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Effect of multi-dimensional nursing combined with early postoperative activity on the prognosis of patients undergoing laparoscopic radical gastrectomy for gastric cancer

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► ***Original article***

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ABSTRACT

***Background*:** To explore the impact of the combined application of multidimensional nursing and early postoperative activities on gastric cancer (GC) patients underwent laparoscopic radical gastrectomy (LRG). ***Materials and Methods*:** 156 GC patients who underwent LRG between January 2020 and December 2021 in our hospital were selected and separated into the observation group (OG) as well as the control group (CG) following the different nursing methods adopted by the patients. The CG carried out conventional nursing, while the OG adopted multidimensional nursing and early postoperative activity intervention. The pain degree, self-living ability, patient's anxiety and depression, postoperative recovery, nursing satisfaction and adverse reactions of patients in both groups were compared. ***Results*:** After nursing intervention, pain score and anxiety and depression scores of the OG were declined relative to the CG (P<0.05), the recovery time of bowel sounds, first anal exhaust time, first feeding time, first anal defecation time as well as hospitalization time in the OG were lessened relative to the CG (P<0.05), the self-living ability score and nursing satisfaction of patients of the OG were promoted relative to the CG (P<0.05), the occurrence of adverse reaction in the OG was lower relative to the CG (P<0.05). ***Conclusion*:** Multidimensional nursing combined with early activities applied to GC patients undergoing LRG could effectively reduce postoperative pain, promote postoperative gastrointestinal function recovery and promote the self-living ability.

INTRODUCTION

Gastric cancer (GC) belongs to the most frequent malignant tumors of the digestive tract, ranking the second in the incidence of tumors in China, which seriously affecting the normal life of human beings [1, 2]. Early GC is usually asymptomatic or only mild symptoms. When the clinical symptoms become obvious, the disease is advanced [3]. Hence, we should be very vigilant about the early symptoms of GC, so as not to delay diagnosis as well as treatment.

Surgery is the main way to treat GC. With the development of minimally invasive techniques such as laparoscopy, it has been widely used in the surgery of gastrointestinal tumors, and the surgical techniques are becoming more and more mature [4]. At present, the application of laparoscopic technology in early GC has been recognized by many scholars, and this technology has become one of the standard surgical methods for early GC in Japan and South Korea [5]. Compared with conventional open surgery, laparoscopic treatment technology is minimally invasive, but the influence of intraoperative traction operation, vagus nerve hyperfunction, postoperative pain and stress, anti-infection treatment and many other factors is easy to disorder the gastrointestinal function of patients, delay the time of postoperative exhaust and defecation, and even increase more postoperative complications of patients [6]. Therefore, it is essential to quickly restore gastrointestinal function after surgery, decrease the occurrence of related complications, as well as help patients to promote the quality of life.

Studies have shown that with the transformation and update of medical mode, the purpose of medical nursing is not only to prolong and maintain the life of patients, but also to provide relevant nursing knowledge, improve the awareness rate of patients' health knowledge, reduce postoperative complications, as well as enhance the quality of life of patients [7]. Multi-dimensional nursing emphasizes detailed nursing intervention for patients from multiple aspects, which can meet the physiological and psychological nursing service requirements of patients and further improve the effectiveness of nursing [8]. Early activity emphasizes early postoperative guidance for passive and active activities, which can promote the early rehabilitation of related physiological functions [9].

The aim of this research was to probe the

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influence of multi-dimensional nursing in association with early postoperative activity in patients undergoing laparoscopic radical gastrectomy. Our study demonstrated that multidimensional nursing combined with early activities could effectively reduce postoperative pain and promote gastrointestinal function recovery in GC patients underwent laparoscopic radical gastrectomy (LRG), which is worthy for promotion.

