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Analysis of the Impact of Nutritional Intervention Combined with Predictive Nursing on the Nutritional Status, Quality of Life, and Adverse Reactions in Patients Undergoing Chemotherapy for Lung Cancer

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Abstract: *Objective:* To evaluate the intervention effect of nutritional intervention combined with predictive nursing on patients undergoing chemotherapy for lung cancer. **Methods:** A total of 88 lung cancer chemotherapy patients admitted between January 2023 and June 2024 were selected and randomly divided into groups using a random number table. The experimental group (44 cases) received nutritional intervention combined with predictive nursing, while the control group (44 cases) received predictive nursing alone. Nutritional status scores, nutritional indicators, quality of life scores, and adverse reaction rates were compared between the two groups. *Results:* After the intervention, the nutritional status scores of the experimental group were lower than those of the control group, while the levels of nutritional indicators in the experimental group were better than those in the control group. The quality of life scores in the experimental group were lower than in the control group, and the adverse reaction rates were also lower in the experimental group ($P < 0.05$). *Conclusion:* Nutritional intervention combined with predictive nursing can improve the nutritional status of lung cancer chemotherapy patients, regulate multiple nutritional indicators, enhance quality of life, and reduce chemotherapy-related adverse reactions.

Keywords: Nutritional intervention; Predictive nursing; Lung cancer chemotherapy; Nutritional status; Quality of life

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1. Introduction

Lung cancer is a high-risk malignant tumor that requires comprehensive treatments such as surgical resection and chemotherapy to prolong patients' survival and improve their quality of life. As a common treatment for lung cancer, chemotherapy can kill cancer cells, reduce tumor size, and mitigate disease severity [1]. However,

chemotherapy drugs also damage healthy cells, leading to adverse reactions such as nausea, vomiting, or loss of appetite, which can trigger malnutrition and reduce patients' adherence to chemotherapy. Therefore, nursing interventions should be implemented during lung cancer chemotherapy with the goal of improving patients' tolerance to chemotherapy and ensuring its safety. Predictive nursing comprehensively assesses the risk factors associated with chemotherapy to enhance its effectiveness through efficient and proactive care measures. However, it pays insufficient attention to the patient's nutritional status, thus requiring the integration of nutritional intervention. This intervention can dynamically evaluate the patients' nutritional condition and implement a comprehensive and detailed nutritional intervention plan to prevent malnutrition and improve physiological function [2]. Based on this, the study selected 88 lung cancer chemotherapy patients to explore the effects of nutritional intervention combined with predictive nursing.

2. Materials and methods

2.1. General information

Eighty-eight patients undergoing chemotherapy for lung cancer who were admitted between January 2023 and June 2024 were selected and randomly divided into groups using a random number table. The experimental group consisted of 44 patients: 26 male and 18 female, aged 42 to 72 years, with an average age of (55.29 ± 4.72) years. The control group also consisted of 44 patients: 27 male and 17 female, aged 41 to 71 years, with an average age of (54.37 ± 4.67) years. There was no statistically significant difference in the general information between the two groups ($P > 0.05$).

Inclusion criteria: Patients met the relevant standards of the "Guidelines for the Diagnosis and Treatment of Primary Lung Cancer (2022)." They were aged 18 to 70 years, eligible for chemotherapy, with an expected chemotherapy cycle of no fewer than 3 sessions and a survival period longer than 6 months. Patients had normal language and comprehension abilities, could cooperate with regular follow-ups, and were informed of and consented to participate in the study.

Exclusion criteria: Patients with language or mental disorders, systemic infections, multiple tumors, heart, liver, or kidney dysfunction, or severe malnutrition were excluded, as were those who withdrew from the study midway.

2.2. Methods

The control group received predictive nursing care:

(1) Gastrointestinal care: Patients were instructed to take antiemetics before each chemotherapy session and maintain a varied, high-nutrition diet.

(2) Skin care: Before and after chemotherapy, blood vessels were repeatedly flushed with saline. After chemotherapy, the puncture site was compressed for 10 minutes to prevent phlebitis. For long-term chemotherapy, a central venous catheter was left in place, and the puncture site was heated periodically to dilate blood vessels and prevent tissue hypoxia.

