

Original Article

Comprehensive high-quality nursing care reduces postoperative pain and improves quality of life in patients with colorectal cancer

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Abstract: Objective: This study aimed to explore the effects of comprehensive high-quality nursing on postoperative pain and prognosis of patients with colorectal cancer. Methods: 218 patients with colorectal cancer admitted to hospital from February 2013 to January 2015 were prospectively analyzed. They were randomly divided into the study group including 109 patients who received comprehensive high-quality nursing care, and the control group including 109 patients who received routine nursing care. Hospital stay, nursing satisfaction scores, pain scores, incidence of adverse reactions and quality of life scores were observed. The two groups were followed for 5 years, and their prognosis was recorded. Results: Length of hospital stay in the study group was significantly shorter than that of the control group ($P < 0.01$). The satisfaction rate of the study group was higher than that of the control group ($P < 0.01$). The study group had a lower incidence of adverse reactions than the control group ($P = 0.02$). One day postoperative (T2), the pain score of the study group was significantly less than that of the control group ($P < 0.01$). The quality of life score of the study group was significantly higher than that of the control group ($P < 0.01$). No significant difference in the prognosis between the two groups was observed ($P > 0.050$). Conclusions: Comprehensive high-quality nursing care can effectively reduce postoperative pain and improve nursing satisfaction and quality of life in patients with colorectal cancer.

Keywords: Comprehensive quality care, colorectal cancer, pain, prognosis

Introduction

Colorectal cancer is a malignant type of tumor that originates in the mucosal epithelium of the large intestine. It is one of the most common malignant tumors in the digestive tract [1]. Colorectal cancer mostly occurs in middle-aged and elderly individuals. However, with the fast-paced life and increasing pressure of the modern lifestyle, the incidence of colorectal cancer has continued to increase among younger individuals in recent years [2]. According to the statistics reported by Van et al., the number of patients who developed colorectal cancer was about 18 million in 2016 [3]. In some large population countries (such as China), the number of patients with colorectal

cancer is as great as 4.5 million. A previous study reported that in the next 20 years, the incidence of colorectal cancer would exceed those of gastric cancer and lung cancer, and that colorectal cancer would become the malignant tumor type with the highest incidence [4]. Among the patients with colorectal cancer, young and middle-aged individuals aged over 30 years are at higher risk (13.42%) of developing this type of cancer, and the trend of younger individuals becomes more and more prevalent [5].

According to the statistics reported by Mayer et al., the number of patients with colorectal cancer has increased 10 fold compared with 10 years ago, and the average annual increase

Effect of comprehensive nursing on colorectal cancer patients

is 1.2 million [6]. At present in clinical practice, the treatment of colorectal cancer, is resection or chemoradiotherapy. However, the early stage of colorectal cancer has no significant features and it is easily overlooked by patients. Once diagnosed, it has often reached the intermediate and advanced stages [7]. The proliferation and metastasis of cancer cells results in the inability to completely remove all infectious lesions during resection, leading to a poor prognosis for colorectal cancer. According to the report of Calon et al., the 5-year survival rate of patients with colorectal cancer is only 35.63% [8]. Because of its high morbidity and mortality rate, colorectal cancer has been a popular topic in clinical research. With the recent developments in medical technology and continuous research, a significant breakthrough has been made in the treatment of colorectal cancer. According to statistics reported by Stoffel et al., since 2012, the effective treatment rate of colorectal cancer patients has reached approximately 70%, and the prognosis of survival rate has also greatly improved [9]. Further improvements in the prognosis of patients is a challenge that needs continuous exploration in the clinic.

At present, more and more research has globally proven that the use of nursing interventions has a great influence on the prognosis of patients with colorectal cancer, and the best nursing methods are still controversial [10-12]. The Medical Security Service Center (CMS) proposed a comprehensive nursing intervention combined with high-quality nursing care [13]. It has achieved significant results in several patients with cancer. However, the current research is still less applicable to patients with colorectal cancer.

Therefore, to provide an effective reference for future clinical treatment of this patient population, we will retrospectively analyze patients with colorectal cancer and explore the effects of comprehensive high-quality nursing care on postoperative pain and prognosis of patients with colorectal cancer.