MATERIALS AND METHODS

Clinical data

A total of 156 GC patients who underwent LRG in the Department of Oncology of our hospital from January 2020 to December 2021 were chosen and separated into observation group (OG) and control group (CG) based on different nursing methods, with 78 cases in each group. Inclusion criteria: (1) All patients were diagnosed by gastroscopic biopsy and scheduled to undergo laparoscopic-assisted radical gastrectomy; (2) Patients had a certain degree of education and could understand the survey content; (3) Patients as well as their family members understood the content and purpose of the study, understood the risk of treatment, and were willing to cooperate with the study. Exclusion criteria: (1) Patients with severe mental or mental disorders; (2) With serious abnormal function of important organs containing heart, liver as well as kidney; (3) With serious chronic diseases; (4) Pregnant or lactating women; (5) Unable to cooperate with the study to complete the assessment; (6) Patients with gastrointestinal stromal tumor or gastric lymphoma confirmed by pathological examination. No significant difference was discovered in general data between both groups (P>0.05, table 1).

Table 1. General data of patients in both groups.

Information		Control group	Observation group	P
Gender (male/female)		45/33	47/31	>0.05
Average age (years)		62.68±7.12	63.14±6.16	>0.05
TNM staging	Stage I	6	7	>0.05
	Stage II	13	13	
	Stage IIIA	22	22	
	Stage IIIB	37	36	

TNM: tumor-node-metastasis.

Methods

Patients in the CG were carried out the routine nursing: Nurses improved the relevant preoperative preparation and guidance work, introduced the relevant knowledge, advantages, and precautions for LRG to the patient, gave the patient reassurance and encouragement, cooperated closely during the operation, monitored the vital signs throughout the operation, prevented complications, and guided the patient to get out of bed as soon as possible.

Patients in the OG received multi-dimensional nursing and early postoperative activity intervention, the process was as follows:

(1) Health education: one day before surgery, patients were interviewed and talked about the related knowledge of laparoscopic gastrectomy, the surgical team, and precautions. Besides, nurses patiently explained the symptoms that may occur in the postoperative recovery process, and informed the treatment methods.

(2) Psychological care: nurses amicably communicated with patients, patiently answered patients' questions, understood their psychological state, soothed their bad emotions, as well as promoted patient relaxation by introducing surgical advantages, guiding patients to breathe deeply, and transferring emotions, so that patients could actively cooperate with the examination. Additionally, nurses introduced cases of successful and good recovery after active cooperation, so as to enhance the patient's confidence in surgery.

(3) Surgical preparation and cooperation: the patients were instructed to eat normally the night before surgery, stopped eating solid food 6 hours before surgery, and abstained from drinking 2 hours before surgery. On the night before surgery and 2 hours before surgery, 500 to 1000 ml of 10% glucose was given orally in split doses, without mechanical bowel preparation. During the operation, the temperature of the operating room was kept at 23-25°C, the infusion fluid was warmed, the laparoscopic flushing fluid was warmed to 37°C, and the patients were kept warm by a warming blanket. Surgical instruments were accurately delivered during the operation, and vital signs were closely monitored.

(4) Postoperative observation and nursing: the patients were told that the operation had been successful with praise and encouraging words. Nurses should pay attention to the observation of the condition and the nursing of the drainage tube. The liver function of the patients was dynamically observed 1 to 5 days after the operation, and the patients' complaints were listened to patiently, and the complications were prevented and nursed well.

(5) Nutritional support nursing: according to the patient's condition, a personalized nutrition plan was designed to ensure a daily intake of 25-30 kilocalorie (kcal)/(kg·day) of energy, 1.5-2.0 g/(kg·day) of protein, and enteral or enteral was chosen on the basis of the actual situation of the patient. External nutritional support program, for patients who were obviously emaciated or malnourished, nutrition could be appropriately increased as appropriate. After 6 hours of postoperative anesthesia, the patient woke up and was given a small amount of warm water and forbidden to eat. After 48 hours after the operation, the patient's intestinal function recovered and the anus began to exhaust, and the patient was given several small amounts of liquid diet, which was

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gradually increased to the full amount of liquid diet. From the 6th day, patients started to enter the semi-liquid, and from the 7th to the 9th day, patients could resume the normal diet.

(6) Early postoperative activities: after returning to the ward, the patient was turned over every 2 hours, and the head of the bed was lifted 15° to 30° when the vital signs were stable. 12 hours after the operation, patient was guided to sit up on the bed for physical activities. On the second day followed by surgery, patients were instructed to walk in the ward for 15 to 30 minutes, 4 to 6 times a day, and they were encouraged to wash their face, brush their teeth, eat and other activities. On the third day after operation, the patients were guided to walk in the corridor for 15-30 minutes, 4-6 times a day.

