



The effect of 5A nursing combined with psychological nursing on the immune function, cancer-related fatigue and complications of patients undergoing radical resection of colorectal cancer

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ABSTRACT

This study aimed to analyze the effects of 5A nursing (including Ask, Assess, Advise, Assist, and Access) combined with psychological nursing on the immune function, cancer-related fatigue, and complications of patients undergoing radical resection of colorectal cancer. For this purpose, 64 patients undergoing radical resection of colorectal cancer were treated with nursing intervention during the perioperative period from March 2019 to March 2021. They were randomly divided into a control group and a study group according to admission order. Each group had 32 cases. The control group performed routine nursing, and 5A nursing combined with psychological nursing was performed on the research group. Then the immune function, cancer-related fatigue, complications, self-efficacy, and nursing satisfaction were compared between the two groups. Results showed that the levels of CD3+ and CD4+ in the two groups were lower than before nursing, and the levels of CD8+, IgA, IgM, and IgG were higher than before nursing ($P < 0.05$). The reduction of CD3+ and CD4+ in the study group was less than the control group, and the increase of CD8+, IgA, IgM, and IgG in the study group was higher than the control group ($P < 0.05$). The scores of cancer-related fatigue after nursing were lower than before nursing ($P < 0.05$), and the reduction of cancer-related fatigue in the study group was higher than the control group ($P < 0.05$). The incidence of postoperative complications in the study group (12.50%) was lower than the control group (25.00%) after nursing ($p < 0.05$). The scores of all dimensions of self-efficacy of the two groups after nursing were higher than before nursing ($P < 0.05$). The improvement of self-efficacy of the study group was better than the control group ($P < 0.05$). The overall nursing satisfaction of the observation group after nursing (96.88%) was higher than the control group (84.38%) ($P < 0.05$). According to the results, the use of 5A nursing combined with psychological nursing can effectively relieve the perioperative psychological pressure of the patients, improve the immune function of the body, relieve cancer-related fatigue, prevent and control the incidence of complications, and improve the quality of clinical life of the patients for patients undergoing radical resection of colorectal cancer.

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Introduction

Due to changes in diet structure and living standards, colorectal cancer has become one of the three primary malignant tumors globally, and its fatality rate ranks fourth. The incidence and mortality of this disease are still increasing year by year in China (1). As a malignant tumor of the digestive system, colorectal cancer is related to dietary habits, living environment, genetics, and other factors. There are no significant symptoms in the early stage (2). With the differentiation and proliferation of tumor cells, patients will have decreased immune systems, malnutrition, etc. In clinical practice, surgery combined with radiotherapy and chemotherapy is

often adopted, seriously affecting patients' quality of life and life safety. Therefore, timely treatment of gastrointestinal discomfort is recommended to avoid delayed treatment (3).

Radical resection of colorectal cancer is the primary method for treating colorectal cancer. Still, the operation of surgical instruments will cause stress response and immune system disorder, resulting in postoperative complications. Patients with psychological discomfort to surgical treatment will produce cancer-induced fatigue in the long run, which will harm the prognosis. Therefore, nursing intervention is essential for patients with radical colorectal cancer surgery (4, 5). By informing

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perioperative matters needing attention and nursing methods, conventional nursing is universal and blind. It has little intervention on patients' psychological state, social role, and therapeutic effect, which cannot meet patients' needs for nursing services. Therefore, improving the nursing level is critical (6).

Psychological nursing achieves a better psychological level and disease recovery by analyzing the patient's psychological state and actively taking psychological measures and approaches to promote the patient's psychological condition. 5A nursing (including Ask, Assess, Advise, Assist, and Access) can improve patients' self-care ability and quality of life by grasping patients' clinical status in time and giving feedback, rationalizing the nursing plan, and applying it to the following nursing round. At the same time, it can also promote patients to get professional nursing techniques and improve clinical nursing comfort and satisfaction, which are mostly used in nursing interventions such as cervical cancer and lung cancer (7, 8).

Research projects on colorectal cancer mainly focus on early tumor markers and pathogenesis, but research on psychological nursing and 5A nursing of colorectal cancer is limited (9, 10). This study aims to carry out 5A nursing combined with psychological nursing for patients undergoing a radical operation for colorectal cancer, and explore the effects of nursing mode on immune function, cancer-related fatigue, and complications of patients, as reported below.

