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ORIGINAL ARTICLE

Retrospective Study

Impact of fast-track surgery on perioperative care in patients undergoing hepatobiliary surgery

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Abstract

BACKGROUND

Fast-track surgery (FTS) is a modern nursing approach that has gained popularity in the perioperative phase of surgery.

AIM

To investigate the impact of FTS on perioperative care for hepatobiliary surgery.

METHODS

A retrospective analysis was performed on 98 patients who underwent hepatobiliary surgery and were admitted to our hospital from August 2021 to October 2023. They were divided into an observation group and a control group with 49 patients in each group according to different nursing directions. The control group was treated with standard nursing and the observation group was treated with FTS concept nursing. The length of hospital stay, visual analog scale (VAS) score, wound complications, nursing satisfaction, self-rating scale (SAS) score, and SF-36 quality of life (QoL) score were compared between the two groups before and after care.

RESULTS

The duration of hospitalization, hospitalization cost, operation time, first implantation time, exhaust time, and first defecation time were shorter than the observation group ($P < 0.05$). Additionally, the observation group showed a significant difference between the VAS and SAS scores on days 1, 3, and 7 ($P < 0.05$). The complication rate in the observation group was 4.05% was significantly lower than the 18.36% in the control group, and the comparison groups were statistically significant ($\chi^2 = 5.018$, $P = 0.025$). The observation group had a significantly higher level of nurse satisfaction (94.92%) than the control group (79.59%; $\chi^2 = 6.078$, $P =$

0.014). Both groups showed higher QoL scores after nursing care, with higher scores in the observation group than in the control group (P = 0.032).

CONCLUSION

FTS in patients undergoing hepatobiliary surgery can effectively improve negative mood, QoL, and nursing satisfaction; reduce wound complications; and accelerate patient rehabilitation.

Key Words: Rapid rehabilitation surgery concept; Hepatobiliary surgery; Quality of life; Wound complications; Fast track surgery

Core Tip: Fast-track surgery (FTS) is a modern nursing approach that has gained popularity during the perioperative phase of surgery. In this study, we investigated the effect of FTS on the perioperative care of patients undergoing hepatobiliary surgery. The study showed that FTS in patients undergoing hepatobiliary surgery can effectively improve negative mood, quality of life, and nursing satisfaction, reduce wound complications, and accelerate patient rehabilitation.

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INTRODUCTION

In recent years, with the development of modern society and changes in living habits and dietary structures, the incidence of hepatobiliary surgical diseases has gradually increased[1]. Hepatobiliary surgery, which is crucial for improving the prognosis of patients with hepatobiliary diseases, has become a key discipline in hospitals[2]. However, surgery and anesthesia can lead to stress and inflammatory reactions in patients and adverse reactions such as immune function suppression and high catabolism[3]. Therefore, effective nursing care is particularly important in the perioperative period of hepatobiliary surgery.

In recent years, rapid rehabilitation surgery, known as fast-track surgery (FTS), has emerged as a nursing practice widely used in various surgical departments in European and American hospitals and has attracted the attention of the medical community[4]. Under the guidance of FTS, the traditional care mode for many surgical diseases has changed to significantly shorten the hospital stay of patients and reduce medical expenses[5]. FTS refers to the application of medical evidence in preoperative, intraoperative, and postoperative measures to reduce postoperative adverse and stress reactions, thereby accelerating patient recovery[6]. In recent years, FTS has been applied in various departments in China, including urology, orthopedics, obstetrics and gynecology, and gastrointestinal surgery[7]. FTS is the synergistic effect of several effective perioperative measures. Moreover, it is a multidisciplinary collaborative process involving medical care, anesthesiologists, rehabilitation therapists, patients, and their families[8].

In addition, an increasing number of researchers have applied the FTS concept to hepatobiliary surgery, especially for patients undergoing liver cancer surgery, for whom the application effect is relatively satisfactory. However, few clinical reports have been published on other applications of FTS in hepatobiliary surgery research. Therefore, in this study, we discuss the clinical application of FTS in hepatobiliary surgery to provide a theoretical basis for the rapid rehabilitation of patients undergoing hepatobiliary surgery.

