Effectiveness of Exercises Based Dysphagia Therapy on Swallowing Ability for Patients with Cerebrovascular Accident

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Abstract: *Dysphagia is defined as difficulty with swallowing and is a common complication after cerebrovascular accident. The presence of dysphagia in stroke survivors has been associated with increased mortality and morbidity such as malnutrition, dehydration, and pulmonary compromise. dysphagia exercises in acute stroke survivors improve outcomes. Aim: The aim of this study was to examine the Effectiveness of exercises based dysphagia therapy on swallowing ability among patients with cerebrovascular accident. Methods: Quasi-experimental design was used, 48 adult patients of both sex, aged (18-65 years old) diagnosed with dysphagia after stroke were eligible for inclusion in the study. They were randomly assigned into two equal groups; first group (intervention group) had a demonstration of dysphagia exercises which included exercises for swallowing such as shaker exercise, hyoid lift maneuver, mendelsohn maneuver, tongue exercises, and masako maneuver. The second group (control group) receives routine care only. Results: The study findings showed that in the pre-test assessment of swallowing ability for CVA patients in the intervention group, 50% of patients had severe dysphagia, and the other 50% had moderate dysphagia. After 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 after one week. There was a significant difference between the two groups regarding level of dysphagia after dysphagia exercises. Moreover, the level of functional oral intake scale indicates that the intervention group patients are in total NG feeding state before beginning the dysphagia exercises. Then after dysphagia exercise, the majority of patients in the intervention group (87.5%) are gradually progressed to total oral diet with single or multiple consistencies. While 37.5% of patients in the control group remain on NG feeding after one week. There is a significant difference between the two groups regarding the level of functional oral intake after one week of dysphagia exercises. Conclusion: dysphagia exercise therapy was an effective measure in enhancing the swallowing ability among CVA patients with dysphagia.*
Key words: *Dysphagia exercises, Dysphagia, Cerebrovascular accident, Swallowing ability*

I. Introduction

Cerebrovascular accident is recognized as a leading cause of death and disability worldwide and is associated with multiple medical complications leading to prolonged hospital stay and significant health care costs.[1] Cerebrovascular stroke (CVS) is a sudden loss of functions resulting from disruption of blood supply to a part of the brain.[2] The CVA affects many body functions namely, neuromotor activity, elimination, intellectual, sensory, and communication functions. Dysphagia is one of the most common disabilities caused by cerebrovascular accident [3-4]. The frequency of dysphasia after a stroke is ranged between 14% and 94% among the different studies [5-7], with a high incidence in acute post-stroke patients (37%–78%). [8] Although many stroke patients recover swallowing spontaneously, 11–50% still have dysphagia at six months. [9]

Dysphagia or difficulty in swallowing is a serious life-threatening medical condition that affects many patients in the first few hours and days after stroke. [10-11] Dysphagia after stroke may involve difficulties with both the oral and pharyngeal phases of swallowing. [12] Persistent dysphasia can result in an excess production of saliva, drooling, coughing or choking during eating, and even difficulty speaking or a hoarse voice. These signs associated with poor outcome and increased mortality and morbidity due to dysphasia complications as aspiration pneumonia, dehydration, malnutrition, and death. [13-16]. Therefore, routine screening and reevaluation of swallowing functions are necessary for patients with stroke.

To prevent and minimize these complications of dysphagia, the evaluation of neurological illness often involves a formal swallowing assessment. This can help identify dysphagia before complications occur. [17] The current therapy of dysphagia in patients with CVA is dysphagia exercises which can improve the functional and physiological changes in swallowing ability and focused on strengthening muscles. [18] In fact, exercising your swallowing muscles is the best way to improve your ability to swallow. dysphagia exercises include shaker

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exercise ,Hyoid Lift Maneuver, Mendelsohn Maneuver, Gargling, Tongue Exercises, Stretch Exercise ,Masako Maneuver, and postural changes (head turn and chin tuck postures) [19-21]

II. Material And Methods

Study Design: Quasi - experimental design has been utilized.

Research Hypothesis: To fulfill the aim of the study the following research hypothesis were formulated:-

H1: Cerebrovascular accident patients who receive dysphagia exercises will improve swallowing ability than others patients.

Setting: 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.

 Sample:A purposive sample composed of all CVA adult patients of both sex, aged (18-65 years old) , who had dysphagia and met the inclusion criteria were selected in the study. They were grouped into two equal groups, first group (intervention group) who agree to participate in the study had demonstration of dysphagia exercises which included exercises for swallowing such 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.

