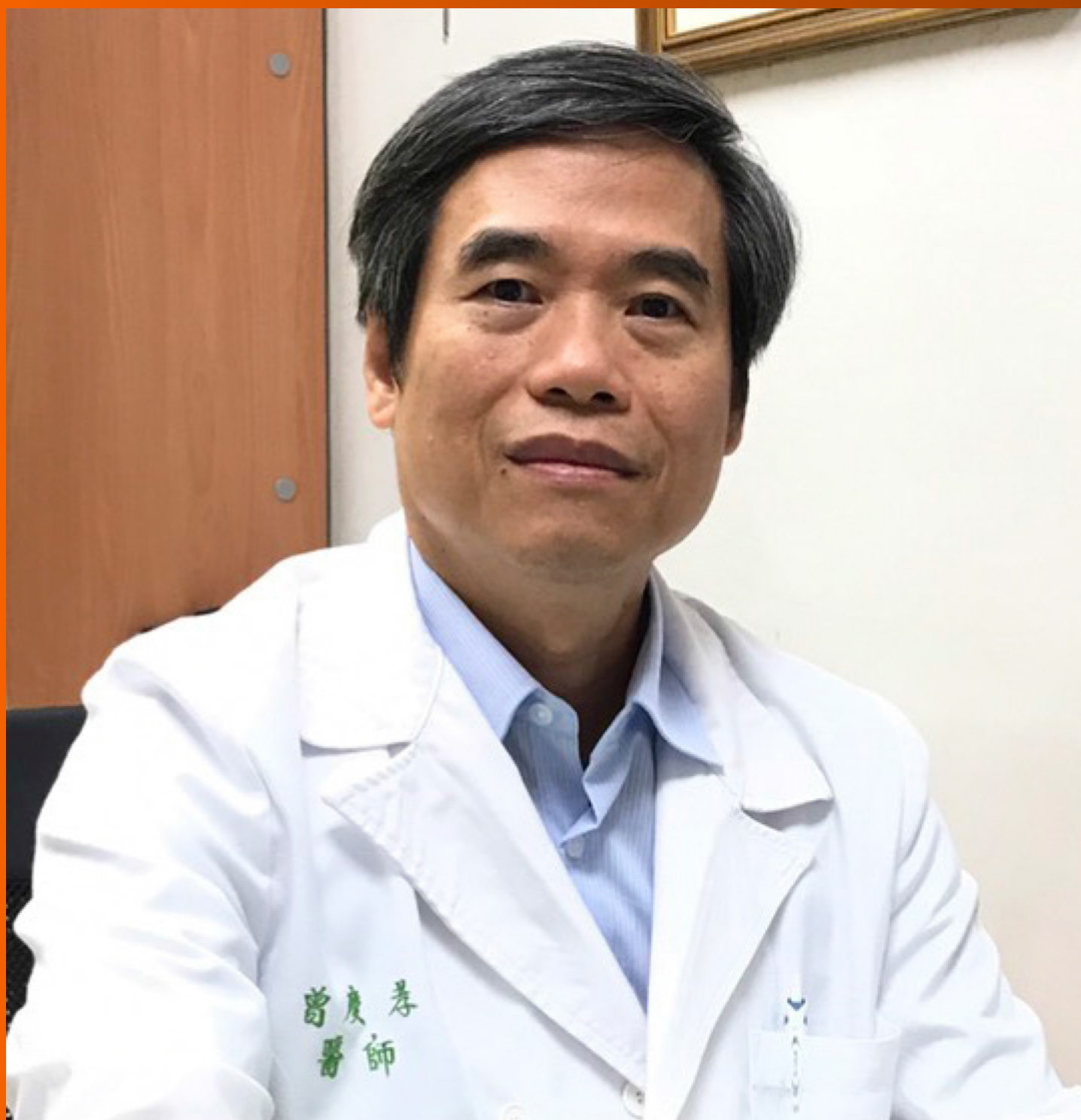


# World Journal of *Clinical Cases*

*World J Clin Cases* 2021 March 6; 9(7): 1499-1760



**REVIEW**

- 1499 Review of the risk factors for SARS-CoV-2 transmission  
*Li X, Xia WY, Jiang F, Liu DY, Lei SQ, Xia ZY, Wu QP*

**MINIREVIEWS**

- 1513 Regulation of the expression of proinflammatory cytokines induced by SARS-CoV-2  
*Zhang XN, Wu LJ, Kong X, Zheng BY, Zhang Z, He ZW*

