International Journal of Psychosocial Rehabilitation, Vol.24, Issue 01, 2020
ISSN: 1475-7192

Effectiveness of Interventional Rehabilitation Program on Swallowing Ability of Patients with Cerebrovascular Accident

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ABSTRACT:

Cerebrovascular disorders are a comprehensive term that refers to a central nervous system dysfunction (CNS) that occurs when normal blood flow to the brain is interrupted. Stroke is the primary cerebrovascular disorders in the United States and is the third leading cause of death after heart disease and cancer. According to the common recent WHO data released in 2017, CVA deaths in Iraq amounted to 14315, or 8.13% of all deaths. After CVA, difficulty swallowing is very common, affecting from 13 to 94 percent Acute CVA patients. A Study and Control Groups Pre-Test, Post-Test1and Post Test2 Quasi Experimental Design used to study the effect of Swallowing Method on Swallowing Ability of Patients with Cerebrovascular Accident, from the period of 1st. September 2019 to the September 2020. A non-probability (purposive sample) of (50) stroke patients are included in the study. The study conducted in Babylon City. 50Patients diagnosed with cerebrovascular accident (CVA) selected through a non-probability accidental sample were included in the study. The study is conduct in Babylon City \ Morgan Medical City, Hilla Teaching Hospital, and Imam Sadiq Hospital. The data are collected by using questionnaire developed by the researchers to determine the effect of the Swallowing Method on Patients Swallowing Ability. Questionnaire which consists of three parts (1) Patients' Demographic data. (2) Patients' clinical data. (3) Swallowing ability scale (Gugging Swallowing Screen). validity of the study instrument achieved through a panel of expert. The data described statistically and analyzed through use of the descriptive and inferential statistical analysis procedures. The findings of the present study indicate that there is an improvement in the Post Test2 group Swallowing Ability compared with the Pre Test and Post Test1 group patients'. Result the study sample indicates that there is a relationship between the effectiveness of the program and the patient age, hemiplegia, hypertension, and ataxia, age 60 and over need a longer period to return to the normal condition compared to younger ages that need a shorter period, this study shows there is a significant relationship between the interventional program and age. In addition, this study shows there is a significant association between the interventional program and problems and hypertension and the highly significant association between the interventional program and problems or complications ataxia. Furthermore, the study sample indicates significant differences in the patients' swallowing ability (post-test 2) according to the presence of hemiplegia and ataxia. While there is a non-significant difference according to hypertension. But according to the statistical mean, the study findings indicate that the swallowing ability decreased as the patients suffer from these problems. The study concluded that the Swallowing method is an effective Swallowing Ability rehabilitation technique in improving the stroke patients' Swallowing Ability. The study recommends to an intensive comprehensive wide population-based (national level) studies could be conducted to determine the effectiveness of the nursing rehabilitation methods in improve the patients' health status and reduce the complications especially for patients with Cerebrovascular accident.

KEY WORDS: *CVA, effectiveness, swallowing ability.*

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INTRODUCTION:

CVA is the second most common cause of disability and death among adults around the world and approximately 15 million people are affected annually. In most countries, CVA is the second or third leading cause and only cause the largest cause of complex preventable weakness in adults.

In addition, the second cause of death is CVA, and the second the largest disease burden in the western world; thus, treatments can reduce CVA effects are necessary. Recently, mortality statistics have been published by Disease Centers Control and Prevention show that in 2008 CVA became the fourth leading cause of death causing a large number of complications that affect all human dimensions (physically and psychologically), some of which are fatal complications such as pulmonary complications. CVA is increasing in popularity, in part due to the aging of populations worldwide, the highest in Europe (108 / 100,000) and North America (140 / 100,000). CVA prevalence in Europe is 95 / 100,000 for women and 141 / 100,000 For men an average of 269 / 100,000 per population in the U.S. In 2008, an estimated 133,750 people died from CVA. Every year about 795,000 people in the U.S. have a CVA. About 610,000 they are the first attacks, and 185,000 repeated attacks. CVA occurrence the largest among the non-Caucasian groups. In Iraq, CVA is developing as a health concern. The number of patients admitted the number of Iraqi hospitals and the annual report for 2013 according to the Ministry of Health reached 23,442, and this number rose to 28,876 patients in 2014. In The city of Najaf, there were 1263 patients admitted to hospitals in 2013, and this number increased to 1,264 patients in 2014. Cerebrovascular accident is the third most frequent cause of life lost in the Western world (after heart disease and cancer), and is responsible for about 20% of all deaths in old age. Strokes are the most common reason for neurological damage leading to permanent handicap. A new statistic, issued by the Saudi Society of Stroke, that the incidence of CVA up to about 20 thousand cases a year in the Kingdom. During a stroke workshop at King Abdul Aziz University Hospital in Jeddah, Saudi Arabia reported that between 50 and 100 CVA cases were reported daily. Saudi Arabia records about 20,000 new cases each year, of which 4,000 cases result in death, and 8,000 cases cause motor and neurological disabilities that affect the patient's mental functions. 69% of stroke cases occur in the form of blood clots in the brain, preventing oxygen from reaching some of its parts, and thus depriving it of normal functioning.

