Social Medicine and Health Management (2026)
Clausius Scientific Press, Canada

DOI: 10.23977/socmhm.2026.070118
ISSN 2616-2210 Vol. 7 Num. 1

The impact of individualized nutritional care guided by NRS-2002 screening on the rehabilitation process and complications in stroke patients with dysphagia

Hu Xueying

TAIHE Hospital, Shiyan, Hubei, 442000, China

Keywords: Stroke; Dysphagia; NRS-2002; Nutritional care; Complications

Abstract: This study aimed to explore the influence of individualized nutritional care guided by Nutritional Risk Screening 2002 (NRS-2002) on rehabilitation progress and complication incidence in stroke patients complicated with dysphagia. A total of 40 eligible patients admitted to our hospital from January 2025 to January 2026 were randomly divided into the observation group and the control group, with 20 cases in each group. The control group received routine nutritional support, while the observation group adopted targeted individualized nutritional care on the basis of NRS-2002 risk assessment. Relevant indicators including nutritional status, swallowing function, complication rate and quality of life were compared between the two groups before and after intervention. After 3 months of intervention, the levels of serum albumin and hemoglobin in the observation group were significantly higher than those in the control group, the scores of Standard Swallowing Assessment (SSA) were improved more obviously, the incidence of aspiration pneumonia and malnutrition was markedly reduced, and the scores of quality of life were also higher than those of the control group, with all differences being statistically significant ($P<0.05$). It is concluded that carrying out individualized nutritional care according to NRS-2002 screening results can effectively improve the nutritional status of stroke patients with dysphagia, accelerate the recovery of swallowing function, reduce the occurrence of various complications and improve patients' quality of life, which is worthy of clinical promotion.

1. Preface

The disability and mortality rates of stroke remain high worldwide. Dysphagia is a common complication after stroke, which directly interferes with patients' nutrient intake, easily induces severe complications such as aspiration pneumonia, prolongs hospital stay, increases medical expenses, and seriously affects patients' prognosis and quality of life[1]. Malnutrition will further increase the risk of infection and slow down the rehabilitation process, resulting in adverse clinical outcomes. The European Society for Parenteral and Enteral Nutrition recommends Nutritional Risk Screening 2002 (NRS-2002) as a standardized nutritional risk assessment tool, which features simple operation, high accuracy, good sensitivity and specificity[2]. At present, most clinical staff adopt unified nutritional intervention schemes for stroke patients with dysphagia, without formulating personalized nursing

plans based on standardized nutritional assessment[3]. This mode cannot meet the individual nutritional needs of patients and adversely affects the rehabilitation effect. Therefore, this study mainly discusses the application effect of NRS-2002-guided individualized nutritional care in stroke patients with dysphagia, so as to provide reference for clinical rehabilitation and complication prevention.

2. Materials and Methods

2.1 General Information

Patients with stroke-related dysphagia who received inpatient care at the neurology department and rehabilitation department of our hospital between January 2025 and January 2026 were selected for this research. A computer-generated random number table was used to split eligible participants into two groups in a 1:1 ratio. There were 20 people in the observation group, and 20 people in the control group. Statistical personnel who did not participate in the study kept the randomization sequence, and stored allocation results in sealed light-proof envelopes. In the control group, there were 22 men and 18 women. Their ages ran from 41 to 78 years, and the average age was 62.31 ± 8.53 years. The duration of the disease ran from 1 to 7 days, and the average duration was 3.21 ± 1.53 days. Thirty-one patients had ischemic stroke, and nine had hemorrhagic stroke. In the observation group, there were 23 men and 17 women. Their ages ran from 40 to 79 years, and the average age was 61.84 ± 8.95 years. The duration of the disease ran from 1 to 6 days, and the average duration was 3.02 ± 1.34 days. Baseline characteristics of the two groups showed no statistically significant difference, $P > 0.05$.