The patients were chosen based on the following criteria: **The inclusion criteria**: Age between 18-65 years, diagnosed with acute stroke from 1to 2 days with symptoms of dysphagia ,voluntary agreement to participation in this study, patients who are conscious, alert, cooperative, obeys commands with the ability to imitate the nurse, patients must be medically stable as determined by the attending neurologist, and patients who can assume sitting position. **Exclusion criteria:** patients with other neurological disorders, patients with ET intubation, patients with tracheostomy, patient who have a history of dysphagia unrelated to the current stroke , and patients who diagnosed with pneumonia were excluded from the study.

Data collection tools:

Demographic and Clinical Data Sheet:

Developed by the researcher to record patient's demographics, diagnosis, medical history and medical condition includes physiological manifestations, swallowing and nutritional assessment.

 Gugging Swallowing Screen (GUSS)

The Gugging Swallowing Screen scale (GUSS) was developed by Trapl M &Michael Brainin 2007 at centre of Clinical Neurosciences, Danube University, Krems, Austria. This could be applied to assess the swallowing ability of patients. It has 2 divisions: the preliminary assessment (Part 1 - indirect swallowing test) and the direct swallowing test (part 2) which consists of 3 subtests namely semisolid diet swallowing test, liquid diet swallowing test and solid diet swallowing test. Thus all these subsets must be performed sequentially from indirect swallowing test to solid diet swallowing test. Score and Interpretation of Gugging Swallowing Screen scale on level of dysphagia as follows: [22]

15-19 - Mild Dysphagia

10-14 - Moderate Dysphagia

0-9 - Severe Dysphagia.

Functional Oral Intake Scale (FOIS)

The Functional Oral Intake Scale was developed by (Crary MA 2005) [23] at the University of Florida Health science center, Gainesville. It is a seven-point scale that describes the various states of NG feeding and feeding ability (levels 1-3 reflect NGT feeding, levels 4-7 reflect oral feedings with varying degrees of supplementation).This is mainly used to assess the feeding performance of dysphagia patients.

Score and Interpretation of Functional Oral Intake Scale:

Score	Interpretation
1	Patient on total NG feeding
2	Patient on NG feed with minimal food trials of semisolid consistency and can move on to liquids if tolerated.
3	Patient on NG feed with consistent oral intake can use water to wash the food through the throat. Meals take extra time (> 1 hour).
4	Patient on diet with single consistency (ground / pureed form otherwise called semisolid) but can drink water.
5	Patient on diet with multiple consistencies, Diet can be prepared using the blender.
6	Patient on diet with multiple consistencies (pureed / grounded / chopped / regular). except salad, rice, meat, bread.
7	Patient on a regular diet without any restrictions.

Content validity: Content validity of the tool Gugging Swallowing Screen scale (GUSS) and Functional Oral Intake Scale (FOIS) was obtained from the expert's in the field. The experts gave their opinions, clarity and appropriateness of the tool.

A pilot study was carried out on five patients out of the sample from each group to ensure clarity, and applicability of the study tools.

Reliability: Reliability of the tool GUSS has been reported in the patient with stroke, with a Cronbach alpha at 0.8 was found to be highly reliable for the study.

Functional Oral Intake Scale's (FOIS) reliability was high, with perfect

agreement on 85% of ratings. Kappa statistics ranged from 0.86 to 0.91 which was already established by Michael A. Crary.

Ethical consideration: Once getting the ethical approval from Mansoura University Faculty of Nursing Ethical Committee. Official written permission was obtained by the researcher from responsible authorities. The researchers introduced themselves to all participants and explain the aim of the study to get their written consent. The confidentiality of information was assured.

Procedure:

Preparatory phase:

All the subjects were explained about the purpose of the study and were educated about the respective treatment procedures. Prior written consent was obtained. Ethical clearance was attained. Detailed subjective assessment of the subjects was done to ruling out criteria.

Implementation phase

The researchers were collected data from the patient medical record (demographic and clinical data) from the Neurology ward at Mansoura University Hospital. The nurse educated all participants about the significance of dysphagia exercises that have been focused on helping patients to learn to swallow safely and helping to actually strengthen and improve their swallowing techniques. For instance, shaker exercise, hyoid lift maneuver, mendelsohn maneuver, tongue exercises and masako maneuver.

