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The Effect of Case Management Model on the Application of Pancreatic Cancer Surgery Patients and the Recovery of Gastrointestinal Function

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Abstract: *Objective:* To evaluate the effect of the case management model on patients operated for pancreatic cancer. *Methods:* 90 pancreatic cancer surgery patients admitted to the hospital between January 2022 and June 2023 were selected and grouped by randomized numerical table. For 45 cases in the observation group, case management mode was adopted, and for 45 cases in the intervention group, conventional nursing care was chosen to compare the indexes of gastrointestinal function recovery. *Results:* The recovery time of all gastrointestinal functions of the observation group was shorter than that of the intervention group; after nursing, the psychological state score of the observation group was lower than that of the intervention group, the self-efficacy score was higher than that of the intervention group and the rate of complications was lower than that of the intervention group ($P < 0.05$). *Conclusion:* The case management model can promote the recovery of gastrointestinal function in patients with pancreatic cancer surgery and its nursing feasibility is high.

Keywords: Case management; Pancreatic cancer surgery; Gastrointestinal function recovery

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1. Introduction

Pancreatic cancer is a malignant tumor with a high degree of malignancy. Its high incidence is related to factors such as poor dietary structure, disordered lifestyle and environmental changes. Patients undergoing radical resection surgery can maximize the removal of cancerous lesions and reduce the risk of the disease [1]. However, the anatomical location of the pancreatic tissue is special and is proximal to the liver and biliary organs. Its complex positional relationship with the surrounding tissues makes surgery difficult. In addition, patients are prone to the imbalance of pancreatic secretion function after surgery, which in turn causes complications such as delayed gastric emptying and affects the recovery of gastrointestinal function after surgery. For this reason, the implementation of case management throughout the perioperative period can be targeted to assess the surgical risk factors of each patient and formulate an individualized care plan to significantly improve surgical efficacy [2].

Based on this, 90 patients undergoing surgery for pancreatic cancer were selected for this study to evaluate the intervention role of case management.

2. Information and methods

2.1. Object information

Between January 2022 and June 2023, 90 cases of pancreatic cancer surgery patients were included, divided evenly by randomized numerical table with 45 cases in the observation group where male patients versus female patients were 19:26; their ages ranged from 46 to 78 years old, with a mean of (52.36 ± 2.91) years old. In the intervention group, there were 45 cases in the observation group, with a male-to-female ratio of 18:27; the age range was from 44 to 79 years old, with a mean of (52.49 ± 2.86) years old. There was no difference in the comparison of basic information between the groups, $P > 0.05$.

Inclusion criteria: (1) Meeting the WHO diagnostic criteria for pancreatic cancer and indications for pancreatectomy; (2) Postoperative pathology consistent with the diagnosis of pancreatic cancer; (3) Informed and consent to the study.

Exclusion criteria: (1) With cognitive disorders; (2) Combined with severe heart, liver, kidney and other vital organ dysfunction; (3) With mental diseases.

2.2. Methods

The intervention group chooses conventional nursing care: Summarize the patients' basic information and assess their age, education, family background and other information to understand their nursing needs. After that, the team explained the disease knowledge and surgical knowledge in detail and provided one-to-one language guidance to the patients to reduce their psychological pressure as much as possible. At the same time, the patients were assisted in completing the preoperative preparation program, and after the operation, the patient's signs and condition changes were continuously monitored. At the same time, the postoperative diet, activities and rehabilitation matters were explained.

The observation group selected anticipatory nursing led by case managers:

(1) On the basis of conventional nursing, adopt the anticipatory nursing model with the case manager as the core member. The case manager is a senior nursing staff whose scope of responsibility is to assess, plan, implement, adjust and evaluate the diagnosis, care, rehabilitation and nutrition of the patients before hospitalization, during hospitalization and after discharge. Besides, the case manager is also responsible for identifying nursing problems, targeting nursing recommendations and responsible for inter-team communication and coordination to provide continuous care for patients.

(2) Nursing assessment: Conduct a comprehensive assessment of the patient's physical ability, body mass index, disease duration, symptomatic manifestations, personality traits, educational level and other information to understand his/her nutritional status, disease status and surgical knowledge cognition, and to summarize the patient's nursing key points. In addition, nurses conduct academic exchanges with supervising physicians, use literature review and screening of typical clinical cases to formulate care plans and learn the latest nursing knowledge to fully integrate the patient's specific situation and refine and improve the care plan. Besides, a case management care plan will also be developed and implemented. According to the characteristics of different treatment periods, such as diagnosis, treatment and rehabilitation, the study applies the case management assessment system to formulate and implement care plans for patients in terms of diet, activity, rehabilitation exercise and complication

prevention. The study focuses on assessing the patient's gastrointestinal function, counting the patient's food type and stool character/color, shortening the time of preoperative fasting and drinking, analyzing the interfering factors in the recovery of gastrointestinal function in anticipation of the patient's recovery, and providing feedback to the medical team for symptomatic treatment.

