

EFFECTIVENESS OF STRUCTURED SWALLOWING EXERCISES ON DYSPHAGIA AMONG PATIENTS FOLLOWING ENDOSCOPIC PROCEDURES

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ABSTRACT

Background

Dysphagia is a common complication following endoscopic procedures and may lead to discomfort, aspiration risk, poor nutritional intake, and delayed recovery. Early identification and intervention are essential to prevent complications and improve quality of life. Swallowing exercises such as the Masako and Mendelsohn maneuvers are simple, non-invasive techniques that enhance swallowing efficiency; however, evidence regarding their effectiveness among post-endoscopy patients remains limited.

Aim

To evaluate the effectiveness of structured swallowing exercises in improving swallowing function among patients following endoscopic procedures admitted to a selected tertiary care hospital, Belagavi.

Materials and Methods

A quantitative evaluative research approach with a quasi-experimental pre-test–post-test control group design was adopted. The study was conducted among 60 post-endoscopy patients selected using non-probability purposive sampling and equally allocated to experimental (n=30) and control (n=30) groups. Swallowing function was assessed using the Gugging Swallowing Screen (GUSS). The experimental group received structured swallowing exercises (Masako and Mendelsohn maneuvers) twice daily for three days along with routine care, while the control group received routine care alone. Data were analysed using descriptive and inferential statistics.

Results

Baseline findings revealed no significant difference between groups, with most participants demonstrating moderate dysphagia ($\chi^2 = 1.069$, $p = 0.599$). Following the intervention, the experimental group showed greater improvement, with 43.3% achieving normal swallowing and no cases of severe dysphagia. In comparison, only 26.7% of the control group achieved normal swallowing, while 6.7% remained severely dysphagic. The post-test difference between groups was statistically significant ($\chi^2 = 7.271$, $p = 0.049$). Age was significantly associated with dysphagia severity in both groups.

Conclusion

Structured swallowing exercises were effective in reducing dysphagia severity among post-endoscopy patients. These exercises are safe, simple, cost-effective, and feasible for nurse-led implementation, supporting improved recovery and better clinical outcomes.

Keywords: Dysphagia, Swallowing exercises, Endoscopy, GUSS, Nursing care, Rehabilitation.

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INTRODUCTION

Swallowing is a complex physiological process involving the coordinated activity of the oral cavity, pharynx, and esophagus to safely transport food and liquids from the mouth to the stomach. Any disruption in this mechanism may result in dysphagia, a condition characterized by difficulty in swallowing that can lead to complications such as malnutrition, dehydration, aspiration pneumonia, prolonged hospitalization, and reduced quality of life. Dysphagia is a significant clinical concern affecting patients across various medical and surgical conditions.^{1,2}

Endoscopic procedures, particularly esophagogastroduodenoscopy (EGD), are commonly performed for the diagnosis and management of gastrointestinal disorders. Although generally considered safe, these procedures may occasionally result in transient swallowing difficulties due to mucosal irritation, tissue manipulation, biopsy, dilation, or stent placement. Elderly patients and those undergoing therapeutic interventions are at greater risk of developing post-procedural dysphagia.^{3,4}

Post-endoscopic dysphagia is often temporary; however, persistent swallowing difficulties may interfere with oral intake, delay recovery, and increase the risk of aspiration-related complications. Studies have reported that throat discomfort and swallowing problems are among the common adverse effects experienced after upper gastrointestinal endoscopy, highlighting the importance of early identification and management.^{5,6}

Swallowing rehabilitation plays a vital role in the management of dysphagia. Structured swallowing exercises are simple, non-invasive, and cost-effective interventions that improve muscle strength, swallowing coordination, and neuromuscular control. The Masako and Mendelsohn maneuvers are widely used therapeutic techniques that have demonstrated effectiveness in enhancing pharyngeal muscle function, laryngeal elevation, and overall swallowing performance among individuals with dysphagia.^{7,8}

Globally, dysphagia remains a prevalent condition among older adults and hospitalized patients, contributing substantially to morbidity and healthcare burden. Despite the growing use of endoscopic procedures and the occurrence of procedure-related swallowing difficulties, structured swallowing rehabilitation is not routinely incorporated into standard patient care.⁹

In Karnataka, limited research has explored the effectiveness of swallowing exercises among patients experiencing dysphagia following endoscopic procedures. Therefore, the present study was undertaken to assess the effectiveness of structured swallowing exercises in improving swallowing function among patients following endoscopic procedures in a selected tertiary care hospital.¹⁰

MATERIALS AND METHODS

Research Approach

A quantitative research approach was adopted for the present study.