Materials and methods

General Information

Sixty-four patients undergoing radical colorectal cancer surgery were randomly divided into control and study groups according to the order of admission from March 2019 to March 2021. There were 32 patients in each group. Nineteen males and 13 females were in the control group, aged 42 to 68 years, with an average of (52.49 ± 6.71) years. The cancer stages were stage i (6 cases), stage ii (13 cases), stage iii (9 cases), and stage iv (3 cases). There were 18 males and 14 females in the study group, aged from 39 to 70 years, with an average of (52.61 ± 6.58) years. The cancer stages were stage i (7 cases), stage ii (14 cases), stage iii (10 cases), and stage iv (1 case). There was no significant difference in baseline data between the two groups

($P > 0.05$). The control group received routine nursing, and the study group received 5A nursing combined with psychological nursing based on the control group. This study was verified and approved by the Ethics Committee of the hospital.

Inclusion and exclusion criteria

Inclusion criteria: A. they met the diagnostic criteria of colorectal cancer in Chinese Society of Clinical Oncology (CSCO) Colorectal cancer Diagnosis and Treatment Guidelines 2018 edition (11); B. Colorectal cancer was diagnosed by sigmoidoscopy, digital rectal examination and pathological examination; C. They did not participate in other nursing research; D. No neurological or cognitive impairment; E. clinical data were complete; F. The subjects understood the research content and voluntarily signed the informed consent.

Exclusion criteria: A. patients had heart, liver, kidney and other important organ dysfunction; B. patients had secondary tumors, distant metastasis of tumors and other malignant tumors; C. Patients had contraindications associated with surgery; D. Patients had hypertension, diabetes, etc.; E. The survival time was estimated more than 6 months.

Research methods

The control group was given routine nursing intervention during the perioperative period, including a comfortable ward environment and scope, monitoring vital clinical signs, relevant dietary and nutritional advice, health education, and paying attention to patients' medication status. The research group gave 5A nursing combined with psychological nursing intervention on the above basis. Based on the above, the research group gave 5A nursing combined with psychological nursing intervention, mainly including five aspects Ask, Assess, Advise, Assist, and Access.

A. Ask and Assess:

After admission, patients filled the personal information, including basic information, treatment history, eating habits, physical examination, imaging examination, treatment plan and evaluation scale. The patient's disease process and psychological state were considered, the way of nursing intervention was explained to patients. The patients who were willing to cooperate with the nursing study took targeted nursing measures and paid attention to the clinical symptoms

and comprehensive situation of the patients during the nursing period, which was evaluated and compared at the return visit 3 months after the operation.

B. Advice:

According to the results of Ask and Assess, nursing staff should explain the etiology, pathogenesis and other relevant knowledge of colorectal cancer to patients in detail, and explain the disease progression, medication and current treatment status of patients. Patients should be helped to relieve perioperative anxiety, recognize the necessity of surgical treatment, establish a positive treatment, nursing attitude;

C. Assist

Life guidance, psychological nursing, complication prevention and other ways should be considered to improve perioperative nursing satisfaction. For example for life guidance, green plants were put in the ward, and disinfection was done in ventilation to provide a clean and comfortable hospitalization environment. Patients' dietary structure and nutritional collocation was adjusted according to their eating habits and living standard. According to the patient's sleep state, the patient was instructed to exercise and breathe before sleep to improve sleep quality and mental state. For psychological suggestion, a professional psychological counseling team actively communicated with patients after admission, understand their inner thoughts and concerns, and guide them to carry out mindfulness training. Timely exchange of experience and encouragement, carrying out appropriate humanistic care behavior, mobilizing patients' enthusiasm and confidence in treatment was done for better cooperation with medical work. The source of emotional fluctuations, and actively communicating and ease were considered for patients with anxiety, fear and depression and other negative emotions. Targeted emotional catharsis measures were taken to encourage patients to establish an optimistic attitude. It should prevent anastomotic bleeding, pay attention to the stability of the indwelling anal tube, check the color of drainage fluid and anastomosis state regularly, and inform the doctor for treatment during blood rheology. To prevent venous thrombosis of lower limbs, it is necessary to pay attention to the blood flow status and congestion of lower limbs during surgery and massage lower limbs regularly after surgery to

promote blood flow and avoid congestion blocking blood vessels. To prevent infection, preoperative disinfection of surgical instruments and operating room, thorough disinfection of the patient's incision, and timely delivery of anti-infection drugs after surgery.

D. Access

The use of telephone, video, information and other ways should be used to pay attention to the patient after discharge. regularly health lectures and psychological nursing should be carried out, to answer the patient care during the problem. A network communication platform was established, the daily care and matters needing attention regularly were checked, the knowledge of disease care was publicized.