Pre-test were conducted regarding the swallowing ability among CVA patients using Gugging Swallowing Screen and Functional Oral Intake Scale and structured questionnaire through the observation method. All the subjects in the intervention group had demonstrated of swallowing exercises such as shaker exercise, hyoid lift maneuver, mendelsohn maneuver, tongue exercises, masako maneuver, gargling, and postural changes (head turn and chin tuck postures). The exercises were administered 3 times a day for seven consecutive days to CVA patients with dysphagia who belonged to the intervention group and the control group received the routine care only, as nasogastric tube feeding, oral hygiene, and education on self-care has given to the family provided by nurses in the wards. Post test for Swallowing ability was done using GUSS (Gugging Swallowing Screen) & FOIS (Functional Oral Intake scale) in both groups after the dysphagia exercise.

Evaluation phase:-

Comparison between intervention and control group by assess the swallowing ability after the exercises using GUSS (Gugging Swallowing Screen) & FOIS (Functional Oral Intake scale).

Statistical analysis:

Data were analyzed by SPSS (ver.23). Data were presented using frequency and percentage distribution of samples to assess the demographic variables. Frequency distribution, mean, standard deviation will be used to describe the swallowing ability before and after dysphagia exercises. Wilcoxon (Z Test) used to compare between before and after exercises in each group. And Pearson Chi-Square X^2 test to compare the intervention and the control group.

III. Result

Table 1: Shows the demographic data of the intervention and control groups. The majority of the sample (83.3 & 70.8) of the study and control group respectively ranged from 51 to 65years old. Male were prevailing in the studied sample (75.0 in the study group &58.3 in the control group).

In intervention and control groups, 79.2% & 75.0% were married in that order. Concerning educational level, not educated and secondary education were prevailed among 33.3% of the intervention group, while 41.7% of the control group was secondary education. Regarding occupation, 25.0% of the intervention group was manual work while 29.1% of the control group was housewife. No significant differences between the two groups concerning all demographic data.

Table (1): demographic data of the intervention group and the control group:

Items	Intervention group		Control group		Total		Pearson Chi-Square X2 test (P)
	No=24	%	No=24	%	No=48	%	
Age (in years)				4.2			
30≥40	1	4.2	1		2	4.2	1.243 (0.537)
41≥50	3	12.5	6	25.0	9	18.8	
51≥65	20	83.3	17	70.8	37	77.0	
Gender							1.500 (0.221)
Male	18	75.0	14	58.3	32	66.7	
Female	6	25.0	10	41.7	16	33.3	

Marital status							0.118 (0.731)
Married	19	79.2	18	75.0	37	77.1	
Widowed	5	20.8	6	25.0	11	22.9	
Others	0	0.0	0	0.0	0	10.0	
Level of Education							
Not educated	8	33.3	3	15.5	11	22.9	
Read& write	2	8.3	3	15.5	5	10.4	9.838 (0.080)
Primary education	4	16.8	3	15.5	7	14.6	
Secondary education	8	33.3	10	41.7	18	37.5	
Associate degree	0	0.0	5	20.8	5	10.4	
University &above	2	8.3	0	0.0	2	4.2	
Occupation							
Manual work	6	25.0	4	16.7	10	20.8	
Professional	5	20.8	6	25.0	11	22.9	1.158
Business	2	8.3	2	8.3	4	8.3	(0.949)
House wife	5	20.8	7	29.1	12	25	
Farmer	4	16.8	4	16.7	8	16.7	
No work	2	8.3	1	4.2	3	6.3	

Table (2): Shows health-relevant data among the intervention group and the control group. It was noticed that Cerebrovascular ischemia was the most common cause of stroke among the intervention group and the control group (62.5% and 91.7 % respectively). With the significant difference between the two groups p= (0.016). The majority of the studied samples were no family history. Regarding associated disease, it observed that hypertension was prevailed among two groups. Concerning current mental status, nearly fifty percent of the studied sample was alert.

Table (2): Health-related data of the two groups:

Items	Intervention group		Control group		Total		Pearson Chi-Square $X2$ test (P)
	No=24	**%**	**No=24**	**%**	**No=48**	**%**	
Causes of stroke.							5.779
Cerebrovascular Ischemia	15	62.5	22	91.7	37	77.0	(0.016) *
Cerebrovascular Hemorrhage	9	37.5	2	8.3	11	23.0	
Family history							
Yes	4	16.7	2	8.3	6	12.5	
No	20	83.3	22	91.7	42	87.5	0.762 (0.383)
Associated disease							
No associated illness	4	16.7	4	16.7	8	16.7	6.102
Hypertension	12	50.0	7	29.2	19	39.5	(0.296)
Diabetes	1	4.2	3	12.5	4	8.3	
Ischemic heart	2	8.3	0	0.0	2	4.2	
Hypertension &diabetes	2	8.3	5	20.8	7	14.6	
IHD& hypertension	3	12.5	5	20.8	8	16.7	
Current mental status							
Alert	14	58.3	12	50.0	26	54.2	0.554
Confused	6	25.0	6	25.0	12	25.0	(0.758)
Drowsy	4	16.7	6	25.0	10	20.8	