**ORIGINAL ARTICLE****Case Control Study**

- 1524 Efficacy and safety of short duration radiotherapy combined with chemotherapy for advanced rectal cancer  
*Gao SQ, Zhang YC, Zhang C, Wang SJ, Ren W, Yuan N, Wen JY*

**Retrospective Study**

- 1532 Effects of transjugular intrahepatic portosystemic shunt using the Viatorr stent on hepatic reserve function in patients with cirrhosis  
*Yao X, Zhou H, Huang S, Tang SH, Qin JP*
- 1543 Primary and secondary postoperative hemorrhage in pediatric tonsillectomy  
*Xu B, Jin HY, Wu K, Chen C, Li L, Zhang Y, Gu WZ, Chen C*
- 1554 Dynamic monitoring of serum liver function indexes in patients with COVID-19  
*Lin H, Wu LJ, Guo SQ, Chen RL, Fan JR, Ke B, Pan ZQ*
- 1563 Construction of a clinical survival prognostic model for middle-aged and elderly patients with stage III rectal adenocarcinoma  
*Liu H, Li Y, Qu YD, Zhao JJ, Zheng ZW, Jiao XL, Zhang J*
- 1580 Short-term outcomes of radiofrequency ablation for hepatocellular carcinoma using cone-beam computed tomography for planning and image guidance  
*Yao XS, Yan D, Jiang XX, Li X, Zeng HY, Li H*
- 1592 Intra-arterial thrombolysis for early hepatic artery thrombosis after liver transplantation  
*Li T, Sun XD, Yu Y, Lv GY*
- 1600 Study on pathogenic genes of dwarfism disease by next-generation sequencing  
*Yang LL, Liang SS*

- 1610** Effects of cooperative nursing and patient education on postoperative infection and self-efficacy in gastrointestinal tumors

*Qiao L, Zeng SQ, Zhang N*

### Observational Study

- 1619** Elevated soluble 4-1BB is associated with serum markers of hepatitis B virus in patients with chronic hepatitis B

*Zhan MR, Gao XZ, Wang C, Peng F, Wang XM, Xu HQ, Niu JQ*

### CASE REPORT

- 1631** Balloon-assisted endoscopic submucosal dissection for treating small intestinal lipomas: Report of two cases

*Chen HY, Ning SB, Yin X, Li BR, Zhang J, Jin XW, Sun T, Xia ZB, Zhang XP*

- 1639** Dysphagia in a patient with ankylosing spondylitis: A case report

*Wang XW, Zhang WZ*

- 1646** Autologous scalp skin grafting to treat toxic epidermal necrolysis in a patient with a large skin injury: A case report

*Xue DD, Zhou L, Yang Y, Ma SY*

- 1654** Epstein-Barr virus-positive diffuse large B-cell lymphoma with human immunodeficiency virus mimicking complicated frontal sinusitis: A case report

*Yoon S, Ryu KH, Baek HJ, An HJ, Joo YH*

- 1661** Multiple well-differentiated retroperitoneal liposarcomas with different patterns of appearance on computed tomography: A case report

*Xie TH, Ren XX, Fu Y, Ha SN, Liu LT, Jin XS*

- 1668** Sarcomatoid carcinoma of the prostate with bladder invasion shortly after androgen deprivation: Two case reports

*Wei W, Li QG, Long X, Hu GH, He HJ, Huang YB, Yi XL*

- 1676** Metastatic thymic-enteric adenocarcinoma responding to chemoradiation plus anti-angiogenic therapy: A case report

*Li M, Pu XY, Dong LH, Chang PY*

- 1682** Solid pseudopapillary neoplasm-diagnostic approach and post-surgical follow up: Three case reports and review of literature

*Abudalou M, Vega EA, Dhingra R, Holzwanger E, Krishnan S, Kondratiev S, Niakosari A, Conrad C, Stallwood CG*

- 1696** Vancomycin-induced thrombocytopenia in endocarditis: A case report and review of literature

*Guleng SR, Wu RH, Guo XB*

- 1705** Human menstrual blood-derived stem cells as immunoregulatory therapy in COVID-19: A case report and review of the literature