Materials and methods

General information

In total, 412 patients with colorectal cancer admitted to the digestive surgery and cancer

surgery department of the Affiliated Hospital of North Sichuan Medical College from February 2013 to January 2015 were prospectively analyzed. Of that, 218 patients aged 20 to 60 years with colorectal cancer confirmed by biopsy, that underwent resection; and had complete medical records were included in the study. Those who developed surgical tolerance, with severe organ failure, with cardiovascular and cerebrovascular diseases, with intestinal perforation and infarction, who underwent chemoradiotherapy before surgery, who were pregnant, with mental illness, and who were transferred after surgery were excluded from the study. The 218 patients were randomly divided into the study group (including 109 patients who received comprehensive high-quality nursing care) and the control group (including 109 patients who received routine nursing care). This study was been approved by the Ethics Committee of the Affiliated Hospital of North Sichuan Medical College, and all the subjects signed an informed consent.

Methods

The following routine nursing care was used in the control group: comfortable temperature and proper ventilation were maintained in the patient's ward; patient's various functions were regularly checked; vital signs were monitored constantly; patients were reminded to take analgesic and anti-inflammatory drugs. Patient's stoma were cleaned with saline on a daily basis and they were taught how to clean by themselves.

The study group was additionally provided with comprehensive high-quality nursing care as follows. Counseling physicians provided patients with weekly psychological counseling; customized recipes were prepared using easily digestible foods. Patients were encouraged to reduce the consumption of crude fiber foods, and they were encouraged to maintain regular bowel habits; patients underwent complete muscle rehabilitation training; soothing music was played daily; and the patients could watch movies with iPads offered by the hospital. Every procedure was approved by the Ethics committee of the Affiliated Hospital of North Sichuan Medical College and was in conformity with the guidelines of the National Institute of Health.

Effect of comprehensive nursing on colorectal cancer patients

Table 1. Baseline data

	Study group (n=109)	Control group (n=109)	χ^2 or t	P
Age	42.69±10.54	41.86±11.24	0.56	0.57
Body weight (KG)	76.24±12.86	75.33±12.92	0.52	0.60
Disease course (weeks)	4.21±2.07	4.52±1.69	1.21	0.23
Gender			0.46	0.50
Male	57 (52.29)	62 (56.88)		
Female	52 (47.71)	47 (43.12)		
Residence			0.73	0.39
City	68 (62.39)	74 (67.89)		
Countryside	41 (37.61)	35 (32.11)		
Smoking			0.96	0.33
Yes	65 (59.63)	72 (66.06)		
No	44 (40.37)	37 (33.94)		
Pathological staging			0.68	0.41
I~II	42 (38.53)	48 (44.04)		
III~IV	67 (61.47)	61 (55.96)		

Table 2. Comparison of hospital stay between the two groups (days)

	Study group (n=109)	Control group (n=109)	t	P
Hospital stay (d)	16.24±5.24	25.17±6.54	11.13	<0.01

Observation indicators

The two study groups were compared based on the following variables: hospital stay (after surgery to discharge time); nursing satisfaction scores (using anonymity score; out of 100 points, more than 90 points for satisfaction, 70 or more points for qualified, and 70 or less for failure; nursing satisfaction = score 70 points or more patients/total number of patients × 100 percent); preoperative (T1), postoperative 1 d (T2), postoperative 3 d (T3), and postoperative 5 d (T4) pain scores (see Goyal et al. [14]; according to Stanford Comparative Pain Scale, pain that does not affect daily life is considered mild pain (score 0 to 3 points); pain that has a certain impact on daily life is considered moderate pain (score 4 to 6 points); pain that severely affects daily life is considered severe pain (score 7 to 10)); the incidence of adverse reactions (the number of patients with one or more adverse reactions/total number of patients × 100 percent); and the quality of life scores (patients were followed-up 1 to 3 months after discharge; patients' physical function, cognitive function, social activity function, emo-

tional function, and pain status scores were assessed; a higher score indicates a better prognosis). The patient and their family members would give a comprehensive evaluation after clarifying the exact meaning of each item. The two groups were followed up for 5 years. The termination event and termination time were patient death and January 2019, respectively. The follow-ups were conducted by telephone, hospital review, or home visit.

