The Impact of PDCA Continuous Quality Improvement on Managing Elderly Patients with Dysphagia

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Abstract: *Objective:* To investigate the effect of PDCA continuous quality improvement on the management of elderly patients with dysphagia. *Methods:* Sixty elderly patients with dysphagia admitted to a hospital between June 2024 and May 2025 were selected and randomly divided into a control group (*n*=30) and an observation group (*n*=30) using the mean score method. The control group received routine clinical management. The observation group additionally implemented the Plan-Do-Check-Act (PDCA) continuous quality improvement management. The incidence of aspiration, improvement rate of swallowing function, and patient satisfaction were compared between groups. *Results:* After intervention, the aspiration incidence in the observation group was 6.67%, significantly lower than the control group's 30.300% ($P < 0.05$). The overall improvement rate in swallowing function in the observation group was 96.67%, significantly higher than the 73.33% in the control group ($P < 0.05$); The overall satisfaction rate in the observation group was 100%, significantly higher than the 73.33% in the control group ($P < 0.05$). *Conclusion:* Applying the PDCA cycle to the clinical management of elderly patients with dysphagia effectively reduces aspiration risk, promotes recovery of swallowing function, and significantly enhances patient and family satisfaction, demonstrating positive value for widespread implementation.

Keywords: PDCA cycle; Dysphagia in the elderly; Continuous quality improvement; Aspiration; Swallowing function

1. Introduction

With the acceleration of global aging, significant changes have occurred in population structure, with the proportion of elderly individuals steadily increasing. According to United Nations projections, by 2050, the global population aged 65 and above will reach 1.5 billion, accounting for 16% of the total global population [1]. Elderly individuals are prone to dysphagia due to weakened pharyngeal and esophageal motility, diminished muscular function in tissues such as the oral cavity and pharynx, and reduced sensitivity of nerve reflexes. This condition not only directly impairs normal eating, leading to malnutrition, but also increases aspiration risk,

potentially causing serious complications like aspiration pneumonia and chronic lung disease [1–2]. In traditional management models for elderly dysphagia patients, healthcare providers implement routine interventions like dietary guidance and swallowing exercises. However, these measures often lack systematic and continuous quality improvement mechanisms, resulting in incomplete assessments, insufficiently targeted interventions, and inadequate quality monitoring. Consequently, they struggle to meet the growing management needs of elderly dysphagia patients. PDCA (Plan-Do-Check-Act) management, as a continuous quality improvement tool, establishes a closed-loop feedback mechanism through the dynamic cycle of "plan-execute-check-improve." This approach enables continuous problem identification, process optimization, and service quality enhancement [3]. Zhao Xiaonan and colleagues found that implementing PDCA continuous quality improvement management in blood collection rooms enhanced work efficiency, reduced adverse event rates, improved puncture success rates, and increased patient satisfaction [4]. Sun Li and colleagues applied the PDCA management model in nursing care for acute cerebral infarction patients with dysphagia [5]. Their practice-based research demonstrated that the PDCA model not only improved nursing service quality and reduced adverse event risks but also effectively promoted patients' swallowing function recovery. This study will conduct a clinical trial to thoroughly investigate the application effectiveness of the PDCA continuous quality improvement model in the clinical management of elderly patients with dysphagia. It aims to evaluate its impact on reducing aspiration incidence, improving swallowing function, and enhancing patient satisfaction. The objective is to provide more scientific and effective management approaches for elderly patients with dysphagia, thereby improving both the quality of care and patients' quality of life.

2. Materials and methods

2.1. General data

A total of 60 elderly patients with dysphagia admitted to a certain hospital between June 2024 and May 2025 were selected. Inclusion criteria: age $\geq$ 60 years, confirmed dysphagia via the Wada drinking test or barium swallow examination. Exclusion criteria: severe cognitive impairment, malignant tumors, or cardiopulmonary failure. Patients were randomly assigned to a control group and an observation group (n=30 each) using the mean value method. The control group comprised 18 males and 12 females with a mean age of 72.21 $\pm$ 3.23 years. Etiologies included stroke (15 cases), Parkinson's disease (8 cases), and Alzheimer's disease (7 cases). The observation group included 16 males and 14 females with a mean age of 71.84 $\pm$ 4.90 years. Causes: 14 cases of stroke, 9 cases of Parkinson's disease, and 7 cases of Alzheimer's disease. There were no significant differences in baseline characteristics between the two groups ($P > 0.05$), indicating comparability.

2.2. Methods

2.2.1. Control group implemented routine clinical management

(1) Basic care: Monitored vital signs, guided positioning, oral hygiene, and nutritional support; (2) Dietary intervention: Adjusted food consistency based on swallowing ability, avoiding hard, dry, or liquid foods; (3) Health education: Verbally explained precautions for dysphagia and aspiration prevention methods.

