Effect of Head Lift Exercise on Knowledge, Practice, and Swallowing Function among Patients with Dysphagia

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Abstract

Background: The head lift exercise is a head-raising workout aiming to improve the opening of this segment, and ultimately to reduce aspiration. **The aim of the study**: Was to evaluate the effect of head lift exercise on knowledge, practice, and swallowing function among Patients with dysphagia. **Research design**: A quasi-experimental research design was used to achieve the aim of the study. **Settings**: The study was conducted at the neurological department at Beni-Suef University Hospital. **Subjects**: A convenient sample of all 50 patients with dysphagia was included in the study within six months from the previously selected setting. **Tools of data collection:** Tool I: Patient's Structured Interview Questionnaire, Tool II: Dysphagic Patients' Knowledge Assessment Sheet, Tool III: Dysphagic Patient's Reported Practice Assessment Sheet, and Tool IV: Gugging Swallowing Screening (GUSS) Scale. **Results**: The study revealed that there was an improvement with highly statistically significant differences detected between dysphagic patients' knowledge regarding head lift exercise pre-, post-two weeks, and one-month post-implementation. There was a highly statistically significant difference in the GUSS score of dysphagia level among patients pre and post-implementation of head lift exercise ($P<0.001$). There was a highly significant positive correlation between dysphagic patients' total knowledge, practice, and swallowing function pre-, post two weeks, and one-month post-implementation ($p < 0.001$). **Conclusion**: The study concluded that head lift exercise has a positive effect in improving knowledge, practice, and swallowing function among patients with dysphagia. **Recommendation**: It is recommended that head lift exercise be used in clinical settings for Patients with dysphagia in the neurological ward to improve their swallowing function. Replicate the study on a larger group; selected from different geographical areas in Egypt to obtain more generalized findings about the current study.

Keywords: Head lift exercise, Knowledge and practice, Patients, Dysphagia, Swallowing function.

Introduction:

The word dysphagia refers to swallowing problems with both solid and liquid foods. Dysphagia is the outcome of nerve or muscle control issues that can coexist with several different medical diseases. These illnesses damage the mouth and throat muscles' coordination in stroke patients, leading to a weakening and anatomical problem that allows food and/or liquids to travel into the trachea (windpipe) rather than the esophagus (food pipe) (**Brly, 2018**). Dysphagia may occur as a temporary side effect brought on by cerebral neuropathy or fibrosis in the radiation-exposed area, or it may develop as an acute side effect brought on by mucositis, discomfort, and edema and go away after treatment (**Banda et al., 2021**).

Starting with a thorough history to help identify the cause of the patient's swallowing difficulty, a clinical evaluation is typically the next stage in the swallowing assessment process. The patient's mouth, throat, or pharynx, as well as their larynx or voice box, are typically examined as part of the clinical assessment.

When evaluating and treating dysphagia, a physician examines the mouth and pharynx's structure's range of motion, speed of movement, and coordination of movement (**Cleveland 2019**).

Dysphagia negatively impacts quality of life, much like any other chronic illness. In addition to having a physical swallowing impairment, a person with dysphagia experiences social and psychological difficulties. By taking an individual's viewpoint of need into consideration, healthcare providers can address both the physical and mental aspects of dysphagia (**Langhorne et al., 2019**). Oropharyngeal dysphagia is not treatable with medication. Rehabilitative care is the primary managerial function. Restoring a safe feeding to as close to normal as feasible is the aim of swallowing rehabilitation. For many chronic conditions, exercise is an essential part of a preventive strategy.

Patients report feeling weak and exhausted after having difficulty swallowing, which affects their overall level of activity. Additionally, eating out of pleasure, missing out on meals with family and friends, and feeling embarrassed and anxious about swallowing difficulties all contribute to feelings of loneliness and a loss of identity (**Bressan et al., 2019**).

The original purpose of the head-lift exercise was to strengthen the suprahyoidal, thyrohyoid, and pharyngeal muscles to increase hyoid and laryngeal elevation, which in turn improved the opening of the upper esophageal sphincter (Shaker et al., 1997). Since research studies have shown some evidence of reduced aspiration during swallowing and less post-swallow residue as well as better preservation of the UES opening, hyoid bone movement, and strengthened suprahyoid muscles (**Logemann et al., 2019**), the head-lift exercise has been used as an intervention for dysphagia among patients for several years (**Larsen et al., 2021**). Nevertheless, there hasn't previously been any evidence from a sizable randomized control experiment. The study team has just released two papers from a randomized control trial that assessed, using an observer-rated instrumental evaluation, the impact of the head-lift exercise on swallowing function and physiology **(Tuomi et al., 2022 Dotevall et al., 2022).**

The head lift exercise was defined using the information that the pull of the thyrohyoid, mylohyoid, geniohyoid, and anterior belly of the diagastric muscles contracting causes the upward and forward movement of the hyolaryngeal structures. This definition followed the description of the upper oesophageal sphincter opening function. The goal is to strengthen and increase the endurance of these muscles, which will widen the upper oesophageal sphincter's opening. The exercise is a head lifting routine that consists of two parts: an isokinetic low-intensity phase that consists of 30 successive head lifts at a constant velocity without holding, and an isometric high-intensity half that consists of three head lifts held for 60 s with a 60 rest time between each one (**Greco et al., 2018**).

