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Analysis of the Application Value of Integrated Nursing for Specific Diseases in Nutritional Status Management and Quality of Life Improvement in Patients with Liver Cirrhosis

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Abstract: *Objective*: To explore the application effect of integrated nursing for specific diseases in nutritional status management and quality of life improvement in patients with liver cirrhosis, providing a reference for optimizing clinical nursing plans for liver cirrhosis. *Methods*: A total of 70 patients with liver cirrhosis admitted to the hospital from January 2023 to December 2024 were selected as the study subjects. They were randomly divided into a study group (35 cases, receiving integrated nursing for specific diseases) and a control group (35 cases, receiving conventional nursing) using the random number table method. Nutritional status indicators [body mass index (BMI), hemoglobin (Hb), albumin (ALB), total protein (TP)], quality of life scores (physical pain, physiological function, emotional role, mental state), and liver function indicators [total bilirubin (TBil), alanine aminotransferase (ALT), aspartate aminotransferase (AST)] were compared between the two groups before and after the intervention. *Results*: Before the intervention, there were no statistically significant differences in BMI, Hb, ALB, TP, scores in each dimension of the SF-36 scale, and levels of TBil, ALT, and AST between the two groups ($p > 0.05$). After the intervention, the study group had higher BMI, Hb, ALB, and TP than the control group; higher scores in physical pain, physiological function, emotional role, and mental state in the SF-36 scale than the control group; and lower TBil, ALT, and AST levels than the control group, with all differences being statistically significant ($p < 0.05$). *Conclusion*: Integrated nursing for specific diseases can effectively improve the nutritional status and quality of life of patients with liver cirrhosis and assist in improving liver function, demonstrating high clinical application value.

Keywords: Liver cirrhosis; Integrated nursing for specific diseases; Nutritional status; Quality of life; Liver function; SF-36 scale

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1. Introduction

Liver cirrhosis is an end-stage liver disease that progresses from chronic liver diseases, with a global

incidence rate of approximately 1.5% to 2.0%. Patients often suffer from nutritional metabolic disorders due to damaged liver cells. About 60% to 80% of patients with liver cirrhosis have varying degrees of malnutrition, manifested as hypoproteinemia and anemia, which further exacerbate liver function damage and form a vicious cycle of "malnutrition-liver function deterioration" [1]. Meanwhile, factors such as recurrent disease and a high risk of complications lead to a significant decline in patients' quality of life. Conventional nursing mainly focuses on disease monitoring and basic nursing, lacking systematic integration of nutritional management, psychological support, and continuous intervention, making it difficult to meet patients' comprehensive needs [2,3]. Integrated nursing for specific diseases takes "specialized treatment for specific diseases and whole-course management" as its core. By integrating multidimensional nursing measures, it specifically addresses the nutritional problems and quality of life pain points of patients with liver cirrhosis. This study compares the effects of integrated nursing for specific diseases and conventional nursing to clarify its application value in the nursing of patients with liver cirrhosis and provide a basis for optimizing clinical nursing plans.

2. Materials and methods

2.1. General information

A total of 70 patients with liver cirrhosis admitted to the Department of Infectious Diseases of our hospital from January 2023 to December 2024 were selected as the study subjects. They were randomly divided into a study group (35 cases) and a control group (35 cases) using the random number table method. In the study group, there were 20 males and 15 females, aged 42 to 68 years, with an average age of (54.68 ± 6.26) years. The causes of liver cirrhosis were hepatitis B virus infection in 13 cases, hepatitis C virus infection in 8 cases, alcoholic liver disease in 7 cases, and others in 7 cases. According to the Child-Pugh classification, there were 13 cases of grade A, 15 cases of grade B, and 7 cases of grade C. In the control group, there were 18 males and 17 females, aged 40 to 69 years, with an average age of (54.43 ± 6.56) years. The causes of liver cirrhosis were hepatitis B virus infection in 13 cases, hepatitis C virus infection in 8 cases, alcoholic liver disease in 7 cases, and others in 7 cases. According to the Child-Pugh classification, there were 13 cases of grade A, 15 cases of grade B, and 7 cases of grade C. There were no statistically significant differences in general information, such as gender, age, cause, and Child-Pugh classification, between the two groups ($p > 0.05$), indicating comparability.

2.2. Inclusion and exclusion criteria

2.2.1. Inclusion criteria

Patients who met the diagnostic criteria for liver cirrhosis in the "Guidelines for the Diagnosis and Treatment of Liver Cirrhosis" [4]. Confirmed by liver function tests, abdominal ultrasound, or CT; aged 18 to 70 years; conscious and able to cooperate in completing nursing interventions and indicator evaluations; voluntarily participated in this study and signed an informed consent form.

