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ORIGINAL RESEARCH

Impact of LEARNS Model-Based Health Education on Swallowing Safety and Psychological Well-Being in Postoperative Esophageal Cancer Patients

Xiaoying Hou[1,*], Yan Qian[1,2,*], Li Cai[1,*], Wei Chen[3], Wenbin Zou[1]

[1]Department of Thoracic Surgery, Tongji Hospital, Tongji Medical College, Huazhong University of Science and Technology, Wuhan, People's Republic of China; [2]School of Nursing, Tongji Medical College, Huazhong University of Science and Technology, Wuhan, People's Republic of China; [3]Department of Pharmacy, Union Hospital, Tongji Medical College, Huazhong University of Science and Technology, Wuhan, People's Republic of China

*These authors contributed equally to this work

Correspondence: Wenbin Zou, Department of Thoracic Surgery, Tongji Hospital, Tongji Medical College, Huazhong University of Science and Technology, 1095 Jiefang Avenue, Qiaokou District, Wuhan, Hubei, 430000, People's Republic of China, Tel +86-27-83665211, Email zouwenbin@hust.edu.cn; Wei Chen, Department of Pharmacy, Union Hospital, Tongji Medical College, Huazhong University of Science and Technology, 1277 Jiefang Avenue, Jianghan District, Wuhan, Hubei, 430000, People's Republic of China, Tel +86-27-85726067, Email chenwei_xh@hust.edu.cn

Objective: This study aims to evaluate the effects of health education grounded in the LEARNS model on the swallowing safety and psychological well-being of patients following radical esophageal cancer surgery.

Methods: A randomized controlled trial was conducted. A convenience sampling method was employed to select 60 patients who underwent radical esophageal cancer surgery between July and December 2023 from a Grade III-A general hospital in Wuhan. Participants were randomly assigned to either a control group (n=30), which received standard health education, or an intervention group (n=30), which received LEARNS model-based health education. Primary outcomes included swallowing function and oral feeding ability; secondary outcomes comprised psychological status and satisfaction with health education. Outcomes were assessed one month post-discharge, and satisfaction was evaluated on the day of discharge.

Results: Following the intervention, the intervention group demonstrated statistically significant improvements in swallowing function (SSA score: 21.86±4.13 vs 23.34±2.42, P<0.05), oral intake ability (FOIS score: 7.25±1.07 vs 6.92±1.44, P<0.05), psychological distress (DT score: 5.45±1.94 vs 6.38±1.30, P<0.05), and satisfaction with health education (total score: 21.90±1.86 vs 17.40±3.38, P<0.05) compared to the control group.

Conclusion: The LEARNS-based health education approach may improve swallowing function, oral feeding ability, psychological status, and education satisfaction in postoperative esophageal cancer patients during short-term follow-up. These findings should be interpreted with caution due to the single-center design and limited sample size.

Keywords: LEARNS model, health education, esophageal cancer, swallowing function, safe feeding, swallowing training

Introduction

Esophageal cancer (EC) is a prevalent malignant tumor of the digestive tract, with surgery remaining the primary treatment modality.[1,2] The surgical procedures, which often involve gastrointestinal reconstruction and lymph node dissection, predispose patients to postoperative esophageal and oropharyngeal swallowing difficulties, resulting in feeding challenges.[3–5] Research indicates that dysphagia is the most severe and prevalent symptom among postoperative esophageal cancer patients. Persistent dysphagia can lead to psychological issues, including sadness, distress, and sleep disturbances,[6,7] as well as physiological complications such as malnutrition, muscle weakness, aspiration pneumonia, or even suffocation.[8,9] These issues significantly affect treatment outcomes and quality of life. Consequently, addressing dysphagia is a critical clinical priority for postoperative esophageal cancer patients.[10,11] Swallowing rehabilitation is thus

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essential for ensuring safe feeding and supporting mental well-being. However, existing education approaches often lack a structured framework that simultaneously addresses functional retraining and psychosocial adjustment.[12,13]

The LEARNS model, as endorsed by the Ontario Nurses Association's "Promoting Patient-Centered Learning" guidelines, advocates for a collaborative care approach between nurses and patients within a non-blaming and non-shaming environment.[14] This model emphasizes patient-centered learning through cooperative engagement in nursing practices. The LEARNS model is structured around six steps: Listen (L), Establish (E), Adopt (A), Reinforce (R), Name (N), and Strengthen (S). It is founded on four core principles: ensuring patient-centered care, enhancing health literacy, building knowledge and skills, and promoting self-management. This model has been shown to play a significant and positive role in enhancing patients' self-care capabilities and psychological well-being.[15] Although it has shown promise in other patient groups, its application in postoperative esophageal cancer care remains unexplored, particularly regarding integrated swallowing and psychological outcomes.