The deglutitive upper oesophageal sphincter opening's anteroposterior diameter and cross-sectional area are intended to be increased. Instead of intrusive treatments like cricopharyngeal myotomy or injections of botulinum toxin, this exercise is non-invasive and specifically designed for dysphagia resulting from upper oesophageal sphincter dysfunction. The management of swallowing difficulties linked to cricopharyngeal dysfunction in the older population poses a multifaceted challenge, and additional research is necessary to determine the efficacy of current intervention methods (**Tuomi et al., 2022**).

According to **Tuomi et al., (2020**), patients who were having trouble complying with the exercise regimen had a significant dropout rate due to muscle soreness. Other studies with older people who were not dysphagic reported neck pain, exhaustion, lightheadedness, and cessation. Completing head-lift exercises can therefore be extremely difficult, particularly for patients who also have dysphagia, pneumonia, and malnourishment (**Greco et al., 2018**).

A non-invasive head lift exercise was developed to increase the upper esophageal sphincter's opening width and duration.

Eliminate aspiration in individuals who have residual in the throat following a swallow due to penurious upper esophageal sphincter opening by using a methodical, two-part exercise regimen consisting of isometric and isokinetic exercises (**Babu et al., 2019**). The head lifts' isometric strengthening portion lasted for 60 seconds, with a 60-second rest interval in between each of the three held head raises. Resistance without movement is what is meant by isometric exercise. The muscle does not lengthen or shorten as tension builds inside it. Up until the point of muscular exhaustion, the exerciser should do effective isometric contractions and then the exercise should be repetitive numerous times for extreme benefit (**Poorjavad et al., 2019**).

Similar to how the isometric portion of the head lift exercise is characterized, the isokinetic portion entails 30 consecutive head lifts performed without "holding" the head lift. The frequency of the repeated head raises is maintained in a very persistent manner. Muscle shortening against receptive resistance is the result of isokinetic exercise. The muscle creates resistance across its whole range of action, matching the shortening force. Strength improvements will be greater when the isokinetic motion is slower (**Shin et al., 2019**).

Nurses can encourage patients to implement the necessary changes in health behavior, such as planned physical activity, by establishing therapeutic interpersonal ties and trust through frequent interaction with patients. Assessing and advising patients on the advantages of physical activity is the responsibility of a nurse. Safe dining practices, recording patient progress, overseeing bedside exercise regimens, and regulating patients' meal times are all important tasks for nurses to perform. Based on the afflicted swallowing stage, the suitable selection of exercises for the bedside exercise program to recover the dysphagic state includes the use of the tongue, facial and neck movements, pharyngeal and laryngeal movements, and respiratory exercises (**Hines et al., 2019).**

Significance of the study:

An estimated 400,000 to 800,000 people worldwide are believed to suffer from neurogenic dysphagia each year, with patient percentages ranging from 25% to 70%. Based on research by **Abd-Allah et al. (2019**), dysphagia is quite prevalent in Egypt, with a prevalence rate ranging from 50% to 80%. Therefore, head lift exercises were thought to help dysphagic individuals swallow more easily. Exercises involving the head improve muscle and awareness, compensate to make swallowing safer, and alter food textures to make eating simpler (**Joundi et al., 2019**).

The oropharyngeal muscles, such as the tongue and suprahyoid muscles, typically exhibit reduced force in stroke patients with dysphagia, which can result in both oral dysfunction and aspiration during the pharyngeal phase (**Santhosh, 2019**). A lack of suprahyoid muscles also directly affects hypopharyngeal movements, resulting in pharyngeal dysphagia, which can lead to aspiration and residue in the throat (**Park et al., 2019**). Hence, the present study is focused on evaluating the effect of head lift exercise on swallowing function among Patients with dysphagia.

Aim of the study:

To evaluate the effect of head lift exercise on knowledge, practice, and swallowing function among patients with dysphagia.

Research hypotheses:

H1: There will be an improvement in knowledge mean scores post-intervention than pre-intervention among patients with dysphagia

H2: There will be an improvement in practice mean scores post-intervention than pre-intervention among patients with dysphagia

H3: There will be an improvement in swallowing function mean scores post-intervention than pre-intervention among patients with dysphagia

Research design:

To accomplish the study's goal, a pre/posttest group quasi-experimental design was employed. Examining if there is a

contributing link between independent and dependent variables is the goal of a quasi-experimental study design. When there is no randomization, it is easier to find information and examine causality in circumstances when extensive control is unlikely. This is the hallmark of a quasi-experimental design (**Rogers & Révész, 2020).** Measuring pertinent outcomes both before and after the sample is exposed to a provocation of some kind is part of the pre-test/post-test research design. A researcher can determine how exposure to the stimuli affects desired outcomes by designing an experiment in this mean **(Braddock, 2019)**.

Setting:

The study was conducted at the neurological department at Beni-Suef University Hospital.