Observation index

(1) The numeric pain rating scale (NRS) was implemented to evaluate the patient's pain degree.

(2) The activities of daily living (ADL) score were implemented to assess the self-living ability of patients.

(3) Self-rating anxiety scale (SAS) as well as self-rating depression scale (SDS) was implemented to determine patient's anxiety and depression.

(4) Postoperative rehabilitation indicators including recovery time of bowel sounds, first anal exhaust time, first feeding time, first anal defecation time and hospitalization time were recorded in both groups.

(5) Nursing satisfaction. The nursing satisfaction survey table made by the department was adopted to investigate the satisfaction of patients with nursing. The satisfaction was classified into three scoring standards: very satisfied, generally satisfied as well as dissatisfied. Total satisfaction rate = (Satisfied + generally satisfied) / Total number of patients * 100%.

(6) The incidence of adverse reactions containing incision infection, nausea and vomiting, anastomotic leakage, as well as abdominal distension was compared.

Statistical analysis

SPSS18.0 software (International Business Machines Corporation, USA) was adopted to analyze the data. t test was utilized to compare the measurement data between both groups, and the measurement data were exhibited as (x±s). The count data were compared by χ^2 test. P<0.05 was significant.

RESULTS

NRS pain score in both groups

Previous to nursing intervention, no statistical difference was discovered in NRS pain score between both groups (P>0.05). After nursing intervention, the NRS pain score in both groups was declined, and that in the OG was lower relative to the CG (P<0.05), as shown in figure 1.

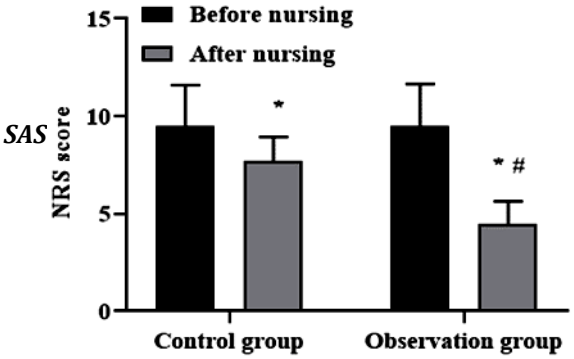

Figure 1. Comparison of NRS pain score in both groups before and after nursing intervention. *P<0.05, compared with before nursing intervention, #P<0.05, compared with control group. P values were obtained by t-test. NRS: numeric pain rating scale.

and SDS scores in both groups

Previous to nursing intervention, no statistical differences were discovered in SAS and SDS scores between both groups (P>0.05). After nursing intervention, the SAS and SDS scores of both groups were declined, and those in the OG were lower compared to the CG (P<0.05), as displayed in figure 2A-2B.

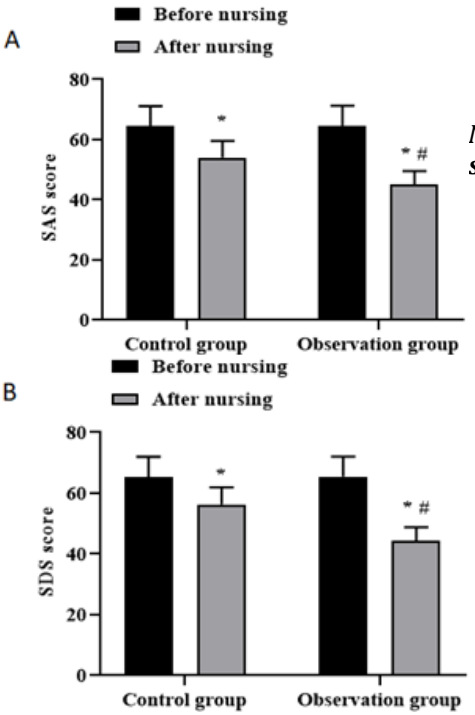

Figure 2. Comparisons of SAS and SDS scores in both groups before and after nursing intervention. **(A)** Comparison of SAS score between the two groups. **(B)** Comparison of SDS score between the two groups. *P<0.05, compared with before nursing intervention, #P<0.05, compared with control group. P values were obtained by t test. SAS: self-rating anxiety scale. SDS: self-rating depression scale.