*Lu J, Xie ZY, Zhu DH, Li LJ*

- 1714** Pure transvaginal natural orifice transluminal endoscopic surgery right hemicolectomy for colon cancer: A case report  
*Song ZJ, Shi YQ, Jiang YM, Liu K, Li Y, Wang CG, Zhao R*
- 1720** Hyperglycemic hemianopia: A case report  
*Xiang XH, Fang JJ, Yang M, Zhao GH*
- 1728** Mucinous appendiceal neoplasm: A case report  
*Chirca A, Negreanu L, Iliesiu A, Costea R*
- 1734** Reconstructing abdominal wall defects with a free composite tissue flap: A case report  
*Wang J*
- 1741** Mononeuropathy multiplex associated with systemic vasculitis: A case report  
*Chae HJ, Kim JW, Lee YL, Park JH, Lee SY*
- 1748** Congenital fiber-type disproportion presenting with type II respiratory failure after delivery: A case report  
*Yang HM, Guo JX, Yang YM*
- 1755** Use of three dimensional-printing in the management of floating aortic thrombus due to occult aortic dissection: A case report  
*Wang TH, Zhao JC, Xiong F, Yang Y*

**ABOUT COVER**

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## Retrospective Study

# Effects of cooperative nursing and patient education on postoperative infection and self-efficacy in gastrointestinal tumors

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**Author contributions:** Qiao L designed this retrospective study; Zeng SQ wrote this paper; Qiao L and Zeng SQ were responsible for sorting the data; all authors revised and approved the manuscript.

**Institutional review board**

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Informed consent was obtained from the patient.

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## Abstract

**BACKGROUND**

Gastrointestinal tumors have a high incidence rate. The application value of the cooperative nursing care system of medical care has received widespread attention in recent years. However, there are few studies on the value of the joint application of collaborative nursing care and self-efficacy education.

**AIM**

To explore the effect of cooperative nursing care management/self-efficacy education on postoperative infection and self-efficacy in gastrointestinal tumor surgery patients.

**METHODS**

A total of 102 patients with gastrointestinal tumors treated in our hospital from October 2018 to February 2020 were selected and divided into a conventional group ( $n = 51$ ) and a combined group ( $n = 51$ ) according to the nursing plan. The routine group adopted routine nursing, and the joint group adopted the medical care cooperative responsibility system nursing management combined with self-efficacy education. The self-efficacy scores, coping style scores, self-experience burden scores, and postoperative complication rates of the two groups before and after intervention were counted.

**RESULTS**

After intervention, the daily life behavior management, cognitive symptom management, and disease management scores of the two groups were higher than those before the intervention, and those of the combined group were higher than those of the conventional group (all  $P = 0.000$ ). After the intervention, the positive response scores of the two groups were higher than those before the intervention, the negative response scores were lower than those before the intervention, and the combined group was better than the conventional group (all  $P = 0.000$ ). After

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the intervention, the two groups' emotional, economic, and physical factor scores were lower than those before the intervention, and the combined group was lower than the conventional group (all  $P = 0.000$ ). The incidence of infection in the combined group (1.96%) was lower than that in the conventional group (15.69%) ( $P = 0.036$ ).

### CONCLUSION

Cooperative nursing care management and self-efficacy education improved the physical and mental states of gastrointestinal cancer surgery patients, change the response to disease, and reduce the risk of postoperative infection.

**Key Words:** Medical care cooperative responsibility system nursing management; Self-efficacy education; Gastrointestinal neoplasms; Postoperative infection; Self-efficacy; Nursing

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**Core Tip:** The application value of the cooperative nursing care system of medical care has received widespread attention in recent years. However, there are few studies on the value of the joint application of collaborative nursing care and self-efficacy education. The effective measures should be taken to intervene in patients with gastrointestinal tumors after surgery.

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## INTRODUCTION

Due to many factors, such as dietary changes and increased living pressure, the incidence rate of gastrointestinal tumors has continued to increase<sup>[1-3]</sup>. Surgery is an essential treatment for gastrointestinal tumors<sup>[4,5]</sup> because it can effectively remove the lesions. However, surgery can cause physiological changes and trauma to the body, further aggravating the patient's pain and increasing the risk of postoperative complications, affecting the patient's state of mind and self-efficacy<sup>[6-8]</sup>. Therefore, effective measures should be taken to intervene in patients with gastrointestinal tumors after surgery.