2.2.2. Exclusion criteria

Patients with severe liver diseases such as primary liver cancer and liver failure; patients with malignant tumors, severe cardiorenal diseases, or blood system diseases; patients with mental disorders or cognitive dysfunction who were unable to communicate; patients who had received nutritional support therapy or other

special nursing interventions in the past 3 months; patients who were lost to follow-up or withdrew from the study during the follow-up period.

2.3. Methods

2.3.1. Control group

Conventional nursing interventions were implemented as follows:

(1) Disease monitoring

Monitor the patient's body temperature, pulse, respiration, blood pressure, and other vital signs daily. Regularly review blood routines and liver function, and record changes in symptoms such as abdominal distension and ascites.

(2) Basic nursing

Instruct the patient to rest in bed and avoid fatigue. Keep the ward environment clean. Assist the patient in completing daily activities such as eating and defecation to prevent pressure ulcers and falls.

(3) Conventional health education

Orally inform the patient to follow a low-salt and low-fat diet, avoid spicy and irritating foods, remind the patient to take medications as prescribed, and provide simple diet and follow-up health education upon discharge.

2.3.2. Study group

Integrated nursing interventions for specific diseases were implemented as follows:

(1) Establish a "liver cirrhosis specialized nursing team"

Consisting of nurses from the Department of Infectious Diseases (5 nurses with work experience of ≥ 5 years), a nutrition specialist nurse (1 nurse), a clinical physician (1 physician), and an infectious disease specialist nurse (1 nurse). Develop a whole-course integrated nursing plan of "assessment-intervention-follow-up".

(2) Personalized assessment (within 1 week before the intervention)

The team jointly conducts a comprehensive assessment of the patient, including nutritional status (using the Subjective Global Assessment (SGA) to assess nutritional risk), liver function classification, psychological state (Self-Rating Anxiety Scale (SAS), Self-Rating Depression Scale (SDS)), and living habits (diet, exercise, medication compliance). Based on the assessment results, a personalized nursing plan is formulated.

(3) Interventions during hospitalization (throughout the hospitalization)

① Nutritional management: The nutrition specialist nurse adjusts the protein intake according to the Child-Pugh classification (grade A: 1.2–1.5 g/kg·d, grade B: 1.0–1.2 g/kg·d, grade C: 0.8–1.0 g/kg·d) and formulates a daily diet list (e.g., sources of high-quality protein: eggs, milk, fish; avoid animal organs). If the patient has ascites, limit sodium intake (< 2 g/d) and supplement with enteral nutrition preparations (e.g., Fresubin, Huiru Pharmaceutical) if necessary. Monitor the patient's weight and BMI weekly and review Hb, ALB, and TP monthly to adjust the nutritional plan dynamically. ② Liver function protection: Instruct the patient to strictly take liver-protecting drugs as prescribed (e.g., polyene phosphatidylcholine) and avoid taking drugs that may damage the liver. Monitor jaundice and abdominal distension. If TBil increases or ascites increases, promptly notify the physician to adjust the treatment plan. ③ Psychological intervention:

The infectious disease specialist nurse communicates with the patient once a week, using methods such as listening and empathy to relieve anxiety and depression. Organize patient exchange meetings to share disease management experiences and enhance treatment confidence.

(4) Continuous nursing (3 months after discharge)

① Follow-up management: Conduct telephone follow-ups once a week within 1 month after discharge and once every 2 weeks from 1 to 3 months after discharge to understand diet compliance, medication compliance, and symptom changes, and answer nursing questions. ② Family guidance: Send liver cirrhosis nutritional knowledge and living precautions via WeChat, encourage family members to supervise the patient's diet and rest, and regularly provide feedback on the patient's condition.

2.4. Observation indicators

2.4.1. Nutritional status

Before the intervention and 3 months after the intervention, the levels of hemoglobin (Hb), albumin (ALB), and total protein (TP) in patients were measured using an automatic biochemical analyzer (Beckman Colter, model AU5800). The body mass index (BMI) of patients was measured using a height-weight scale (Taixing Hengxin Electronics, model HCS-RT).

2.4.2. Quality of life

Before the intervention and 3 months after the intervention, the Short-Form Health Survey (SF-36) was used for evaluation, which included four core dimensions: physical pain, psychological function, emotional role, and mental health. Each dimension was scored from 0 to 100 points, with higher scores indicating a better quality of life.

2.4.3. Liver function

Before the intervention and 3 months after the intervention, the levels of total bilirubin (TBil), alanine aminotransferase (ALT), and aspartate aminotransferase (AST) in patients were measured using an automatic biochemical analyzer (Beckman Colter, model AU5800).

