

The Application of Stratified Quantitative Management Combined with Accelerated Rehabilitation Care in Patients Undergoing Liver Cancer Surgery

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Abstract

Objective: To analyze the application value of stratified quantitative management combined with sensitive indicators of accelerated rehabilitation care in patients with liver cancer surgery. **Methods:** 66 Hcancer patients were admitted to the hospital from November 2022 to December 2023. The numbers were divided into the control group (n = 33) and the study group (n = 33). Using routine nursing, stratified quantitative management, and accelerated rehabilitation nursing sensitive indicators, both groups were continuously for 3 weeks. Perioperative indicators, complication rates, and liver function levels were compared between groups [glutamyltransferase (glutamyltransferase; GGT), grass transaminase (glutamic-oxalacetic transaminase; AST), GALT (glutamic-pyruvic transaminase; ALT)] and quality of care score. **Results:** The first discharge, first ambulation, and hospitalization time ((19.96 ± 3.06) h, (14.96 ± 2.07) h, (9.07 ± 2.96) d) were shorter than the control group ((28.51 ± 4.37) h, (20.09 ± 2.66) h, (14.96 ± 6.06) d) ($P < 0.05$). The complication rate was lower in the study group (3.03%) than in the control group (18.18%) ($\chi^2 = 3.995$, $P < 0.05$); There was no significant difference in liver function (AST, ALT and GGT) between the two groups ($P > 0.05$), postoperative liver function indexes in both groups were lower than those before operation ($P < 0.05$), AST, ALT, GGT were lower than the control group ($P < 0.05$). There was no significant difference in liver function between the groups at 3 weeks after operation ($P > 0.05$). The study group of basic nursing, practical operation, and exercise training scores were higher than the control group. Statistical significance was established ($P < 0.05$). **Conclusion:** Stratified quantitative management combined with the establishment of sensitive indicators of accelerated rehabilitation nursing can significantly shorten the incidence of patients' outcomes, reduce the incidence of complications, improve liver function and

nursing quality, and achieve the remarkable comprehensive nursing effect.

Keywords

Stratified Quantitative Management, Accelerated Rehabilitation Nursing, Sensitive Index, Liver Cancer, Surgery

1. Introduction

Liver cancer is a malignant tumor that occurs clinically in hepatocytes or intrahepatic bile duct epithelial cells and is one of the common malignant tumors in China [1]. At present, the etiology and pathogenesis of primary liver cancer are still unclear, but according to relevant investigations and studies, alcohol consumption, viral hepatitis, and genetic factors are common causes of the occurrence of liver cancer in clinical practice [2]. According to the research data reported in China [3] [4], the incidence of liver cancer in China ranks fourth among malignant tumors, and the mortality rate ranks second among malignant tumors, and it is more common in middle-aged men, which is a type of disease that threatens the life and health of patients in clinical research. Surgical treatment is the main clinical treatment for patients with liver cancer, but studies have found [5] that due to the severity of the disease and other factors, the postoperative prognosis of patients is longer, which is not conducive to their physical and mental health. Therefore, further strengthening clinical nursing intervention can effectively consolidate the clinical treatment effect and ensure the physical and mental health of patients. In the past, routine nursing was mainly based on disease care, and individualized care for patients was insufficient. It was difficult to shorten the prognosis time of patients, and the nursing effect was limited [6]. Hierarchical quantitative management combined with the establishment of sensitive indicators of accelerated rehabilitation nursing is hierarchical management implemented under the core concept of accelerated rehabilitation surgery, which emphasizes patient-centeredness and individualized rapid rehabilitation care for different patients through the establishment of sensitive nursing indicators [7] [8]. However, at present, there are few studies on the establishment of sensitive indicators of hierarchical quantitative management combined with accelerated rehabilitation nursing in clinical research, which makes it difficult to provide theoretical guidance for clinical nursing intervention. Therefore, this study took 66 patients with liver cancer surgery in a hospital as the object, aiming to analyze the application value of hierarchical quantitative management combined with sensitive indicators of accelerated recovery nursing in patients undergoing liver cancer surgery and the specific contents are as follows.