MATERIALS AND METHODS

General data

A retrospective analysis was performed on 98 patients who underwent hepatobiliary surgery and were admitted to Kecheng District People's Hospital from August 2021 to October 2023. The patients were divided into observation and control groups, with 49 patients in each group, according to the different nursing directions. The patients in the observation group ranged in age from 20 to 72 years old, with a mean age of 47.32 ± 3.72 years, including 19 cases of gallbladder or main duct stones, 13 gallbladder polyps, 11 liver cysts, and six others. The patients in the control group ranged in age from 21 to 70 years, with a mean age of 46.53 ± 3.85 years, including 20 gallbladder or common duct stones, 12 gallbladder polyps, 12 liver cysts, and five others. The general characteristics of the two groups were comparable (P > 0.05).

Inclusion criteria and exclusion criteria

The inclusion criteria were as follows: (1) All patients diagnosed with hepatobiliary surgery-related diseases by imaging and biochemical examination; (2) All patients who met the corresponding indications for surgical treatment and tolerated the operation; and (3) The study was approved by the ethics committee of the hospital.

The exclusion criteria were as follows: (1) Severe failure of the liver, heart, or other important organs; (2) Incomplete clinical data and cognitive abnormalities; (3) Inability to cooperate with investigators, pregnancy, or lactation; and (4) Malignant tumors, autoimmune diseases, or coagulation disorders.

Nursing method

Control group: General nursing group, including healthcare, education, observation, diet care, preoperative bowel cleaning, 4 hours before water, 12 hours fasting, postoperative analgesia, rehabilitation guidance, and discharge follow-up.

Observation group: In addition to the basic care given to the patients in the control group, the observation group underwent perioperative FTS concept nursing as follows: Setting up the FTS team, including one head nurse, two nurses, and two physicians, providing a targeted rapid rehabilitation plan for patients.

Preoperative nursing: (1) Mainly provided patients with psychological, social, and physiological interventions. The preoperative nursing staff communicated patiently with patients and their families and introduced disease-related knowledge, surgical plans, prognosis, complication prevention, and FTS-related knowledge and advantages to patients to gain their trust, improve their enthusiasm for treatment, and establish correct disease cognition. The patients were encouraged to express their doubts and questions, and were provided with answers and reassurance to alleviate any negative emotions; (2) Dietary guidance: The patients were asked to drink a moderate amount of sugar water or warm boiled water 2 hours before surgery. Preoperative consumption of sugar water can inhibit postoperative catabolism, reduce the incidence of postoperative insulin resistance, relieve preoperative hunger and thirst, and supplement appropriate energy for patients to tolerate surgery better. In particular, patients undergoing hepatobiliary surgery mostly have a certain degree of insufficient liver glycogen reserve because their liver function is more or less impaired, making it more suitable; (3) Intestinal preparation: A laxative agent or a recommended less residual diet was given 1 day before surgery, without a mechanical enema, to reduce the patient's pain and discomfort; and (4) Catheter care: The FTS concept emphasizes the insertion of a urinary catheter after intraoperative anesthesia with no gastric tube before surgery. The urinary catheter can be removed 1 day after surgery to facilitate early activity. Intraoperative nursing: Paying attention to patient insulation during surgery, intraoperative hypothermia can cause certain stress reactions and arrhythmia, and can even cause fatal metabolic acidosis and coagulation dysfunction complications caused by hypothermia. Nursing staff should pay close attention to the appropriate temperature and humidity adjustment of the operating room to approximately 24 °C. For patients with hepatobiliary stones that need to be washed with a choliodochoscope, the irrigation fluid should be warmed. The patient's body temperature was maintained at approximately 36 °C to reduce adverse stress reactions.

Postoperative care: (1) Pain management: Unbearable pain after surgery can affect the early implantation movements of patients. At 48 hours after surgery, analgesic drugs can be injected with intravenous or nonsteroidal anti-inflammatory painkillers, and opioid analgesics can be prohibited to reduce the occurrence of intestinal paralysis; (2) Early postoperative activity: FTS concept nursing suggests that patients get out of bed as soon as possible to promote the recovery of bladder and gastrointestinal function, reduce the occurrence of urinary retention and abdominal distension, and reduce the risk of lower-extremity thrombosis. Postoperatively, the patient was awake and could assist in passive and active limb activities, including turning over, hip lifting, flexion, and extension. When the postoperative 1-day electrocardiogram monitor showed that the patient's vital signs were relatively stable, there was no other discomfort. At this point, the monitor can be removed and the patient can get out of bed. The patient could walk slowly along the bed and then gradually along the corridor of the department according to their own situation to avoid palpitations or dizziness; and (3) Early postoperative eating: Instead of the routine practice of withholding food for 4–5 days after surgery, patients are encouraged to start consuming light liquid food as soon as anal exhaust occurs, gradually transitioning to regular food. Additionally, an appropriate amount of water can be consumed 6 hours after surgery, which can enhance the patient's confidence and comfort and reduce the adverse reactions of nausea and vomiting. Related studies have reported that an early diet can reduce the displacement of intestinal bacteria, promote the early recovery of intestinal function, and improve mucosal barrier function.