Table (3): Shows nutritional assessment of the intervention group and the control group, it was revealed that 87.5 & 83.3 of the intervention and control group respectively were on Nil per oral NPO. And 100% of the NPO sample dependent on nasogastric tube NGT for feeding. 87.5 & 95.8 of the intervention and control group respectively were completely dependent on feeding.

Table (3): Nutritional Assessment of the intervention group and the control group:

Nutritional Assessment	Intervention group		Control group		Total		Pearson Chi-Square $X2$ test (P)
	No=24	**%**	**No=24**	**%**	**No=48**	**%**	
Current diet.							
NPO	21	87.5	20	83.3	41	85.4	3.824
Liquid	2	8.3	4	17.7	6	12.5	(0.148)
Semi liquid	1	4.2	0	0.0	1	2.1	
Alternative diet							
NGT	21	100.0	20	100.0	41	100.0	
Percutaneous entero gastrostomy feed	0	0.0	0	0.0	0	0.0	a
Feeding ability							
Independent self feeding	0	0.0	0	0.0	0.0	0.0	1.091
Partially dependent Completely	3	12.5	1	4.2	4	8.3	(0.296)
dependent	21	87.5	23	95.8	44	91.7	

Table (4). Describes the symptoms presented by stroke patients regarding their swallowing ability. In the intervention group, drooling was absent in 87.5 %& 95.8% in the control group. Coughing was present in 54.2% of the intervention group while absent in 62.5% of the control group. Chocking was also absent among all patients in intervention group and one patient only in the control group have chocking. All of them were have a cough. Mostly have pain in swallowing (87.5% &91.7) in the intervention and control group respectively. All of them have weight loss except for one patient in the intervention group. None of them had a history of aspiration.

Table (4): Dysphagia symptoms of the intervention group and the control group:

Dysphagia symptoms &complications	Intervention group No=24	%	Control group No=24	%	Total No=48	%	Pearson Chi-Square X2 test (P)
Drooling							1.091 (0.296)
Absent	21	87.5	23	95.8	44	91.7	
Present	3	12.5	1	4.2	4	8.3	
Coughing							1.343 (0.247)
Absent	11	45.8	15	62.5	26	54.2	
Present	13	54.2	9	37.5	22	45.8	
Chocking							1.021 (0.312)
Absent	24	100.0	23	95.8	47	97.9	
Present	0	0.0	1	4.2	1	2.1	
Pain on swallowing							0.223 (0.637)
Absent	3	12.5	2	8.3	5	10.4	
Present	21	87.5	22	91.7	43	89.6	
Weight loss							1.021 (0.312)
Absent	1	4.2	0	0.0	1	2.1	
Present	23	95.8	24	100.0	47	97.9	
History of aspiration							a
Absent	24	100.0	24	100.0	48	100.0	
Present	0	0.0	0	0.0	0	0.0	

Table (5) & Figure (1): Describes the comparative view of the level of dysphagia between two groups. In the intervention group before beginning the exercises, 50% fall into the category of severe dysphagia (GUSS score is 0-9), 50% were having moderate dysphagia(GUSS score is 10-14) with a mean score10.166 ±2.160 . While in the control group 45.8% were having sever dysphagia with a mean score 10.416 ±2.586 . After one week of dysphagia exercises, the majority of the intervention group 75% of them were having mild dysphagia (GUSS score is 15-19) with a mean score 14.708 ±1.731. While 79.2% of the control group were having moderate dysphagia with mean score13.375 ±1.689. There was a significant difference between the two groups after dysphagia exercises.

Table (5): Compare of the level of dysphagia among two groups &Compare the mean score for GUSS between the intervention group and the control group before beginning the exercises and after one week from dysphagia exercises.

