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Effect of swallowing maneuvers on neurological deglutition among extubated patients

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Abstract
Post-extubation dysphagia is a common complication among neurological patients, increasing the risk of aspiration, malnutrition, and prolonged hospitalization. Swallowing maneuvers are simple, non-invasive techniques to improve deglutition. Effectiveness of swallowing maneuvers on neurological deglutition among extubated patients in critical care units was evaluated. Quasi-experimental pre-test and post-test control group design was adopted. Sixty extubated patients with neurological impairment were purposively selected and allocated to experimental (n = 30) and control group (n = 30). The experimental group received structured swallowing maneuvers twice daily for 15-20 minutes over 7 days. Control group received routine care. Neurological deglutition was assessed pre- and post-intervention using a structured swallowing assessment scale. Results revealed that post-test deglutition scores were significantly higher in the experimental group compared to the control group ($p < 0.001$). Swallowing maneuvers significantly improve neurological deglutition in extubated patients. Structured interventions can prevent complications, promote oral intake, and enhance recovery.

Keywords: Swallowing maneuvers, Neurological deglutition, Dysphagia, Extubated patients

Introduction
Post-extubation dysphagia is a frequent complication among neurological patients, leading to aspiration, malnutrition, prolonged ICU stay, and delayed rehabilitation. Swallowing maneuvers, such as chin-tuck, effortful swallow, supraglottic swallow, and Mendelsohn maneuver, have been shown to improve airway protection and facilitate safe oral intake. However, evidence for their routine application in post-extubation care remains limited. This study aims to evaluate the effect of structured swallowing maneuvers on neurological deglutition among extubated patients in a critical care setting.

Need for the Study
Globally, post-extubation dysphagia affects 30-62% of neurological ICU patients (Skoretz *et al.*, 2010) [4].
In India, approximately 40% of extubated neurological patients exhibit swallowing difficulties, increasing the risk of aspiration pneumonia and extended hospital stay. Early interventions like swallowing maneuvers can reduce complications and improve recovery outcomes. Supporting studies by Carnaby *et al.* (2006) [1] and Suiter & Leder (2008) [2] demonstrate the effectiveness of these maneuvers in improving deglutition and preventing aspiration.

Statement of the Problem
A study to evaluate the effect of swallowing maneuvers on neurological deglutition among extubated patients in selected critical care units.

Objectives
1. To assess level of neurological deglutition before and after structured swallowing maneuvers in experimental and control groups
2. To evaluate the effectiveness of structured swallowing maneuvers on neurological deglutition.

Hypothesis

RH: There is a significant improvement in post-test neurological deglutition scores in the experimental group compared to pre-test.

Materials and Methods

- **Design:** Quasi-experimental pre-test and post-test control group design.
- **Setting:** Selected critical care units of a tertiary hospital in Tamilnadu, India.
- **Population & Sample:** Sixty extubated patients with neurological impairment; experimental (n=30) and control (n=30) groups using purposive sampling.
- **Inclusion Criteria:** Age ≥18 years, extubation within 48-72 hours, able to follow commands.
- **Exclusion Criteria:** Tracheostomy, structural oral/pharyngeal abnormalities, severe cognitive impairment, unstable clinical status.
- **Intervention:** Experimental group received structured swallowing maneuvers twice daily for 15-20 minutes over 7 days; control group received routine care.
- **Outcome Measure:** Structured Swallowing Assessment Scale, pre- and post-intervention.
- **Data Analysis:** Descriptive statistics, paired and independent *t*-tests, and Chi-square for demographic association.
- **Ethical Considerations:** Institutional Ethics Committee approval and written informed consent obtained.