Subject:

A convenient sample of all 50 patients with dysphagia was included in the study months from the previously selected setting within six months

Inclusion criteria:

- Adult patients age 18-65 years old
- Stroke patient with dysphagia
- Patients who can communicate, fully understand, and who can follow the study instructions

Exclusion criteria:

- A patient who had a cognitive problem
- Patients who did not follow the study instructions

Tools of data collection:

Tool I: Structured Interviewing Questionnaire: was created by the researchers following a thorough analysis of current and pertinent literature, and it was subsequently translated into Arabic by an expert in English to Arabic translation. There were two sections to it:

Part (1): Patients' data: It was written in Arabic to evaluate the patients' personal information, which included age, gender, educational level, and occupation.

Part (I1): Patients' clinical data: After examining the most recent related literature, this tool was created in English and extracted from patient medical records, which contained information on the body area that was afflicted, prior medical history, and body mass index (**Smithard, 2016**).

Tool II: Dysphagic Patients' Knowledge Assessment Sheet: It has 15 multiple-choice questions and was created by the researchers following a thorough analysis of current and pertinent literature (**Alali et al., 2016; Balou et al., 2019)**. It was designed to collect data on the knowledge of dysphagic patients regarding swallowing exercises, an overview of stroke and its potential impact on swallowing, the definition of dysphagia, the food consistency levels given to the patient based on their level of swallowing, food types that patients with dysphagia should avoid, feeding procedures for patients with dysphagia, the definition and advantages of head lift exercise, and instructions on how to perform this exercise.

Scoring system: A score of 1 was assigned to the instrument for accurate responses and a score of 0 for inaccurate ones. With 0 being the lowest score and 15 representing the greatest, the total knowledge score was between 0 and 15. Knowledge was measured on a range of 0 to 7, with a score of less than 50% indicating unsatisfactory knowledge, and 8 to 15 indicating satisfactory knowledge (≥50%) **(Henok et al., 2020).**

20	No Dysphagia minimal risk of aspiration
15-19	Slight Dysphagia low risk of aspiration
10-14	Moderate dysphagia risk of aspiration
0-9	Severe dysphagia high risk of aspiration

Tool III: Dysphagic patient's reported practice assessment sheet: The ten questions on it were multiple choice questions, and it was created by the researchers following a thorough analysis of current and pertinent literature (**Alali et al., 2016; Balou et al., 2019**). It was designed to collect data regarding head lift exercise practices reported by dysphagic patients, including the definition, advantages, and technique of head lift exercise.

Scoring system for dysphagic patient's reported practice: Correctly completed steps received a score of 1, while incomplete items received a value of 0. The mean score for the portion was calculated by adding up all of the item scores for each area and then dividing the total by the total number of items. A percentage score was created from these scores. A score of 0 represented the lowest overall practice score, while a score of 10 represented the highest. A dysphagic patient's reported practice score between 5 and 10 was deemed appropriate, while a score with a proportion of 50% or higher between 0 and 4 was deemed inadequate.

Tool IV: Gugging Swallowing Screening scale (GUSS): It was taken from **Trapl (2007**) to evaluate the degree of dysphagia and the ability to swallow. Given its simplicity and ease of use, the GUSS test has strong predictive power for assessing aspiration risk and grading the severity of dysphagia (**Abdelhamid & Abo-Hasseba, 2017).** The GUSS test is divided into two parts:

Part 1: the preliminary assessment (indirect swallowing test) contains one subtest with amaximum of 5 points

Part 2: the direct swallowing test which contains 3 swallowing sub-items specifically semisolid diet, liquid diet,and solid diet with a maximum of 15 points. These 4 sub-items must be done consecutively. Apoint system was chosen in which higher numbers denote better performance, with a maximum of 5 points that can be extended in each sub-item. This maximum must be achieved to continue to the next sub-item, with a sum of 20 scores (part 1 besides part 2). The highest potential score is 20, with a score of 14 representing a risk of aspiration.

Score and interpretation of the GUSS scale on the level of dysphagia as follows:

Filed work:

Preparatory, implementation, and assessment phases comprised the study's implementation, and data gathering took place between early November 2023 and April 2024. For six months, the researchers collected data from dysphagic patients three days a week during the morning shift, from 9 a.m. to 1 p.m. It took about 25 to 35 minutes to finish each interview with the tools.

A-Preparatory phase:

Before beginning the head lift exercise, the dysphagia patients were given the data collection instruments as a pre-test to gauge their understanding and habits. Participants in the previously described contexts provided information for data collection, which included personal, clinical, knowledge, practice, and the Gugging Swallowing Screening (GUSS) scale. The researchers assess their swallowing status (first assessment without assistance) during the initial interview.

Patients with dysphagia were given the simplified booklet in Arabic as a supportive resource, which covered all the topics related to head lift exercise knowledge and practices after the relevant literature was reviewed and the actual needs of the patients under study were evaluated. Instructional approaches included talks, debates, pictures, and posters.

Tools validity

A panel of five experts evaluated the tools' face and content validity. Three professors of medical-surgical nursing and two professors of neurology reviewed the instrument to ensure that it was clear, relevant, comprehensive, easy to understand, and simple to administer. No changes were made.

Tools reliability

To assess the study tool's internal consistency, the Alpha Cronbach test was applied. Tool II demonstrated reliability at

88.0%, Tool III demonstrated reliability at 89.0%, and the Gugging Swallowing Screening test demonstrated reliability at 93.0%.