2. Date and Methodology

2.1. General Information

A total of 66 patients with liver cancer who were clinically admitted to the hospital

from November 2022 to December 2023 were included in the study, and the digital lottery group was divided into the control group ($n = 33$, 24 males, 9 females, aged 40 - 73 years, mean (56.95 ± 7.03) years). The Child-Pugh classification of liver function was grade A in 11 cases and grade B in 22 cases. TNM stages: Stage II (19 cases), stage III (14 cases). The tumor diameters ranged from 2.3 to 5.9 cm, and the mean value was (3.97 ± 0.41) cm; Body Mass Index (BMI) was 21.89 - 29.03 kg/m^2 , with a mean value of (24.71 ± 1.33) kg/m^2 and the study group ($n = 33$, 21 males, 12 females, aged 42 - 73 years, mean (57.04 ± 6.71) years). The Child-Pugh classification of liver function was Class A in 16 cases and Class B in 17 cases. TNM stages: 16 cases of stage II and 17 cases of stage III. The tumor diameter was 2.1 - 5.9 cm, and the mean value was (3.59 ± 0.42) cm. The body mass index (BMI) was 21.44 - 28.64 kg/m^2 , and the mean value was (24.52 ± 1.35) kg/m^2 , and there was no significant difference in the baseline data between the groups ($P > 0.05$). The study was approved by the in-house ethics committee.

2.2. Inclusion and Exclusion Criteria

Inclusion criteria: 1) Meet the diagnostic criteria for primary liver cancer in the Guidelines for the Diagnosis and Treatment of Primary Liver Cancer (2022 Edition) [9], with two typical imaging manifestations and lesions > 2 cm; alpha-feto-protein (AFP) > 400 ng/ml; positive liver biopsy; 2) Child-Pugh grade of liver function is grade A or B; 3) TNM stage II - III. 4) Age ≥ 40 years old; 5) Independent cognitive and language expression skills and normal consciousness; 6) Clinical, surgical treatment and indications for surgical treatment; 7) Complete clinical medical records.

Exclusion criteria: 1) Combined with other malignant tumors or combined with malignant tumor cell metastasis; 2) Severe renal, cardiac, and other organ dysfunction; 3) Mental disorders or combined with depression, anxiety, and other diseases; 4) Poor compliance; 5) Unwillingness to accept follow-up; 6) History of previous abdominal surgery; 7) Combined with extrahepatic metastases.

2.3. Methods

2.3.1. Control Group

Routine nursing was implemented in the group: 1) Preoperatively: patients were given routine fasting for 8 - 12 hours before surgery, drinking was prohibited for 4 hours before surgery, and patients were given regular indwelling gastric tubes before surgery. The specialist nurse used face-to-face communication to evaluate the patient's emotional state 1 day before surgery, used the health knowledge manual or oral description to clarify the causes, symptoms, and surgical treatment process of liver cancer to the patient, and gave the patient encouragement and support based on the actual situation of the patient. 2) Intraoperative: Cooperate with the doctor to complete the corresponding surgical operation during the operation and pay close attention to the patient's vital signs during the operation. 3) Postoperatively: pay close attention to the patient's vital signs 24 hours after surgery, give

the patient gastrointestinal decompression, and give the patient health knowledge education and medication nursing according to the doctor's advice. 1 - 2 days after surgery, the patient's incision dressing was closely observed, and the patient was given routine drainage tube care to confirm the patency of the drainage tube, as well as to observe the amount and color of the drainage fluid. Patients were given nursing care such as back tapping, expectoration, and other nursing care in the early stages, and they should be encouraged to get out of bed to exercise. Combined with the patient's actual situation, observe gastrointestinal peristalsis and anal exhaust, and provide targeted dietary nursing intervention to the patient.

2.3.2. Study Groups

Hierarchical quantitative management was implemented in the group to establish nursing in combination with sensitive indicators of accelerated rehabilitation nursing, and the specific nursing care was as follows:

1) Establish a hierarchical quantitative management specialist nursing team

1 - 2 attending physicians, 1 head nurse, and 6 clinical specialist nurses are included in the department to form a specialist nursing team, which is divided into N1 (junior responsible nurses, nursing experience > 1 year), N2 (senior responsible nurse, nursing experience 2 - 4 years), and N3 (responsible team leader, nurse in charge and nursing experience 5 - 7 years). The head nurse of the group serves as the team leader. The team leader led the members of the group to intensively study the hierarchical quantitative management training, accelerate the training of sensitive indicators of Rehabilitation Nursing (including selection, monitoring, and evaluation) and other contents by consulting literature, combining with clinical nursing practice, etc., and strengthen the training and assessment of theoretical knowledge of nursing plan in the group. All nurses can work with certificates only after passing the assessment.