Observing indicators

(1) Length of hospitalization, hospitalization costs, operation time, first implantation time, exhaust time, and first postoperative defecation time in both groups; (2) The anxiety self-rating scale (SAS) was used to assess anxiety before and after nursing. There are 20 questions on this scale, with each question having four possible options based on severity, or 1–4 points, where the higher the score, the greater the anxiety; (3) The pain of all patients on days 1, 3, and 7 was evaluated using the visual analog pain scoring method; the score range was 0-10, and the score was proportional to the degree of pain; (4) The occurrence of wound complications was recorded in both groups, mainly incision infection, pressure ulcer, lung infection, and urinary tract infection; (5) Before and after nursing, the patient's quality of life (QoL) was assessed using the SF-36 QoL score. The evaluation content of this scale includes six dimensions (overall scores for health status, mental health, physical functioning, emotional functioning, social functioning, and physical pain), which are proportional to the patient's QoL; and (6) The nursing satisfaction of the two groups of patients was compared using a nursing satisfaction questionnaire developed by our hospital. The questionnaire consisted of 100 points, with a total score

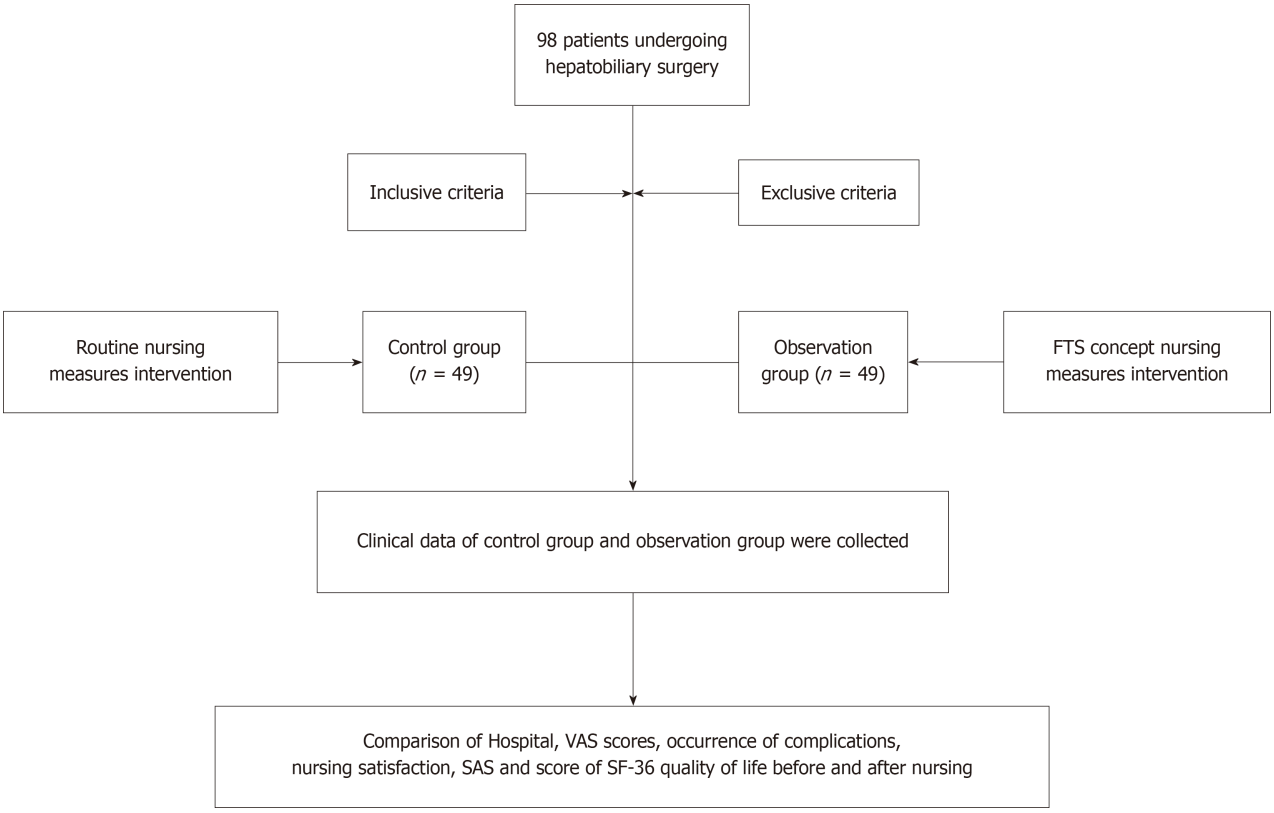

Figure 1 The flowchart of the study. FTS: Fast track surgery; VAS: Visual analog scale scores; SAS: Self-rating scale.

of < 60 dissatisfaction, 60-80, > 80 satisfaction = (satisfied cases + satisfied cases)/100 total cases.