A pilot study

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Ethical considerations:

Official consent was secured before starting the study, and the Dean of the Faculty of Nursing issued a letter confirming this. To gain their consent and to explain the purpose of the study, the researchers met with the medical and nursing directors of the chosen setting. Oral consent was obtained to win over patients who had dysphagia and cooperate. The goal of the research and the anticipated results of its execution were specified to obtain approval for the collection of data. It was explained to the patients that they could choose not to participate in the study at all. The study participants are free to leave at any moment and without explanation. Patients received notification that their data would be kept confidential and used exclusively for research.

The researchers developed and put into practice head lift exercise instructional guidelines. It was put into practice with the use of talks, posters, instructional movies, role-plays, and situations. Patients received an instructional pamphlet about head lift exercises from the researchers, written in plain Arabic and accompanied by descriptive photographs.

Booklet preparation:

After reviewing recent research in medicine and nursing as well as pertinent literature, the researchers created a booklet (**Abd-Allah, 2014, Padma et al., 2016; Hines, 2016; Amol et al., 2018**). The definition of dysphagia, food consistency levels for dysphagic patients based on their swallowing abilities, food types to avoid, feeding procedures for dysphagic patients, and the advantages and techniques of head lift exercise were all included. A panel consisting of two specialists in neurology and three experts in medical-surgical nursing then evaluated the booklet.

B-Implementation phase:

To train the study sample on the head lift exercise, individual, private interviews with each patient lasted between 25 and 35 minutes each session. During six sessions—two theoretical and four practical—the researchers provide the patients with a thorough description of the swallowing exercises.

- · Give the patients an overview of stroke and any potential effects it may have on swallowing during the first session.
- In the second session, patients will learn what dysphagia is, how to feed themselves, what foods to avoid, and how to provide dysphagic patients food that is appropriate for their level of swallowing.
- In the third session, the patients are taught several swallowing exercises, including the Masako maneuver, jaw push, lollipop swallowing, and isokinetic (dynamic) and isometric (static) head lift exercises.
- On the fourth session, instruct the patients on swallowing exercises like the supraglottic maneuver, yawn, and Mendelsohn maneuver.
- At the fifth session, instruct the patients in head lift activities like tongue strength exercises and tongue range of motion, and tongue retraction.
- **The sixth session**: teach the patients head lift exercises such as effortful pitch glide, and lip range of motion.

- **Each patient in the study sample was taught to do the exercise throughout the training session:**

-The swallowing function was determined by the researchers by evaluating the swallowing function after the workout was performed. There were two occasions that the observation was made (two weeks, and one month).

-For a month, head lifting exercises were used. To make sure they knew how to complete the exercise properly, the patient was asked to repeat it.

Procedures and intervention

- The 0° head lift exercise group performed head lift exercise in a lying position on a flat surface. Conversely, the 45° head lift exercise group performed HLE in the lying position while maintaining a 45° reclining position. The studied patients performed head lift exercises with the same frequency and type of exercise. The exercise was performed with isotonic and isometric contractions. Participants sustained three head lifts held for 1 minute without movement in the supine position, and a 60 rest was allowed between the lifts. Then, the participants performed 30 repetitive head lifts without holding in the same supine position. The participants lifted their heads high enough to observe their toes without raising their shoulders. Head lift exercise was performed three times per day, 5 days a week, for 4 weeks.

- Patients in the study sample were followed up on and supervised via daily phone calls. Following two weeks of meetings and revitalizing activities, patients were advised to perform head lift exercises regularly. Following up with patients once a month, they were advised to progressively increase the amount of exercises based on each patient's capacity at follow-up meetings.

C-Evaluation phase:

Using the same instruments as the pre-test (II & III, IV), this phase sought to assess the effect of head lift exercise on swallowing function in patients with dysphagia after two weeks and one month.

Statistical design:

A desktop computer was used to code and tabulate the data. SPSS, or the Statistical Package for Social Science, version 20, was employed. Frequencies and percentages were used in descriptive statistics to display the data. Three times—before, post-1, and post-2—the effects of the shaker exercise on swallowing abilities were examined using the T-test as an inferential statistic. The chi-square test was employed to identify relationships between qualitative variables, and the paired-t test was also employed. P-value $\leq$ 0.05 was used to determine statistical significance.

Results:

According to **Table (1),** the majority of the patients (44.0%) were from 45 to 65 years of age, with a mean age of (42.56±6.33). Of the patients, 58% were male and 44% were read and write. Of the patients' occupations, 46% worked in jobs requiring physical effort. Of the patients' residences (66% were in urban areas), 46% had right-side affection, and 80% had a history of hypertension. Of the patients' body mass index, the current results show that 62% of the patients were between 18.5 and 24.9.

As regards to head lift exercise, **Table (3)** shows that the mean score of the patients under study was 3.24±2.12 before implementation, but after two weeks and one month of implementation, it improved to 12.33±1.22 and 10.39±2.42, respectively. These variations are statistically significant (p=0.000).