Routine care is mostly based on common diseases with a lack of targeted and systematic treatments, which results in low patient benefits. Self-efficacy education is an essential clinical intervention model. It is an individual's expectation of his ability. It can eliminate inner fear and other psychologies through many forms of care and deepen the disease's correct recognition, establishing confidence in recovery<sup>[9,10]</sup>. The application value of the cooperative nursing care system of medical care has also received widespread attention in recent years. In this system, a joint medical staff and nursing staff, through the promotion of cooperation, provide patients with comprehensive, effective, and safe medical care services; however, there are few studies on the value of the joint application of collaborative nursing care and self-efficacy education.

Therefore, this study selected patients after gastrointestinal cancer surgery in our hospital to discuss the effect of medical care cooperative responsibility system nursing management combined with self-efficacy education intervention.

## MATERIALS AND METHODS

### General information

A total of 102 patients with gastrointestinal tumors treated in our hospital from October 2018 to February 2020 were selected, and the inclusion criteria were: (1) Diagnosis by surgical pathology; (2) Clear consciousness and specific expression ability; (3) Clinical staging of stage I-III; and (4) Know the study and sign the consent form. Exclusion criteria were: (1) The presence of other benign and malignant tumors; (2) The presence of speech communication impairments, cognitive dysfunction, and neuropathy; (3) The use of antidepressant or anti-anxiety drugs within 2 wk before the study; (4) Cardio-cerebrovascular disease; and (5) Expected survival period of less than 6 mo.

The nursing plan was divided into a conventional group ( $n = 51$ ) and a combined group ( $n = 51$ ). There was no statistically significant difference in the general data between the two groups of patients, as shown in [Table 1](#).

### Nursing methods

The conventional group took routine care, including condition monitoring, pain care, medication guidance, and explanation of relevant precautions. The combined group adopted the cooperative medical care responsibility system nursing management and joint self-efficiency education based on the conventional group.

The medical care cooperative responsibility system nursing management: (1) Selected the attending physicians and experienced nursing staff to form an intervention group, earnestly learned the medical care cooperative responsibility system nursing management, gastrointestinal cancer postoperative care, and other related content, conducted assessments, and carried out nursing interventions after passing the training; (2) Was responsible for nursing, completing nursing evaluation, life nursing, basic nursing, *etc.* During physician rounds, the chief physician reported the examination status and bedside readings, introduced the medical history, treatment, and rehabilitation process; the nurses explained the postoperative pain, sleep, diet, and other related knowledge to the patient. After feedback, a targeted rehabilitation plan based on the individualized condition of the patient was made; (3) Chose multimodal analgesia; the responsible nurse evaluated the pain perception of patients after gastrointestinal tumor surgery and used timely targeted health for those who lacked cognition by playing videos, organizing lectures, and other forms of education to deepen their recognition of postoperative pain; if the patient's pain control was not good, the doctor was consulted to develop an analgesic plan and intervened according to the specific situation; and (4) Explained postoperative precautions, diet knowledge, *etc.* 10 min/time; the rehabilitation therapist, responsible nurses, and attending physicians guided patients with postoperative depression and anxiety, pain, and compliance with functional exercise during ward rounds.

Self-efficacy education included: (1) Health knowledge education, specialized medical personnel who regularly explained disease-related knowledge to patients with gastrointestinal tumor surgery, deepened their correct understanding of disease severity, postoperative treatment, and rehabilitation measures, eliminated psychological barriers, alleviated the fear, anxiety, and other emotions arising from the lack of awareness of the disease; (2) Mental health education because patients with gastrointestinal cancer have a greater economic burden on treatment, and the disease is more serious. It is prone to different degrees of depression and anxiety emotions, and self-efficacy is poor. Medical staff should be patient, communicate with patients, master their state of mind, target psychological counseling, share with patients successfully treated past cases, establish a positive image, and help patients to positively face disease and rehabilitation treatment; (3) Family support encouragement; because patients may have different types of adverse reactions or complications after surgery, it is necessary to inform the family in advance to prevent the patients suffering from gastrointestinal tumor stress due to excessive emotional reactions, such as fear. Family members should be encouraged to improve communication with patients through "we will be with you" and other language to give comfort and support; (4) Targeted encouragement based on the specific conditions of each patient to develop targeted goals and tasks, including playing Tai Chi, playing chess, listening to music, walking, *etc.*, to be completed under the supervision of family members or medical staff in order to divert attention to the disease and improve self-efficacy; and (5) Discharge guidance, which instructed patients to return to the hospital regularly for re-examination, develop good diet and rest habits outside the hospital, and utilize a 24-h consultation hotline to solve