Statistical analysis

Data were analyzed using SPSS 23.0. Statistical analyses were performed separately for measurement and count data. The measurement data is represented by mean ± SD, and the comparison between groups is performed by *t*-test; the count data is calculated by *n* (%), and the comparison between groups is performed by χ^2. Normality tests were conducted on continuous variables using the Shapiro-Wilk method. Statistical analyses of the measured data were performed using an independent sample *t*-test (two-tailed Student's *t*-test). Statistical significance was set at $P < 0.05$.

RESULTS

Comparison of general data between the two groups

The research route used in this study is illustrated in Figure 1. As shown in Table 1, there were no significant differences in age or disease type between the two groups.

Comparison of hospitalization between the two groups

The length of hospitalization, hospitalization cost, operation time, first implantation time, exhaust time, and first post-operative defecation time were shorter in the observation group than in the control group ($P < 0.05$; Table 2).

Comparison of visual analog scale and SAS scores between the two groups

The visual analog scale (VAS) scores of the observation group on days 1, 3, and 7 were lower than those of the control group ($P < 0.05$; Figure 2A). The SAS scores were not significantly different between the two groups ($P = 0.795$) before nursing. As shown in Figure 2B, the SAS scores of both groups were lower after than before nursing, and the SAS score of the observation group was lower than that of the control group ($P = 0.021$).

Comparison of the occurrence of wound complications in the two groups

In the observation group, the wound complication rate was 4.05%, which was significantly lower than that of the control group (18.36%; $\chi^2 = 5.018$, $P = 0.025$; Table 3).

Comparison of nursing satisfaction between the two groups

In the observation group, the nursing satisfaction was 95.92%, which was significantly higher than the 79.59% reported in

Table 1 Comparison of the general data between the two patient groups

Group	Age (year)	Disease type (example)			
		Gallbladder or bile duct stones	Cholecystic polypus	Hepatic cyst	Other
Observation group (n = 49)	47.32 ± 3.72	19	13	11	6
Control group (n = 49)	46.53 ± 3.85	20	12	12	5
t/χ^2	1.033	0.200			
P value	0.304	0.978			

Table 2 Comparison of hospitalization between the two groups (mean ± SD)

Group	Length of stay (day)	Hospitalization cost (ten thousand yuan)	Time of surgery (min)	First time (hour)	Evacuation time (hour)	Time of the first defecation after the operation (hour)
Observation group (n = 49)	7.25 ± 1.38	0.75 ± 0.23	78.52 ± 15.23	15.31 ± 3.53	22.36 ± 2.53	39.21 ± 6.52
Control group (n = 49)	13.12 ± 3.25	1.23 ± 0.51	103.25 ± 23.62	35.52 ± 5.85	41.52 ± 3.89	56.53 ± 8.75
t value	11.637	6.006	6.160	20.705	28.903	11.111
P value	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001

Table 3 Comparison of the occurrence of wound complications in the two groups, n (%)

Group	Infection of incisional wound	Pressure sores	Pulmonary infection	Poor wound healing	Total incidence
Observation group (n = 49)	1 (2.04)	0 (0.00)	0 (0.00)	1 (2.04)	2 (4.08)
Control group (n = 49)	3 (6.12)	2 (4.08)	1 (2.04)	3 (6.12)	9 (18.36)
χ^2	-	-	-	-	5.018
P value	-	-	-	-	0.025