(3) Supervision and coordination involve daily monitoring of the patient's progress in nutrition, medication, testing and other treatments, patient completion, failure to complete the program on schedule and communication with the medical team to adjust the care plan.

(4) Provide health education for patients throughout the whole process.

(a) Preoperative: Distribute the paper version of the education manual or play the education video to patients, explaining in detail the process of pancreatic cancer surgery, the expected efficacy, technical maturity and perioperative care methods. This is to ensure the patients fully understand the relevant details and psychological status through interviews and questionnaires and patiently guide them to express their nursing demands, analyze the main triggers of their negative psychology, and encourage them to listen to soft music, watch comedy programs, read books or paintings to relieve tension and anxiety by shifting their attention. This step will focus on preoperative fasting requirements, intraoperative anesthesia, common abnormal reactions and postoperative response.

(b) Postoperative: The implementation of postoperative accelerated rehabilitation of surgical care concepts, as soon as possible to tube removal, instructing family members to help patients every 2h to massage the patient's abdomen, each massage 15 min and morning and evening warm water foot bath care for 30 min, to promote gastrointestinal function recovery. After the patient has resumed eating, implement the principle of small meals, forbidding greasy or spicy food. First, choose fluids, which can be combined with intestinal probiotics, with no bloating or diarrhea and other symptoms, then gradually transition to semi-fluid food, which can be combined with probiotic yogurt. If the patient's digestive function is poor, the patient can take gastric power promotion drugs as prescribed by the doctor and take exogenous digestive enzymes with meals. Gastrointestinal function should be evaluated once in 2d intervals, and the management measures should be adjusted timely according to the recovery situation.

(c) Pain management: Test the patient's pain sensitivity and provide targeted pain guidance. For those with high sensitivity, postoperative pain medication can be taken 3 to 4 times a day for 4 to 5 d. For those with low sensitivity, massage techniques and attention diversion methods can be utilized to relieve pain, with physical pain relief methods.

(5) Discharge guidance. According to the patient's recovery, a personalized follow-up program is formulated in the information system, which can realize the tracking and management of patients through face-to-face visits, online visits, and micro-letter follow-ups. Focusing on tracking the patient's recovery at home, some other protocols can be done through test and examination results, giving personalized health guidance to the patient's care problems during the home period, and pushing health knowledge regularly. The study records the content of follow-up visits and continues to provide consultation and registration services for patients.

2.3. Observation indexes

(1) Recovery time of gastrointestinal function: (a) Time of the first flatulence; (b) Time of bowel sound recovery; (c) Time of the first defecation; (d) Time of the first time to get out of bed; (e) Time of feeding, and also statistics of hospitalization time.

(2) Psychological state score: Anxiety self-assessment scale (20 items, standardized score = 50 points) and depression self-assessment scale (20 items, standardized score = 53 points) were issued, and negative psychological positive recording score.
(3) Self-efficacy: Cancer self-efficacy scale was selected, containing stress relief (count: 10 items), self-decision making (count: 3 items) and positive attitudes (count: 15 items), with 1 to 5 points for each item, for a total of 140 points, and positively recorded scores.
(4) Complications: Abnormal blood sugar, digestive enzyme deficiency, pancreatic fistula with delayed gastric emptying.

2.4. Statistical analysis

Data processing was completed by SPSS 21.0 software, the measurement data were compared and tested by *t*-value, count data were compared and tested by χ^2 value, and the criterion for assuming the significance of the calibration was *p*-value less than 0.05.

3. Results

3.1. Comparison of gastrointestinal function recovery time between the two groups

The gastrointestinal function recovery time of the observation group is shorter than that of the intervention group ($P < 0.05$). See **Table 1**.

Table 1. Comparison of gastrointestinal function recovery time between the two groups (mean ± SD)

Group	Time to first flatulence (h)	Time to return of bowel sounds (h)	Time to first defecation (h)	Time to first get out of bed (h)	Time to feeding (h)	Length of hospitalization (d)
Observation group ($n = 45$)	25.81 ± 3.62	15.80 ± 2.35	40.61 ± 4.94	20.49 ± 2.93	36.53 ± 3.18	16.33 ± 2.08
Intervention group ($n = 45$)	37.45 ± 3.81	22.71 ± 3.15	50.81 ± 4.99	34.11 ± 2.97	41.91 ± 4.08	20.37 ± 2.11
t	14.857	11.795	9.745	21.900	6.977	9.147
p	0.000	0.000	0.000	0.000	0.000	0.000

3.2. Comparison of the psychological state scores of the two groups

Before nursing, the psychological state scores of the two groups were compared, and there was no difference ($P > 0.05$). After nursing, the psychological state scores of the observation group were lower than those of the intervention group ($P < 0.05$). See **Table 2**.