Table 1. Monitoring items of sensitive indicators for accelerated rehabilitation nursing.

Monitoring projects	Specific content
Activity	Hip lifting exercises, ≥ 4 groups in 24 hours, 6 - 10 pieces in each group Bed turning activity (2 h/time) Under-bed activities (≥ 3 times in 24 h, 30 m each time)
Respiratory care	Provide patients with postoperative cough and expectoration training guidance Balloon blowing training (≥ 3 sets in 24 h, 10 min per set) Guide patients to perform active cough training (≥ 3 sets in 24 h, 15 min per set)
Gastrointestinal function training	Chewing gum (≥ 3 times in 24 h) After awakening under anesthesia or 6 h after surgery, drink 15 ml of warm water every 30 min
Prevention of venous thrombosis	Ankle pump exercise (≥ 3 sets in 24 h, 15 min each time) Give the patient a lower limb pressure pump or elastic socks

2) Formulation of nursing plan

The specialist nursing team uses intra-group meetings and other methods to focus on discussing and formulating nursing plans for hierarchical quantitative management and accelerated rehabilitation nursing with sensitive indicators. Among them, the establishment of sensitive indicators for accelerated rehabilitation nursing was based on previous literature and the China Expert Consensus on Accelerated Rehabilitation Surgery (2018 Edition) [10]. The monitoring items of sensitive indicators for rapid rehabilitation nursing are shown in **Table 1**.

3) Nursing practice

Due to the large trauma of liver cancer surgery, long-term bedridden, patients' breathing limitations, cough difficulties, pulmonary infection, gastrointestinal dysfunction, and other problems, early activities are very important for the recovery of patients. 1) Provide preoperative evaluation of patients based on the patients' age, condition, and pathological stage. ① Before the operation, the N1 level nurses give patients preoperative health knowledge education by means of mind mapping, health knowledge manual, or popular science video, give the patient preoperative psychological state assessment and counseling and use suggestive language and typical cases to improve the patient's confidence in treatment. Before surgery, patients are taught to turn over in bed and cough and sputum cough training to ensure that the patients can master the correct exercise and sputum cough training methods after surgery. The N1 level nurses were given preoperative monitoring of vital indicators such as temperature, blood pressure, and heart rate, as well as corresponding records. ② On the basis of the routine nursing care of N1 nurses before the operation, N2 nurses gave patients preoperative electrocardiogram monitoring, hemodynamic monitoring, and excretion detection and assisted patients to complete the relevant preoperative examinations. ③ N3 nurses gave patients detailed management of preoperative standardized monitoring items on the basis of preoperative nursing. Instruct patients to take deep breathing, produce effective sputum and blow up balloons before surgery. Patients were given 300 - 500 ml of glucose orally 4 hours before surgery. 2) Intraoperative: 30 min before the surgery, the N2 nurse will contact the corresponding operating room nursing staff and anesthesiologist, 30min before the surgery, heat the rinse solution and other items required during the operation in advance and check the surgical instruments 30 min before the operation. The intraoperative temperature is controlled at 26°C, the humidity is controlled by about 50%, the patient's private parts are covered with sterile pads during the operation, and the patient is kept warm during the operation to avoid hypothermia. 3) Postoperative: N1 nurses actively communicate with patients, encourage family members to give patients understanding and support, encourage patients, and use mindfulness therapy to divert patients' attention. The patient's vital signs and related index data were closely monitored by N2 nurses for 24 hours after the operation. N3 nurses combined with the sensitive index monitoring project of accelerated recovery nursing gave the patient 24 hours of postoperative monitoring nursing, deep breathing: guide the patient to relax the whole body, use the nasal cavity to breathe deeply,

stagnate for 1 - 2 s, and then use the mouth to exhale. Effective cough: first, take a deep breath, then use deep nasal exhalation to hold your breath for 2 - 3 s, open your mouth and abdomen to contract and cough hard, and cough 2 - 3 times in a row. On the first day after surgery, the patient was encouraged to get out of bed, and the N2 nurse gave guidance to the patient and did a good job of supporting them. Twenty-four hours after the operation, the patient was given a lower limb massage and stretching exercises. After the patient is discharged, the N1 nurse will give the patient a post-hospital follow-up by phone or WeChat 3 times a week, each time for 10 - 20 minutes.