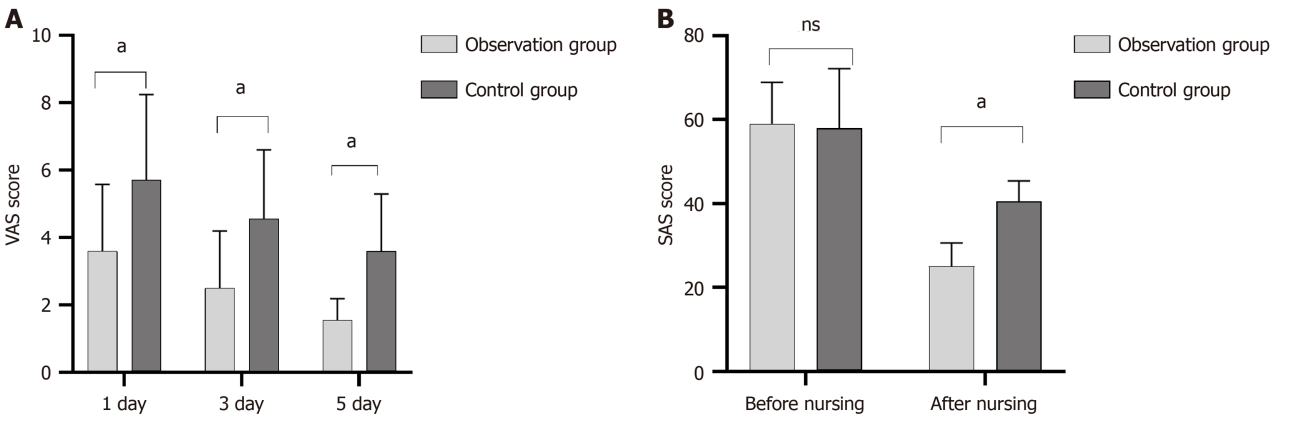

Figure 2 Comparison of visual analog scale scores and self-rating scale scores between the two groups of patients. VAS: Visual analog scale scores; SAS: Self-rating scale.

the control group (χ^2 = 6.078, P = 0.014; Table 4 and Figure 3).

Comparison of SF-36 QoL scores before and after care in the two groups

Before nursing, there was no significant difference in the QoL scores between the two groups (P = 0.705). After nursing, the QoL score of the two groups was higher in the observation group than in the control group (P = 0.032; Figure 4).

Table 4 Comparison of patient satisfaction with care between the two groups, *n* (%)

Group	Discontent	More satisfied	Satisfied	Segree of satisfaction
Observation group (n = 49)	2 (4.08)	20 (40.82)	27 (55.10)	47 (95.92)
Control group (n = 49)	10 (20.41)	18 (36.73)	21 (42.86)	39 (79.59)
χ^2	-	-	-	6.078
P value	-	-	-	0.014

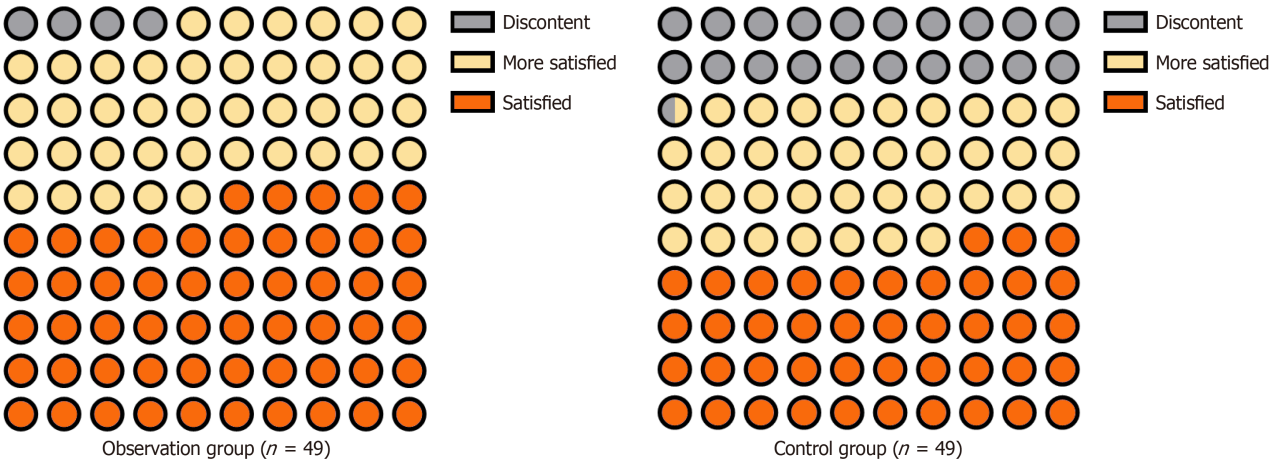

Figure 3 Intuitive pie charts of patient satisfaction in both groups.