Therefore, this study aims to evaluate the effects of a LEARNS model-based health education program on swallowing safety and psychological well-being in postoperative esophageal cancer patients. We hypothesize that, compared to standard health education, the LEARNS-based intervention will lead to greater improvements in swallowing function, oral intake ability, psychological distress, and patient satisfaction.

Data and Methodology

General Data

This was a two-arm, parallel-group randomized controlled trial conducted at a Grade III-A general hospital in Wuhan from July to December 2023. Patients scheduled for radical esophageal cancer surgery were assessed for eligibility. Inclusion criteria were: (1) Histologically confirmed diagnosis of esophageal or esophagogastric junction carcinoma, consistent with the National Comprehensive Cancer Network (NCCN) Clinical Practice Guidelines in Oncology;[16] (2) scheduled for radical surgery; (3) normal cognitive and communication ability; (4) age ≥18 years; (5) provision of informed consent. Exclusion criteria included: (1) refusal to participate; (2) history or current diagnosis of mental illness requiring medication; (3) critically ill patients unable to communicate. Withdrawal criteria were: (1) need for post-operative tracheotomy; (2) inability to consume food orally; (3) discontinuation of treatment; (4) failure to provide post-intervention evaluation data.

The sample size was calculated based on the dual primary endpoints of swallowing function (SSA) and oral feeding ability (FOIS). Using an anticipated medium effect size (Cohen's d = 0.8) derived from prior pilot data and similar rehabilitation studies, with a two-tailed $\alpha = 0.05$ and power $(1–\beta) = 0.90$, the minimum required sample size per group was 27. To account for potential attrition, 30 patients were enrolled per group, resulting in a total of 60 participants.

Eligible patients were randomly assigned in a 1:1 ratio to either the intervention group (LEARNS-based health education) or the control group (standard health education). The flow of participant enrollment, allocation, follow-up, and analysis is shown in Figure 1. The randomization sequence was generated by an independent research assistant using a computer-generated random number table Allocation was concealed using sequentially numbered, opaque, sealed envelopes, which were opened by the recruiting nurse only after baseline assessments and written informed consent were completed.

There were no significant differences between the two groups in operative approach, nutritional tube type, or perioperative management ($P > 0.05$), indicating baseline comparability. Details are presented in Table 1.

Intervention Methods

Control Group

A structured and comprehensive swallowing training program was administered to thoracic surgery patients following radical resection for esophageal cancer, as documented in.[12] Upon admission, nurses provided a one-time oral education session (approximately 15 min) to the patient and family. Throughout the perioperative period, designated nurses delivered daily bedside instruction and supervision (about 10 min per session) to support swallowing training. No structured follow-up was provided after discharge; however, patients were invited to join a WeChat group ("Thoracic Surgery Esophageal Cancer Group A") for receipt of general educational materials without individualized interaction.