2.4. Observation Indicators

2.4.1. Perioperative Indicators

The first exhaust time, the first time getting out of bed, and the hospitalization time were compared between the study group and the control group.

2.4.2. Incidence Rate of Complications

Complications such as pulmonary infection, intestinal obstruction, intraoperative hypothermia, and deep vein thrombosis of the lower limbs were compared between the study group and the control group.

2.4.3. Liver Function

4 ml of fasting venous peripheral blood was collected from the patient before, 1 week, and 3 weeks after surgery, and the levels of glutamyl transferase (GGT), aspartate aminotransferase (AST), and alanine aminotransferase (ALT) were detected by the P800 automatic biochemical analyzer provided by Roche.

2.4.4. Nursing Quality

The self-made Nursing Quality Scoring Table was used to evaluate the nursing quality of the two groups. The scale included practical operation, basic nursing, and sports training, with 10 points for each item, and the score was directly proportional to the nursing quality. The Cronbach's α was 0.896, with high reliability and validity.

2.5. Statistical Analysis

SPSS 25.0 Processing data, measurement data meet normal distribution in ($\bar{x} \pm s$), compare between groups using independent sample *t*-test, and count data in [example (%)], rows χ^2 test, $P < 0.05$.

3. Results

3.1. Comparison of Perioperative Indexes between the Two Groups

The first exhaust time, the first ambulation time, and the length of hospital stay are important indicators to evaluate the postoperative recovery of patients with liver cancer. They are of great significance for judging the rehabilitation process and prognosis of patients. The first exhaust, first ambulation, and hospital stay ((19.96 \pm 3.06) h, (14.96 \pm 2.07) h, (9.07 \pm 2.96) d) in the study group were shorter

than those in the control group ((28.51 ± 4.37) h, (20.09 ± 2.66) h, (14.96 ± 6.06) d) ($P < 0.05$), as shown in **Table 2**.

Table 2. Comparison of perioperative indexes between the two groups ($\bar{x} \pm s$).

Group	Number of examples	First exhaust time (h)	Time to get out of bed for the first time (h)	Length of hospital stay (d)
Study Group	33	19.96 ± 3.06	14.96 ± 2.07	9.07 ± 2.96
Control Group	33	28.51 ± 4.37	20.09 ± 2.66	14.96 ± 6.06
<i>t</i>	-	12.747	7.0667	6.466
<i>P</i>	-	0.000	0.000	0.000

3.2. Comparison of Complication Rates between the Two Groups

It is crucial to monitor and manage postoperative complications such as lung infection, intestinal obstruction, intraoperative hypothermia, and deep vein thrombosis in patients with liver cancer. The occurrence of these complications not only affects the patient's rehabilitation process, but may also endanger the patient's life. The complication rate was lower in the study group (3.03%) than in the control group (18.18%) ($\chi^2 = 3.995$, $P < 0.05$), as shown in **Table 3**.

Table 3. Comparison of complication rates between the two groups [n, (%)].

Group	Number of examples	Lung infections	Ileus	Intraoperative hypothermia	Deep vein thrombosis of the lower extremities	Incidence
Study Group	33	1 (3.03)	0 (0.00)	0 (0.00)	0 (0.00)	1 (3.03)
Control Group	33	2 (6.06)	1 (3.03)	2 (6.06)	1 (3.03)	6 (18.18)
χ^2	-	-	-	-	-	3.995
<i>P</i>	-	-	-	-	-	0.046

3.3. Comparison of Liver Function Levels between the Two Groups before and after Surgery

The importance of indicators such as AST, ALT, and GGT cannot be ignored in postoperative observation of patients with liver cancer. These indicators can reflect the functional status of the liver and are of great significance for evaluating surgical outcomes, monitoring disease changes, and guiding subsequent treatment. There was no statistically significant preoperative liver function (AST, ALT, GGT) between the two groups ($P > 0.05$), the postoperative liver function indexes of the two groups were lower than those before the operation ($P < 0.05$), the study group had lower AST, ALT, and GGT than the control group ($P < 0.05$) one week after surgery, and there was no significant difference in liver function between the two groups three weeks after surgery ($P > 0.05$), as shown in **Table 4**.