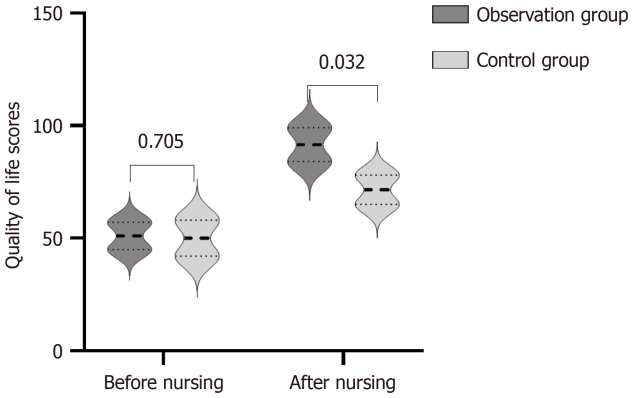

Figure 4 Comparison of quality of life scores before and after care between the two groups.

DISCUSSION

Surgery is an important treatment option for patients with hepatobiliary surgical diseases[9]. Treatment is highly targeted, has obvious effects, and can be performed accurately and quickly[10]. However, it is invasive, the anatomical structure of the hepatobiliary system is more complex, and the operation is difficult, with different degrees of stress reactions and complications common after surgery[11]. Additionally, the functional recovery of surgical patients is slow [12]. Related complications prolong hospitalization time, reduce patient confidence in treatment, increase the risk of disease, easily induce doctor-patient disputes, and affect the reputation of the hospital[13]. Therefore, effective nursing measures are particularly important to improve the QoL and prognosis of patients undergoing hepatobiliary surgery.

In this study, the length of hospitalization, hospitalization cost, operation time, first implantation time, exhaust time, and first postoperative defecation time were shorter in the FTS group than those in the control group ($P < 0.05$), suggesting that FTS could accelerate the rehabilitation of patients undergoing hepatobiliary surgery. Nursing satisfaction, QoL, and complication rates were higher in the observation group than in the control group ($P < 0.05$), whereas the VAS score was lower. The application of FTS in patients undergoing hepatobiliary surgery can reduce complications and pain and improve nursing satisfaction, negative mood, and QoL.

These improvements may be due to the following reasons: (1) Preoperative patient and patient health education and psychological intervention to establish a correct perception of the disease, increase confidence in fighting the disease, and reduce bad mood[14]. Moreover, it is recommended to drink appropriate amounts of sugar water or warm boiled water 2 hours before surgery, which is conducive to inhibiting postoperative catabolism; reducing the incidence of postoperative insulin resistance; relieving preoperative hunger, thirst, anxiety, and other feelings; supplementing appropriate energy for patients; and improving surgical tolerance[15]. The FTS concept does not require the insertion of a gastric tube before surgery, and the catheter can be removed 1 d after surgery to facilitate early mobilization[16]. Research has reported that conventional indwelling gastric tubes increase patients' psychological tension, fear, and other negative emotions, can cause throat discomfort, and increase the risk of lung and throat infections[17]; (2) Paying attention to the maintenance of the patient's body temperature during intraoperative nursing to reduce the occurrence of related complications caused by body temperature; and (3) In pain management in postoperative care, appropriate pain medication intervention can relieve pain, whereas opioid analgesics should be prohibited to reduce the occurrence of intestinal paralysis. Postoperative guidance for early ambulation can promote the early recovery of gastrointestinal function, reduce thrombosis, constipation, and inflammation, and promote patient recovery[18]. The concept of postoperative FTS emphasizes that early feeding and water should be provided after anal exhaust. This can reduce the stress reactions of patients, replenish energy, reduce the occurrence of complications such as dehydration, hypoglycemia, and constipation, and increase patient confidence[19]. Additionally, an early diet can reduce the displacement of intestinal bacteria, reduce the occurrence of infection-related complications, promote healing of incisions and early recovery of intestinal function, and alleviate pain in patients[20].

CONCLUSION

Perioperative application of the FTS concept in patients undergoing hepatobiliary surgery can effectively improve their negative mood and QoL, reduce wound complications, improve nursing satisfaction, accelerate rehabilitation, and reduce hospitalization costs.

FOOTNOTES

Author contributions: Wang XH and Chen FF contributed equally to this work as co-first authors; Pan J, Jiang YF designed the research study; Jiang YF, Yao MY performed the primary literature and data extraction; Wang XH, Chen FF analyzed the data and wrote the manuscript; Wang XH, Chen FF were responsible for revising the manuscript for important intellectual content; all authors read and approved the final version.

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