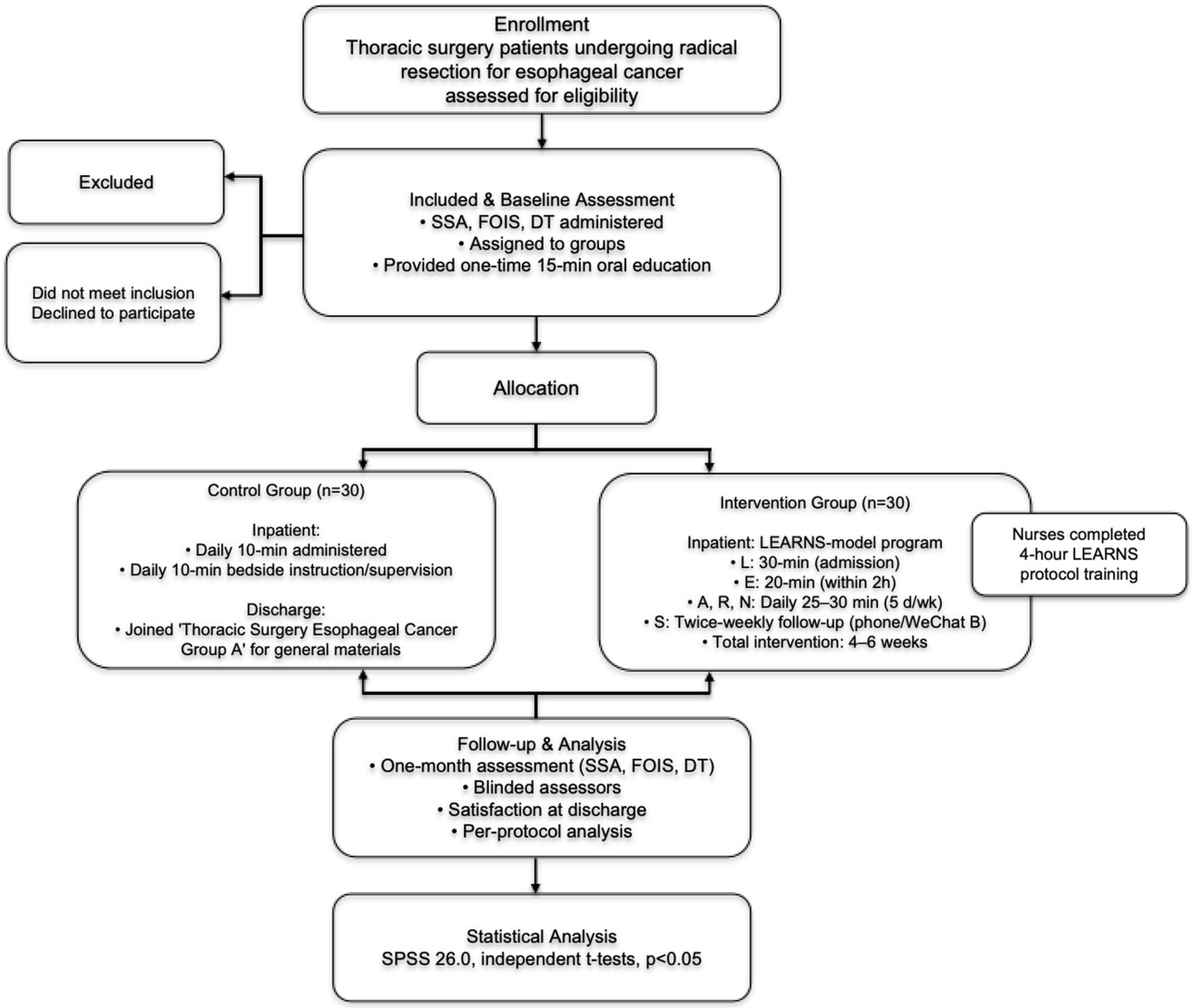

Figure 1 Study flow diagram of participant enrollment, randomization, follow-up, and analysis.

Intervention Group

Patients in the intervention group received a LEARNS-model-based health education program, which was delivered by a trained nurse team. The intervention was structured according to the six steps of the LEARNS model and implemented as follows: Listen (L): At admission assessment, one 30-min session to identify patient needs and preferences. Establish (E): Within 2 h after admission, one 20-min session to build partnership and co-develop a personalized swallowing training plan. Adopt, Reinforce, Name (A, R, N): During hospitalization, once-daily sessions (25–30 min each, 5 days per week) involving multi-channel education (eg, videos, illustrated manuals, hands-on coaching) and continuous feedback. Strengthen (S): After discharge, twice-weekly follow-up (15–20 min per session) for one month via telephone or the dedicated WeChat group ("Thoracic Surgery Esophageal Cancer Group B"), with personalized guidance and reinforcement. Total intervention duration was approximately 4–6 weeks. A detailed overview of the implementation strategy is provided in Table 2.