Inclusion criteria include six items. First, patients need to meet the diagnostic criteria written in the "China Guidelines for Diagnosis and Treatment of Stroke" [4], and have a confirmed stroke diagnosis through CT or MRI. Second, dysphagia is confirmed through standard swallowing function assessment, which is also called SSA, and the SSA score is no less than 25 points. Third, the onset of stroke is within 2 weeks. Fourth, patients' age falls between 40 years and 80 years. Fifth, patients stay conscious and can cooperate with relevant examinations. Sixth, patients have signed an informed consent form.

Exclusion criteria: (1) Presence of severe cardiac, hepatic, or renal dysfunction; (2) History of dysphagia; (3) Concurrent presence of malignant tumors or other wasting diseases; (4) Mental disorders or cognitive impairment rendering participation in treatment impossible; (5) Allergy to enteral nutrition formulations; (6) Participation in other clinical trials.

2.2 Methods

2.2.1 Control Group

Patients in the control group received routine neurological nursing and swallowing rehabilitation training: (1) The head of the bed was raised by 30° during meals; (2) Food texture was selected according to swallowing function assessment results; (3) Oral care was performed twice a day; (4) Standard nutritional support was provided with a daily calorie supply of 25–30 kcal/kg based on body weight.

2.2.2 Observation Group

Individualized nutritional care guided by NRS-2002 screening was implemented based on the control group: (1) NRS-2002 assessment: A trained specialized nutrition nurse conducted the initial assessment within 24 hours of admission, followed by weekly re-evaluations. The assessment

included a nutritional status impairment score (ranging from 0 to 3 points) and a disease severity score (also ranging from 0 to 3 points); an additional point was awarded for patients aged ≥70 years, with a total score ≥3 indicating nutritional risk. (2) Individualized nutritional intervention: Nutritional goal setting: Calculated individualized caloric intake (25–35 kcal/kg/day) and protein requirements (1.2–1.5 g/kg/day) based on assessment results. Nutritional approach selection: Oral intake was recommended for SSA scores ≤20; oral intake combined with nasogastric tube for SSA scores>20–30; nasogastric tube with percutaneous endoscopic gastrostomy for SSA scores>30. Food consistency adjustment: Determined based on swallowing studies, including paste-like, puree-like, or thick liquid formulations. Meal management: Divided into 5–6 small meals daily, with controlled portion sizes, slowed eating speed, adjusted sitting posture during meals, and 30-minute post-meal sitting position. Nutritional supplementation: Oral nutritional supplements or tube feeding solutions were administered when oral intake failed to meet requirements. Monitoring and adjustment: Weekly monitoring of body weight, upper arm circumference, serum albumin levels, etc., to promptly adjust intervention strategies. (3) Swallowing rehabilitation training: Both groups underwent the same standardized swallowing rehabilitation training, which included Shaker exercises, Mendelssohn techniques, ice acid stimulation, articulation training, and respiratory training. Training was conducted once daily for 30 minutes, five days per week.

2.3 Observation Indicators

2.3.1 Nutritional status

Serum albumin (g/L), hemoglobin (g/L) and body mass index (BMI, kg/㎡) were detected at admission (baseline), 1 month and 3 months after intervention.

2.3.2 Swallowing function

Standard Swallowing Assessment (SSA) was adopted for evaluation. The total score of SSA ranged from 18 to 46 points, and higher scores indicated more severe dysphagia. Evaluation time points were baseline, 1 month and 3 months after intervention.

2.3.3 Complications

The incidence of aspiration pneumonia, malnutrition and electrolyte disturbances in the two groups was statistically compared.

2.3.4 Quality of life

The 36-item Short Form Health Survey (SF-36) was used to evaluate patients' quality of life 3 months after intervention, including 8 dimensions such as physiological function and emotional function.

2.4 Statistical Analysis

Data analysis was performed using SPSS 26.0 software. Measurement data were expressed as mean ± standard deviation ($\bar{x} \pm s$); intergroup comparisons were conducted using the independent samples t-test or Mann-Whitney U test. Count data were presented as rates (%), with intergroup comparisons analyzed by χ^2 test or Fisher's exact probability method. Repeated-measurement data were analyzed using repeated-measurement ANOVA. A P-value <0.05 was considered statistically significant.

