



Nursing Intervention and Application Value of Nutritional Support for Critically Ill Cancer Patients

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Abstract: This study explored the impact of systematic nutritional support nursing intervention on nutritional status, quality of life, complication rate, and nursing satisfaction in critically ill cancer patients, providing clinical evidence for optimizing nutritional nursing programs for ICU patients with critical cancer. A prospective randomized controlled study was conducted, selecting 88 critically ill cancer patients admitted to the ICU of our hospital from January 2024 to December 2024. They were randomly divided into an observation group and a control group, with 44 patients in each group. Nutritional indicators (serum albumin, prealbumin, hemoglobin), Karnofsky Performance Status (KPS) scores, complication rates, and nursing satisfaction were compared between the two groups before and two weeks after the intervention. Systematic nutritional support nursing intervention can effectively improve the nutritional status of critically ill cancer patients, reduce the risk of nutrition-related complications, and improve patients' quality of life and nursing satisfaction.

Keywords: critically ill cancer patients; nutritional support; nursing intervention; nutritional status; complications

1. Introduction

Malignant tumors have become a major global public health problem. Most cancer patients are in the terminal stage of the disease or in a critical condition after surgery. They are often complicated by multiple organ dysfunction, severe infection and adverse reactions of radiotherapy and chemotherapy. Their bodies are in a state of high catabolism and high metabolism. At the same time, they are affected by tumor consumption, eating disorders and gastrointestinal dysfunction. The incidence of malnutrition is as high as 70% or more [1]. Malnutrition not only leads to muscle atrophy and decreased immune function, but also reduces treatment tolerance and increases the risk of complications such as infection and multiple organ failure. It is an independent risk factor affecting the prognosis and survival of cancer patients [2].

This study constructs a systematic nutritional support nursing intervention system for critically ill cancer patients and analyzes its clinical application effect through randomized controlled trials, so as to provide a scientific clinical basis for optimizing the nutritional nursing model for critically ill cancer patients in the ICU[3].

2. Materials and Methods

2.1 Research Subjects

Eighty-eight critically ill cancer patients admitted to the ICU of our hospital from January 2024 to December 2024 were selected as the study subjects. Inclusion criteria: ① diagnosed with malignant tumor by pathological histology or imaging; ② admitted to the ICU due to critical condition, with an Acute Physiology and Chronic Health Evaluation II (APACHE II) score ≥ 15 ; ③ Nutritional risk screening 2002 (NRS2002) score ≥ 3 , indicating nutritional risk; ④ conscious or able to complete the study with the cooperation of family members, with an expected survival of ≥ 4 weeks; ⑤ informed consent signed by the patient and family members. Exclusion criteria: ① complicated with irreversible end-stage diseases such as severe liver and kidney failure and coagulation dysfunction; ② complicated with contraindications to enteral nutrition such as severe gastrointestinal bleeding and intestinal obstruction [4]; ③ had received long-term standardized nutritional support before admission; ④ complicated with mental illness or cognitive impairment and unable to cooperate with the study. This study was approved by the Ethics Committee of our hospital (ethics approval number: 2023-KY-126).

Eighty-eight patients were randomly divided into an observation group and a control group, with 44 patients in each group. See Table 1 for details.

Table 1. Comparison of general information between the two groups of patients

Group	Number of examples	Gender (Male/Female)	Age (x±s, years)	Tumor types (examples)	APACHE II score (x±s, points)	NRS2002 score before intervention (x±s, points)
Observation group	44	25/19	61.82±8.15	Lung cancer 17, stomach cancer 10, colorectal cancer 7, pancreatic cancer 5, other 5	21.05±3.62	4.86±0.92
control group	44	24/20	62.37±7.93	Lung cancer 16, stomach cancer 11, colorectal cancer 8, pancreatic cancer 4, others 5	20.78±3.59	4.91±0.88
t/χ ² value	-	0.046	0.327	0.218	0.351	0.264
p-value	-	0.830	0.744	0.995	0.726	0.792

2.2 Nursing Interventions

The control group received routine nutritional support care for critically ill cancer patients, strictly followed the doctor's orders to prepare and administer enteral/parenteral nutrition solutions, monitored changes in patients' vital signs and nutritional indicators, recorded daily intake and output, observed for complications such as nausea, vomiting, diarrhea, and infection, and received routine health education and basic nursing care.