Quality Control

To ensure methodological rigor, both groups followed the same staged swallowing training program as the educational framework. A dedicated health education strategy based on the LEARNS model was developed for postoperative swallowing rehabilitation and refined through literature review, expert consultation, and team discussion to ensure clarity and feasibility. All nurses in the intervention group completed a standardized 4-hour training workshop on the LEARNS protocol, and

Table 1 Baseline Demographic and Clinical Characteristics of the Control and Intervention Groups

Groups		Control Group	Intervention Group	Statistics	P value
Number of participants (n)		30	30		
Gender	Man	24	21	$\chi2$=0.800	0.371
	Woman	6	9		
Age (year)		65.16±6.98	65.50±7.05	t=−1.494	0.135
Educational background	High school or above	16	11	$\chi2$=1.684	0.194
	Junior high school and below	14	19		
Marital status	Married	22	17	$\chi2$=1.832	0.176
	Unmarried, divorced or widowed	8	13		
Type of nutrient tube	Nasointestinal tube	23	25	$\chi2$=0.417	0.519
	Stomal stoma tube	7	5		
Modus operandi	One incision	2	1	Z=−0.745	0.459
	Two incisions	3	3		
	Three incisions	25	26		

Table 2 LEARNS Model-Based Health Education Implementation Strategy for Swallowing Training in Postoperative Esophageal Cancer Patients

Strategy	Implementation Node	The Specific Connotation of Strategy Implementation
Listen	During admission assessment	The attending nurse welcomes patients in a calm environment, using gentle communication to ease anxiety and promote relaxation. Through a structured interview, the nurse listens to patients' care needs and gathers important information about their health status and preferred education methods, documenting it in their health file. The nurse also evaluates the patient's swallowing, eating ability, and psychological condition with standard tools. Patients are encouraged to follow our department's WeChat account and join the "Thoracic Surgery Esophageal Group B" via QR code.
Establish	Within 2 hours of admission	The nurse evaluates the patient's condition and forms a trusting partnership to explain the swallowing training program for esophageal cancer surgery patients. They encourage active patient involvement in creating a personalized perioperative swallowing training strategy, collaboratively deciding on education methods. The nurse collects feedback and adjusts the plan as needed, maintaining a goal-oriented therapeutic relationship throughout.
Adopt	Duration of hospital stay	Customize the timing and duration of swallowing therapy sessions based on patients' educational backgrounds and preferred learning methods. Use a multi-channel health education strategy that includes short videos, multimedia demonstrations, illustrated manuals, WeChat discussions, official account content, and hands-on coaching. This patient-centered approach emphasizes monitoring knowledge retention and optimizing learning experiences for effective outcomes. Continuously refine plans by assessing patients' responses to educational programs.
Reinforce	Duration of hospital stay	Nurses actively participate in implementing the swallowing training program, selecting strategies based on patients' understanding and acceptance, and enhancing their knowledge through Q&A sessions.
Name	Duration of hospital stay	Swallowing therapy sessions should be conducted in a supportive and stress-free environment, with consistent encouragement for patients. Nurses should avoid evaluative language and encourage open communication about any uncertainties. Use feedback methods like Teach-back, goal-oriented instruction, and the ask-tell-ask cycle to ensure patients understand the therapy protocol.

(*Continued*)

Table 2 (Continued).

Strategy	Implementation Node	The Specific Connotation of Strategy Implementation
Strengthen	Patients began eating orally until one month after discharge	Since patients may forget or misremember concepts, nurses should reinforce and review information before introducing new topics. After discharge, patients can choose follow-up methods such as phone consultations, WeChat discussions, online consultations, or home care. Nurses monitor patients' dietary habits, including food variety and texture.

adherence was monitored using a step-specific checklist. To prevent cross-group contamination, patients were assigned to separate wards, and distinct WeChat groups ("Group A" for control, "Group B" for intervention) were used, with educational materials strictly limited to the assigned group. One month after discharge, all participants were followed up via their preferred communication method. Outcome assessment and data entry were performed by two nurses per group who were not involved in intervention delivery, and the project leader supervised the entire process to resolve uncertainties and ensure consistency.

Evaluation Method

Assessments were conducted at baseline (pre-intervention) and one month after discharge. The one-month time point was chosen because it represents a critical early recovery phase when swallowing patterns are being re-established and psychological adjustment is actively occurring, consistent with common follow-up timelines in post-esophagectomy rehabilitation research. Additionally, the satisfaction with health education was evaluated on the day of discharge. Due to the nature of the behavioral intervention, participants and care providers were not blinded. However, outcome assessors (two nurses who performed the SSA, FOIS, and DT evaluations at follow-up) were blinded to group allocation.

Swallowing Function Assessment

The standardized swallowing assessment (SSA)[17] was used to evaluate swallowing function. The SSA has been widely applied in clinical dysphagia screening and has demonstrated acceptable reliability and validity in different patient populations, including postoperative patients. It included: 1) Assessing consciousness, head and trunk control, lip closure, breathing, speech, choking, and coughing, scored 8–23 points. 2) The patient swallowed 5 mL of water three times, checking for drooling, swallowing movements, breathlessness, choking, or voice changes, scored 5–11 points. If two attempts were normal, the test continued. 3) The patient then swallowed 60 mL of water, observing for complete drinking, breathlessness, and voice changes, scored 5–12 points. Lower scores indicated better swallowing ability.