Rehabilitation it's a scientific and ongoing process, through which the nurses are play an important role in management of stroke patients, and they able to decreasing complication after stroke and improving the patient health status. Also, they able to improve the patient's self-management through translate skills in therapy into meaningful activities**.**

MATERIALS AND METHODS:

Design of the Study:

A study quasi-experimental design with employ to determine the effectiveness of interventional rehabilitation program on swallowing ability of patients with cerebrovascular accident.

Setting of the Study:

The study is conduct in Babylon City \ Morgan Medical City, Hilla Teaching Hospital, and Imam Sadiq Hospital.

Sample of the Study:

A non-probability (purposive sample) of (50) Cerebrovascular accident patients are included in the study. all patients are medically diagnosed with a cerebrovascular accident (CVA).

Including criteria:

1. Adult patients
2. Orient patients
3. Patients from Arabic Nationally
4. Free from psychological or intellectual disorder.
5. Stable patients as reported verbally by the physician

Study Instrument:

An assessment tool is developed by the researchers to determine the effect of the Swallowing method on patients' Swallowing ability. The final copy consists of the following parts:

Part I: Patient's demographic data form consists of (8) items, which include age, gender, level of education, monthly income, marital status, occupational status, smoking and alcohol consumption.

Part II: Patient's clinical data form consists of (2) subparts, which include:

A- Present history: includes type of stroke, body side is affected by stroke , recurrence of stroke , duration of stroke, and complication of stroke .

B- Past history: includes associated diseases, smoking, and Alcohol consumption .

Part III: Swallowing ability scale (Gugging Swallowing Screen)

Gugging swallowing screen consists of (2) subparts,

A- Assessment preliminary; swallowing test Indirect, a simple successful, the precondition for the second part of the swallowing evaluation is saliva swallow. Swallowing tests most commence with a specified water volume.

B- The swallowing test direct consists of 3 sequential subtests, beginning with semi-solid, then liquid and ultimately solid textures. Before the data collection process is starting, the validity and the reliability of the questionnaire are estimated. The face validity of the questionnaire is estimated through distribution of the questionnaire to 17 experts in field of adult heath nursing and Neurological medicine.

Data Collection:

The data were collected through the utilization of the developed questionnaire, and by means of structured interview technique with the subjects who were individually interviewed, by using the Arabic version of the questionnaire.

Statistical analysis:

The data were analyzing through application of the descriptive and inferential data analysis methods, included:

1. Descriptive Data Analysis:

a. Tables (Frequencies, and Percentages).
b. Statistical figures (Bar Charts).
c. Statistical mean and standard deviation.

2. Inferential Data Analysis:

a. Independent sample t-test
b. chi-square
c. ANOVA

STUDY RESULTS AND FINDINGS:

Table (1) Study Sample Socio-Demographic Data

Socio-Demographic Data	Rating And Intervals	Frequency	Percent
Age / Years	30 – 39	2	4
	40 – 49	3	6
	50 – 59	13	26
	60 – 69	20	40
	70+	12	24
	Total	50	100
Gender	Male	33	66
	Female	17	34
	Total	50	100
Levels of Education	Illiterate	27	54
	Able to Read and write	7	14
	Primary School graduated	4	8
	Secondary school graduated	2	4
	Institutes graduated	3	6
	College and post graduated	7	14
	Total	50	100
Monthly Income	Sufficient	10	20
	Sufficient to some extent	29	58
	Insufficient	11	22
	Total	50	100
Marital Status	Single	2	4
	Married	39	78
	Widowed	7	14
	Divorced	1	2
	Separated	1	2
	Total	50	100