The pre-and post-implementation total knowledge level of the patients under study is shown in **Figure 1.** It was shown that, before to and after two weeks of implementation, 80% of the patients in the study possessed inadequate information about head lift exercises, which fell to 18%. On the other hand, 82% of the patients in the study after two weeks of implementation possessed adequate information about the head lift exercise, compared to only 18% of them before implementation. However, after a month of implementation (88%) of the studied patients had satisfactory knowledge levels regarding head lift exercises.

Table 4 shows that there were improvements and highly statistically significant differences seen in the reported head lift exercise behaviors of the patients under study before, after two weeks, and one month after implementation (P<0.000). Additionally, it demonstrated that, before implementation, the mean score of the patients under study's total practices for the head lift exercise was (2.23±1.12); after two weeks, it rose to (8.22±1.41); and after a month, it became (7.47±2.22).

Figure (2) portrays the overall reported practice level of the patients under study both before and after the implementation. It was

shown that, before and after two weeks of implementation, (84%) of the patients in the study reported having insufficient behaviors related to head lift exercises. This percentage thereafter dropped to (14%). On the other hand, 86% of the patients in the study reported having sufficient head lift exercise routines after two weeks of implementation, compared to only 16% of them before to implementation. However, after a month of adoption, 90% of the patients in the study reported having appropriate reporting habits for the Shaker swallowing exercise.

Table 5 displays that, at <0.001, there were statistically significant variations in the dysphagia levels before, after two weeks, and one month of head lift exercise implementation. Additionally, there were statistically significant changes in the dysphagia level after the head lift exercise was implemented on day two, with a significance level of less than 0.05.

Table (6): Demonstrates that the patient's overall knowledge, practices, and swallowing function have a highly significant positive correlation. Knowledge-practices ($r = 0.276$, $p < 0.01$), knowledge-swallowing function ($r = 0.345$, $p < 0.01$), and practices-swallowing function ($r = 0.331$, $p < 0.01$) showed significant positive linear correlations, according to the correlation.

Table (1): Personal data among the studied **patients with dysphagia (n=50)**

Demographic characteristics	**N**	**%**
Age		
18- < 35	4	8.0
35- <45	9	18.0
45- <65	15	30.0
60 years	22	44.0
Mean ± SD	**42.56±6.33**	
Gender		
Male	29	**58.0**
Female	21	42.0
Education Level		
Illiterate	15	30.0
Read & write	22	44.0
bachelor degree	13	**26.0**
Occupation		
Unemployed	12	24.0
need physical effort	23	**46.0**
need mental effort	15	30.0
Residence		
Rural	17	34.0
Urban	33	**66.0**

Table (2): Clinical data among the studied **patients with dysphagia (n=50)**

Clinical data	N	%
Affected body part		
Left side	17	34.0
Right side	23	46.0
Sensory affection	10	20.0
History		
Hypertension	40	80.0
Diabetes mellitus	28	56.0
Hyperlipidemia	24	48.0
Heart disease	20	40.0
Others	7	14.0
Body mass index		
<18.5	10	20.0
18.5- 24.9	31	62.0
25- 29.9	9	18.0
Mean ± SD	24.6 ± 3.56	

Table (3): Differences in patients with dysphagia's knowledge mean score about head lift exercise pre-, post-two weeks, and one-month post-implementation (n=50)

Items	Pre-implementation	Post two weeks of implementation	Post- one-month implementation	t-test	P-value
knowledge score Mean± SD	3.24±2.12	12.33±1.22	10.39±2.42	**18.43**	**0.000****

(**) statistically significant at p ≤0.05 (**) highly statistical significance at p < 0.001

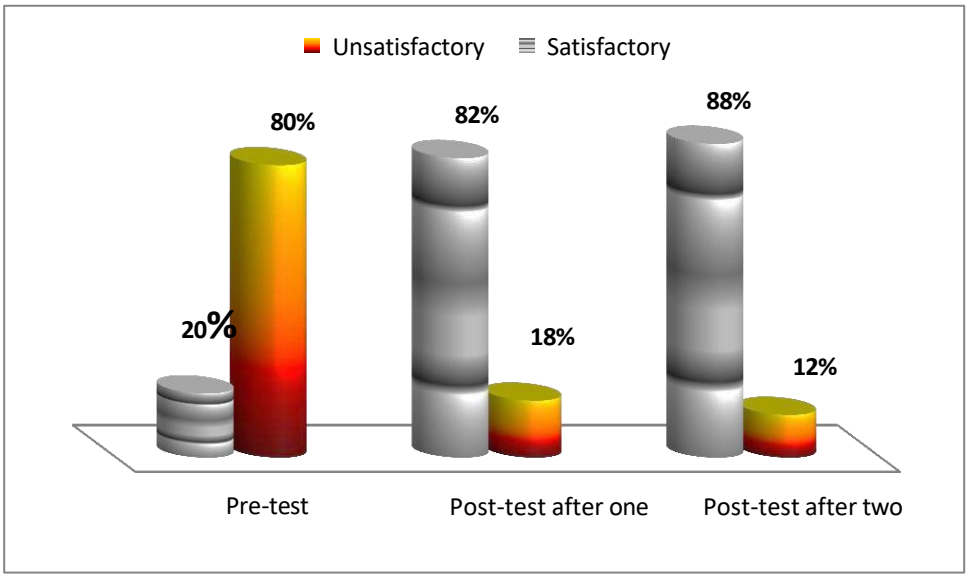

Figure (1): Total knowledge level among the studied patients regarding head lift exercises past two weeks, and one month of implementation