Observation Indicators

The immune function, cancer-related fatigue, complications, self-efficacy and nursing satisfaction of 2 groups were observed before and one week after the intervention.

3~5mL of fasting peripheral venous blood was taken from the patient, centrifuged at high speed for 8~10min, and the supernatant was taken for detection. Immune factors including CD3+, CD4+, CD8+, immunoglobulin A (IgA), immunoglobulin M (IgM), immunoglobulin G (IgM) were detected by flow cytometry (IgG).

Cancer-related Fatigue was assessed with Piper Fatigue Scale-revised (FPS-R) (12), which included 22 items in behavioral, somatosensory, emotional, and cognitive aspects, with scores from "0" to "10" indicating "no" to "very serious". The score was positively correlated with the degree of cancer-related fatigue.

The incidence of postoperative complications was analyzed, including anastomotic fistula, infection, intestinal obstruction, lower limb venous thrombosis and hypercapnia.

Exercise of Self-Care agency (ESCA) (13) was used to measure self-efficacy. The scale included four dimensions of self-concept, nursing responsibility, nursing professional knowledge, and nursing skills, with a total of 43 items. 0~4 points were used to score. The score was positively correlated with the level of self-care.

According to the nursing professional degree, attitude and nursing atmosphere and other self-made nursing satisfaction scale, a total of 25 questions, from 0~4 points, indicating very dissatisfied to very satisfied, the total score of 0~100 points, divided into four grades, ≥ 95 is very satisfied, 80~95 is relatively satisfied, 60~79 is generally satisfied, < 60 is not satisfied.

Overall satisfaction = Very satisfaction rate + relatively satisfaction rate + general satisfaction rate

Statistical analysis

SPSS 24.0 statistical software was used. The measurement data conforming to normal distribution were expressed as $\pm S$, and t-test was used for comparison between groups. The statistical data were expressed as the number of cases (n) and percentage (%), and the comparison between groups was performed by χ^2 test, $P < 0.05$ indicated a statistically significant difference.

Results and discussion

Comparison of immune functions

The results showed that there was no significant difference in immune function between the two groups before nursing ($P > 0.05$). After nursing, the levels of CD3+ and CD4+ decreased compared with before nursing, while the levels of CD8+, IgA, IgM and IgG increased compared with before nursing, with statistical significance ($P < 0.05$). The decreased degree of CD3+ and CD4+ in the study group was less than that in the control group, while the increased degree of CD8+, IgA, IgM and IgG was higher than that in the control group, with statistical significance ($P < 0.05$) (Figure 1).

Comparison of the degree of cancer-related fatigue

The results showed that there was no significant difference in the degree of cancer-induced fatigue before nursing between the 2 groups ($P > 0.05$). The scores of cancer fatigue after nursing were lower than before nursing, the difference was statistically significant ($P < 0.05$). The reduction degree of cancer-related fatigue in the study group was significantly higher than that in the control group, and the difference was statistically significant ($P < 0.05$), as shown in Table 1.

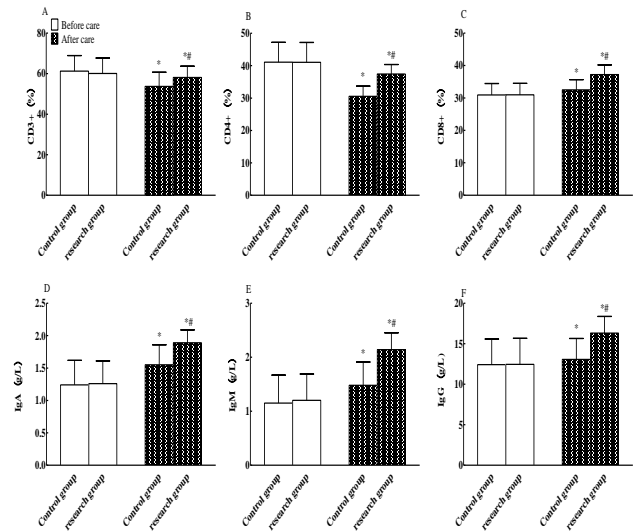


Figure 1. Comparison of immune function (A: CD3+;B:CD4+;C: CD8+;D: IgA;E: IgM;F:IgG, compared with the pre-care and control group, *# $P < 0.05$.)