Results

Table 1: Frequency & Percentage of demographic Distribution (N=60)

Variable	Category	Experimental (n=30)	Control (n=30)
Age (years)	18-40	6 (20%)	5 (16.7%)
	41-60	12 (40%)	13 (43.3%)
	>60	12 (40%)	12 (40%)
Gender	Male	16 (53.3%)	15 (50%)
	Female	14 (46.7%)	15 (50%)

In the table 1, distribution of demographic characteristics among experimental and control groups (N = 60) is depicted. Majority of participants were aged 41-60 years, with nearly equal representation of males and females. Most had ICU stays of 1-6 days, and stroke was the predominant neurological diagnosis. Both groups were comparable at baseline, indicating homogeneity.

Table 2: Pre-test vs Post-test Scores within Experimental Group

Parameter	Pre-test Mean ± SD	Post-test Mean ± SD	Mean Difference	Paired t-value
Neurological Deglutition Score	12.3 ± 2.1	18.7 ± 1.8	6.4	12.45**

**Significant at $p<0.001$ level

As shown in table 2, the experimental group showed a significant improvement in neurological deglutition scores after receiving structured swallowing maneuvers ($p < 0.001$). This indicates that the intervention was effective in enhancing swallowing function among extubated patients with neurological impairment.

Table 3: Pre-test vs Post-test Scores within Control Group

Parameter	Pre-test Mean ± SD	Post-test Mean ± SD	Mean Difference	Paired t-value t-value
Neurological Deglutition Score	12.1 ± 2.3	12.8 ± 2.2	0.7	1.52

As shown in table 3, No significant change was observed in the control group, indicating that routine care alone did not improve swallowing function.

Table 4: Comparison of Post-test scores experimental and control group

Group	Post-test Mean ± SD	t-value	Level of Significance
Experimental (n=30)	18.7 ± 1.8	11.89*	Significant at $p<0.001$
Control (n=30)	12.8 ± 2.2		

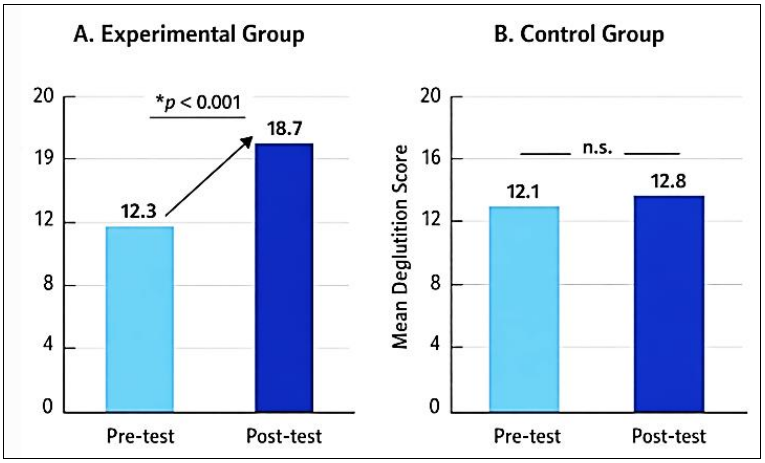

Fig 1: Comparison of mean scores of experimental and control groups

Discussion

The study demonstrated significant improvement in neurological deglutition in the experimental group ($p < 0.001$). This aligns with Carnaby *et al.* (2006) [1] and Suiter & Leder (2008) [2], who reported enhanced swallowing function and reduced aspiration risk with structured exercises. No significant association was found between demographic variables and baseline scores, confirming homogeneity. The intervention is feasible, cost-effective, and non-invasive, supporting early rehabilitation and

integration into routine nursing care.

Conclusion

Structured swallowing maneuvers significantly improve neurological deglutition in extubated patients. Early implementation prevents complications, facilitates safe oral intake, and supports recovery. Incorporation into routine nursing care is recommended.

Nursing Implications

- Nurses can integrate structured swallowing maneuvers into post-extubation care.
- Interventions are simple, safe, and cost-effective.
- Patient and caregiver education enhances adherence and recovery.
- Hospitals should include swallowing rehabilitation protocols in ICU guidelines.
- Further research is recommended for long-term outcomes and multicenter validation.

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