In addition to the routine nursing care provided to the control group, the observation group received systematic nutritional support nursing intervention, the specific measures of which are as follows:

(1) Dynamic nutritional risk assessment: The first nutritional risk screening was completed using the NRS2002 scale upon admission. The nutritional support plan was dynamically adjusted according to the assessment results. A special nutritional nursing file was established, and the implementation of nutritional support was recorded throughout the process.

(2) Individualized nutrition plan formulation and implementation: For patients who cannot tolerate enteral nutrition, parenteral + enteral nutrition support is provided. The daily required calories, protein and trace elements are accurately calculated, and the infusion volume is gradually increased in accordance with the principle of "from less to more, from slow to fast, and step by step". Enteral nutrition is continuously pumped in using a constant temperature infusion pump. The initial rate is 20~30mL/h, and it is gradually adjusted to 50~80mL/h according to the patient's tolerance. The temperature of the nutrient solution is controlled at 38~40°C [5].

(3) Systemic prevention and control of nutrition-related complications: Specific prevention and control measures are formulated for common complications of enteral nutrition such as diarrhea, abdominal distension, aspiration, and infection. Elevate the head of the bed 30°~45° to prevent reflux and aspiration, provide oral care twice a day, and regularly flush the feeding tube to prevent blockage; strictly implement aseptic operation, prepare the nutrient solution fresh and use it immediately, and change the infusion system every 24 hours.

(4) Psychological and family support intervention: Communicate with patients and their families daily to explain the importance of nutritional support for disease treatment, answer patients' and their families' questions in a timely manner, and alleviate negative emotions such as anxiety and fear.

2.3 Observation Indicators

① Nutritional indicators: Fasting venous blood samples were collected from patients before intervention and 2 weeks after intervention to measure serum albumin (ALB), prealbumin (PA), and hemoglobin (Hb) levels. These three indicators are the core indicators for clinical assessment of patients' nutritional status; higher levels indicate better nutritional status. ② Quality of life score: The Karnofsky Performance Status Scale (KPS) was used to assess patients' quality of life before and 2 weeks after intervention. The scale has a total score of 0-100; higher scores indicate better health and higher quality of life. ③ Incidence of nutrition-related complications: The incidence of nutrition-related complications such as diarrhea, abdominal distension, aspiration, catheter-related infections, and electrolyte imbalances during the intervention period was recorded, and the overall incidence rate was calculated. ④ Nursing satisfaction: Two weeks after the intervention, the satisfaction of patients and their families with nursing care was assessed using a self-made ICU nursing satisfaction questionnaire. The questionnaire included four dimensions: nursing attitude, professionalism of nutritional nursing, prevention and control of complications, and communication guidance. The total score was 100 points. ≥90 points was very satisfied, 80~89 points was satisfied, and <80 points was dissatisfied. Satisfaction rate = (number of very satisfied cases + number of satisfied cases) / total number of cases × 100%.

3. Results

3.1 Comparison of nutritional indicators before and after intervention in the two groups

Before the intervention, there were no statistically significant differences in ALB, PA, and Hb levels between the two groups ($P>0.05$). Two weeks after the intervention, all nutritional indicators in both groups were significantly higher than before the intervention, and the ALB, PA, and Hb levels in the observation group were significantly higher than those in the control group ($P<0.05$), as detailed in Table 2.