3. Results

3.1 Comparison of nutritional parameters between the two groups

After 3 months of intervention, the nutritional parameters in the observation group were superior to those in the control group (P<0.05). There was a statistically significant difference in the trends of serum albumin and hemoglobin levels between the two groups over time (P<0.01) (Table 1).

Table 1 Comparison of nutritional parameters between the two groups before and after intervention (x ±s)

group	Serum albumin (g/L)			Hemoglobin (g/L)			BMI(kg/㎡)		
	base line	1 month	3 months	base line	1 month	3 months	base line	1 month	3 months
Observation group (n=20)	32.11±2.93	35.64±3.16	38.77±3.28	112.00±11.00	120.00±12.00	128.00±12.00	20.11±1.88	21.38±1.99	22.54±2.06
Control group (n=20)	31.84±2.75	33.21±2.86	32.54±2.84	110.00±10.00	113.00±10.00	115.00±10.00	20.31±1.76	20.54±1.86	20.81±1.82
t	0.300	2.550	6.422	0.602	2.004	3.722	0.347	1.379	2.815
P	0.765	0.015	< 0.01	0.551	0.052	0.001	0.730	0.176	0.008

3.2 Comparison of swallowing function recovery between the two groups

After intervention, both groups showed improvement in SSA scores, with the observation group demonstrating greater improvement. At 3 months post-intervention, the SSA score in the observation group was significantly lower than that in the control group (P<0.05) (Table 2).

Table 2 Comparison of SSA scores between the two groups of patients (x ±s)

group	SSA Score (points)		
	base line	1 month	3 months
Observation group (n=20)	35.25±4.86	28.74±4.06	22.34±3.15
Control group (n=20)	34.74±5.16	31.55±4.64	28.51±4.23
t	0.322	2.038	5.232
P	0.749	0.049	< 0.01

3.3 Comparison of complication incidence between the two groups

The overall incidence of complications was lower in the observation group compared to the control group (P<0.05). The most significant differences were observed in the incidence rates of aspiration pneumonia and malnutrition, as shown in Table 3.

Table 3 Comparison of complication incidence between the two groups [n (%)]

complication	aspiration pneumonia	innutrition	electrolyte disturbances	amount to
Observation group (n=20)	2(10.00)	3(15.00)	2(10.00)	5(25.00)
Control group (n=20)	7(35.00)	9(45.00)	4(20.00)	12(60.00)
χ^2 price	4.286	4.800	0.889	5.013
P price	0.038	0.028	0.346	0.025

3.4 Comparison of quality of life scores between the two groups

At 3 months post-intervention, the observation group exhibited a higher total SF-36 score than the control group (P<0.05), as shown in Table 4.

Table 4 Comparison of SF-36 scores between the two groups after 3 months of intervention (x ±s)

dimension	physiologic function	Physiological Functions	Somatic pain	general health	vigour	social function	Emotional Function	emotional health	total points
Observation group (n=20)	70.28±8.16	65.84±7.96	72.55±8.36	66.34±7.56	69.85±7.26	68.54±7.86	70.37±8.02	72.64±8.20	68.51±7.2
Control group (n=20)	58.34±7.52	54.24±6.85	68.33±7.96	55.71±6.36	60.57±6.59	59.27±6.92	62.81±7.36	65.36±7.74	56.31±6.82
t price	4.986	5.321	1.678	4.923	4.378	4.127	3.235	2.987	5.678
P price	<0.001	<0.001	0.101	<0.001	<0.001	<0.001	0.002	0.005	<0.001

4. Discussion

Swallowing dysfunction after stroke is a common severe clinical complication. Earlier research mostly centers on rehabilitation training for swallowing function. Nutritional support has not gotten enough attention. In fact, malnutrition and swallowing impairment often form a vicious cycle, and this worsens a patient's overall health [5]. NRS-2002 is a nutritional risk screening tool used around the world, its clinical effect has been confirmed in many kinds of diseases. Research focusing on applying this tool to stroke patients with swallowing disorders is still rare.

