs (cough, drooling, voice change) are also inconspicuous. The examiner may decide how many bread trials are needed. The GUSS only provides for one test sip.

Appendix N7

Instruction on how to use the gugging swallow screen scale

- If the bread swallows are without aspiration signs, this is marked with "Swallowing successfully" (= 2 points).

Coughing:

- If the patient coughs involuntarily (due to swallowing of bread) before, during or after swallowing, the examination is evaluated with "Yes" (=0 points) and the examination must be interrupted.
- "Coughing until 3 minutes later";P.[L]O means that at the end of the subtest "Solid" the examiner is advised to wait up to 3 minutes to determine whether coughing follows the swallows.
- If the patient does not cough, the next piece of bread may be administered to the patient, even if the other 3 aspiration signs (deglutition, drooling, voice change) are inconspicuous
- If the patient does not cough after the last (bread) solid bolus, "No" (=1 point) is ticked.

Drooling:

- If the bread or a piece of bread is drooling visibly out of the mouth, it is evaluated with "Yes" (=0 points).
- If there is no drooling, and the other 3 signs of aspiration (deglutition, coughing, voice change) are inconspicuous, continue with another piece of bread.
- If there is no drooling even after the last (test) bolus, then please score "No"(= 1 point).

Voice change:

- The patient must be capable of vocalising. Ask the patient to speak a long "ohhh" at first. If the voice sounds gargly, husky or altered, as if saliva, mucus or a bolus has accumulated in the throat, a "yes" (=0 points) should be checked and the examination must be stopped. If you are not sure if the voice is altered, instruct the patient to speak a long "Ahhhhh".

Appendix N8

Instruction on how to use the gugging swallow screen scale

- If the patient cannot produce a voice, please listen to the respiratory sounds using a stethoscope.
- If a change of voice (or gurgled breathing) is audible, the examination must be stopped.

- If the voice remains unaltered after the solid bolus swallowand the other 3 signs of aspiration (deglutition, drooling, coughing) are inconspicuous, continue with another solid bolus.

- If there is no voice change after the last swallow of solid food (bread), you should score "No" (= 1 point).

- Add all the points of the "SOLID" sub-test together and write the number in the "Sum" field.

- If the patient has reached at least 5 points, the GUSS is successfully completed. Add up all the points (maximum of20) and enter this into the total sum field.

Appendix M

Statistician certificate

Republic of Iraq
Ministry of higher education & scientific research
University of Karbala
College of Nursing
Graduate studies Division

جمهورية العراق
وزارة التعليم العالي والبحث العلمي
جـــامعة كربلاء
كـلية التـمريـض
شعبة الدراسات العليا

إقرار الخبير الإحصائي

أشهد بأن الرسالة الموسومة :

" مقارنة أثر استخدام مناورة البلع فوق المزمار ومناورة الرفع اللامي في عسر البلع لدى المرضى المصابين بالجلطة الدماغية "

Comparing the Effect of Using Super Supra Glottic Swallow Maneuver and Hyoid Lift Maneuver on Dysphagia in Patients with Stroke "

قد تم الإطلاع على الإسلوب الإحصائي المتّبع في تحليل البيانات و إظهار النتائج الإحصائية وفق مضمون الدراسة و لأجله وقعت .

توقيع الخبير الإحصائي :

الإسم و اللقب العلمي : أ.م.د

الإختصاص الدقيق :

مكان العمل : جامعة كربلاء / كلية الإدارة والاقتصاد

التاريخ : ١٢ / ٥ / 2024

العنوان : العراق - محافظة كربلاء المقدسة - حي الموظفين - جامعة كربلاء
Mail: nursing@uokerbala.edu.iq website: nursing.uokerbala.edu.iq

Appendices

Appendix O

Language expert ’s certificate

Republic of Iraq
Ministry of higher education & scientific research
University of Karbala
College of Nursing
Graduate studies Division

جمهورية العراق
وزارة التعليم العالي والبحث العلمي
جامعة كربلاء
كلية التمريض
شعبة الدراسات العليا

إقرار الخبير اللغوي

اشهد بأن الرسالة الموسومة :

" مقارنة أثر استخدام مناورة البلع فوق المزمار ومناورة الرفع اللامي في عسر البلع لدى المرضى المصابين بالجلطة الدماغية "

" Comparing the Effect of Using Super Supra Glottic Swallow Maneuver and Hyoid Lift Maneuver on Dysphagia in Patients with Stroke "

قد جرى مراجعتها من الناحية اللغوية بحيث أصبحت بإسلوب علمي سليم خالٍ من الأخطاء اللغوية و لأجله وقعت .