Occupational Status	**Governmental employed**	**1**	**2**
	Private or Self employed	**11**	**22**
	Retired	**11**	**22**
	Disable	**17**	**34**
	Housewife	**10**	**20**
	Total	**50**	**100**
Smoking	**Yes**	**23**	**46**
	No	**27**	**54**
	Total	**50**	**100**
Alcohol Intake	**Yes**	**7**	**14**
	No	**43**	**86**
	Total	**50**	**100**

Table (1) Exhibits Socio-Demographic distribution of the study sample. The study findings show that (40%) are within (60 -69) years old, (66%) are males, (54%) are illiterate, and (58%) are present with sufficient to some extent monthly income. In addition, the study findings show that (78%) of the participants are married, (34%) are disabled, (54%) are none smokers, and (86%) are no alcohol intake.

Table (2) the Present Medical History of the Study Sample

Variables	**Rating and intervals**	**Frequency**	**Percent**
Body side that is affected by Cerebrovascular Accident	**Right Side**	**26**	**52**
	Left Side	**24**	**48**
	Total	**50**	**100**
Recurrence of Cerebrovascular Accident	**Yes**	**21**	**42**
	No	**29**	**58**
	Total	**50**	**100**
How many the Cerebrovascular Accident is recurrent	**None**	**29**	**58**
	2	**14**	**28**
	3	**6**	**12**
	4	**1**	**2**
	Total	**50**	**100**
Duration of Cerebrovascular Accident / days	**<= 5**	**11**	**22**
	6 – 10	**18**	**36**
	11 – 15	**11**	**22**
	16 – 20	**3**	**6**
	21+	**7**	**14**
	Total	**50**	**100**

Table (2) refers the present medical history of the study sample. The study findings show that (52%) of the study sample are right side affected, the patient has no recurrent CVA (58%), and (36.0%) are suffering from CVA for 6-10 days.

Table (3) Cerebrovascular Accident Related Problems and Complications

Problems / Complications	**Responses**	**Frequency**	**Percent**
Pneumonia	**Yes**	**3**	**6**
	No	**47**	**94**

	Total	**50**	**100**
Epileptic Seizure	**Yes**	**1**	**2**
	No	**49**	**98**
	Total	**50**	**100**
Deep Venous Thrombosis	**Yes**	**1**	**2**
	No	**49**	**98**
	Total	**50**	**100**
Painful Shoulder	**Yes**	**14**	**28**
	No	**36**	**72**
	Total	**50**	**100**
Pressure Sore	**Yes**	**15**	**30**
	No	**35**	**70**
	Total	**50**	**100**
Urinary Tract Infection	**Yes**	**10**	**20**
	No	**40**	**80**
	Total	**50**	**100**
Constipation	**Yes**	**8**	**16**
	No	**42**	**84**
	Total	**50**	**100**
Joint Contracture	**Yes**	**11**	**22**
	No	**39**	**78**
	Total	**50**	**100**
Hemiplegia	**Yes**	**38**	**76**
	No	**12**	**24**
	Total	**50**	**100**
Hemiparesis	**Yes**	**17**	**34**
	No	**33**	**66**
	Total	**50**	**100**
Visual Deficit	**Yes**	**22**	**44**
	No	**28**	**56**
	Total	**50**	**100**
Pulmonary Embolism	**No**	**50**	**100**
Sensory Loss	**Yes**	**2**	**4**
	No	**48**	**96**
	Total	**50**	**100**
Ataxia	**Yes**	**41**	**82**
	No	**9**	**18**
	Total	**50**	**100**
Vertigo	**Yes**	**32**	**64**
	No	**18**	**36**
	Total	**50**	**100**

Table (3) Shows the current problem and complications related to medical history / CVA among the study sample. The study findings to show that the majority of the study have no (pneumonia 94%, epileptic seizure 98%, deep vein thrombosis 98%, painful shoulder 72%, pressure sore 70%, urinary tract infection 80%, constipation 84%, joint contraction 78%, hemiparesis 66%, visual deficit 56%, pulmonary embolism 100%, and sensory loss 96%). While they have (hemiplegia 76%, ataxia 82%, and vertigo 64%).