2.5. Statistical analysis

Data were processed using SPSS 26.0 statistical software. Measurement data were expressed as ($\overline{x} \pm s$). Paired *t*-tests were used for comparisons within groups before and after the intervention, and independent sample *t*-tests were used for comparisons between groups. Count data were expressed as [n (%)], and comparisons were made using the χ^2 test. A p-value < 0.05 was considered statistically significant.

3. Results

3.1. Comparison of nutritional status indicators between the two groups

Before and After the Intervention. Before the intervention, there were no statistically significant differences in BMI, Hb, ALB, and TP levels between the two groups ($p > 0.05$). After the intervention, all nutritional indicators in the study group were higher than those in the control group, with statistically significant differences ($p < 0.05$). See **Table 1** for details.

Table 1. Comparison of nutritional status indicators between the two groups before and after the intervention ($\overline{x} \pm s$)

Group	Number of cases	BMI/(kg/m^2)		Hb/(g/L)		ALB/(g/L)		TP/(g/L)	
		Before intervention	After intervention	Before intervention	After intervention	Before intervention	After intervention	Before intervention	After intervention
Control group	35	20.84 ± 1.43	19.99 ± 1.36	111.34 ± 8.15	110.47 ± 7.64	32.12 ± 2.03	31.61 ± 1.85	65.36 ± 3.43	64.75 ± 3.25
Study group	35	21.15 ± 1.57	22.41 ± 1.52*	112.91 ± 7.93	121.34 ± 8.32*	32.48 ± 1.98	34.47 ± 2.12*	65.76 ± 3.36	68.81 ± 3.58*
t	/	0.542	6.735	0.338	5.982	0.401	6.217	0.385	5.643
p	/	0.590	< 0.001	0.736	< 0.001	0.689	< 0.001	0.702	< 0.001

Note: Compared with pre-intervention, *$p < 0.05$.

3.2. Comparison of SF-36 scale scores between the two groups before and after intervention

Before the intervention, there was no statistically significant difference in the SF-36 scale scores across all dimensions between the two groups ($p > 0.05$). After the intervention, the scores in all dimensions were higher in the study group than in the control group, with statistically significant differences ($p < 0.05$). See **Table 2** for details.

Table 2. Comparison of SF-36 scale scores between the two groups before and after intervention ($\overline{x} \pm s$, points)

Group	Number of cases	Bodily pain		Physiological function		Role emotional		Mental state	
		Before intervention	After intervention	Before intervention	After intervention	Before intervention	After intervention	Before intervention	After intervention
Control group	35	57.73 ± 6.33	61.25 ± 5.93*	58.48 ± 5.73	62.64 ± 5.53*	57.08 ± 6.43	60.91 ± 6.15*	57.83 ± 5.85	63.06 ± 5.26*
Study group	35	58.54 ± 6.18	74.05 ± 6.27*	59.12 ± 5.66	78.84 ± 5.87*	57.74 ± 6.25	73.74 ± 6.52*	58.50 ± 5.63	76.55 ± 5.64*
t	/	0.327	9.842	0.231	10.563	0.258	9.215	0.382	11.074
p	/	0.745	< 0.001	0.818	< 0.001	0.797	< 0.001	0.703	< 0.001

Note: Compared with pre-intervention, *$p < 0.05$.

3.3. Comparison of liver function indicators between the two groups

Before and After Intervention. Before the intervention, there was no statistically significant difference in the levels of TBil, ALT, and AST between the two groups ($p > 0.05$). After the intervention, all liver function indicators in the study group were lower than those in the control group, with statistically significant differences ($p < 0.05$). See **Table 3** for details.

Table 3. Comparison of liver function indicators between the two groups before and after intervention ($\overline{x} \pm s$)

Group	Number of cases	TBil/(μmol/L)		ALT/(U/L)		AST/(U/L)	
		Before intervention	After intervention	Before intervention	After intervention	Before intervention	After intervention
Control group	35	30.47 ± 4.65	28.65 ± 4.57*	76.73 ± 7.77	62.78 ± 7.53*	82.38 ± 8.45	65.45 ± 8.14*

Group	Number of cases	TBil/(μmol/L)		ALT/(U/L)		AST/(U/L)	
		Before intervention	After intervention	Before intervention	After intervention	Before intervention	After intervention
Study group	35	30.82 ± 4.47	20.27 ± 4.22*	76.82 ± 7.54	46.01 ± 6.87*	82.54 ± 8.29	48.94 ± 7.35*
t	/	0.289	8.572	0.229	8.943	0.301	8.216
p	/	0.773	< 0.001	0.820	< 0.001	0.764	< 0.001

Note: Compared with pre-intervention, *$P < 0.05$.

