Effectiveness of Shaker Exercise on Swallowing Function among Stroke Patients with Dysphagia in a Tertiary Care Hospital, Kanpur, India

Mrs.Niladrita Deb,

Associate Professor, Dept of MSN, Faculty of Nursing, Rama University.

Mail: sweetnila.deb@gmail.com

ABSTRACT

Background: *Stroke is a leading cause of mortality and long-term disability worldwide. Dysphagia is a common complication following stroke and can result in serious outcomes such as aspiration pneumonia, malnutrition, and prolonged hospitalization.****Objective:*** *To evaluate the effectiveness of Shaker exercise in improving swallowing ability among stroke patients with dysphagia.****Methods:*** *A quantitative approach with a quasi-experimental pre-test and post-test control group design was adopted. The study was conducted among 30 stroke patients with dysphagia in a tertiary care hospital in Kanpur. Participants were selected using purposive sampling and divided into experimental (n=15) and control (n=15) groups. Swallowing ability was assessed using the Gugging Swallowing Screen (GUSS). The experimental group received Shaker exercise intervention for 8 days, while the control group received routine care. Data were analyzed using descriptive statistics and unpaired t-test.****Results:*** *The mean post-test swallowing score in the experimental group (17.27 ± 1.62) was significantly higher than in the control group (12.87 ± 0.20). The calculated t-value (24.55) was statistically significant ($p<0.001$), indicating the effectiveness of the intervention.****Conclusion:*** *Shaker exercise significantly improves swallowing function in stroke patients with dysphagia and can be incorporated as a cost-effective rehabilitation strategy in clinical practice.*[1]

KEYWORDS : Stroke; Dysphagia; Shaker Exercise; Swallowing Rehabilitation; Nursing Intervention; GUSS Scale

INTRODUCTION

Stroke is a major neurological disorder and one of the leading causes of death and disability worldwide. Despite advancements in acute care, a large proportion of stroke survivors experience long-term complications that affect their quality of life. Among these, dysphagia is one of the most frequent and clinically significant complications.

Dysphagia affects a substantial number of stroke patients and is associated with increased risk of aspiration, malnutrition, dehydration, and mortality. The condition can delay recovery, extend hospital stay, and increase healthcare costs. Early

identification and management of dysphagia are therefore essential components of stroke rehabilitation.

Various therapeutic interventions have been developed to improve swallowing function. Shaker exercise is a well-established rehabilitative technique that focuses on strengthening the suprahyoid muscles, enhancing laryngeal elevation, and improving upper esophageal sphincter opening. Evidence suggests that targeted exercises like Shaker exercise can significantly enhance swallowing efficiency.

However, there is limited research from Indian clinical settings evaluating its effectiveness. Hence, this study aims to assess the impact of Shaker exercise on swallowing ability among stroke patients with dysphagia.[2]

MATERIALS AND METHODS

Research Approach and Design

A quantitative research approach was utilized with a quasi-experimental pre-test and post-test control group design. This design enabled comparison between intervention and non-intervention groups.

Study Setting

The study was conducted at Rama Medical College Hospital and Research Centre**,** Kanpur, a tertiary care facility providing neurological and rehabilitation services.

Population and Sample

The study population consisted of patients diagnosed with cerebrovascular accident (CVA) with dysphagia.

- Sample size: 30 participants
- Experimental group: 15
- Control group: 15

Sampling Technique

Participants were selected using purposive sampling, ensuring inclusion of patients who met specific clinical criteria.

Inclusion Criteria

- Diagnosed stroke patients with dysphagia
- GUSS score between 9–14 (moderate dysphagia)
- Glasgow Coma Scale score 13–15
- Patients on liquid or semi-solid diet
- Ability to understand Hindi or English
- Willing to participate

Exclusion Criteria

- Severe dysphagia
- History of head/neck surgery
- Critically ill patients

- Comorbid conditions like end-stage renal disease

Tool Description

Section A: Demographic Data

Included age, gender, education, income, occupation, type of stroke, duration, and diagnosis.

Section B: Gugging Swallowing Screen (GUSS)

A standardized tool used to assess swallowing ability:

- Evaluates direct and indirect swallowing
- Scores categorize severity of dysphagia
- Reliable and widely used in clinical practice

Validity and Reliability

- Tool validity ensured through expert review
- GUSS is a standardized validated scale
- Reliability considered high based on previous studies

Intervention: Shaker Exercise Protocol

The experimental group received Shaker exercise training:

Procedure

- Patient lies in supine position
- Raises head to look at toes without lifting shoulders
- Holds position for 60 seconds (isometric phase)
- Followed by three consecutive head lifts (isotonic phase)

Frequency

- 3 sessions per day
- 3 repetitions per session
- Duration: 8 consecutive days

The control group received **routine dysphagia care only**.

Pilot Study

A pilot study was conducted on 10% sample to ensure feasibility and clarity.