Table (4): Differences in patients with dysphagia' reported practices **mean score about head lift exercise pre-, post-two weeks, and one-month post-implementation (n=50)**

Items	Pre-implementation	Post two weeks of implementation	Post- one-month implementation	t	P-value
Total practices score Mean± SD	2.23±1.12	8.22±1.41	7.47±2.22	**43.22**	**0.000****

(**) highly statistical significance at p < 0.001

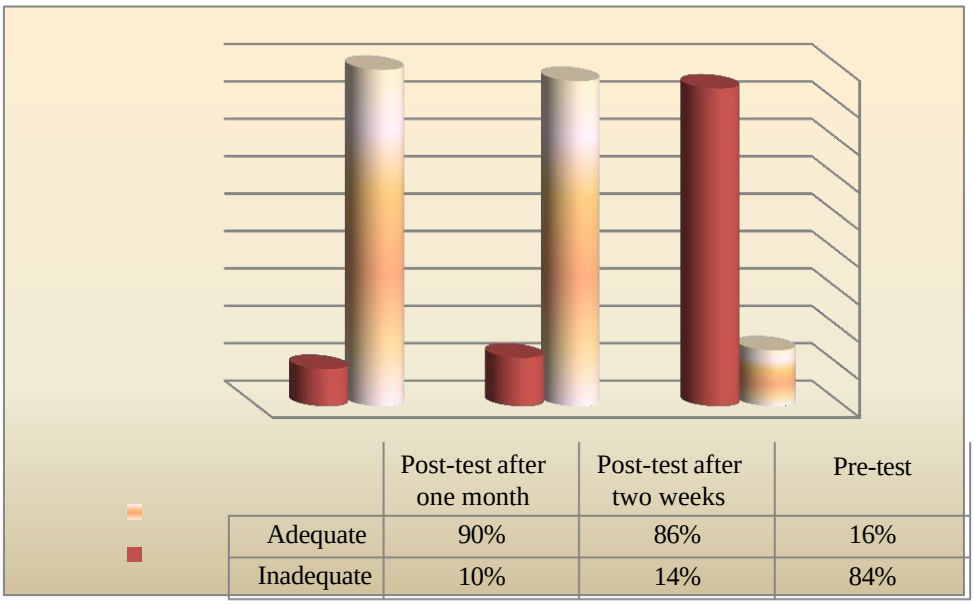

Figure (2): Total reported practice level among the studied patients regarding head lift exercise pre-, post-two weeks, and one month of implementation.

Table (5) Difference between the patients' dysphagia level based on overall GUSS score pre-, post-two weeks, and one month of implementation of head lift exercise (n=50)

Dysphagia level		Pre		Post 1 (three days later)		Post 2 (one week later)	
		N	%	N	%	N	%
20: No dysphagia		0	0.0	3	6.0	10	20.0
15-19: mild dysphagia		0	0.0	29	58.0	35	70.0
10-14: moderate dysphagia		10	20.0	12	24.0	5	10.0
0-9: severe dysphagia		40	80.0	6	12.0	0	0.0
Chi-square	X^2	72.33		90.67		8.45	
	P-value	<0.001*		<0.001*		0.053*	

t1=pre &post1 t2=pre &post2 t3= post1&post2 *p -value <0.001 significant.

Table (6): Correlation between patient's total knowledge, practices, and swallowing function

Variable	Correlation coefficient	P-value
Knowledge- practices	0.276	<0.01
Knowledge- swallowing function	0.345	<0.01
Practices- swallowing function	0.337	<0.01

Correlation statistically significance p<0.05

Discussion:

The most prevalent dysphagia cause is stroke. This disease may result in dysphagia, which makes it challenging to breathe, eat, drink, or take medication. To address the impaired process, several approaches to swallowing training have been developed. Among these methods include temperature, taste stimulation, biofeedback stimulation, and strengthening workouts (**Kim et al., 2019**). Early dysphagia screening should be a primary priority in healthcare practices as it is essential for preventing future health issues. Nurses should be knowledgeable of dysphagia's symptoms to identify patients who struggle with it (**Tanton, 2019**).

Training program for swallowing that include activities for compensating is the most popular treatment for dysphagia. Stroke patients can improve their swallowing safety and manageability by modifying the textures of their food and engaging in head lift exercises.

There has been improvement in stroke outcomes from earlier research examining the effectiveness of the head raise exercise in healthy individuals. Dysphasic individuals showed improvement in their penetration-aspiration ratings after performing the head-raise exercise. Moreover, after six weeks of head lift exercise, there was a significant decrease in post-swallow aspiration, according to a small randomized study including dysphagic individuals (**Jong et al., 2020).**

The current study's results showed that over half of the patients were male and over two-fifths of them were 60 years of age or older, with a mean age of 42.56±6.33. The results are consistent with the findings of **Ebrahim et al. (2018**), who noted that the majority of the patients in their study were male. The study was titled "Effect of swallowing training program on dysphagia following cerebrovascular stroke". is greater in males than in women, and for both sexes, the risk doubles as age exceeds 60. That is because aging-related arteriosclerotic alterations in the brain coexist with one or more stroke risk factors that are controllable (**Weber and Kelley, 2018).**