Table 2. Comparison of nutritional indicators between the two groups of patients before and after intervention (x±s)

Group	Number of examples	Time point	ALB (g/L)	PA (mg/L)	Hb(g/L)
Observation group	44	Before intervention	27.35±3.26	120.58±21.34	92.63±10.25
		Two weeks after intervention	35.82±3.57	215.76±28.59	112.58±11.36
control group	44	Before intervention	27.51±3.19	118.72±22.15	93.15±10.18
		Two weeks after intervention	31.26±3.42	168.35±25.47	102.47±10.82
		t-value (after intervention)	6.025	8.326	4.278
		p-value	<0.001	<0.001	<0.001

3.2 Comparison of KPS scores and complication rates before and after intervention between the two groups

Before the intervention, there was no statistically significant difference in KPS scores between the two groups ($P>0.05$). Two weeks after the intervention, KPS scores in both groups were significantly higher than before the intervention, and the score in the observation group was significantly higher than that in the control group ($P<0.05$), as detailed in Table 3.

Table 3. Comparison of KPS scores and complication rates between the two groups

project	Number of examples	KPS score (x±s, points)		Occurrence of complications (examples)			Overall incidence of complications (%)
		Before intervention	Two weeks after intervention	Diarrhea/ bloating	Aspiration/ infection	Electrolyte imbalance	
Observation group	44	52.36±8.25	75.82±7.63	2	1	1	9.09
control group	44	51.89±8.31	66.25±7.94	5	3	4	27.27
t/χ ² value	-	0.267	5.782	-	-	-	4.889
p-value	-	0.790	<0.001	-	-	-	0.027

3.3 Comparison of nursing satisfaction between the two groups

Two weeks after the intervention, the nursing satisfaction rate in the observation group was 97.73%, which was significantly higher than that in the control group (81.82%). The difference was statistically significant ($P<0.05$). See Table 4 for details.

Table 4. Comparison of nursing satisfaction between the two groups of patients

Group	Number of examples	Very satisfied (example)	Satisfied (example)	Dissatisfied (example)	Satisfaction rate (%)
Observation group	44	32	11	1	97.73
control group	44	20	16	8	81.82
χ ² value	-	-	-	-	6.065
p-value	-	-	-	-	0.014

4. Discussion

4.1 Current Status and Core Logic of Nutritional Nursing Care for Critically Ill Cancer Patients

Patients with severe cancer are affected by multiple factors, Malnutrition is an independent risk factor affecting treatment tolerance, immune function, and prognosis. However, routine clinical nutritional care primarily relies on administering nutritional infusions according to physician orders, which has limitations such as single-session nutritional assessments, homogenized protocols, and passive complication prevention, making it difficult to adapt to the dynamically changing

conditions and nutritional needs of critically ill cancer patients. The systematic nursing intervention constructed in this study aims to break away from the passive model of routine nursing and establish a closed-loop management process encompassing "assessment-protocol-implementation-prevention-feedback." Nursing strategies are developed with individual patient needs at the core, aligning with the actual clinical nursing requirements of critically ill cancer patients.

4.2 Clinical value and mechanism of action of systematic nutritional nursing intervention

The results of this study showed that the nutritional indicators and KPS scores of the observation group were significantly higher than those of the control group after intervention, while the incidence of complications was significantly lower, confirming the clinical effectiveness of this intervention model. Its mechanism of action is mainly reflected in three aspects: First, dynamic nutritional risk assessment enables full-process monitoring of patients' nutritional status, providing a precise basis for dynamic adjustment of the treatment plan and avoiding problems of insufficient or excessive nutritional supply; second, individualized nutritional plans prioritize enteral nutrition to protect the gastrointestinal mucosal barrier, accurately match patients' metabolic needs, and maximize nutrient absorption efficiency; third, systematic complication prevention and control mitigates risks from multiple dimensions, including infusion procedures, positioning management, and aseptic principles, reducing the risk of nutrition-related complications from the source, while psychological and family support improves patient treatment adherence, further ensuring the effectiveness of nutritional support implementation.

References

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