Table 1. Comparison of the degree of cancer-related fatigue ($\bar{X} \pm s$, points)

Group	Time	Control group (n=32)	Study group (n=32)
Behavioral	Before the nursing	5.76 \pm 1.15	5.75 \pm 1.13
	After the nursing	4.25 \pm 0.89*	2.83 \pm 0.64*#
Somatosensory	Before the nursing	5.91 \pm 1.20	5.86 \pm 1.18
	After the nursing	4.10 \pm 0.92*	2.37 \pm 0.56*#
Emotional	Before the nursing	6.85 \pm 1.34	6.83 \pm 1.31
	After the nursing	3.97 \pm 1.01*	2.45 \pm 0.74*#
Cognitive	Before the nursing	6.37 \pm 1.25	6.34 \pm 1.27
	After the nursing	4.62 \pm 0.93*	2.68 \pm 0.49*#

Note: compared with pre-nursing and control group, *# $P < 0.05$.

Comparison of incidence of postoperative complications

The results showed that the incidence of postoperative complications in the nursing study group was 12.50% significantly lower than 25.00% in the control group, with statistical significance ($P < 0.05$), as shown in Table 2.

Table 2. Comparison of postoperative complications (cases, %)

Group	Control group (n=32)	Study group (n=32)	χ^2	P
Anastomotic fistula	3 (9.38)	2 (6.25)	-	-
Infection	2 (6.25)	1 (3.13)	-	-
Intestinal obstruction	3 (9.38)	0 (0.00)	-	-
Venous thrombosis of lower extremity	0 (0.00)	1 (3.13)	-	-
hypercapnia	1 (3.13)	0 (0.00)	-	-
Complication rate	25.00%	12.50%	0.194	0.028

Comparison of self-efficacy

The results showed that there was no significant difference in self-efficacy before nursing between the two groups ($P>0.05$). The scores of self-efficacy in all dimensions were higher in the two groups after nursing than before, the difference was statistically significant ($P<0.05$). The improvement of self-efficacy in the study group was significantly better than that in the control group, and the difference was statistically significant ($P<0.05$), as shown in Figure 2.

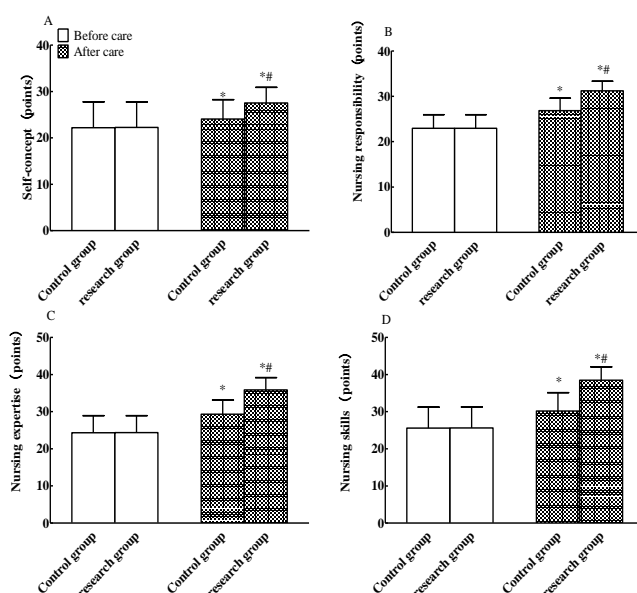


Figure 2. Comparison of self-efficacy (A: Self-concept; B: Nursing responsibility; C: Nursing expertise; D: Nursing skills, compared with the pre-care and control group, *# $P<0.05$.)

Comparison of overall nursing satisfaction

The results showed that the overall nursing satisfaction of the study group was 96.88% significantly higher than that of the control group (84.38%), with statistical significance ($P < 0.05$). As shown in Table 3.

Table 3. Comparison of overall nursing satisfaction (cases, %)

Group	Control group (n=32)	Study group (n=32)	χ^2	P
Very satisfied	13 (40.63)	18 (56.25)	-	-
Satisfied	8 (25.00)	9 (28.13)	-	-
Generally satisfied	6 (18.75)	4 (12.50)	-	-
Not satisfied	5 (15.63)	1 (3.13)	-	-
Nursing satisfaction	84.38%	96.88%	0.207	0.003