**Table 1 Comparison of two groups of general information, *n* (%)**

	Conventional group ( <i>n</i> = 51)	Combined group ( <i>n</i> = 51)	<i>t/P</i> values
Sex (male/female)	31/20	33/18	0.168/0.682
Age (yr)	50.61 (7.78)	49.68 (8.08)	0.592/0.555
BMI (kg/m <sup>2</sup> )	22.96 (2.20)	23.04 (2.11)	0.187/0.852
Pathological type			
Gastric cancer	29 (56.86)	26 (50.98)	0.359/0.836
Cancer	9 (17.65)	10 (19.61)	
Colon cancer	13 (25.49)	15 (29.41)	
Stage of disease			
Phase I	12 (23.53)	14 (27.45)	0.602/0.547
Phase II	19 (37.25)	20 (39.22)	
Phase III	20 (39.22)	17 (33.33)	
Level of education			
Secondary and below	15 (29.41)	18 (35.29)	0.440/0.803
High school	21 (41.18)	20 (39.22)	
College or above	15 (29.41)	13 (25.49)	

BMI: Body mass index.

problems encountered by patients during out-of-hospital rehabilitation in a timely manner.

### Observation indicators

The observation indicators include the following aspects: (1) Count the self-efficacy scores of the two groups before and after the intervention and evaluate according to the general self-efficacy scale, including three dimensions of daily life behavior management, cognitive symptom management, and disease management. The higher the score, the better the self-efficacy; (2) Count the coping style scores of the two groups before and after the intervention and evaluate according to the simple coping style questionnaire, including two dimensions of positive coping and negative coping, adopting a 4-level scoring system, divided into "frequently adopted," "sometimes adopted," "occasionally adopted," and "not adopted"; (3) Calculate the self-experience burden scores of the two groups before and after the intervention according to the self-perceived burden scale assessment, including three dimensions of emotional factors, economic factors, and physical factors. The higher the score, the more severe the self-experience burden; and (4) Count the incidence of postoperative complications in the two groups.

### Statistical analysis

SPSS 22.0 software package was used for data processing. Measurement data were expressed by mean  $\pm$  SD and calculated by *t* test. Count data were expressed by *n* (%) and calculated by the  $\chi^2$  test. *P* < 0.05 indicated a statistically significant difference.

## RESULTS

### Self-efficacy score

There was no significant difference in the scores of daily life behavior management, cognitive symptom management, and disease management between the two groups before intervention (*P* > 0.05). The combined group was higher than the conventional group (*P* < 0.05; Table 2).

**Table 2 Comparison of self-efficacy scores between two groups (mean  $\pm$  SD, score)**

	Combined group (n = 51)	Conventional group (n = 51)	t/P values
Number of cases	51	51	
Daily life behavior management			
Before intervention	11.20 $\pm$ 1.97	10.99 $\pm$ 2.03	0.530/0.597
After intervention	19.71 $\pm$ 2.28 <sup>1</sup>	15.63 $\pm$ 2.10 <sup>1</sup>	9.400/0.000
Cognitive symptom management			
Before intervention	9.96 $\pm$ 1.13	10.10 $\pm$ 1.09	0.637/0.526
After intervention	19.18 $\pm$ 2.23 <sup>1</sup>	15.41 $\pm$ 2.15 <sup>1</sup>	8.692/0.000
Disease management			
Before intervention	16.98 $\pm$ 3.03	17.12 $\pm$ 2.93	0.237/0.813
After intervention	28.60 $\pm$ 3.10 <sup>1</sup>	23.96 $\pm$ 2.92 <sup>1</sup>	7.781/0.000

<sup>1</sup>Indicates significant difference in comparison to before intervention ( $P < 0.05$ ).

### **Coping style score**

There was no significant difference between the positive and negative coping scores of the two groups before the intervention ( $P > 0.05$ ). The positive coping scores of the two groups after the intervention were higher than before the intervention, and the negative coping scores were lower than before the intervention ( $P < 0.05$ ; Table 3).

### **Burden of self-perception**

There was no significant difference in the scores of affective factors, economic factors, and physical factors between the two groups before intervention ( $P > 0.05$ ). After the intervention, the scores of affective factors, economic factors, and physical factors were lower than before the intervention, and the combined group was lower than the conventional group ( $P < 0.05$ ; Table 4).