Table (4) Study Sample Past Medical History

Associated diseases	**Responses**	**Frequency**	**Percent**

Diabetes Mellitus	**Yes**	**24**	**48**
	No	**26**	**52**
	Total	**50**	**100**
Ischemic Heart Disease	**Yes**	**9**	**18**
	No	**41**	**82**
	Total	**50**	**100**
Hypertension	**Yes**	**41**	**82**
	No	**9**	**18**
	Total	**50**	**100**
Heart Failure	**Yes**	**2**	**4**
	No	**48**	**96**
	Total	**50**	**100**
Renal Diseases	**Yes**	**6**	**12**
	No	**44**	**88**
	Total	**50**	**100**

Table (4) Shows the past medical history of the study sample. The study findings signify that the majority of the study has no (diabetes mellitus 52%, ischemic heart diseases 82%, heart failure 96%, and renal diseases 88%). While they have hypertension (82%).

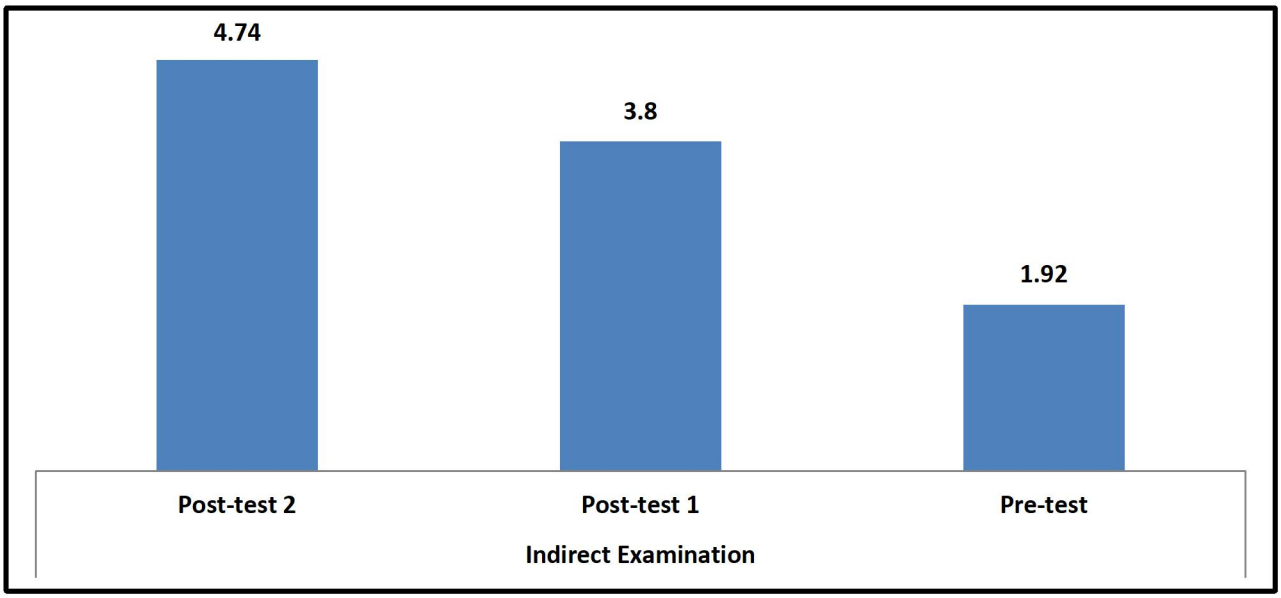

Figure (1) Overall Mean of the Indirect Examination of the Swallowing Ability among Study Sample throughout Three Periods of Measurements (Pre-test, Post-test 1, Post-test 2)