توقيع الخبير اللغوي :

الإسم و اللقب العلمي : ا.م.د. توفيق مجيد احمد

الإختصاص الدقيق : علم اللغة التطبيقي

مكان العمل : جامعة كربلاء \ كلية

التاريخ : 7 / 2024

العنوان : العراق - محافظة كربلاء المقدسة – حي الموقلين - جامعة كربلاء
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CamScanner

الخلاصة

خلفية البحث: عسر البلع هو احد المشاكل الشائعة بين مرضى الجلطة الدماغية. يمكن البدء بالرعاية المبكرة لتحسين البلع وتقليل المضاعفات اللاحقة. تهدف هذه الدراسة إلى مقارنة تأثير استخدام مناورة البلع فوق المزمار ومناورة الرفع اللامي في عسر البلع لدى مرضى الجلطة الدماغية.

منهجية البحث: أجريت دراسة شبه تجريبية في الردهات الباطنية، للمدة من 1 تشرين الأول 2023 إلى 30 حزيران 2024. تم شمول عينة غرضية مكونة من تسعون مريضًا مصابًا بالجلطة الدماغية وتم تقسيمهم إلى ثلاثة مجموعات: 30 مريضًا لكل من مجموعة مناورة البلع فوق المزمار ومناورة الرفع اللامي والمجموعة الضابطة. تم إجراء مناورتي البلع فوق المزمار والرفع اللامي ثلاث مرات في اليوم لمدة سبعة أيام وتم إعطاء المجموعة الضابطة الرعاية الاعتيادية فقط. تضمنت أداة جمع البيانات على جزأين: الجزء الأول يتعلق بالبيانات الاجتماعية والديموغرافية والسريرية؛ ويشمل الجزء الثاني مقياس فحص البلع بهدف تقييم مستوى البلع. تم استخدام كل من التحليل الاحصائي الوصفي والاستدلالي لتحليل نتائج الدراسة (اختبار المتوسطات لعينتين مستقلتين، اختبار المتوسطات لعينة واحدة ، والاختبارأحادي الاتجاه)؛ تم تحديد قيمة الدلالة الإحصائية بمستوى معنوية اقل من 0.05.

النتائج: أظهرت النتائج أن 100% من المرضى في المجموعة الضابطة ومجموعتي مناورة البلع فوق المزمار ومناورة الرفع اللامي كانوا يعانون من عسر بلع شديد على التوالي عند التقييم القبلي. بينما وجد في نفس المجموعات في الاختبار اللاحق أن 100% و0.0% و0.0% من المرضى كانوا يعانون من عسر بلع شديد على التوالي. من خلال تطبيق مناورات البلع فوق المزمار والرفع اللامي وجد فرقًا كبيرًا في مستوى عسر البلع بين مدتي الاختبار القبلي والبعدي عند قيمة معنوية (0.000) لكل مجموعة من المرضى. في المقابل، شهدت المجموعة الضابطة فرقًا غير مهم عند قيمة معنوية 0.161.علاوة على ذلك، كان هناك فرق غير مهم في تأثير مناورة البلع فوق المزمار والرفع اللامي على مستوى عسر البلع عند قيمة معنوية (0.973).

الاستنتاجات: إن تطبيق مناورات البلع فوق المزمار والرفع اللامي ثلاث مرات يوميًا لمدة 7 أيام يحسن بشكل كبير من قدرة المرضى الذين يعانون من الجلطة الدماغية على البلع، وهذه المناورات لها نفس التأثير على عسر البلع.

التوصيات: وفقا للدراسة والاستنتاجات، يوصي الباحث بالتوصيات اللاحقة على النحو التالي: يمكن توجيه جميع المرضى الذين يعانون من السكتة الدماغية لأداء مناورة البلع فوق المزمار ومناورة رفع اللامي بعد السكتة الدماغية ثلاث مرات يوميا لمدة 7 أيام لتحسين مستوى عسر البلع. ، يمكن إجراء

المزيد من الدراسات لاستقصاء التأثيرات طويلة المدى لمناورة البلع فوق المزمار ومناورة الرفع اللامي على مستوى عسر البلع، ويمكن تشجيع جميع طاقم التمريض في ردهات الجملة العصبية على تنفيذ مناورة البلع فوق المزمار ومناورة الرفع اللامي كطريقة ممارسة الرعاية الروتينية لتحسين وظيفة البلع والتقليل من مستوى صعوبة البلع.

جامعة كربلاء

كلية التمريض

مقارنة أثر استخدام مناورة البلع فوق المزمار ومناورة الرفع اللامي في عسر البلع لدى المرضى المصابين بالجلطة الدماغية

رسالة مقدمة الى مجلس كلية التمريض / جامعة كربلاء وهي جزء من متطلبات نيل درجة الماجستير في علوم التمريض

كُتب بواسطة

حوراء عبدالزهرة خليوي

بإشراف

أ.م.د. حسن عبد الله عذبي

تموز– 2024 م **محرم – 1446هـ**