### **Postoperative complications**

The incidence of infection in the combined group (1.96%) was lower than that in the conventional group (15.69%) ( $P < 0.05$ ; Table 5).

## **DISCUSSION**

Gastrointestinal cancer surgery can have a significant impact on the quality of life of the patient. If the patient does not receive the timely and effective intervention after surgery, complications such as postoperative infection may occur, adversely affecting the functional recovery of the body and the prognosis of the disease<sup>[11-15]</sup>. Therefore, the application of effective nursing intervention after gastrointestinal tumor surgery is of great significance.

Most patients with gastrointestinal tumors have different negative emotions, such as fear, anxiety, and depression due to the disease itself and surgically invasive treatment; thus, the self-efficacy is poor. Such factors can harm the rehabilitation of the disease<sup>[16-19]</sup>. Therefore, this study implemented self-efficacy education for patients with gastrointestinal tumors during the intervention period. It implemented self-efficacy training for patients based on health knowledge and guided by psychological intervention that created a family support environment and deepened their knowledge of the gastrointestinal tract. Tumor and surgical treatment measures, postoperative rehabilitation, and postoperative complications may facilitate their acceptance of the diseased state, easing negative emotions and enhancing confidence in defeating the disease and continuing life<sup>[20,21]</sup>.

The cooperative nursing care system is also a clinically significant nursing intervention model. Through the nursing staff as an intermediate hub, fostering close contact with physicians and patients, nursing staff can participate in physician rounds and discuss medical records to comprehensively evaluate and master patient treatment and provide timely care to patients. The plan will be improved and updated.

**Table 3 Comparison of coping style scores between groups (mean  $\pm$  SD, score)**

	Combined group (n = 51)	Conventional group (n = 51)	t/P values
Number of cases	51	51	
Positive responses			
Before intervention	1.30 $\pm$ 1.01	1.27 $\pm$ 0.98	0.152/0.879
After intervention	2.95 $\pm$ 0.88 <sup>1</sup>	1.97 $\pm$ 0.90 <sup>1</sup>	5.560/0.000
Negative responses			
Before intervention	2.78 $\pm$ 0.62	2.81 $\pm$ 0.65	0.239/0.812
After intervention	0.80 $\pm$ 0.56 <sup>1</sup>	1.56 $\pm$ 0.60 <sup>1</sup>	6.613/0.000

<sup>1</sup>Indicates significant difference in comparison to before intervention ( $P < 0.05$ ).

**Table 4 Comparison of self-feeling burden between groups**

	Combined group (n = 51)	Conventional group (n = 51)	t/P values
Number of cases	51	51	
Emotional factors			
Before intervention	20.06 $\pm$ 2.96	19.85 $\pm$ 3.03	0.354/0.724
After intervention	14.59 $\pm$ 1.98 <sup>1</sup>	17.91 $\pm$ 2.06 <sup>1</sup>	8.298/0.000
Economic factors			
Before intervention	9.65 $\pm$ 2.04	10.02 $\pm$ 1.86	0.957/0.341
After intervention	6.50 $\pm$ 1.50 <sup>1</sup>	8.12 $\pm$ 1.41 <sup>1</sup>	5.620/0.000
Physical factors			
Before intervention	8.26 $\pm$ 2.13	8.53 $\pm$ 2.08	0.648/0.519
After intervention	5.51 $\pm$ 1.14 <sup>1</sup>	7.28 $\pm$ 1.22 <sup>1</sup>	7.570/0.000

<sup>1</sup>Indicates significant difference in comparison to before intervention ( $P < 0.05$ ).

**Table 5 Comparison of postoperative complications between two groups, n (%)**

	Combined group (n = 51)	Conventional group (n = 51)	P values
Number of cases	51	51	
Infection	1 (1.96)	8 (15.69)	4.387/0.036
Anastomotic fistula	2 (3.92)	3 (5.88)	0.000/1.000
Crack	2 (3.92)	4 (7.84)	0.177/0.674
Intestinal obstruction	0 (0.00)	3 (5.88)	1.374/0.241

At the same time, medical and nursing cooperative responsibility system nursing management is conducive to strengthening teamwork, making full use of medical resources, increasing communication time between nursing staff and patients, and ensuring health education duration. It is helpful for nursing staff to formulate nursing plans by patients' specific conditions, and patients can be familiar with them. It proactively implements nursing programs to ensure the quality of intervention.