The results of this study show that individualized nutritional care adjusted according to NRS-2002 screening results can help such patients recover better nutritional status. The observation group saw larger changes in serum albumin, hemoglobin levels, and BMI increase than the control group (P<0.05). Three potential mechanisms work together to produce these effects. First, regular assessments let clinicians catch changes in nutritional risk early. Second, separate calculation of caloric and protein requirements matches patients' actual needs more closely. Third, combining different nutritional support methods lets patients get all the nutrients they need. For recovery of swallowing function, the observation group had larger improvement in the SSA score (P<0.01). This hints that good nutritional status may help the nervous system repair itself. Past studies found that enough protein intake supports healing of neural tissue. B vitamins and antioxidant nutrients reduce damage caused by oxidative stress. Both these changes help the swallowing center rebuild its function. Better nutritional status also boosts muscle strength and endurance, which indirectly helps swallowing muscles recover. The observation group had much fewer complications, and aspiration pneumonia showed the clearest drop. A properly designed nutritional intervention cuts the risk of aspiration, improves immune function, and lowers the chance of malnutrition. These benefits are connected to scientific monitoring of nutritional status, and timely changes to intervention strategies. When it comes to quality of life, every dimension on the SF-36 scale got better in the observation group. This comes from the combined benefits of improved nutrition, restored function, and fewer complications. It confirms that comprehensive nutritional management works to lift the overall health of patients.

This study has a limited sample size and a relatively short follow-up duration. Future research can work on studies with multicenter collaboration and large-scale long-term follow-up. More work is needed to clarify how different nutritional formulations change the process of swallowing function recovery. In clinical work, trained specialized nutrition nurses are needed, and multidisciplinary nutrition management teams can be set up to give full rehabilitation support to stroke patients.

In conclusion, if we implement personalized nutritional care following the NRS-2002 screening protocol, we can effectively improve the nutritional status of stroke patients who have dysphagia. It can help patients recover swallowing function, lower the risk of complications and ultimately improve patients' quality of life. This intervention method works well in clinical practice, and it has great potential to be used on a larger scale.

5. Conclusion

NRS-2002-guided individualized nutritional care can significantly improve the nutritional status of stroke patients with dysphagia, accelerate the recovery of swallowing function, reduce the incidence of clinical complications, and comprehensively enhance patients' quality of life. This intervention model is safe, effective and highly operable, which is worthy of widespread application in clinical rehabilitation nursing for stroke patients.

References

[1] Wu Linbo, Zeng Li, Deng Shiwan. Application effects of repetitive transcranial magnetic stimulation and modified dietary management in patients with swallowing disorders after stroke [J]. Anhui Medical Journal, 2025,29(12):2500–2503.

[2] Cheng Jie, Zhang Yuanling, You Min, et al. Comprehensive rehabilitation nursing based on NRS 2002 nutritional assessment: Its impact on nutritional status and prognosis in patients with post-stroke dysphagia [J]. Journal of Clinical and Pathology, 2020,40(7):1794–1800.

[3] Han Mei, Hu Jiahui, Hu Xiaohong, et al. Application of individualized dietary plans in rehabilitation care for patients with swallowing disorders after stroke [J]. China Nursing Management, 2025,25(8):1131-1135.

[4] Neurology Branch of Chinese Medical Association, Cerebrovascular Disease Group of Neurology Branch of Chinese Medical Association. China Guidelines for the Diagnosis and Treatment of Acute Ischemic Stroke 2023 [J]. Chinese Journal of Neurology, 2024,57(6):523-559.

[5] Dai Siqin, Ye Meiling. The impact of the 3S2E nursing strategy on swallowing function and nutritional status in patients with post-stroke dysphagia [J]. Primary Medical Forum, 2025,29(28):122–124+149.