Table 4. Comparison of liver function levels between the two groups before and after surgery ($\bar{x} \pm s$).

Group		AST (U/L)	ALT (U/L)	GGT (U/L)
Study Group (n = 33)	Preoperatively	57.96 ± 7.07	103.53 ± 27.74	88.64 ± 16.56
	1 week postoperatively	42.14 ± 6.62 ^{ab}	40.19 ± 5.90 ^{ab}	50.14 ± 8.02 ^{ab}
	3 week postoperatively	40.26 ± 6.62 ^a	38.49 ± 6.68 ^a	41.12 ± 10.93 ^a
Control Group (n = 33)	Preoperatively	57.69 ± 7.10	101.41 ± 29.64	88.94 ± 16.65
	1 week postoperatively	47.12 ± 6.66 ^{ab}	45.97 ± 6.01 ^{ab}	61.75 ± 6.89 ^{ab}
	3 week postoperatively	40.52 ± 6.95 ^a	40.14 ± 6.74 ^a	56.68 ± 11.47 ^a

Note: The intra-group and preoperative comparison ^a $P < 0.05$; The ^b $P < 0.05$ between groups 1 week after surgery; The ^c $P < 0.05$ between groups at 3 weeks after surgery.

3.4. Comparison of Nursing Quality Scores between the Two Groups

Basic nursing, practical operation, and exercise training each play an indispensable role in the care of postoperative liver cancer patients. They work together to promote the comprehensive recovery of patients' physical and mental health during the rehabilitation process. The scores of basic nursing, practical operation, and exercise training in the study group were higher than those in the control group, and the statistical significance was established ($P < 0.05$), as shown in **Table 5**.

Table 5. Compares the quality of care scores between the two groups ($\bar{x} \pm s$, points).

Group	Number of examples	Basic care	Hands-on	Functional training
Study Group	33	8.72 ± 0.23	8.81 ± 0.37	9.23 ± 0.27
Control Group	33	7.05 ± 0.25	7.22 ± 0.43	7.68 ± 0.39
<i>t</i>	-	4.374	4.635	5.587
<i>P</i>	-	0.000	0.000	0.000

4. Discussion

Liver cancer is clinically divided into two types: primary liver cancer and secondary liver cancer, among which primary liver cancer mainly includes hepatocellular carcinoma, intrahepatic cholangiocarcinoma, and other types, of which hepatocellular carcinoma accounts for more than 85% - 90% [11] [12]. Liver cancer surgery is an effective measure for the clinical treatment of liver cancer, and clinical strengthening of perioperative rehabilitation care can significantly reduce surgical complications and improve the prognosis of patients. In recent years, with the continuous improvement of the technical level of clinical medical services, more and more nursing programs have been widely used in clinical disease nursing, but among the many nursing intervention models, seeking nursing models with higher comprehensive application value is still the focus of clinical nursing research.