(3) Hair loss care: Preventive measures against hair loss include shoulder and neck massages, sun exposure, and the application of hair care oils.

(4) Cognitive care: Caregivers assessed the patient's thought patterns and corrected misconceptions through verbal guidance, examples of successful cases, educational talks, and health lectures. Patients were encouraged to read psychology books, listen to music, and watch television to alleviate negative emotions.

(5) Behavioral intervention: Patients were guided to lie still for 10 minutes daily, combined with deep breathing exercises for full-body relaxation. If their physical condition allowed, muscle contraction and relaxation exercises were performed as tolerated. Patients were encouraged to get out of bed daily, walk with support, climb stairs, and perform self-care activities like dressing and washing to gradually restore their independence.

The experimental group received nutritional intervention combined with predictive nursing, with the same predictive nursing plan as the control group. The nutritional intervention plan included:

(1) Nutritional assessment: Within 24 hours of admission, caregivers provided patients with the Nutrition Risk Screening 2002 (NRS 2002), Patient-Generated Subjective Global Assessment (PG-SGA), and Quality of Life Questionnaire (EORTC QOL-C30) to evaluate their nutritional risk and quality of life. Physical measurements were taken to assess nutritional status. Patients were given a detailed explanation of the purpose and benefits of nutritional intervention combined with predictive nursing and were guided to join a WeChat group and follow the department's public account. After gathering the patients' basic information, they received a lung cancer nutrition management manual, with detailed explanations of nutritional therapy for lung cancer. Based on the assessment results, patients received targeted care, such as nutritional consultations, oral nutritional supplements, or parenteral nutrition. Their daily meal intake, preferences, and frequency were recorded, and family members were trained in techniques like food exchange and dietary structure adjustment.

(2) Nutritional plan: Patients' daily energy target was 25–30 kcal/kg, with a protein requirement of 1.2–2 g/kg per day. Care was differentiated based on the NRS 2002 score. For scores below 3, continuous monitoring of nutritional status and dietary guidance were provided. For scores of 3 or higher, the "Five-Step Nutritional Therapy Principle" was followed: nutritional education was provided, and interventions such as oral nutrition, full enteral nutrition, enteral and parenteral nutrition, or total parenteral nutrition were chosen. Oral and enteral nutrition were prioritized. Dietary plans were adjusted to ensure that whole grains and tubers made up more than one-third of the staple diet, with daily vegetable intake between 300–500g, fruit intake between 200–300g, and a focus on high-quality proteins like meat, eggs, and dairy.

(3) Follow-up care: Patients participated in weekly group discussions in the WeChat group every Friday at 6 p.m., where they shared their nutritional status and raised concerns. The group administrator summarized common issues and provided answers through educational materials and videos. A weekly WeChat video follow-up service, shorter than 10 minutes, was conducted to fully understand the patient's nutritional status outside the hospital and improve individual care plans.

Both groups were treated for 3 months.

2.3. Observational indicators

(1) Nutritional status: The PG-SGA was used for assessment, which includes a self-evaluation form and a medical staff evaluation form, with the total score being the sum of the two. Scores between 0 and 1 indicated no malnutrition, 2 to 3 suggested suspected malnutrition, 4 to 9 indicated moderate malnutrition, and scores of 9 or higher indicated severe malnutrition.

(2) Nutritional indicators: Before the intervention and after 3 months of continuous intervention, venous blood was drawn, centrifuged, and analyzed using an automatic biochemical analyzer to measure serum

albumin (ALB), hemoglobin (Hb), and total lymphocyte count (TLC).

(3) Quality of life: The EORTC QOL-C30 was used for evaluation, consisting of 30 items, including 5 functional domains, 1 overall quality of life domain, and 9 symptom domains. Items 1–28 were scored from 1 to 4, while items 29–30 were scored from 1 to 7, with total scores ranging from 30 to 126. Quality of life was calculated using negative scoring.