Feeding Capacity Assessment

The Functional Oral Intake Scale (FOIS)[18] assesses feeding ability on a scale from 1 to 7. Levels 1–3 require tube feeding, while levels 4–7 allow for oral intake without tube feeding. Higher scores indicate better feeding capacity.

Psychological Distress Assessment

The Distress Thermometer (DT), originally developed by Roth et al[19] in 1998, is a visual analog self-assessment tool featuring a single-item format. This instrument allows patients to quantify their psychological distress on a scale from 0 to 10, with 0 denoting an absence of distress and 10 signifying extreme psychological distress. The scoring system exhibits a direct correlation between numerical values and the intensity of psychological suffering.

Satisfaction with Health Education

A custom-designed satisfaction questionnaire was employed, encompassing three dimensions: health education delivery (including environmental implementation, timing, and methods), health education experience (focusing on nurses' teaching attitude, tone, and language), and perceived effectiveness of health education (assessing satisfaction with current swallowing status, eating habits, and Psychological distress). The questionnaire comprises 9 items, each rated on a 3-point scale: "very satisfied" (3 points), "satisfied" (2 points), "neutral" (1 point), and "dissatisfied" (0 points). The total score ranges from 0 to 27 points, with higher scores indicating greater satisfaction. The Cronbach's α coefficient for this questionnaire was 0.873. The

self-designed satisfaction questionnaire was developed based on a literature review and expert consultation (three nursing professors and two clinical specialists). Face validity and clarity were assessed through a pilot test with five postoperative patients (not included in the main study).

Statistical Analysis

Data were entered using Epidata 3.1 and analyzed with SPSS 26.0 (IBM Corp., Armonk, NY, USA). Continuous variables were assessed for normality using the Shapiro–Wilk test and for homogeneity of variances using Levene's test prior to parametric analyses. As all outcome variables met the assumptions for parametric testing, data are presented as mean ± standard deviation (SD), and between-group comparisons were performed using independent samples t-tests.

In addition to P-values, effect sizes were calculated using Cohen's d based on pooled standard deviations and interpreted as small (0.2), moderate (0.5), or large (0.8). Where appropriate, 95% confidence intervals (CIs) were reported to indicate the precision of the estimated effects.

All randomized participants completed the one-month follow-up assessment for the primary outcomes, and no missing data were observed. Therefore, analyses were conducted using a per-protocol approach. A two-sided P-value of less than 0.05 was considered statistically significant.

Trial Registration and Reporting Guidelines

This randomized controlled trial was not prospectively registered in a public clinical trial registry. This is acknowledged as a limitation of the study. The design, conduct, and reporting of the study were guided primarily by the Consolidated Standards of Reporting Trials (CONSORT) 2010 statement for randomized controlled trials. In addition, given the behavioral and educational nature of the intervention, relevant elements of the TREND (Transparent Reporting of Evaluations with Nonrandomized Designs) statement were considered to improve the transparency of intervention description and implementation.

Results

At one month after discharge, patients in the intervention group demonstrated significantly better swallowing safety, oral intake ability, and psychological status than those in the control group (Table 3). The improvement in swallowing function (SSA score) corresponded to a small-to-moderate effect size (Cohen's d = 0.44), while oral intake ability assessed by FOIS showed a small effect (Cohen's d = 0.26). In addition, psychological distress measured by the Distress Thermometer was significantly reduced in the intervention group, with a moderate effect size (Cohen's d = 0.56).