Table 2. Comparison of the psychological state scores of the two groups (mean ± SD/points)

Group	Anxiety		Depression	
	Pre-nursing	After care	Pre-nursing	After care
Observation group ($n = 45$)	49.62 ± 4.25	24.15 ± 2.06	47.27 ± 4.31	25.31 ± 2.38
Intervention group ($n = 45$)	49.57 ± 4.22	29.37 ± 2.10	47.34 ± 4.19	30.92 ± 2.43
t	0.056	11.904	0.078	11.064
p	0.955	0.000	0.938	0.000

3.3. Comparison of self-efficacy scores between the two groups

Before nursing, there was no difference in the self-efficacy scores of the two groups ($P > 0.05$). After nursing, the self-efficacy scores of the observation group were higher than those of the intervention group ($P < 0.05$). See **Table 3**.

Table 3. Comparison of self-efficacy scores between the two groups (mean ± SD/points)

Group	Stress relief		Self-determination		Positive attitude	
	Pre-nursing	After care	Pre-nursing	After care	Pre-nursing	After care
Observation group ($n = 45$)	24.38 ± 2.91	41.29 ± 3.37	8.15 ± 1.75	12.05 ± 1.71	48.35 ± 3.94	65.18 ± 2.84
Intervention group ($n = 45$)	24.33 ± 2.86	36.94 ± 3.32	8.19 ± 1.70	10.08 ± 1.67	48.38 ± 3.90	60.13 ± 2.81
t	0.082	6.168	0.110	5.529	0.036	8.479
p	0.935	0.000	0.913	0.000	0.971	0.000

3.4. Comparison of the complication rate between the two groups

The complication rate of the observation group was lower than that of the intervention group ($p < 0.05$). See **Table 4**.

Table 4. Comparison of complication rate between the two groups [n/%]

Group	Glycemic abnormalities	Digestive enzyme deficiencies	Pancreatic fistula	Delayed gastric emptying	Incidence
Observation group ($n = 45$)	1 (2.22)	0	0	1 (2.22)	4.44 (2/45)
Intervention group ($n = 45$)	4 (8.89)	1 (2.22)	1 (2.22)	3 (6.67)	20.00 (9/45)
χ^2	-	-	-	-	5.075
p	-	-	-	-	0.024

4. Discussion

Pancreatic cancer mainly develops in middle-aged and elderly people, and there are no obvious symptoms in the early stage of the disease, which makes it difficult to diagnose [3]. When the disease progresses, patients will have obvious symptoms such as abdominal pain, jaundice and deep yellow urine, which need to be treated surgically to ensure the effectiveness of surgery, mostly in the perioperative period of joint nursing services. Routine nursing can assist patients in performing preoperative preparation, which focuses on physiological care and has certain nursing limitations [4]. Case management is a relatively new nursing method, which can give full play to the professional advantages of the case manager, pre-screen nursing problems and develop countermeasures, thus preventing complications and ensuring the quality of care. The professionalism and pertinence of this care are strong, can fully consider the subjective differences of patients and can integrate the nursing difficulties of pancreatic cancer surgery, so the nursing effect is remarkable [5].

The results showed that the recovery time of all gastrointestinal functions in the observation group was shorter than that of the intervention group, the psychological state score was lower than that of the intervention group, the self-efficacy score was higher than that of the intervention group, and the complication rate was lower than that of the intervention group ($P < 0.05$). The reason is that the implementation principle of the case

management model for anticipatory nursing care is to prevent in advance, to be able to prevent before caring, to screen the risk factors of pancreatic cancer surgery in advance, and to formulate preventive measures in a targeted manner, which in turn improves the timeliness of care [6,7]. The management can comprehensively assess the patient's disease status, clearly delineate the duties and responsibilities of nursing staff, ensure the orderly development of nursing measures, dynamically assess the patient's gastrointestinal function status, and then flexibly adjust the nursing measures to promote postoperative recovery [8]. This management can pre-screen the risk of complications in patients and prevent complications by means of fluid regulation and electrolyte monitoring. In addition, the care emphasizes psychological guidance, which can improve patients' understanding of surgical knowledge and enable them to regulate their negative psychology actively, thereby reducing their psychological pressure [9,10]. Through perioperative anticipatory, refined and comprehensive care, patients can have basic self-care skills, so their sense of self-efficacy is high. Thus, they can feel nursing care in the nursing program, fully understand and recognize the nursing measures, and have high nursing satisfaction [11].

5. Conclusion

In conclusion, implementing anticipatory nursing care for pancreatic cancer surgery patients under the case management model can shorten the recovery time of gastrointestinal function, improve patients' psychological state, enhance their self-efficacy, and reduce postoperative complications.

Disclosure statement

The author declares no conflict of interest.

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