Statistical analysis

SPSS 22.0 statistical software (Shanghai Beka Information Technology Co., Ltd.) was used to analyze and process the data. The enumeration data such as nursing satisfaction, incidence of adverse reactions, etc. between groups were compared using a chi-squared test. Data such as length of hospital stay, pain scores, etc. are expressed as mean ± standard deviation and were compared using t-tests. Multiple time points were compared using repeated measures analysis of variance and post hoc Bonferroni tests. Survival ratios were calculated using the Kaplan-Meier method and the survival rates were compared using the Log-rank test. P<0.05 is considered significant. All results of SPSS calculations were verified using Graph Prism 6.0 software.

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Results

Baseline clinical characteristics of patients

No statistical differences were observed in the clinical data (age, gender, weight, pathological stage, etc.) between the two groups (P>0.05), which proves that the two groups of patients were comparable (**Table 1**).

Patients that received comprehensive high-quality nursing care showed better treatment effects

The study group exhibited a significantly shorter length of stay and a higher satisfaction rate than that of the control group (P<0.01). The study group also had a lower incidence of

Effect of comprehensive nursing on colorectal cancer patients

Table 3. Nursing satisfaction between the two groups [n (%)]

	Study group (n=109)	Control group (n=109)	χ^2	P
Satisfaction	78 (71.56)	24 (22.02)		
Qualified	24 (22.02)	46 (42.20)		
Not satisfied	7 (6.42)	39 (35.78)		
Nursing satisfaction	93.58	64.22	28.21	<0.01

Table 4. Incidence of adverse reactions between the two groups [n (%)]

	Study group (n=109)	Control group (n=109)	χ^2	P
Nausea	5 (4.59)	12 (11.01)		
Vomiting	4 (3.67)	9 (8.26)		
Diarrhea	6 (5.50)	4 (3.67)		
Fever	4 (3.67)	7 (6.42)		
Venous thrombosis	1 (0.92)	2 (1.83)		
Incidence of adverse reactions	18.35	31.19	4.83	0.03

Table 5. Pain scores between the two groups

	Study group (n=109)	Control group (n=109)
T1	8.29±1.20	8.34±1.37
T2	6.01±1.36*	7.05±2.26*
T3	4.15±0.88*#	6.24±1.86*#
T4	2.14±0.84*#Δ	5.88±1.34*#Δ
F	629.52	42.39
P	<0.01	<0.01

Note: *Represents $P < 0.05$ compared with T1 pain scores within the same group. #Represents comparison with T2 pain scores within the same group ($P < 0.05$). ΔRepresents comparison with T3 pain scores within the same group ($P < 0.05$).

adverse events than the control group ($P = 0.02$; **Tables 2-4**).

Patients that received comprehensive high-quality nursing care showed less pain after surgery

No significant differences in the pain scores were observed between the two groups at T1 ($P > 0.05$). At T2, T3 and T4, the pain scores of the study group were significantly lower than those of the control group (all $P < 0.01$), suggesting the decline of the pain score in the study group was due to the nursing care (**Table 5**).

Patients that received comprehensive high-quality nursing care showed better quality of life scores

The quality of life score of the study group was significantly higher than that of the control group ($P < 0.01$; **Table 6**).

Prognosis

Of the 218 patients, 212 were successfully followed up, with the success rate being 97.25%. The 5-year overall survival rate of the study group was 88.68%, and that of the control group was 84.91%. There was no significant difference in the survival prognosis between the two groups ($P > 0.05$; **Figure 1**).

Discussion

Tumor is caused by an attack and proliferation of healthy cells by oncogenic factors; it greatly affects human life [15]. It is believed that the occurrence of tumors is closely related to both the internal and external environments [16]. Most types of cancers are curable when treated at an early stage, and tumors can be eliminated through resection, which is the goal of treatment [17]. Traditional surgery cannot completely isolate the invasive microlesions. Thus, chemoradiotherapy is used for further treatment [18]. However, chemoradiotherapy has extremely serious side effects, causing secondary injury to the patient's body [19]. Therefore, before developing a technology that can possibly replace tumor resection surgery and chemoradiotherapy, nursing methods are used to improve the prognosis of patients with cancer. After colorectal cancer surgery, as the effects of anesthesia wear off, patients may tend to feel the pain caused by the wound and surrounding tissue damage. At this time, the patient not only experiences impaired body functions because of the traumatic surgery but also experiences psychological burden as the pain often makes the patient lose his or her confidence to undergo rehabilitation [20]. The core of comprehensive high-quality care is to use the most professional and best care to