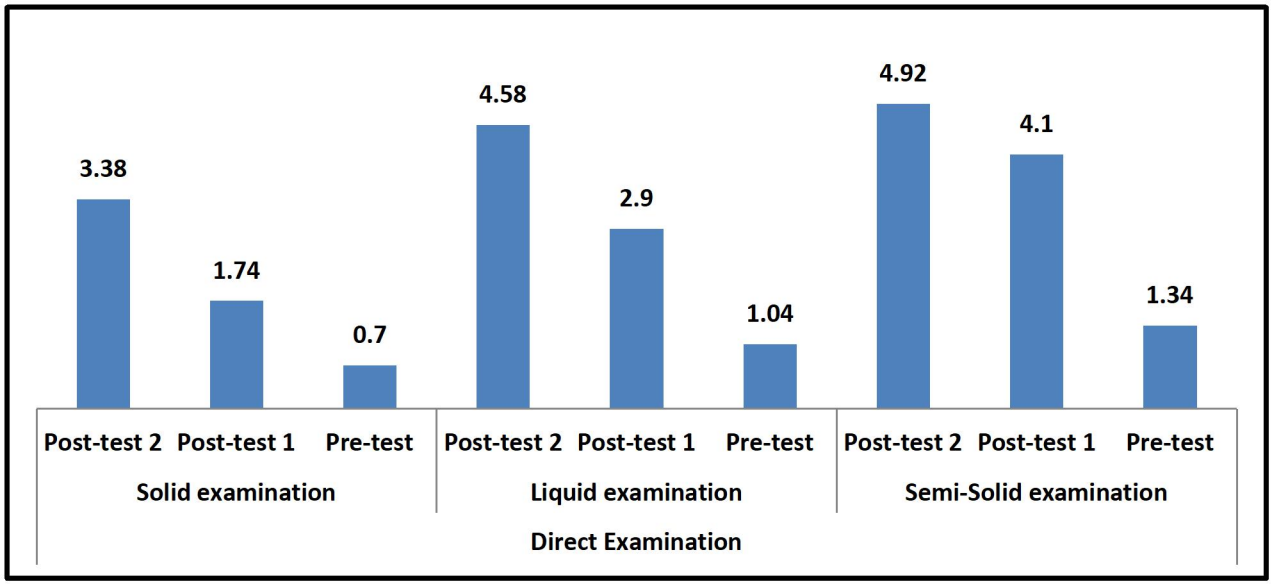

Figure (2) Overall Mean of the Direct Examination of the Swallowing Ability among Study Sample throughout Three Periods of Measurements (Pre-test, Post-test 1, Post-test 2)

Table (5) Overall Assessment of Swallowing Ability among Study Sample

Main studied domain	Levels	Pre-test		Post-test 1		Post-test 2	
		Freq.	%	Freq.	%	Freq.	%
Overall Assessment of Swallowing Ability	Sever dysphagia	44	88.0	10	20.0	0	0
	Moderate dysphagia	4	8.0	24	48.0	0	0
	Mild dysphagia	2	4.0	15	30.0	41	82.0
	Normal	0	0	1	2.0	9	18.0
	Total	50	100.0	50	100.0	50	100.0

Normal (20 points), Mild dysphagia (15-19 points), Moderate dysphagia (10-14 points), and extreme or Severe dysphagia (<=9 points)

Table (6) Shows that the swallowing ability among the majority of the patients is severed at the pre-test, while it moderate at the post-test 1, and mild at the post-test 2.