Research Design

A quasi-experimental pre-test-post-test control group design was used to assess the effectiveness of structured swallowing exercises on dysphagia among patients following endoscopic procedures.

Setting

The study was conducted in the gastroenterology ward of a selected tertiary care hospital in Karnataka.

Participants

The study population comprised patients who had undergone endoscopic procedures.

- **Sample size:** 60 participants
- **Sampling technique:** Non-probability purposive sampling
- **Group allocation:** Experimental group (n = 30) and control group (n = 30)

Inclusion Criteria

- Patients aged above 20 years
- Patients who had undergone endoscopic procedures for the first time
- Patients who were available during the period of data collection
- Patients willing to participate in the study

Exclusion Criteria

- Patients with pre-existing dysphagia
- Unconscious patients
- Patients with neurological disorders affecting swallowing such as stroke, Parkinson's disease, and traumatic brain injury
- Patients who had previously undergone swallowing therapy

Sample Size Determination

The sample size was determined based on pilot study findings considering a 5% level of significance and 80% power. A minimum sample of 27 participants per group was required; however, 30 participants were included in each group to account for possible

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attrition.

Measurement Tool

Data were collected using:

- Socio-demographic and clinical data questionnaire Gugging Swallowing Screen (GUSS)

The Gugging Swallowing Screen (GUSS) is a validated tool used to assess swallowing function and categorize dysphagia severity as:

- Normal swallowing
- Mild dysphagia
- Moderate dysphagia
- Severe dysphagia

Intervention

Participants in the experimental group received structured swallowing exercises consisting of:

- Masako maneuver
- Mendelsohn maneuver

Masako Maneuver

Participants were instructed to protrude the tongue slightly and hold it gently between the teeth while swallowing.

Mendelsohn Maneuver

Participants were instructed to swallow and voluntarily maintain laryngeal elevation for 2–5 seconds during swallowing.

Duration of Intervention

- Twice daily
- 10–15 repetitions per session
- Conducted for 3 consecutive days

The control group received routine nursing care.

Data Collection Procedure

- Pre-test assessment was conducted using the Gugging Swallowing Screen (GUSS).
- Structured swallowing exercises were administered to the experimental group.
- The control group received routine nursing care.
- Post-test assessment was conducted after completion of the intervention using the same assessment tool.

Data Analysis

Data were analyzed using descriptive and inferential statistics.

- **Descriptive statistics:** Frequency and percentage
- **Inferential statistics:** Chi-square test and Fisher's exact test

The chi-square test was used to compare dysphagia severity within and between groups and to determine associations between dysphagia severity and selected socio-demographic variables. Statistical significance was set at $p < 0.05$.

Ethical Considerations

- Ethical approval was obtained from the Institutional Ethics Committee prior to data collection.
- Written informed consent was obtained from all participants.
- Confidentiality and anonymity of participants were maintained throughout the study.

RESULTS:

Socio-Demographic Findings

- Majority of participants (56.7% in the experimental group and 63.3% in the control group) were aged 41–60 years.
- Most participants were male (63.3% in the experimental group and 70.0% in the control group).
- Majority were married and belonged to nuclear families.
- Most participants had secondary or higher secondary education and were privately employed.
- The majority had a monthly income between ₹10,000–₹30,000 and resided in rural areas.
- Gastroesophageal reflux disease (GERD) and hypertension were the most commonly reported comorbidities.

Baseline Findings

- At pre-test, most participants in both groups had moderate dysphagia (56.7% in the experimental group and 60.0% in the control group).
- Severe dysphagia was observed in 16.7% of the experimental group and 23.3% of the control group.
- No statistically significant difference was found between the groups at baseline ($\chi^2 = 1.069$, $p = 0.599$), indicating group comparability.

Post-Intervention Findings

- Following the intervention, 43.3% of participants in the experimental group achieved normal swallowing status compared to 26.7% in the control group.
- No participants in the experimental group had severe dysphagia after the intervention, whereas 6.7% of participants in the control group remained in the severe category.
- Moderate dysphagia decreased considerably in the experimental group following structured swallowing exercises.