Data Collection Procedure

- Ethical approval obtained
- Informed consent taken
- Pre-test conducted using GUSS
- Intervention given to experimental group
- Post-test conducted after 8 days

Ethical Considerations

- Institutional ethical clearance obtained

- Confidentiality maintained
- Participation was voluntary

Data Analysis

- Descriptive statistics: Mean, SD, percentage
- Inferential statistics: **Unpaired t-test**
- Significance level: **$p < 0.05$**

RESULTS (ELABORATED – SCOPUS LEVEL)

1. Socio-Demographic and Clinical Characteristics of Participants

- ✓ A total of 30 stroke patients with dysphagia were included, equally divided into experimental (n=15) and control (n=15) groups.
- ✓ The age distribution showed variation between groups. In the experimental group, the majority of participants (60%) were in the 45–55 years category, whereas in the control group, most participants (60%) belonged to the 56–65 years age group. This indicates that the control group had relatively older participants.[3]
- ✓ Regarding gender, males predominated in both groups, accounting for 73.3% in the experimental group and 80% in the control group, reflecting the higher incidence of stroke among males.
- ✓ In terms of educational status, the experimental group had a higher proportion of individuals with elementary education (60%), whereas the control group had a larger number of illiterate participants (46.6%), suggesting comparatively lower literacy levels.
- ✓ Analysis of monthly income revealed that the majority of participants in the experimental group (60%) earned between ₹5000–10000, while a significant proportion of the control group (40%) had income below ₹5000, indicating relatively poorer socioeconomic status.
- ✓ The most common occupation in both groups was manual labor (coolie), comprising 40% in the experimental group and 33.3% in the control group.
- ✓ Clinically, ischemic stroke was the predominant type observed in both groups (73.3% in experimental and 80% in control). Most participants were in the acute phase of stroke (<5 days), accounting for 73.3% in the experimental group and 80% in the control group.

2. Distribution of Dysphagia-Related Symptoms

Assessment of dysphagia-related symptoms revealed that:

- Coughing during swallowing was the most common symptom, observed in 86.7% of the experimental group and 73.3% of the control group, indicating impaired airway protection.
- Difficulty in swallowing semisolid food was reported by the majority of participants (86.7% experimental; 73.3% control), suggesting moderate dysphagia severity.
- Pain during swallowing was significantly higher in the experimental group (93.3%) compared to the control group (20%), indicating greater initial symptom burden.
- Weight loss was reported in approximately half of the participants in both groups, reflecting the nutritional consequences of dysphagia.
- A history of aspiration was present in a small proportion of patients (13.3% experimental; 6.7% control), highlighting the risk of complications.

Overall, the findings suggest that dysphagia symptoms were prevalent and clinically significant in both groups prior to intervention.

3. Pre-test and Post-test Dysphagia Levels in Experimental Group

Before the intervention, all participants in the experimental group exhibited moderate dysphagia, with a mean GUSS score of 12.93 ± 2.05.

Following the implementation of Shaker exercise:

- 86.7% of participants achieved normal swallowing function
- 6.7% demonstrated mild dysphagia
- Only 6.7% remained with moderate dysphagia

The mean post-test score increased to 17.27 ± 1.62, indicating a substantial improvement in swallowing ability.

4. Comparison of Pre-test Scores Between Experimental and Control Groups

At baseline, the mean GUSS score in the experimental group was 12.93 ± 2.05, while in the control group it was 12.27 ± 1.44.

The calculated t-value (6.413) indicated a statistically significant difference between groups at baseline. However, the mean values suggest that both groups were clinically comparable, with participants predominantly in the moderate dysphagia category.

5. Comparison of Post-test Scores Between Experimental and Control Groups

After the intervention:

- Experimental group mean score: 17.27 ± 1.62
- Control group mean score: 12.87 ± 0.20

The calculated t-value (24.55) was highly significant at $p < 0.001$, demonstrating a strong effect of the Shaker exercise intervention.

The control group showed only minimal improvement, likely due to routine care alone.

6. Clinical Interpretation of Findings

The improvement observed in the experimental group reflects:

- Enhanced muscle strength of suprahyoid muscles
- Improved laryngeal elevation
- Better upper esophageal sphincter opening

These physiological improvements contribute to safer and more efficient swallowing.

7. Summary of Key Findings

- Majority of participants had moderate dysphagia at baseline
- Shaker exercise resulted in significant improvement in swallowing function
- Experimental group showed dramatic shift to normal swallowing
- Control group showed minimal improvement
- Statistical analysis confirmed highly significant effectiveness ($p < 0.001$)

DISCUSSION

The findings confirm that Shaker exercise significantly enhances swallowing ability in stroke patients. This improvement can be attributed to strengthening of suprahyoid muscles and improved laryngeal elevation.[4]

Similar results have been reported in recent studies (Kim et al., 2021; Park et al., 2022), which demonstrated that targeted

swallowing exercises improve functional outcomes.[5]

Early initiation of rehabilitation was also observed to contribute to better recovery. The study reinforces the importance of incorporating structured swallowing exercises into routine nursing care.

IMPLICATIONS FOR NURSING PRACTICE

- Nurses can implement Shaker exercise easily
- Improves patient recovery and reduces complications
- Cost-effective and non-invasive intervention
- Can be included in rehabilitation protocols

LIMITATIONS

- Small sample size
- Short duration
- Single-center study

RECOMMENDATIONS

- Larger multi-center studies
- Long-term follow-up
- Comparison with other swallowing therapies

CONCLUSION

Shaker exercise is an effective intervention for improving swallowing ability in stroke patients with dysphagia. It is simple, safe, and can be integrated into routine clinical practice to enhance patient outcomes and quality of life.[10]

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