This study found that the first exhaust, first ambulation activity, and hospital stay in the study group were shorter than those in the control group, and the incidence of complications in the study group was lower than that in the control group ($P < 0.05$), and the results were consistent with the results of previous studies [13], suggesting that in the clinical care of patients undergoing liver cancer surgery, the implementation of hierarchical quantitative management combined with the establishment of sensitive indicators for accelerated recovery nursing can further shorten the prognosis of patients and reduce the incidence of perioperative complications in patients. Reason analysis: The nursing sensitive index is an important guarantee to reflect the characteristics of nursing work, meet the requirements of nursing quality management and improve the improvement of nursing quality. The establishment of a clinical nursing sensitive index provides index support for realizing the improvement of specialized nursing quality and implementing the content of rapid rehabilitation nursing at all stages [14]. Some researchers [15] have shown that accelerating the establishment and application of sensitive indicators for rehabilitation nursing and urging medical staff to apply nursing procedures to provide overall care for patients will help significantly improve the quality of nursing and promote the rapid prognosis of patients after surgery. Hierarchical quantitative management can further reflect the pertinence of nursing and can provide symptomatic nursing intervention to patients based on the nursing needs of different nursing stages, which can easily accelerate the postoperative recovery effect [16] [17]. Hierarchical quantitative management combined with sensitive indicators of accelerated recovery nursing can maximize the pertinence and effectiveness of the nursing intervention, meet the needs of rapid surgical care, and shorten the prognosis of patients. At the same time, the results showed that the AST, ALT, and GGT in the study group were lower than those in the control group at 1 week after surgery ($P < 0.05$), and there was no significant difference in liver function between the groups at 3 weeks after surgery ($P > 0.05$); it suggested that stratified quantitative management combined with sensitive indicators of accelerated rehabilitation care could improve the short-term prognosis and shorten the prognosis of patients. Cause analysis, hierarchical quantitative management combined with sensitive indicators of accelerated rehabilitation nursing can help to rationally allocate medical resources, improve the quality and efficiency of clinical nursing intervention, and further improve patients' postoperative self-care ability while promoting patients' recovery and through the construction of sensitive indicators of rapid rehabilitation nursing, it can play a significant role in shortening patients' prognosis and improving short-term rehabilitation effects [18] [19]. Finally, the results showed that the scores of basic nursing, practical operation, and exercise training in the study group were higher than those in the control group ($P < 0.05$), suggesting that the quality of nursing with sensitive indicators of hierarchical quantitative management combined with accelerated rehabilitation nursing was higher, which was mainly related to factors such as the rational allocation of medical resources and the provision of targeted

and professional care to patients, which could better meet the needs of clinical nursing and improve the quality of nursing [20].

Although this study reveals the positive role of hierarchical quantitative management combined with accelerated rehabilitation nursing-sensitive indicators in postoperative care of liver cancer patients, further analysis is needed to understand the mechanism of prognosis in liver cancer patients. For example, further exploration can be conducted on how this nursing model affects the biological and immunological mechanisms of liver cancer patients by optimizing the allocation of medical resources, improving nursing quality and efficiency, and promoting patient self-care ability and rapid recovery. In addition, the specific effects of this nursing model on postoperative inflammatory response, immune function, nutritional status, and other aspects of liver cancer patients can be studied to gain a deeper understanding of its mechanism for improving prognosis.

In summary, although this study has achieved certain results in postoperative care for liver cancer patients, further in-depth research is still needed to overcome limitations and explore the mechanism of this nursing model on the prognosis of liver cancer patients in greater depth. This will help provide more scientific and effective nursing plans for liver cancer patients and improve their quality of life and prognosis.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

- [1] Chen, Q.Q., Rui, F.J., Ni, W.J., *et al.* (2024) Research Progress on Epidemiology and Risk Factors of Primary Liver Cancer. *Chinese Journal of General Practice*, **27**, 637-642.
- [2] Smayi, H. and Setihan, G. (2020) Analysis on High Risk Factors of Recurrent Hepatitis B Virus Reactivation in Patients with Hepatitis B Liver Cancer after Transcatheter Arterial Chemoembolization. *Xinjiang Medical Journal*, **7**, 109-113.
- [3] Xian, L.F., Fang, L.T., Liu, W.B., *et al.* (2022) Prevalence Status, Main Pathogenesis and Prevention and Control Strategies of Primary Liver Cancer. *Chinese Journal of Cancer Prevention and Control*, **14**, 320-328.
- [4] Zhou, Z.W., Liu, Y.C., Xiang, B., *et al.* (2021) Global Outlook for Primary Liver Cancer: Prevalence, Risk Factors, and Population Attribution Scores. *Chinese Journal of Cancer Prevention and Control*, **13**, 14-21.
- [5] Trivedi, N.K., Tiwari, R., Anand, A., *et al.* (2022) Application of Machine Learning for Diagnosis of Liver Cancer. *2022 International Conference Advancement in Data Science, E-Learning and Information Systems (ICADEIS)*, Bandung, 23-24 November 2022, 1-5. <https://doi.org/10.1109/ICADEIS56544.2022.10037379>
- [6] Zhang, S.C. (2018) Effect of Accelerated Recovery Nursing Concept in the Perioperative Period of Liver Cancer Patients. *Inner Mongolia Medical Journal*, **50**, 1383-1384.
- [7] Zhang, X.L. and Wang, H.M. (2023) Effect of Quantitative Assessment-Based Stratified Care Model on Rehabilitation Outcomes in Elderly Patients with Lumbar Intervertebral