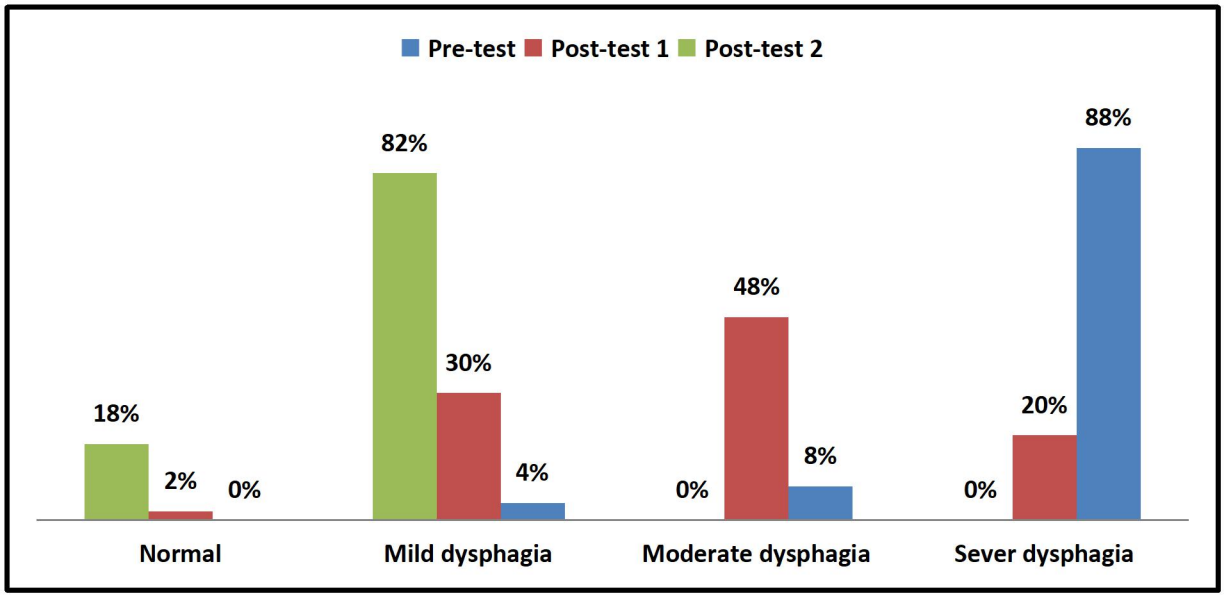

Figure (3) Overall Assessment of the Swallowing Ability among Study Sample throughout Three Periods of Measurements (Pre-test, Post-test 1, Post-test 2)

Table (6) Effectiveness of the Interventional Program through Applying the One Way Analysis of Variance Test (ANOVA)

Main domains		Periods of measurements	Mean	Std. Deviation	F	Sig.
Indirect Examination		Pre-test	1.92	.92	165.977	.0001 HS
		Post-test 1	3.80	.90		
		Post-test 2	4.74	.44		
		Total	3.48	1.41		
Direct Examination	Semi-Solid examination	Pre-test	1.34	1.20	209.525	.0001 HS
		Post-test 1	4.10	.99		
		Post-test 2	4.92	.27		
		Total	3.45	1.78		
	Liquid examination	Pre-test	1.04	1.14	126.214	.0001 HS
		Post-test 1	2.90	1.40		
		Post-test 2	4.58	.67		
		Total	2.84	1.82		
	Solid examination	Pre-test	.70	.99	78.977	.0001 HS
		Post-test 1	1.74	1.19		
		Post-test 2	3.38	1.02		
		Total	1.94	1.53		
Overall Assessment		Pre-test	5.00	3.87	186.858	.0001 HS
		Post-test 1	12.54	3.96		
		Post-test 2	17.86	1.67		
		Total	11.80	6.24		

Table (7) Displays a substantial difference in the research sample swallowing ability over three measurement intervals (pre-test, post-test1, and post-test2). According to the statistical mean,

the study results indicate that the swallowing ability improved later the application of the interventional program.

Table (7) Effect of demographic data on the Effectiveness of the Interventional Program (post-test 2)

Variables	Rating and intervals	Swallowing ability		Total	Sig.
		Mild dysphagia	Normal		
Age / Years	30 – 39	0	2	2	10.661 d.f. (4) p-value (0.031) S
	40 – 49	2	1	3	
	50 – 59	12	1	13	
	60 – 69	17	3	20	
	70+	10	2	12	
Hemiplegia	Yes	34	4	38	5.992 d.f. (1) p-value (0.014) S
	No	7	5	12	
Ataxia	Yes	37	4	41	10.488 d.f. (1) p-value (0.001) HS
	No	4	5	9	
Hypertension	Yes	36	5	41	5.20 d.f. (1) p-value (0.023) S
	No	5	4	9	

Table (7) Describes that is a significant association between the effectiveness of the program and the patient's age, hemiplegia, hypertension, and ataxia. While there is a nonsignificant association with the other socio-demographic and clinical data.

Table (8) Effect of Hemiplegia, Ataxia, and Hypertension on the Swallowing Ability of the Study Sample (post-test 2)

Main variables	Responses	N	Mean	Std. Deviation	t-value	df	p-value
Hemiplegia	Yes	38	17.55	1.688	2.415	48	.020 S
	No	12	18.83	1.267			
Ataxia	Yes	41	17.56	1.644	2.883	48	.006 HS
	No	9	19.22	1.093			
Hypertension	Yes	41	17.73	1.659	1.158	48	.253 NS
	No	9	18.44	1.740			

Table (8) Plays there are significant differences in the patients' swallowing ability (post-test 2) according to the presence of hemiplegia and ataxia. While there is a nonsignificant difference according to hypertension. But according to the statistical mean, the study findings show that the swallowing ability decreased as the patients suffer from these problems.