GUSS	Intervention group Before beginning the exercises No=24	%	After one week No=24	%	Control group Before beginning the exercises No=24	%	After one week No=24	%	Pearson Chi-Square X2 test (p)a	Pearson Chi-Square X2 test (p)b
GUSS Score.										
▪ **0-9: severe dysphagia**	12	50.0	0	0.0	11	45.8	0	0.0	6.420 (0.779)	19.832 (0.006) *
▪ **10-14: moderate dysphagia**	12	50.0	6	25.0	11	45.8	19	79.2		
▪ **15-19: mild dysphagia**	0	0.0	18	75.0	2	8.4	5	20.8		
Mean Score of GUSS	10.166 ±2.160		14.708 ±1.731		10.416 ±2.586		13.375 ±1.689		**T test(p)a** 0.363 (0.718)	**T test(p)b** 2.700 (0.010)*
Z test (p)¹		4.298(0.000)*				4.126(0.000)*				

Wilcoxon Singed Ranks Z Test (p) ¹: comparing before and after exercises in each group.
Pearson Chi-Square X2 test (p)a: comparing intervention and control group before exercises .
Pearson Chi-Square X2 test (p) b: comparing intervention and control group after exercises.
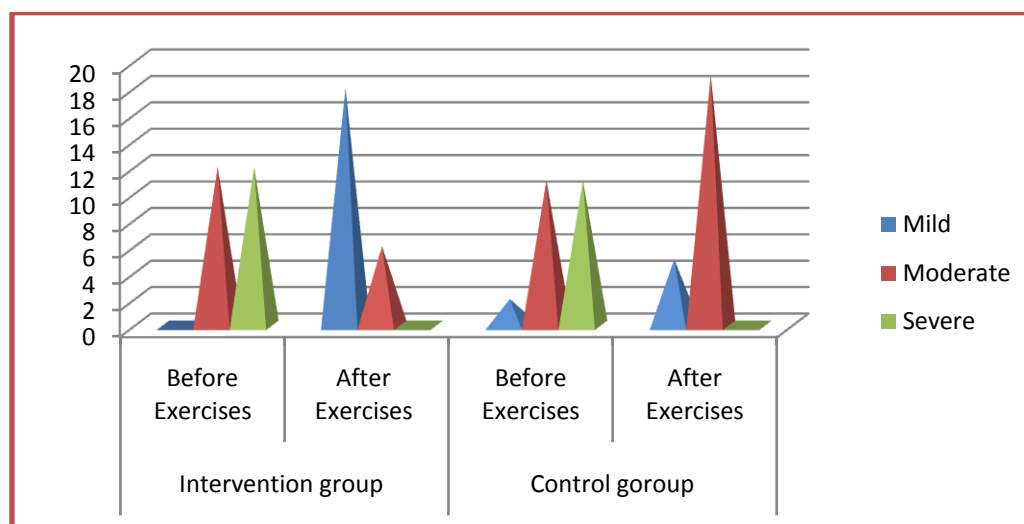*significant at p≤0.05.*

Figure (1) Compare of the level of dysphagia between CVA patients in the intervention group and the Control group based on the GUSS score.

Table (6): illustrates the level of functional oral intake scale. Before beginning the dysphagia exercises, wherein the intervention group patients are in total NG feeding state 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 NG 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.

Table (6): Compare of feeding performance using functional oral intake scale among two group &Compare the mean score for FOIS between the intervention group and the control group before and after one week from dysphagia exercises.

functional oral intake scale	Intervention group				Control group				Pearson Chi-Square X2 test (p)[a]	Pearson Chi-Square X2 test (p)[b]
	Before beginning the exercises		After one week		Before beginning the exercises		After one week			
	No= 24	%	No= 24	%	No=24	%	No=24	%		
FOIS Score.										
1 - Patient on total NG feeding.	13	54.2	0	0.0	13	45.2	0	0.0		
2 - Patient on NG feed with minimal food trials of semisolid consistency	5	20.8	0	0.0	5	20.8	0	0.0		
3 - Patient on NG feed with consistent oral intake	3	12.5	3	12.5	4	16.7	9	37.5	0.343 (0.952)	7.472 (0.58)
4 - Patient on diet with single consistency	3	12.5	8	33.4	2	8.3	10	41.7		
5-Patient on diet with multiple consistencies.	0	0.0	11	45.8	0	0.0	5	20.8		
6-Patient on diet with multiple except salad, rice, meat, bread.	0	0.0	2	8.3	0	0.0	0	0.0		
Mean Score of FOIS	1.833 ±1.090		4.500 ±0.834		1.791 ±1.020		3.833 ±0.761		**T test(p)[a]**	**T test(p)[b]**
									0.137 (0.892)	2.892 (0.006)*
Z test (p)[1]	4.313(0.000)*				4.143(0.000)*					