Effectiveness of Intervention

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- Structured swallowing exercises demonstrated significant improvement in swallowing function among post-endoscopy patients.
- A statistically significant difference was observed between the experimental and control groups at post-test ($\chi^2 = 7.271$, $p = 0.049$).
- The intervention effectively reduced dysphagia severity and improved swallowing status in the experimental group.

Association Findings

- In the experimental group, age showed a statistically significant association with dysphagia severity ($\chi^2 = 11.054$, $p = 0.035$).
- In the control group, significant associations were observed with age, educational status, occupation, and comorbidities ($p < 0.05$).
 - No significant association was found with gender, marital status, family type, income, residence, caregiver, or lifestyle habits ($p > 0.05$).

DISCUSSION

The present study demonstrated that structured swallowing exercises significantly improved swallowing function among patients following endoscopic procedures. The findings are consistent with previous studies reporting beneficial effects of swallowing rehabilitation techniques on dysphagia management and swallowing outcomes.

The improvement observed in swallowing function indicates enhanced swallowing coordination and reduced dysphagia severity following the intervention. Participants who received the Masako and Mendelsohn maneuvers showed a greater improvement in swallowing status, with a higher proportion achieving normal swallowing and no cases of severe dysphagia in the post-test assessment. Similar findings were reported by Byeon, who observed significant improvement in swallowing function following structured swallowing exercises among patients with dysphagia.

The present study also demonstrated a considerable reduction in moderate dysphagia among participants in the experimental group compared to the control group. These findings are supported by previous studies showing that swallowing exercises improve laryngeal elevation, pharyngeal muscle strength, and

swallowing efficiency, thereby reducing the severity of dysphagia. Kim et al. similarly reported significant improvement in swallowing ability and a reduction in aspiration risk following the implementation of the Mendelsohn maneuver. Age was found to have a significant association with dysphagia severity in both groups. Additional associations with educational status, occupation, and comorbidities were observed in the control group. However, no significant association was found between dysphagia severity and other socio-demographic variables, suggesting that swallowing rehabilitation may be beneficial across diverse patient populations.

Structured swallowing exercises likely improve neuromuscular control of swallowing by enhancing laryngeal elevation, upper esophageal sphincter opening, pharyngeal wall movement, and overall swallowing coordination. Speyer et al. also emphasized the effectiveness of behavioral swallowing interventions in improving swallowing function and reducing dysphagia severity.

Incorporating structured swallowing exercises into routine nursing care may promote faster recovery, prevent aspiration-related complications, and improve quality of life among patients experiencing dysphagia following endoscopic procedures.

CONCLUSION

The study concluded that structured swallowing exercises are effective in improving swallowing function and reducing dysphagia severity among patients following endoscopic procedures. The intervention was simple, safe, non-invasive, economical, and beneficial in enhancing swallowing coordination and promoting recovery. Therefore, structured swallowing exercises can be incorporated into routine nursing care to improve swallowing outcomes, prevent complications, and enhance the quality of care among post-endoscopy patients.