Regarding satisfaction with health education, the intervention group reported consistently higher scores across all dimensions compared with the control group (Table 4). Notably, the between-group difference in total satisfaction score

Table 3 Post-Intervention Outcomes: Swallowing Function, Oral Intake Ability, and Psychological Distress in the Control and Intervention Groups

Group	Control Group	Intervention Group	t	P
Number of participants (n)	30	30		
Swallowing function (SSA score) (score, mean ± SD)	23.34±2.42	21.86±4.13	8.022	<0.05
Oral intake ability (FOIS score) (score, mean ± SD)	6.92±1.44	7.25±1.07	−2.616	<0.05
Psychological distress (DT score) (score, mean ± SD)	6.38±1.30	5.45±01.94	5.081	<0.05

Notes: Data are presented as mean±standard deviation (SD). Between-group comparisons were performed using independent samples t-tests. Effect sizes were calculated using Cohen's d based on pooled standard deviations. Cohen's d values of 0.2, 0.5, and 0.8 were interpreted as small, moderate, and large effects, respectively. The effect size for swallowing function (SSA) was d = 0.44 (small-to-moderate effect), for oral intake ability (FOIS) was d = 0.26 (small effect), and for psychological distress (DT) was d = 0.56 (moderate effect).

Abbreviations: SSA, Standardized Swallowing Assessment; FOIS, Functional Oral Intake Scale; DT, Distress Thermometer.

Table 4 Comparison of Health Education Satisfaction Scores Between the Control and Intervention Groups

Group	Control Group	Intervention Group	*t*	*P*
Number of participants (n)	30	30		
Health education delivery (score, mean ± SD)	5.50±2.05	7.57±1.07	−4.898	<0.05
Health education experience (score, mean ± SD)	6.27±1.86	7.43±0.97	−3.051	<0.05
Perceived effectiveness of health education (score, mean ± SD)	5.63±2.39	6.90±0.88	−2.727	<0.05
Total satisfaction score	17.40±3.38	21.90±1.86	−6.387	<0.05

Notes: Data are presented as mean±standard deviation (SD). Between-group comparisons were conducted using independent samples t-tests. Effect sizes were calculated using Cohen's d based on pooled standard deviations. The total health education satisfaction score demonstrated a large effect size (Cohen's d = 1.63), indicating a substantial perceived benefit of the LEARNS model–based health education program compared with standard education.

demonstrated a large effect size (Cohen's d = 1.63), indicating a substantial perceived benefit of the LEARNS model–based health education program.

These between-group differences were accompanied by small-to-moderate effect sizes, supporting the potential clinical relevance of the findings.

Discussion

In line with the study objectives, this study found that LEARNS model–based health education was associated with improved swallowing-related outcomes, reduced psychological distress, and higher satisfaction with health education during the early postoperative recovery period. The magnitude of these effects varied across outcome domains, with small-to-moderate effects observed for functional and psychological outcomes and a large effect observed for satisfaction with health education.

Regarding functional rehabilitation, the intervention achieved clinically meaningful gains in swallowing safety through optimized patient engagement and knowledge translation. Given that 22% of post-esophagectomy patients experience dysphagia and 15% require hospitalization for aspiration pneumonia,[20] swallowing capacity is critical for postoperative recovery. Our intervention group showed significantly better swallowing function than controls, attributable to the model's core strategies: Establishing collaborative nurse-patient partnerships enabled personalized training plans, while multi-channel education (videos, illustrated manuals, WeChat interactions, and hands-on coaching) accommodated diverse learning preferences. Crucially, feedback mechanisms like Teach-back ensured proper technique mastery. By continuously adapting to patients' educational backgrounds and real-time feedback, the intervention transformed passive recipients into active participants – directly addressing the root causes of dysphagia and achieving safe feeding objectives. These findings align with the model's success in improving health literacy among colonoscopy outpatients, tuberculosis patients, and primiparous women.[21–23] The LEARNS model is a guided health education approach that personalizes and empowers patients through establishing strong partnerships and tailored teaching methods. This stimulates learning motivation and fosters self-directed participation. Each implementation node of the model's strategies considers patient needs and preferences, integrating feedback-oriented health education throughout the process to enhance learning outcomes. In this study, patients were treated as independent individuals, and personalized LEARNS health education strategies were developed according to patients "personality and preferences. During the implementation of strategies, attention was paid to patients" acceptance, feedback and effect after education, so as to ensure that patients could implement and master the movements of swallowing training, so as to achieve the purpose of safe feeding. Rather than intensifying swallowing training itself, the LEARNS model may facilitate functional recovery by optimizing the educational process through individualized goal setting, multimodal teaching strategies, and continuous feedback, thereby supporting patients' understanding and adherence to swallowing rehabilitation.