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faction in both groups

The nursing satisfaction of the OG was 92.30%, which was elevated compared to 71.79% of the CG (P<0.05, table 2).

Table 2. Comparison of nursing satisfaction in both groups (n, %)

Group	N	Very Satisfied	Satisfied	Dissatisfied	Total satisfaction (%)
Observation group	78	52 (66.67)	20 (25.64)	6 (7.69)	72 (92.30*)
Control group	78	30 (38.46)	26 (33.33)	22 (28.21)	56 (71.79)

Note: * was P<0.05, which compared with the control group. P value was obtained by chi-square test. N: number.

Gastrointestinal function recovery and hospitalization time in both groups

The recovery time of bowel sounds, first anal exhaust time, first feeding time, first anal defecation time as well as hospitalization time in the OG were all reduced compared to the CG (P<0.05, figure 3A-3E).

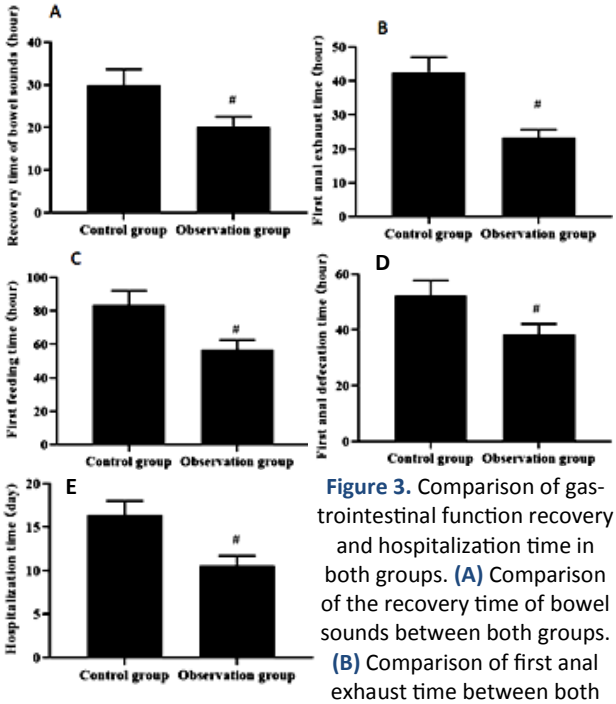

Figure 3. Comparison of gastrointestinal function recovery and hospitalization time in both groups. **(A)** Comparison of the recovery time of bowel sounds between both groups. **(B)** Comparison of first anal exhaust time between both groups. **(C)** Comparison of first feeding time between both groups. **(D)** Comparison of first anal defecation time between both groups. (E) Comparison of hospitalization time between both groups. #P<0.05, compared with the control group. P values were obtained by t test.

Self-living ability of patients in both groups

Relative to the CG, the ADL score in the OG was higher (P<0.05, figure 4).

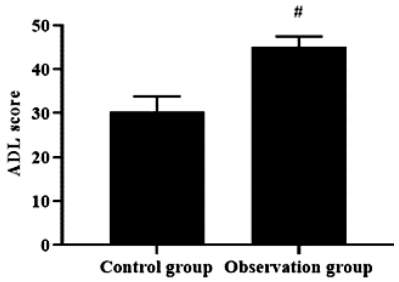

Figure 4. Comparison of self-living ability of patients in both groups. #P<0.05, compared with the control group. P values were obtained by t test. ADL: activities of daily living.

Incidence of adverse reactions in both groups

The incidence of adverse reaction in the OG was 7.68%, which was lower than 19.20% in the CG (P<0.05, table 3).

Table 3. Incidence of adverse reactions in both groups (n, %).