4. Discussion

The core distinction between specialized integrated care and conventional care lies in its "systematic" and "targeted" nature. Conventional care primarily focuses on "disease monitoring" and lacks integration of nutritional, psychological, and long-term management aspects for patients. In contrast, patients with liver cirrhosis have multidimensional and long-term care needs, nutritional metabolic disorders require dynamic dietary adjustments, psychological issues necessitate continuous counseling, and post-discharge continuity of care is essential to prevent recurrence [5]. The specialized integrated care model developed in this study employs a closed-loop approach of "multidisciplinary nurse joint assessment-precise interventions during hospitalization-post-discharge follow-up", integrating nutritional management, liver function protection, and psychological support throughout the care continuum. This approach addresses the "fragmented" nature of conventional care and tailors personalized plans to meet the needs of patients with different Child-Pugh classifications, such as reducing protein intake in Class C patients to prevent hepatic encephalopathy, ultimately achieving synergistic improvements in nutritional status, quality of life, and liver function.

The results of this study showed that BMI, Hb, ALB, and TP levels in the study group were significantly higher than those in the control group after intervention ($p < 0.05$), indicating that specialized integrated care can improve patients' nutritional status. Analysis suggests that, on the one hand, nutrition specialist nurses within the specialized team formulated differentiated protein intake plans based on patients' liver function classifications, avoiding the "one-size-fits-all" dietary guidance in conventional care. For example, patients with Child-Pugh Class A could appropriately increase their intake of high-quality protein to supplement nutrition, while those with Class C controlled their protein intake to reduce the metabolic burden on the liver, meeting nutritional needs while preventing hepatic encephalopathy [6]. On the other hand, a dynamic adjustment mechanism of "weekly weight monitoring + monthly biochemical indicator reviews" promptly corrected dietary deviations. For instance, when a patient's ALB level decreased, enteral nutrition supplements were added to prevent worsening malnutrition. Additionally, family involvement and supervision in continuity of care improved patients' dietary compliance, ensuring long-term implementation of nutritional plans and ultimately achieving significant improvements in nutritional indicators. Meanwhile, quality of life scores in the study group were higher than those in the control group ($P < 0.05$), suggesting that specialized integrated care can enhance patients' quality of life. This is primarily attributed to the comprehensive satisfaction of "physiological-psychological-social" needs through specialized integrated care. From a physiological perspective, improved nutritional status alleviated symptoms such as fatigue and anemia, while reduced liver function indicators decreased discomfort such as jaundice and abdominal distension, lowering the risk of complications (e.g., esophageal and gastric variceal bleeding) and directly enhancing patients' physical comfort, as reflected in increased scores in the "bodily pain" and "physiological

function" dimensions [7]. Psychologically, professional interventions from infectious disease specialist nurses and peer support through patient communication sessions effectively alleviated common anxiety and depression in patients with liver cirrhosis. Research indicates that approximately 40% of patients with liver cirrhosis experience psychological disorders, and conventional care often lacks psychological interventions. In contrast, specialized care, through empathetic communication and experience sharing, helps patients build treatment confidence and improves "emotional role" and "mental state" [8]. Socially, continuity of follow-up made patients feel sustained medical support, reducing post-discharge loneliness and anxiety, further enhancing quality of life. Additionally, TBil, ALT, and AST levels in the study group were significantly lower than those in the control group ($p < 0.05$), indicating that specialized integrated care can improve patients' liver function. Analysis suggests that this is not because care directly "treats" liver damage, but rather through an "auxiliary protection" mechanism that reduces the liver's burden. First, improved nutritional status provides the material basis for hepatocyte repair, increased ALB enhances liver detoxification function, while elevated TP maintains hepatic synthetic metabolism capacity, reducing further hepatocyte necrosis [9]. Second, strict medication guidance and avoidance of hepatotoxic drugs prevent exogenous secondary harm to the liver, while encouraging patients to adhere to hepatoprotective medications enhances the liver's self-repair ability. Third, psychological interventions reduce the adverse effects of stress responses on the liver. Long-term anxiety and depression can promote the release of inflammatory factors through the neuroendocrine-immune axis, exacerbating hepatocyte inflammation. Psychological counseling in specialized care lowers stress levels, indirectly reducing hepatic inflammatory responses, as reflected in decreased inflammatory markers such as ALT and AST [10].

5. Conclusion

In summary, specialized integrated care, through multidisciplinary collaboration, personalized interventions, and continuous follow-up, effectively improves the nutritional status of patients with liver cirrhosis, enhances their quality of life, and aids in reducing liver damage, demonstrating superior outcomes compared to conventional care.

Disclosure statement

The authors declare no conflict of interest.

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