This outcome is consistent with research by **Hwangbo and Kim (2018**), who found that the mean age of the patients they looked at was 60.13±8.98 in their study, "Effects of proprioceptive neuromuscular facility-action neck flexion exercise and the shaker exercise on the activities of the suprahyoid muscles in chronic stroke patients with dysphagia." The present study's patient demographic revealed that more than half of the patients were male. Due to key stroke risk factors such as a higher history of cardiovascular disease, diabetes, and obesity in men than in women, males develop stroke at a higher rate than women across all age categories. This outcome concurs with a study by **Bhuvaneshwari & Somiya (2020**) named "Effectiveness of dysphagia exercises on swallowing ability among patients with cerebrovascular accidents" andfound that more than half of the patients were male.

The present study's results showed that after two weeks and one month of implementation, there were highly statistically significant differences in the examined patients' mean score regarding head lift exercise-related overall knowledge. According to the experts, the head lift exercise program fits the needs of dysphagic patients and gives them enough information, and it has been shown to have favorable results.

Regarding the dysphagic patients under investigation, the current study's findings indicate that most of them possessed satisfactory knowledge regarding head lift exercise after it was implemented, both before and after it was implemented. According to the researchers, this progress highlights how motivated most patients are to learn more about their diseases and demonstrates the efficacy of the head lift exercise application.

The results of this study showed that the majority of the dysphagic patients had adequate levels of practice for head lift exercises after implementation, both in terms of their overall practice level before and after the exercise was

implemented. This improvement, according to the researchers, highlighted the benefits of implementing the head lift exercise and validated how patients' growing understanding of their diseases affected their practices.

The results of the current study are corroborated by **Susan and Jessica's (2019**) study, "Efficacy of exercises to rehabilitate dysphagia," which discovered that patients with dysphagia required more time to strengthen their suprahyoid muscles and improve the opening of their upper esophageal sphincter. The Head Lift exercises yielded positive results after one week. Because head lift exercise strengthens the suprahyoid muscles, enhances the contraction of the thyrohyoid muscle, and facilitates the upward and forward movement of the larynx, which opens the upper esophageal sphincter, this finding suggests that head lift exercise may be beneficial in treating patients (**Antunes and Lunet 2019).** Additionally, because it is close to the pharyngeal muscle, it increases the activity of the infrahyoid and suprahyoid muscles, decreases the residue of the pyriform sinus and backflow aspiration, and restores the oesphysiologic changes in the suprahyoid muscles (**Logemann et al. 2019**).

Similar findings were made by **Elfetoh and Karaly (2018**), who looked at the "Effect of a swallowing training program on dysphagia following cerebrovascular stroke" and found that more than half of the patients were able to swallow a variety of food consistencies better. The "Rehabilitation program of dysphagia screening after acute ischemic stroke: Predictors and outcomes" that **Joundi (2019**) reported on in his study supports these findings as well. It involves adjusting bolus consistency, positioning, and oral motor range of motion exercises for patients with dysphagia following acute ischemic stroke to normal swallow (level 7 on the swallowing rating scale).

The current study's findings are also consistent with those of **Chulay and Suzanne (2019**), who examined "Neurological Concepts, Cranial Nerve Function, Patient education is associated with the return of swallowing to a normal level after a dysphagic cerebrovascular accident, according to Carr and **Shepherd's (2018)** analysis of the "Stroke Rehabilitation Guidelines for Exercises and Training to Optimize Motor Skills" and the Essentials of Critical Care Nursing Pocket Handbook.

According to the study's findings, there were statistically significant variations in the degree of dysphagia before, after, and one month after head lift exercise. Additionally, there were statistically significant variations in the degree of dysphagia after the head lift exercise was implemented on day one and day two.

This outcome is in line with the findings of a study by **Abdel Hamid and Abo-Hasseba (2019**) titled "Application of the GUSS test on adult Egyptian dysphagic patients," which concluded that the GUSS test was a reliable, valid method for predicting the degree of dysphagia and aspiration risk in adult Egyptian patients.

A research paper titled "Is the head lift exercise useful for improving swallowing function in people with dysphagia brought on by upper esophageal dysfunction? Critical review" demonstrated that following the initial intervention, head lift exercise has an instant positive impact.

The results of this study showed that the dysphagia level improved more after the head lift exercise was implemented. This finding demonstrates the beneficial impact of head lift training on the muscles involved in swallowing. The results of this study support the notion that head lift exercise is an effective exercise for the recovery of swallowing function in stroke survivors with dysphagia. **Choi et al. (2019**) studied "Effects of Shaker exercise in stroke survivors with oropharyngeal dysphagia" and discovered that the experimental group showed greater improvement in both the swallowing function compared with the control group.

Moreover, among the patients under study, there were statistically significant variations in the overall dysphagia levels before and after the Shaker exercise was implemented. The results of this study are comparable to those of **Kang et al. (2019**), who investigated "The effect of bedside exercise program on stroke patients with dysphagia" and discovered that the application of an exercise program, which included head lift exercises, significantly improved, in comparison to the controlled group.