Table (9) Effect of Age on the Swallowing Ability of the Study Sample (post-test 2)

Age intervals	N	Mean	Std. Deviation	F	r	Sig.
30 – 39	2	20.00	0.000	1.949	-0.397	.119 NS
40 – 49	3	19.00	1.000			
50 – 59	13	17.92	1.441			
60 – 69	20	17.90	1.447			
70+	12	17.08	2.151			
Total	50	17.86	1.678			

Table (9) Plays there are nonsignificant differences in the swallowing ability of the study sample according to their age groups. But according to the statistical mean and pearson correlation value, the study findings signify that the swallowing ability increased as the age is decreased.

DISCUSSION:

Cerebrovascular accident is described as a sudden onset of neurological disability due to a core vascular cause. Because of the complicated brain anatomy and blood vessels, the clinical manifestations of CVA are very different. Lack of blood flow that lasts up to several minutes is cause brain ischemia. One of the major reasons for adult disability is CVA and is the second leading cause of death worldwide. Dysphagia is a common complication in patients with CVA, with an incidence reported at an acute stage of a CVA of around 55 percent. Clinically important treatment of dysphagia, as it can impact everyday living habits, quality of life, and CVA patient prognosis. A very recent phenomenon is the use of counseling as a treatment for dysphagia. Improve dysphagia by using Gugging Swallowing Screening the GUSS test is split into two parts: the assessment preliminary (part 1, swallowing test indirect, and the swallowing test direct part 2), consisting of three subtests. Such four subtests are to be performed sequentially. The present study aimed to improve the difficulty of swallowing for patients who suffer from a cerebrovascular accident, as one of the most important problems of the CVA is difficulty in swallowing and usually they need long periods to return to the normal state, but through the application of special exercises the patient returns to the normal situation in a short period of time and this is what our research aims. The findings of the present research show that most of the subjects are of the research are of age advanced. This authenticates the cerebrovascular accident incidence is increased as the age of the patient rises and vice versa. As to the gender of the patients, the findings of the present analysis show that the male is the dominant gender for the sample of the analysis In addition, socioeconomic status, the study findings to show that the socio-economic status of the majority of the study sample is sufficient to some extent and most of them are married. Furthermore, the research findings show that many study participants are nonsmokers and nonalcoholic. The findings of the study show that the majority of the research sample is on the right side affected due to CVA. That means that the right side is a common side that may be affected due to the CVA compared with the left side. Most common complications and problems related to that CVA, are hemiplegia and ataxia. They studied the majority of the study also has hypertension in the study and they find that most of the patients with CVA suffer from hypertension. The study sample indicates that there is a relationship between the effectiveness of the program and the patient age, hemiplegia, hypertension, and ataxia, After applying the GUSS in the present test, the outcomes of the study showed an increase in the swallowing ability of the study group (e.g. the procedure applied is a successful way to enhance the swallowing ability of the patients). In the majority of patients, swallowing ability is extreme at the pre-test, moderate at the post-test 1 and mild at the post-test 2. Furthermore, the study sample indicates significant differences in the patients' swallowing ability (post-test 2) according to the presence of hemiplegia and ataxia. While there is a non-significant difference according to hypertension. But according to the statistical mean, the study findings indicate that the swallowing ability decreased as the patients suffer from these problems.

CONCLUSION:

Based on the study results, the rate of a cerebrovascular accident increases with an increasing age group. In male patients, the frequency of cerebrovascular accident is increased as opposed to female patients. Patients suffering from cerebrovascular accidents can meet their needs depending on their economic status. Cerebrovascular accident on the right is more frequent than cerebrovascular accident on the left hand. Complications are commonly associated with a cerebrovascular accidents are hemiplegia and ataxia.

RECOMMENDATIONS:

Based on the study results and conclusion, the higher education and scientific ministry should use the findings of the present study in order to conduct other studies in the field of patients' rehabilitation especially for patients with neurological disorders. Under the supervision of faculty expertise in nursing and rehabilitation, a guideline for Rehabilitation of the nursing care should be planned and updated to be used by health personnel in the Ministry of Health as a standardized for the patients managed with chronic conditions and handicaps. The ministry of health should establish a rehabilitation guideline for patients especially those with neurological disorders to minimize their problems and help them to fulfill their life as possible.

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