(4) Adverse reactions: Rates of adverse reactions, such as loss of appetite, diarrhea, nausea, vomiting, constipation, phlebitis, and hair loss, were observed.

2.4 Statistical analysis

Data were processed using SPSS 28.0 software. Measurement data were expressed as mean ± standard deviation (SD) and compared using the *t*-test. Count data were expressed as [*n* (%)] and compared using the chi-squared test. Statistical significance was set at $P < 0.05$.

3. Results

3.1. Comparison of nutritional status scores between the two groups

Table 1 shows that before the intervention, there was no significant difference in the nutritional status scores between the two groups ($P > 0.05$). After 3 months of intervention, the nutritional status scores of the experimental group were significantly lower than those of the control group ($P < 0.05$).

Table 1. Comparison of nutritional status scores between the two groups (mean ± SD, points)

Group	*n*	Before intervention	After intervention
Experimental	44	3.15 ± 0.43	1.53 ± 0.37
Control	44	3.17 ± 0.45	1.89 ± 0.41
t		0.213	4.324
P		0.832	0.000

3.2. Comparison of nutritional indicators between the two groups

Table 2 shows that before the intervention, there was no significant difference in nutritional indicators between the two groups ($P > 0.05$). After 3 months of intervention, the nutritional indicator levels in the experimental group were significantly better than those in the control group ($P < 0.05$).

Table 2. Comparison of nutritional indicators between the two groups before and after intervention (mean ± SD)

Group	*n*	ALB (g/L)		Hb (g/L)		TLC	
		Before	After	Before	After	Before	After
Experimental	44	46.35 ± 4.91	55.70 ± 4.45	106.95 ± 15.98	113.06 ± 7.53	1.38 ± 0.43	1.66 ± 0.31
Control	44	46.31 ± 4.82	51.08 ± 4.42	106.72 ± 15.34	108.92 ± 7.47	1.40 ± 0.46	1.50 ± 0.34
t		0.039	4.886	0.069	2.589	0.211	2.307
P		0.969	0.000	0.945	0.011	0.834	0.023

Abbreviations: ALB, albumin; Hb, hemoglobin; TLC, total lymphocyte count.

3.3. Comparison of quality of life scores between the two groups

Table 3 shows that before the intervention, there was no significant difference in quality of life scores between the two groups ($P > 0.05$). After 3 months of intervention, the quality of life scores in the experimental group were significantly lower than those in the control group ($P < 0.05$).

Table 3. Comparison of quality of life scores between the two groups (mean ± SD, points)

Group	*n*	Before intervention	After intervention
Experimental	44	49.85 ± 4.33	25.15 ± 2.38
Control	44	49.72 ± 4.27	30.19 ± 2.47
t		0.142	9.747
P		0.888	0.000

3.4. Comparison of adverse reaction rates between the two groups

Table 4 shows that the adverse reaction rate in the experimental group was significantly lower than in the control group ($P < 0.05$).

Table 4. Comparison of adverse reaction rates between the two groups [*n* (%)]

Group	n	Loss of appetite	Diarrhea	Nausea & vomiting	Constipation	Phlebitis	Hair loss	Incidence rate
Experimental	44	1	0	1	0	0	0	2 (4.55)
Control	44	2	1	2	1	1	1	8 (18.18)
χ^2								4.062
P								0.044

4. Discussion

The development of lung cancer is typically slow, with no typical symptoms in the early stages, and it is often diagnosed in the middle or late stages, requiring early symptomatic treatment to achieve a better prognosis [3]. Currently, chemotherapy is a common treatment for lung cancer patients, effectively eliminating cancer cells and slowing disease progression, thus prolonging survival. However, chemotherapy drugs are highly irritating and can easily cause side effects such as nausea, vomiting, and loss of appetite, leading to malnutrition. Prolonged malnutrition can reduce the effectiveness of chemotherapy, lower the patient's quality of life, increase the treatment burden, and elevate the mortality rate [4]. Therefore, comprehensive nutritional and predictive nursing care during chemotherapy is essential to improve patient acceptance of treatment and ensure overall efficacy.