This suggests that the training could be a useful tool for stroke patients who have dysphagia.

The findings of this investigation support the findings of **Kang et al. (2019**), who reported in their study titled "The effect of bedside exercise program on patients with dysphagia" that a bedside exercise program improved the severity of dysphagia. **Robbins et al. (2019**) found that four weeks of exercise reduces dysphagia severity in stroke patients. This finding is consistent with the results of the current study, which is also entitled "Age-related differences in pressures generated during isometric presses and swallows by healthy adults." Because the head lift exercise enhanced the suprahyoid muscles and lowered aspiration and pyriform fossa residue, it can be associated with these findings. It also improved pharyngeal peristalsis (**Basiri, Vali, &Agah, 2021).**

Similar to this, the results of this study show that head lift exercise therapy improved swallowing issues. Similarly, there were variations observed in the instrumental swallowing assessment between the pre-and post-head lift exercise treatments; however, the patient-reported outcome showed modest improvement. According to the researchers, this demonstrated the effectiveness of the head raise exercise.

There have been reports that the head raise exercise may help avoid dysphagia. Preventive exercise programs for patients' swallowing commonly incorporate head lift exercises, which have led to decreased feeding tube use, increased oral intake tolerance, and better self-perceived symptom experience (**Audag et al., 2022).**

Nonetheless, head lift exercises actively support the enhancement of swallowing function. The extrinsic neck muscles are the main focus of the head raise exercise. The infra- and suprahyoidal muscles are used during a typical swallow 65–68. Numerous studies have examined the muscles involved in the head lift exercise. It has been found that the sternocleidomastoid and infra-suprahyoid muscles are engaged during the exercise, suggesting that it should improve swallowing function (**Joundi et al., 2022**).

The efficacy of dysphagia exercises on patients' ability to swallow is evaluated by **Jansi et al. (2019**), which provides support for the current investigation. According to **Kang et al. (2019**), patients who participated in the activities program showed a significant improvement in their ability to swallow compared to the control group. These investigational findings were consistent with their findings.

The current study's findings were different from those of the previous investigation, which found that none of the examined variables had improved statistically significantly. Given the physiological changes that occur after fibrosis, such as stiffness and a high prevalence of pharyngeal residue after swallowing, it is plausible that the problems observed in patients are distinct from those observed in patients who have, say, suffered a stroke (**National Stroke Association, 2022**).

It's conceivable that the head lift exercise was unable to address the alterations that followed radiotherapy, such as the stiffness and fibrosis of the structures, which were the main reasons for the reported swallowing difficulties (e.g., residue in the vallecular and sinus pyriform spaces). Comparatively, in a randomized controlled research, **Langmore et al., (2019**) assessed the effectiveness of electrical stimulation (e-stim) in conjunction with swallowing exercises vs swallowing exercises alone (control group) in patients with dysphagia after therapy. After the intervention, this study showed few statistically meaningful differences.

The head lift exercise did not, however, increase maximal suprahyoid muscle activation, according to multiple studies comparing its effects to the chin tuck against resistance (CTAR). That the Shaker head lift exercise does not explicitly strengthen the muscles involved in swallowing could be one explanation for the current study's lack of substantial improvements in swallowing performance (**Krekeler et al., 2021**).

The study's findings demonstrated a significantly positive correlation between the swallowing function of the patients and their overall knowledge and practice. Knowledge and practices, as well as knowledge and swallowing function, showed strong positive linear

connections, according to the correlation analysis. Sufficient knowledge can result in beneficial behaviors that enhance the ability to swallow. Swallowing function significantly improved with head raise exercise. This indicated that head lift exercises might benefit stroke patients who comparably have dysphagia.

The current investigation verified that patients with dysphagia improved when they performed the head lift exercise. Additionally, prior research has demonstrated that head lift exercise promotes widespread activation of extrinsic muscles like the hyoglossus and has a good impact on the tongue's functional mobility during the oral phase. According to **Hajdú et al., (2022**), tongue strength increased during the head lift exercise when the subject was in a supine or reclined position. The findings of this investigation are corroborated by this earlier research.

Numerous investigations have demonstrated that head lift exercise causes the suprahyoid muscles to contract, and more recent studies have demonstrated that head lift exercise causes comparable high levels of muscular activation. When muscles are sufficiently activated, a significant number of motor units are recruited, which should lead to an increase in muscle strength with repeated use. By causing adequate anterior-superior movement of the hyoid bone, the suprahyoid muscles' increased muscular power raises the possibility that they support regular swallowing mechanisms throughout the pharyngeal phase, such as airway protection (lower aspiration) opening (**Larsen et al., 2021**). Numerous research investigations have documented a significant proportion of participant dropouts during head lift exercises. Swallowing function and compliance were found to be effective in a head lift exercise comparative study (**Dawe et al., 2021**).

Conclusion:

Based on the current study findings, the current study concluded that head lift exercise has a positive effect in improving swallowing function among patients with dysphagia.

Recommendations:

Depending on the results of the present study the following suggestions are recommended:

- To help patients with dysphagia in neurological wards improve their ability to swallow, head lift exercises are recommended in clinical settings.
- Replicate the study on a larger group; selected from different geographical areas in Egypt to obtain more generalized findings about the current study

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