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TABLES AND GRAPHS

Table 1: Distribution of participants by socio demographic characteristics

		Experimental		Control	
		n	%	n	%
Age (in years)	<40	7	23.3	5	16.7
	41-60	17	56.7	19	63.3
	61-70	5	16.7	5	16.7
	>70	1	3.3	1	3.3
Gender	Male	19	63.3	21	70.0
	Female	11	36.7	9	30.0
Educational Status	Illiterate	0	0.0	1	3.3
	Primary	3	10.0	3	10.0
	Secondary	16	53.3	12	40.0
	Higher secondary	7	23.3	9	30.0
	Graduate	4	13.3	4	13.3
	Post Graduate	0	0.0	1	3.3
Occupation	Unemployed	0	0.0	0	0.0
	Labourer	6	20.0	6	20.0
	Farmer	3	10.0	4	13.3
	Private employe	8	26.7	9	30.0
	Govt employee	1	3.3	2	6.7
	Professional	2	6.7	3	10.0
	Retired	2	6.7	1	3.3
	Other	8	26.7	5	16.7
Martial Status	Single	3	10.0	2	6.7
	Married	25	83.3	27	90.0
	Widowed	2	6.7	1	3.3
	Divorced/Separated	0	0.0	0	0.0
Type of family	Nuclear	19	63.3	19	63.3
	Joint	11	36.7	11	36.7
	Extended	0	0.0	0	0.0
Monthly Income (in rupees)	<10000/-	7	23.3	7	23.3
	10000-30000/-	19	63.3	18	60.0
	30001-60000/-	4	13.3	5	16.7
	>60001/-	0	0.0	0	0.0
Place of residence	Rural	18	60.0	16	53.3
	Urban	12	40.0	13	43.3
	Semi-Urban	0	0.0	1	3.3
Primary Caregiver	Spouse	18	60.0	16	53.3
	Son/Daughter	9	30.0	8	26.7
	Parent	3	10.0	4	13.3
	Sibling	0	0.0	2	6.7
	Other	0	0.0	0	0.0
Duration since endoscopy	1 day	30	100.0	30	100.0
Comorbidities	Hypertension	5	16.7	4	13.3
	Diabetes Mellitus	2	6.7	1	3.3
	Stroke	0	0.0	0	0.0
	GERD	8	26.7	5	16.7
	Other(Specify)	2	6.7	1	3.3
	None	13	43.3	19	63.3
Lifestyle habits	Smoker	0	0.0	5	16.7
	Alcohol use	4	13.3	7	23.3
	Tobacco chewing	6	20.0	3	10.0
	None	20	66.7	15	50.0

*n = Frequency

*% = Percentage

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Table 2 Comparison of Pre and Post-Test Dysphagia Scores Within & between Experimental and Control Groups

Dysphagia		Experimental		Control		Chi-square (Sig.)
		n	%	n	%	
Pre test	Severe	5	16.7	7	23.3	1.069 (0.599)
	Moderate	17	56.7	18	60.0	
	Mild	8	26.7	5	16.7	
	Normal, No dysphagia	0	0.0	0	0.0	
Post test	Severe	0	0.0	2	6.7	7.271 (0.049)
	Moderate	7	23.3	15	50.0	
	Mild	10	33.3	5	16.7	
	Normal, No dysphagia	13	43.3	8	26.7	

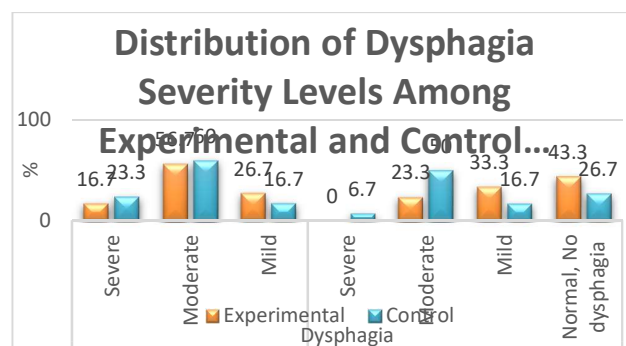
* χ^2 = Chi-square test.
 * Statistically significant at $p < 0.05$.
 * Dysphagia severity was assessed using the Gugging Swallowing Screen (GUSS).

Table 3 Association between Pretest Dysphagia Severity in Experimental and control group with socio demographic characteristics

Variable	Experimental Group χ^2 (p-value)	Significance	Control Group χ^2 (p-value)	Significance
Age group	11.054 (0.035)*	Significant	24.067 (<0.05)*	Significant
Gender	1.675 (0.388)	NS	0.912 (0.738)	NS
Educational status	5.900 (0.418)	NS	21.241 (0.001)*	Significant
Occupation	13.614 (0.211)	NS	17.931 (0.020)*	Significant
Marital status	1.840 (1.000)	NS	4.912 (0.285)	NS
Type of family	0.735 (0.873)	NS	2.004 (0.386)	NS
Monthly income	7.294 (0.079)	NS	6.610 (0.102)	NS
Place of residence	2.492 (0.345)	NS	2.488 (0.804)	NS
Primary caregiver	1.087 (1.000)	NS	10.083 (0.057)	NS
Duration since endoscopy	—	—	—	—
Comorbidities	6.070 (0.679)	NS	13.773 (0.021)*	Significant
Lifestyle habits	7.670 (0.053)	NS	6.881 (0.272)	NS

*Significant at $p < 0.05$; NS = Not Significant.

Figure 1: Distribution of Dysphagia Severity Levels Among Experimental and Control Groups During



Pre-test and Post-test Assessments

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