- Disc Herniation. *Journal of Qilu Nursing*, **29**, 14-16.
- [8] Hong, Y. (2020) Application of Enhanced Recovery Surgery in Perioperative Rehabilitation Nursing for Laparoscopic Hepatocellular Cancer Resection. *Chinese Journal of Community Physicians*, **36**, 175-176.
- [9] Medical Administration of the National Health Commission of the People's Republic of China (2022) Guidelines for the Diagnosis and Treatment of Primary Liver Cancer (2022 Edition). *Chinese Journal of Digestive Surgery*, **21**, 143-168.
- [10] Chen, R., Chen, Y.J., Dong, H.L., et al. (2018) Chinese Expert Consensus and Pathway Management Guidelines for Accelerated Recovery Surgery (2018 Edition). *Chinese Journal of Practical Surgery*, **38**, 1-20.
- [11] Liver Cancer Committee of Chinese Anti-Cancer Association (2022) Guidelines for the Integrated Diagnosis and Treatment of Cancer in China-Liver Cancer (2022 Condensed Version). *Chinese Journal of Clinical Oncology*, **49**, 865-873.
- [12] Erichsen, R., Jepsen, P., Jacobsen, J., Nørgaard, M., Vilstrup, H. and Sørensen, H.T. (2022) Time Trends in Incidence and Prognosis of Primary Liver Cancer and Liver Cancer of Unknown Origin in a Danish Region, 1985-2004. *European Journal of Gastroenterology & Hepatology*, **20**, 104-110.
<https://doi.org/10.1097/MEG.0b013e3282f17517>
- [13] Nie, P.H. and Sun, N. (2021) Effect of Stratified Nursing in Patients with Severe Head Injury after Surgery Based on Quantitative Evaluation Strategy. *Medical Clinical Research*, **38**, 319-321.
- [14] Wang, Y., Yu, J.H. and Zhang, Y. (2020) Application of Specialized Nursing Quality Sensitive Indicator Management Model in Inpatients of Neurology. *Journal of Qilu Nursing*, **26**, 34-36.
- [15] Li, J., Li, W., Song, D.D., et al. (2022) Application of ERAS Sensitive Indicators in Specialized Nursing in Patients Undergoing Partial Hepatic Resection. *Journal of Qilu Nursing*, **28**, 14-16.
- [16] McGouhg, N.N., Hauschildt, B., Mollon, D., et al. (2015) Nurses'knowledge and Comfort Levels Using the Physician Orders for Life-Sustaining Treatment (POLST) form in the Progressive Care Unit. *Geriatric Nursing*, **36**, 21-24.
<https://doi.org/10.1016/j.gerinurse.2014.09.001>
- [17] Sheng, L., Wang, L.Q. and Tan, L.Y. (2020) Application Effect of Stratified Quantitative Evaluation Management in Intravenous Therapy Quality Management. *Chinese Journal of Modern Nursing*, **26**, 806-810.
- [18] Burston, S., Chaboyer, W. and Gillespie, B. (2019) Nurse-Sensitive Indicators Suitable to Reflect Nursing Care Quality: A Review and Discussion of Issues. *Journal of Clinical Nursing*, **12**, 1785-1795. <https://doi.org/10.1111/jocn.12337>
- [19] Chu, X.M., Zhou, H.Q., Ma, R.Y., et al. (2020) Evidence-Based Construction of a Sensitive Index System for Nursing Quality of Perioperative Pulmonary Function Rehabilitation. *Chinese Journal of Practical Nursing*, **36**, 2268-2274.
- [20] Yan, Q., Shen, H.Y. and Jiang L.Y. (2020) Application Effect of Nursing Quality Sensitive Indicators in Continuous Improvement of Neurosurgical Aspiration Prevention Management. *PLA Journal of Nursing*, **37**, 83-85.