IV. Discussion

Exercises based dysphagia therapy helps to improve the swallowing ability among CVA patients with dysphagia. The main objective is to evaluate the effect of dysphagia exercise in improving swallowing ability among CVA patients with dysphagia. It is noticeable from the present study that the majority of studied samples were in the age group 51- 65 years old and most of the studied patients were males. This in the same direction with study by *(Abo Elfetoh EE. 2018)* [24] who reported that 45% of the studied patients were above 60 years old and 62.5% were male, Moreover study by *(Bakhtiyari et al, 2015)* [25] who reported that 65% , 70% and 80% of the three studied groups were male .Also *(Diana M ,2014)* [26] who stated that the majority of the samples 40% were in the age group of 51-60 years. These results came in contrast with *(Priya SN, 2017)* [27] that most of the patients in the intervention group (50%) patients and comparison group (37.5%) patients belonged to the age group of 45 - 55 years.

In relation to the causes of stroke, the majority of the studied samples were diagnosed as an ischemic stroke. This is in congruence with *(Abo Elfetoh EE. 2018)* [24] who reported the majority of studied patients(87.5%) had ischemic stroke. Furthermore, these finding in the same line with (Samia E S B, et al 2017) [28] who stated that, the main cause of stroke was infarction 36 patients (90%), while only 4 patients had a hemorrhagic stroke (10%). hypertension prevailed among the two groups. This finding was supported by another study by *(Soliman RH et al, 2018)*[29] who stated that, the most common risk factor for stroke was hypertension.

Regarding the nutritional assessment of the studied sample, it was revealed that 87.5 & 83.3 of the study and control group respectively were on Nil per oral NPO. And 100% of the NPO sample dependent on Nasogastric tube NGT for feeding. These results are consistent with another study *(Priya SN, 2017)*[27] who revealed that in comparison group, (18.75%) were on a semisolid diet and partially dependent for feeding whereas (100%) in the intervention group were on nil per oral and completely dependent for feeding.

Concerning the level of dysphagia using the GUSS scale among CVA patients. The present study revealed that in the intervention group before beginning the exercises, 50% had severe dysphagia & 50% had moderate dysphagiawith mean score10.166 ±2.160. While in the control group 45.8% were having sever dysphagia with mean score 10.416 ±2.586 . After one week of dysphagia exercises, the majority of the intervention group 75% of them were has mild dysphagia with a mean score 14.708 ±1.731. While 79.2% of the control group were having moderate dysphagia with a mean score13.375 ±1.689. There was a significant difference between two groups after dysphagia exercises. This is in accordance with a study carried out by*(Priya SN, 2017)*[27]who reported that, In the intervention group initially all 100%patients were having severe dysphagia, gradually at the end of eight days of therapy mostly 56.25% of them progressed to mild dysphagia and 31.2% of them progressed to no dysphagia. Thus it signifies 31.2% of them attained optimal swallowing state in the intervention group. In contrary, in the comparison group even at the end of eight days of observation 75% of them were having severe dysphagia. Furthermore, study carried out by *(Essays, UK 2018)*[30] who explained that, on the basis of (GUSS), (73.3%) of the subjects expressed swallowing improvement after the therapy, (26.7%) of the subjects had no changes in their swallowing performance after the therapy (shaker exercise and hyoid lift maneuver).

In relation to assess the Swallowing and Feeding Performance using functional oral intake scale FOIS. Before beginning the dysphagia exercises, in the intervention group patients are in total NG feeding state 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 4.500 ±0.834. While 37.5% of patients in the control group remain on NG feeding after one week with mean score 3.833 ±0.761. There is a significant difference between the 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. These findings go well together with *(Essays, UK 2018)*[30] revealed that (80%) had an improvement in their feeding ability after the therapy , but (20%) showed no changes in the feeding ability when assessed by FOIS.

V. Conclusion

Dysphagia and aspiration risk in post-CVA patients remains a significant clinical problem. Nurses must teach patients and families strategies to improve swallowing and minimize the risks of aspiration. The exercise was an effective, inexpensive measure for improving swallowing ability among CVA patients with dysphagia. The report of this study was found that there was a significant improvement within 7 days in the swallowing ability among CVA patients with dysphagia in the intervention group than control group according to the GUSS score and functional oral intake scale

VI. Recommendation

1. Dysphagia exercise training programs can be included in the nursing curriculum for CVA patients .
2. Provision should be made for staff working in the Neurology ward to get training on dysphagia exercise.
3. A similar study could be conducted in rehabilitation centers and community settings.

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