Beyond functional metrics, the intervention exerted significant salutary effects on psychological well-being. The National Comprehensive Cancer Network (NCCN) describes "psychological distress" as negative emotional experiences stemming

from various psychological, social, or mental health factors, including both general and abnormal psychological issues. It is recommended as a screening tool for cancer patients.[24] Our study showed that patients in the intervention group had significantly higher DT scores than those in the control group ($P<0.05$). Postoperative dysphagia, common in esophageal cancer patients due to gastrointestinal reconstruction, often causes psychological distress.[7,25] Research shows that improving patients' understanding of their disease enhances their psychological well-being during rehabilitation. Educators with a friendly approach can reduce negative emotions.[26] By emphasizing respectful communication, non-judgmental interactions, and collaborative decision-making, the LEARNS model may help patients develop a greater sense of control and self-efficacy during recovery. Improved understanding of swallowing rehabilitation and clearer expectations regarding postoperative adaptation may, in turn, mitigate anxiety and distress. Importantly, these findings suggest an association between patient-centered education and psychological well-being, rather than a direct causal effect.

Among all assessed outcomes, satisfaction with health education showed the largest between-group difference, highlighting the particular relevance of the LEARNS model for patient-centered nursing practice. The LEARNS model emphasizes a patient-centered approach through nurse-patient collaboration, offering personalized guidance instead of traditional lectures. This tailored method better meets patient needs, making them feel valued and enhancing their experience. Recently, the LEARNS model has gained popularity in clinical health education. Its six stages allow nurses to adjust training based on patient feedback, making it more effective and acceptable than traditional methods. Throughout the study, nurses followed the LEARNS model's "patient-centered" philosophy. Upon admission, the emphasis was placed on cultivating an interactive environment and discerning patients' preferences for health education, thereby ensuring they felt valued. During the implementation phase, nurses prioritized patient experience and the efficacy of training, transitioning patients from passive recipients to active learners. Subsequent post-training follow-up care and reinforcement significantly enhanced patients' comprehension of swallowing techniques, ultimately achieving the objectives of safe feeding. This comprehensive health education and training model contributes to maintaining a positive and stable mood among patients during the rehabilitation period and enhances their satisfaction with the health education provided.

This study has several limitations that should be considered when interpreting the findings. First, due to the nature of the educational intervention, neither participants nor nurses could be blinded, which may have introduced performance or response bias. Second, the follow-up period was limited to one month after discharge, precluding assessment of medium- and long-term sustainability of the observed benefits. Third, swallowing outcomes were assessed using clinical screening tools rather than objective instrumental measures such as videofluoroscopic swallow studies or fiberoptic endoscopic evaluation of swallowing. Finally, as a single-center study with a relatively small sample size, the generalizability of the findings may be limited. Future multicenter studies with longer follow-up and objective outcome measures are warranted. In addition, the study was not prospectively registered in a clinical trial registry, which may limit transparency and should be addressed in future studies.

In summary, this study suggests that LEARNS model–based health education is associated with favorable functional, psychological, and experiential outcomes in postoperative esophageal cancer patients, particularly with regard to patient satisfaction and engagement during early recovery.

Conclusion

Within the limitations of this single-center, short-term randomized study, the findings suggest that health education based on the LEARNS model is associated with improvements in swallowing-related outcomes, psychological distress, and satisfaction with health education among postoperative esophageal cancer patients during the early recovery period.

From a clinical perspective, the LEARNS model may serve as a practical framework for nursing-led health education by promoting patient engagement, individualized instruction, and continuous feedback throughout hospitalization and early post-discharge care. Its application may be particularly valuable in supporting swallowing rehabilitation and enhancing patients' educational experience following esophagectomy.

In terms of nursing education, these findings support the integration of structured, patient-centered educational models such as LEARNS into training programs for thoracic surgery nurses, with emphasis on communication skills, shared decision-making, and reinforcement strategies.

Future research should aim to validate these findings through multicenter studies with larger sample sizes and longer follow-up periods. Incorporating objective swallowing assessments and evaluating the sustainability of functional and psychological outcomes over time would further clarify the long-term effectiveness and generalizability of LEARNS model–based interventions.

Ethics Approval and Consent to Participate

This study was conducted according to the Declaration of Helsinki and approved by the ethic committee of Tongji Medical College of Huazhong University of Science & Technology with the approval number TJ-IRB20221273. All human participants involved in this study have voluntarily signed an informed consent form after being fully informed of the content, purpose, procedures, and potential risks of the study. They are also clearly aware of their rights to participate in the study and the right to withdraw from the study at any time.

Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

Disclosure

All authors declare no conflict of interest.

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