Group	N	Intra-abdominal infection	Incision bleeding	Intestinal adhesion	Bloating	Total incidence (%)
Observation group	78	1 (1.28)	3 (3.84)	1 (1.28)	1 (1.28)	6 (7.68)*
Control group	78	3 (3.84)	6 (7.68)	4 (5.12)	2 (2.56)	15 (19.20)

Note: * was P<0.05, which compared with the control group. P value was obtained by chi-square test. N: number.

DISCUSSION

LRG is a common treatment for GC at the present stage, which can preserve functional gastric anatomical structure to the greatest extent while completely removing the lesion, so as to effectively prolong the survival time of patients [10]. Compared with the traditional open gastrectomy for GC, LRG for GC has the benefits of less trauma, faster postoperative recovery as well as less pain. Nevertheless, the stomach belongs to the largest digestive organ of the human body, and distal gastrectomy is used in the early stage, although the cancerous tissue can be removed, the spread and metastasis of cancer can be prevented, and the patient's life is safe, the operation needs to cut off the vagus nerve, and the gastrointestinal dysfunction is easy to occur after surgery, which is not conducive to prognosis [11, 12]. Therefore, for GC patients undergoing LRG, it is necessary to continuously optimize nursing measures in clinical practice to decline surgical trauma and stress response, and improve surgical effect and safety.

Multi-dimensional nursing emphasizes the professional and detailed nursing intervention based on comprehensive consideration of the nursing needs of patients, so that to reach the physiological together with psychological nursing requirements of patients [13]. Early activity emphasizes the implementation of activity guidance for patients as soon as possible, which can facilitate the early recovery of limbs, muscles, joints and body of patients and promote smooth postoperative rehabilitation [14].

Under the psychological stress trauma caused by knowing that they are suffering from GC and need to receive surgical treatment, most GC patients undergoing LRG have negative emotions containing anxiety and fear, and their psychological resilience is reduced. They worry about the operation and postoperative recovery effect, which affects the smooth development of the operation [15]. In this study, multi-dimensional nursing and early activity intervention were carried out on GC patients underwent LRG, and the outcomes demonstrated that the NRS pain score as well as SAS and SDS scores

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were declined in the OG relative to the CG after nursing intervention, suggesting multi-dimensional nursing combined with early activity intervention could reduce postoperative pain and improve the psychological state of GC patients underwent LRG, which was consistent with former studies [16]. This was because that multi-dimensional nursing could improve patients' cognition level of surgery and reduce adverse psychological emotions caused by deviation and wrong cognition through health education for patients. At the same time, psychological nursing could help patients relax and promote the alleviation of negative emotions, so as to improve their psychological resilience and reduce the fear of disease progression.

Under the influences of anesthesia, artificial pneumoperitoneum, intraoperative operation and traction of gastrointestinal tract, analgesic drug application and other factors, the gastrointestinal nervous system may be disordered in GC patients underwent LRG, which may slow down gastrointestinal peristalsis after surgery [17]. In this study, the outcomes displayed that after nursing intervention, the recovery time of bowel sounds, first anal exhaust time, first feeding time, first anal defecation time and hospitalization time in the OG were all reduced compared to the CG, which suggested that multi-dimensional nursing combined with early activities could effectively facilitate the recovery of gastrointestinal function in GC patients underwent LRG, which was in line with previous literatures [18].

In addition, the self-living ability together with nursing satisfaction of patients in the OG were elevated relative to the CG, the incidence of adverse reaction rate in the OG was reduced relative to the CG, implying that multi-dimensional nursing in association with early activities could effectively promote quality of life of patients and lessen as well as occurrence of adverse reactions, so as to promote the nursing satisfaction, which was similar to former reports [19].

In conclusion, the combined application of multi-dimensional nursing and early activity in GC patients underwent LRG can effectively promote postoperative recovery, which is worthy for promotion.

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Ethical consideration: Our study was carried out with the approval of the ethics committee of the First Affiliated Hospital of Soochow University.

Author Contributions: Chengjuan Peng and Ting Chen participated in the study design and the literature search. Chengjuan Peng and Ting Chen collected the data and wrote the manuscript. Chengjuan Peng and Ting Chen revised the manuscript. Chengjuan Peng and Ting Chen read and approved the final manuscript.

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