In this study, the first joint medical and nursing cooperative responsibility management nursing management and self-efficacy education were used to intervene in patients with gastrointestinal tumors in our hospital. The results showed that after the intervention, the combined group's self-efficacy score was higher than that of the conventional group. The scores of various dimensions of the coping style were better in the conventional group. Moreover, the score of each dimension of self-feeling

burden was lower than the corresponding score of the conventional group, and the incidence of postoperative infection was lower than that of the conventional group, indicating that the joint implementation of medical care cooperative responsibility system nursing management and self-efficacy education can improve the healing of the gastrointestinal tract more effectively.

Following tumor surgery, patients' self-efficacy and coping styles can reduce the self-feeling burden and help reduce postoperative infection risk. Self-efficacy education guides patients to talk about subjective feelings and psychological problems, actively conducts targeted counseling, and encourages patients to relieve negative emotions through encouragement. It also helps them to become brave in facing their illness, builds confidence in their recovery, gradually reduces their psychological pressure, and stimulates their self-efficacy. Simultaneously, self-efficacy education can deepen the gastrointestinal cancer patient's understanding of the disease, establish a correct health concept, and enhance the patient's self-management and control capabilities.

The responsible nurse is the person who has the most contact with the patient. The harmonious nurse-patient relationship is conducive to directly grasping the patient's psychological state and providing corresponding psychological counseling. However, some patients are affected by traditional concepts, and most think that the nursing staff will only perform medicine delivery and operations, such as injections, and only have a high degree of trust in physicians while lacking trust in the health education of the nursing staff, which in turn affects the effectiveness of health education. In the cooperative nursing system of medical care, full use of the authority of the doctor and the patient's trust in the doctor let the doctor participate in the patient's postoperative care, maximize the different professional advantages of medical care, and provide patients with a full range of medical and nursing support. In addition, in the management of the cooperative nursing responsibility system, patients are closer to physicians and nursing staff, which can make patients more familiar with physicians and nursing staff, create a comfortable hospitalization environment, increase patient trust, and reduce unneeded claims on the physicians' and nursing staff's time so that they have more time to communicate among each other and with patients.

Through the development of collaborative nursing care with medical care, physicians and nursing staff can accurately position their roles and put their job responsibilities in the proper place. Nursing staff and physicians can make rounds together to discuss the focus of medical care and the patient's condition, treatment and rehabilitation, and other concerns. They can pay attention to information sharing and provide mutual help and mutual learning. The professional cooperation, communication, and contact between doctors and nursing staff are close and direct, which is conducive to the full implementation of diagnosis and treatment plans and early recovery of patients.

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## CONCLUSION

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In summary, the joint adoption of medical care and cooperative responsibility management and self-efficacy education can improve patients' physical and mental states after gastrointestinal tumor surgery, change the response to disease, and reduce postoperative infection risk.

## ARTICLE HIGHLIGHTS

### **Research background**

The value of the cooperative nursing care system of medical care has received widespread attention in recent years.

### **Research motivation**

Surgery is an essential treatment for gastrointestinal tumors, which can effectively remove the lesions, but it can cause physiological changes and body trauma, further aggravate patient pain, increase the risk of postoperative complications, and affect patient mood and self-efficacy.

### Research objectives

The joint adoption of cooperative nursing management and self-efficacy education can improve the physical and mental state of patients undergoing gastrointestinal tumor surgery, change the way of coping with the disease, and reduce the risk of postoperative infection, which is of positive significance to patients with gastrointestinal tumors.

### Research methods

According to the nursing plan, a total of 102 patients with gastrointestinal tumors treated in our hospital from October 2018 to February 2020 were selected and divided into a conventional group ( $n = 51$ ) and a combined group ( $n = 51$ ).

### Research results

After the intervention, the daily life behavior management, cognitive symptom management, and disease management scores of the two groups were higher than those before the intervention. Those of the combined group were higher than those of the conventional group after the intervention. After the intervention, the two groups' emotional, economic, and physical factors scores were lower than those before the intervention, and the combined group was lower than the conventional group. The infection incidence in the combined group (1.96%) was lower than that in the conventional group (15.69%).

### Research conclusions

The joint adoption of medical care and cooperative responsibility management and self-efficiency education can improve patients' physical and mental states after gastrointestinal tumor surgery, change the response to disease, and reduce the risk of postoperative infection.

### Research perspectives

An innovative nursing model can achieve better treatment results.

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