Predictive nursing is a relatively new nursing method that comprehensively evaluates the patient's disease condition and physical state, integrates various nursing measures, and provides anticipatory and comprehensive care services. This type of nursing can predict chemotherapy side effects and carry out targeted preventive care, thereby reducing discomfort during chemotherapy [5]. However, its scope of care is limited and may not provide scientific guidance on the patient's dietary structure. Therefore, it can be combined with nutritional intervention. Comprehensive nutritional intervention can effectively monitor the patient's nutritional status, analyze daily

nutritional requirements, and provide professional nutritional guidance [6]. The combined use of these nursing measures can comprehensively regulate the patient's nutritional status, resulting in superior care outcomes.

In this study, the experimental group showed lower post-intervention nutritional status scores, better nutritional indicators, lower quality of life scores, and fewer adverse reactions compared to the control group ($P < 0.05$). These results are consistent with the findings of An and Ren [7]. The reason is that the nutritional intervention follows a process of screening, plan formulation, implementation, and monitoring, allowing for a comprehensive assessment of the patient's nutritional needs. Individualized nutritional intervention ensures timely and efficient nutritional support [8,9]. This care can extend to post-discharge care, continuously monitoring the patient's nutritional status, and compensating for the limitations of predictive nursing, thus enhancing the quality of care by utilizing the strengths of both nursing approaches.

5. Conclusion

In summary, nutritional intervention combined with predictive nursing can improve the nutritional status of lung cancer patients undergoing chemotherapy, enhance their quality of life, and prevent post-chemotherapy side effects, offering significant nursing advantages.

Disclosure statement

The author declares no conflict of interest.

References

[1] Wang Y, Yang Y, Ren F, et al., 2023, The Value of Intestinal Nutritional Intervention in Mid-Stage Lung Cancer Patients and Its Impact on Quality of Life. Journal of Clinical Military Medicine, 51(11): 1162–1164 + 1170.

[2] Hou M, Xu J, Tian Y, 2023, Analysis of the Effect of Rapid Recovery Intervention Combined with Early Oral Nutritional Support in Lung Cancer Patients. Guizhou Medical Journal, 47(11): 1719–1720.

[3] Zhou P, Zhang J, 2020, The Effect of Parenteral Nutritional Support on Immune Function and Lung Function in Lung Cancer Patients Undergoing Chemotherapy. Hebei Medical Journal, 42(17): 2598–2601.

[4] Bai L, Tao Z, An R, et al., 2022, Practice of Applying A Follow-Up Nutritional Care Plan in Non-Small Cell Lung Cancer Patients Undergoing Chemotherapy. China Medical Herald, 19(33): 172–175.

[5] Gong P, Wu N, Zhi C, et al., 2020, Study on the Application of Nutritional Intervention Combined with Emotional Management in the Process of Chemotherapy for Advanced Lung Cancer. Cancer Progress, 18(3): 311–313.

[6] Dong Q, Li J, Ding Q, 2021, The Effect of Patient-Participatory Dietary Intervention on Improving the Nutritional Status and Fatigue of Elderly Lung Cancer Patients Undergoing Chemotherapy. Hebei Medical Journal, 43(17): 2598–2601.

[7] An H, Ren X, 2021, The Effect of Predictive Nursing Combined with Nutritional Intervention on Prognosis and Adverse Reactions in Lung Cancer Patients Undergoing Chemotherapy. China Pharmaceuticals and Clinics, 21(12): 2227–2228.

[8] Zhao N, Li M, Ren X, 2021, The Effect of Predictive Nursing on Patients with Non-Small Cell Lung Cancer Undergoing Lobectomy and Their Quality of Life. Laboratory Medicine and Clinics, 18(9): 1302–1304.

[9] Ricketts W, Gutteridge C, Houston A, et al., 2024, AI-Based Approach to Enable Proactive Identification of Early

Lung Cancer: A Retrospective Population Health Study and Economic Model. Journal of Clinical Oncology, 42(16S): 10536–10536. https://doi.org/10.1200/JCO.2024.42.16_suppl.10536