Colorectal cancer is a kind of malignant tumor with unknown etiology and pathogenesis. It is "invisible" in the early stage, and it is already in the middle and late stage when detected by people without regular examination. The survival of 50% of patients treated with surgery combined with radiotherapy and chemotherapy is less than 5 years. Therefore, early detection and early treatment are recommended to improve the five-year survival rate (14). The treatment of colorectal cancer is mainly radical resection to remove the focal tissue and prolong the life cycle. However, distant metastasis and recurrence of the disease will occur, requiring long-term follow-up and follow-up, which will have adverse effects on patients' physiology, psychology and society (15). Relevant data show the incidence of cancer-related fatigue in colorectal cancer patients can be as high as 80%~95%, which seriously affects the surgical effect and quality of life, requiring professional nursing intervention (16). The 5A nursing by ask, assessment, advice, assistance and access of patients with comprehensive care, adjustment and feedback, better to help improve the ability of self-management, alleviate the pain caused by the operation and the psychological experience, promote the patient recovery at an early date, the nursing mode more attention in patients with diabetes, obesity, less research on colorectal cancer (17, 18). In this study, 5A nursing combined with psychological

nursing was used for intervention patients undergoing radical resection of colorectal cancer to explore the nursing effect.

Most patients with colorectal cancer have no significant characteristics in the early stage and are often accompanied by different degrees of immune dysfunction and cancer-related fatigue in the middle and late stages. Radical clinical treatment often causes a stress response in the body, aggravates abnormal expression of immune factors, and further leads to anxiety, depression and other adverse emotions in patients (19). T lymphocyte subsets are important barriers in the immune function of the body, and their level changes can reflect the immune status of the body, including CD3+, CD4+, CD8+ and so on. Immunoglobulin is a protein with antibody activity in the body. As an immune effector, it can participate in and regulate the humoral immune system of the body, including IgA, IgM and IgG (20). Sitkovskaya et al. (21) measured the level of immune cells in patients with colorectal cancer at different stages, and found that CD4+ levels were increased in the early and late stages of the disease. Kim et al. (22) significantly improved the mental and physical status of patients with colorectal cancer through a family health exercise program. The results of this study showed that the decreased degree of CD3+ and CD4+ in the study group was less than that in the control group, while the increased degree of CD8+, IgA, IgM and IgG was higher than that in the control group. The reduction of cancer-induced fatigue in the study group was significantly higher than that in the control group. Consistent with the results of Sitkovskaya and Kim's study, 5A nursing combined with psychological nursing can significantly improve immune function and mental state. 5 a joint psychological nursing care by questioning and evaluating patients psychological status, giving the corresponding diet, sleep, and psychological counseling, improve the sleep quality and mental outlook, alleviate psychological mood, such as anxiety, depression, improve patients' nutritional status, and adjust the level of T lymphocyte subsets, reduce the operation of the body to stimulate, significantly reduce cancer-related fatigue.

The clinical treatment of colorectal cancer is mainly based on radical resection, and complications such as anastomotic bleeding and intestinal obstruction are caused during surgery due to stenosis, excessive

operation and improper anastomosis, which seriously affect the postoperative quality of life (23). Berkel et al. (24) adopted nursing intervention for the perioperative period of colorectal cancer, during which patients could improve cardiopulmonary function, shorten the operation time, reduce the incidence of postoperative complications, and improve the quality of life-related to physical and mental health. Van et al. (25) performed preoperative pre-rehabilitation intervention for complications of colorectal cancer patients, increased body functional status and strength training, supplemented nutrition and psychological intervention. It is beneficial to reduce the incidence of adverse reactions, improve patients' clinical satisfaction and promote postoperative recovery. The results of this study showed that the incidence of postoperative complications in the study group was significantly lower than the control group, and the overall nursing satisfaction was significantly higher than the control group. The improvement degree of self-efficacy in the study group was significantly better than that in the control group. Consistent with the results of Berkel and Van's study, it showed that 5A nursing combined with psychological nursing significantly reduced the incidence of complications and improved self-efficacy and nursing satisfaction. 5A nursing By mastering patients' clinical nursing needs and physical state, targeted nursing help is adopted to improve patients' physiological state and immune function and provide a physiological basis for reducing complications. The preventive measures of perioperative complications, effectively reduce the risk of complications, improve clinical nursing satisfaction. 5A nursing combined with psychological nursing can improve the cognition and nursing necessity of patients with colorectal cancer, and improve the compliance of nursing work. Master nursing knowledge and professional nursing methods, improve self-care level and sense of responsibility, relieve patients' cancer-related fatigue, and greatly improve their satisfaction with nursing services.

In conclusion, 5A nursing combined with psychological nursing intervention for radical resection of colorectal cancer can improve patients' sense of participation in nursing, promote their physical and psychological health, improve the immune level of the body, and effectively reduce the probability of complications, which is worthy of clinical promotion.

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None.

Conflict interest

The authors declare no conflict of interest.

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