Effect of comprehensive nursing on colorectal cancer patients

Table 6. Quality of life scores between the two groups

	Study group (n=109)	Control group (n=109)	t	P
Physical function	81.53±8.27	68.14±10.86	10.24	<0.01
Cognitive function	85.04±6.92	70.52±8.05	14.28	<0.01
Social activity	83.27±8.98	72.35±6.82	10.11	<0.01
Emotional function	87.54±10.52	68.04±11.28	13.20	<0.01
Pain situation	84.35±7.18	67.59±6.23	18.41	<0.01
Average score	84.35±8.37	69.32±8.65	13.04	<0.01

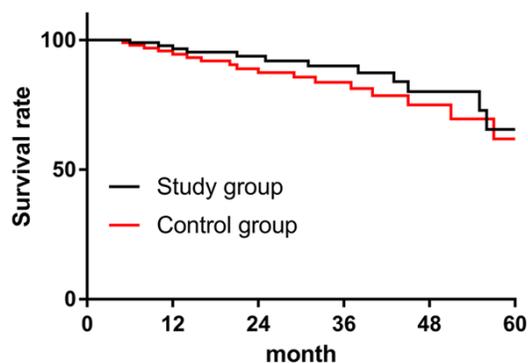


Figure 1. Prognosis survival curves of the two groups. The 5-year overall survival rate of the study group was 88.68%, and the 5-year overall survival rate of the control group was 84.91%. There was no significant difference in the prognosis between the two groups ($P>0.05$).

improve the patient's quality of life on the premise of promoting patient survival. It is of great help to reduce the pain of cancer patients and improve their prognosis [21, 22]. Hence, this study provides clinical reference by comparing the prognosis of patients with colorectal cancer who received comprehensive high-quality nursing care with those who received routine nursing care.

The results of this study showed that the study group who received comprehensive high-quality nursing care had better results in terms of hospital stay, nursing satisfaction, incidence of adverse reactions, pain scores, and prognostic quality of life scores than those of the control group who received routine nursing care. This result suggests that the application of a comprehensive high-quality nursing model is more valuable. This finding is consistent with that of Kane et al.'s study on the application of comprehensive high-quality nursing care, which corroborates the results of this experimental study [23]. Compared with the traditional nursing

model, the comprehensive high-quality nursing model emphasizes the use of a human-centered customized nursing approach, based on the patient's condition and rehabilitation plan; focuses on the patient's body function and psychological status; and aims to provide targeted, structured, and careful nursing services [24]. Patients with colorectal cancer commonly experience nausea, regurgitation, constipation, and other conditions after

surgery. Hence, they are unable to take adequate nutrients needed to repair the body's immune function, thus causing patients to recover slowly and experience adverse reactions more frequently. As comprehensive high-quality nursing care quickly provides a "fuel" for the body's immune function by preparation of customized recipes and health training. By ingesting high-protein foods and taking traditional Chinese medicine, the recovery time of patients' gastrointestinal function is shortened, and patients can effectively prevent the occurrence of adverse reactions. Postoperative patients require prolonged bed rest and are prone to venous thrombosis. However, regular massage and weight training can effectively prevent the deterioration of patients' metabolic function and accelerate the recovery process [25]. To manage patient's pain, the nursing staff is required to strictly understand the mechanism of pain and minimize the external factors to help reduce pain. Patients are provided with adequate knowledge and counseling regarding pain management, stimulating their mental strength from the inside and thus reducing pain. To change the patients' mentality, the staff encourages them to actively participate and coordinate with the medical staff's rehabilitation arrangements. It greatly improves mutual trust in the process of communication with the medical staff. After learning the relevant knowledge and the advantages and disadvantages of the disease, the quality of life score will eventually improve. There was no significant difference in the prognosis of the two groups of patients, suggesting that comprehensive quality care will not affect the prognosis of patients.

This study has several limitations owing to the limited experimental conditions. For example, this study lacks scientific basis, and the number of participants within the specified age range is relatively small. Furthermore, the study

Effect of comprehensive nursing on colorectal cancer patients

used a small sample size, and other contingencies may have not been excluded. Hence, we will conduct a longer follow-up survey on the participants in this study, continue to improve our future research, and increase the amount of research in order to achieve the best results.

In summary, comprehensive high-quality nursing care can effectively reduce the postoperative pain and quality of life in patients with colorectal cancer.

Disclosure of conflict of interest

None.

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Effect of comprehensive nursing on colorectal cancer patients

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