2.2.2. Observation group

Implemented PDCA continuous quality improvement management on top of routine care, following these steps:

(1) Planning Phase (Plan): 1) Identify bottlenecks in managing suspected dysphagia and swallowing dysfunction through medical record analysis, patient satisfaction surveys, and healthcare staff interviews, pinpoint root causes, implement timely interventions, and prevent escalation. 2) Set objectives: a. Enhance patients' and families' awareness and self-management capabilities regarding dysphagia management; b. Improve healthcare professionals' swallowing expertise and professional conduct, optimize dysphagia treatment protocols, and reduce complication rates from swallowing disorders; c. Implement a management model emphasizing prevention, integrated prevention and treatment, comprehensive care, and post-discharge follow-up; d. Develop standardized workflows for swallowing function assessment, intervention, rehabilitation, and monitoring to achieve consistent management.

(2) Implementation Phase (Do): 1) Standardized Assessment: Within 24 hours of admission, complete the Watanabe Water Swallowing Test and VFSS (Video Fluoroscopic Swallowing Study). Document dysphagia severity and develop personalized rehabilitation plans. 2) Rehabilitation Training: Therapists administer twice-daily sessions using swallowing therapy devices and transcranial magnetic stimulation equipment to progressively enhance swallowing muscle strength and flexibility. Concurrently, family members receive home support education covering dysphagia risks and fundamental home management principles, supplemented by weekly WeChat follow-up support.

(3) Check Phase: Collect data on patient aspiration frequency, changes in swallowing function scores, and satisfaction levels. Identify key issues through data comparison to inform improvement strategies.

(4) Improvement Phase (Action): 1) Standardization: Revise management protocols based on assessment results and establish a standardized rapid evaluation process for future implementation and application. 2) Management Protocol Enhancements: a. Provide families with detailed rehabilitation knowledge manuals and conduct regular online rehabilitation education sessions;b. Establish a WeChat group for post-discharge swallowing disorder home monitoring to facilitate timely communication, feedback, planning, and adjustment of home rehabilitation methods with families and patients; c. Incorporate video support into follow-up care to enable prompt feedback on patients' actual rehabilitation progress. 3) Next-Step Plan Cycle: Integrate successful experiences and lessons learned from this PDCA cycle into standardized operating procedures for gradual implementation in subsequent management. Identify unresolved issues as improvement themes for the next PDCA cycle to ensure continuous optimization.

2.3. Observation indicators

(1) Aspiration Incidence Rate: Record aspiration events (e.g., choking, dyspnea) caused by food/fluid intake during hospitalization in both groups. Calculate the incidence rate = number of aspiration events / total number of patients × 100%.

(2) Swallowing Function Improvement Rate: Assess patient swallowing function improvement using the Standardized Swallowing Assessment (SSA) and the Choppa Test before intervention and 4 weeks post-intervention. Efficacy Criteria: Cure: Choppa Test improves to Grade 1, significant decrease in SSA score, able to eat safely; Effective: Water swallow test improved by at least one grade, SSA score decreased, dysphagia symptoms alleviated; Ineffective: No change or worsening in grade. Overall improvement rate = (Number of cured cases + Number of effective cases) / Total number of cases × 100%.

(3) Patient satisfaction: A self-designed questionnaire assessed patient satisfaction. Overall satisfaction rate = Number of satisfied patients / Total number of patients × 100%.

2.4. Statistical methods

Data analyzed using SPSS 23.0 software. Count data expressed as rates (%), analyzed with chi-square (x^2) test; continuous data expressed as mean ± SD ($\overline{x}$± s), analyzed with t-test. $P < 0.05$ indicated a significant difference.

3. Results

3.1. Comparison of aspiration incidence between groups

Two cases of aspiration occurred in the observation group (6.67%), while nine cases occurred in the control group (30.00%) (**Table 1**). The difference between groups was statistically significant ($P < 0.05$).

Table 1. Comparison of aspiration incidence between groups [n(%)]

Group	Aspiration Occurrence	Incidence Rate
Observation Group (*n*=30)	2	6.67%
Control group (*n*=30)	9	30.00%
x^2		5.455
P		0.019

3.2. Comparison of swallowing function improvement rates between the two groups

After 4 weeks of intervention, the total effective rate of swallowing function improvement in the observation group (96.67%) was significantly higher than that in the control group (73.33%), with a statistically significant difference ($P < 0.05$) (**Table 2**).

Table 2. Comparison of swallowing function improvement between groups [n(%)]

Group	Cured	Effective	No Improvement	Overall Response Rate
Control Group (*n*=30)	5 (16.67)	17 (56.67)	8 (26.67)	22 (73.33)
Observation group (*n*=30)	12 (40.00)	17 (56.67)	1 (3.33)	29 (96.67)
x^2				4.706
P				0.030

3.3. Comparison of patient satisfaction between groups [n(%)]

The satisfaction survey results showed that the satisfaction rate in the observation group was (30/30) 100.00%, significantly higher than that in the control group (23/30, 76.67%), with a statistically significant difference ($P < 0.05$) (**Table 3**).

Table 3. Comparison of patient satisfaction between groups

Group	Very Satisfied	Satisfied	Dissatisfied	Satisfaction Rate
Control Group (n=30)	13 (43.33)	10 (33.33)	7 (23.33)	23 (76.67)
Observation group (n=30)	21 (70.00)	9 (30.00)	0	30 (100)
x^2				5.822
P				0.016

4. Discussion

Dysphagia is a prevalent syndrome among the elderly, directly impacting patients' nutritional intake and increasing aspiration risks. Conventional management often focuses on symptom control while neglecting dynamic monitoring of outcomes and feedback mechanisms, failing to meet patients' needs for refined, systematic care [6]. PDCA management establishes a dynamic, sustainable system for enhancing management quality through its closed-loop "Plan-Do-Check-Act" cycle. This creates a virtuous cycle of "problem identification-resolution-experience consolidation-continuous optimization", enabling a spiral of improvement in management quality.

This study demonstrates that PDCA continuous quality improvement management significantly enhances swallowing function and reduces aspiration risk in elderly patients with dysphagia. First, the PDCA model precisely identifies management weaknesses through root cause analysis. By implementing standardized feeding protocols, positional management, and targeted rehabilitation training, it establishes robust defenses against aspiration, thereby lowering patient risk [7]. Second, the "individualized treatment plan" principle within the PDCA model ensures precise alignment of rehabilitation measures with patients' functional impairments. Combined with daily, scheduled, and supervised rehabilitation training, this significantly enhances management effectiveness [8]. Finally, under the PDCA continuous quality improvement framework, healthcare providers deliver systematic health education, enabling patients to genuinely comprehend geriatric dysphagia knowledge and cooperation essentials, thereby enhancing self-management capabilities and security [9–10]. Furthermore, standardized training further strengthens healthcare professionals' technical skills and service standardization, ultimately earning patients' deep trust.

5. Conclusion

In summary, applying the PDCA continuous quality improvement model to the management of elderly dysphagia patients systematizes and standardizes fragmented management measures, forming a self-improving virtuous cycle. This approach not only effectively reduces aspiration risks and improves patients' swallowing function but also significantly enhances patient satisfaction. However, this study is a single-center investigation with a limited sample size and a relatively short observation period. Future multi-center, large-sample, long-term follow-up studies are warranted to further validate the long-term benefits of this model.

Disclosure statement

The authors declare no conflict of interest.

References

[1] Yan XJ, Chen JH, 2025, Application of Aspiration Risk Assessment-guided Rehabilitation Training Combined with Anxiety-identification Nursing in Elderly Patients with Dysphagia Following Intracerebral Hemorrhage. Medical Theory and Practice, 38(20): 3556–3558.

[2] Chen YX, Lin YL, Huang QW, et al., 2025, Scope Review of Longitudinal Studies on Dysphagia in Community-dwelling Older Adults. Military Nursing, 42(10): 79–82.

[3] Ma J, Wang YX, Hu HJ, et al., 2025, Factors Influencing Frailty in Elderly Individuals with Post-Stroke Dysphagia in Nursing Homes and Construction of a Risk Prediction Model. Modern Health Preservation, 25(17): 1335–1341.

[4] Zhao XN, Fu Y, Yang J, et al., 2025, Impact of PDCA Continuous Quality Improvement Management on Blood Collection Room Efficiency in Oncology Hospitals. Heilongjiang Medicine, 38(4): 965–967.

[5] Sun L, Kang TT, Zhao D, et al., 2025, Practice of PDCA Management Model in Nursing Care for Patients with Dysphagia Following Acute Cerebral Infarction. Jiangsu Health Management, 36(4): 512–515.

[6] Liu JL, Wen XY, Zhang HY, et al., 2025, Application Effectiveness of Evidence-Based Nursing in Rehabilitation Training for Elderly Patients with Dysphagia. Contemporary Medical Forum, 23(23): 151–153.

[7] Wang Q, Zhou Q, 2023, Application Value of the FOCUS-PDCA Continuous Quality Improvement Program in Nursing Care for Elderly Cerebral Infarction Patients with Dysphagia. Journal of Modern Chinese-Western Medicine Integration, 32(21): 3063–3066.

[8] Ji YH, Chang ZW, 2021, Effects of PDCA Nursing Intervention on Stigma and Quality of Life in Stroke Patients with Dysphagia. Contemporary Chinese Medicine, 28(35): 227–230.

[9] Li ZJ, Zhao YH, Yu MX, et al., 2024, Interpretation of Guidelines and Expert Consensus on Dysphagia in the Elderly from a Full-Cycle Rehabilitation Perspective. Chinese Medical Journal, 59(11): 1194–1196.

[10] Zhang L, Xu TT, 2024, Application Effectiveness of Failure Mode and Effects Analysis in Preventing Aspiration Pneumonia Among Patients with Post-Stroke Dysphagia Undergoing Intermittent Oral-to-Esophageal Tube Feeding. Clinical Medical Research and Practice, 9(4): 171–174.