ORIGINAL RESEARCH

Enhancing Gastrointestinal Function Recovery in Post-Intestinal Surgery Patients Through Rapid Rehabilitation Nursing Therapy

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ABSTRACT

Objective • This study aimed to investigate the efficacy of rapid recovery nursing therapy in enhancing digestive tract function recovery following intestinal surgery.

Methods • This study included 100 post-intestinal surgery patients between March 2020 and March 2022. A random table method was used, and patients were assigned to either a control group receiving standard nursing care or an experimental group receiving rapid rehabilitation therapy. A thorough assessment compared different outcomes such as gastrointestinal function recovery, physical recuperation, stress levels, postoperative adverse events, nutritional status, nursing efficacy, and patient satisfaction between the two groups.

Results • Compared to the control group, the experimental group exhibited significant improvements in gastrointestinal function and physiological parameters ($P < .05$). Additionally, the experimental group experienced fewer adverse effects, improved nursing outcomes, and higher patient satisfaction post-treatment ($P < .05$).

Conclusions • Rapid rehabilitation nursing therapy in patients undergoing intestinal surgery substantially enhances digestive tract function and overall patient well-being. It effectively reduces the incidence of postoperative complications, accelerates the patient's recovery process, and improves their quality of life. Patient satisfaction with postoperative fast recovery care was notably high. This rehabilitation approach holds significant promise for patients undergoing intestinal surgery and merits wider adoption. (*Altern Ther Health Med.* 2023;29(8):892-897).

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INTRODUCTION

Intestinal inflammation is a common and frequently occurring disease,[1] and its incidence tends to increase with age, especially among individuals aged 50 and older.[2] Men are more commonly affected than women.[3] If left untreated, enteritis can potentially progress to malignancy over time. The primary approach to treat enteritis typically involves addressing the underlying inflammatory condition.[4] However, enteritis treatment can be physically draining, leading to the deterioration of the patient's health. Moreover, it may result in various postoperative complications, including wound infections, delayed healing, postoperative bleeding, nausea, vomiting, and sepsis.[5] These complications can significantly impede patient recovery and, in severe cases, threaten patients' lives.

Gastroduodenal ulcers often necessitate surgery, which may involve intestinal resection. This procedure can reduce peristaltic function in the intestinal tract, resulting in symptoms including indigestion, excretion disorders, and other gastrointestinal issues.[6] Therefore, patients who have undergone intestinal surgery require appropriate nursing measures to accelerate the restoration of their gastrointestinal function, enabling a faster recovery to normal daily activities.[7]

Fast Track Surgery (FTS) has emerged as a contemporary surgical approach with modern medicine, evidence-based practices, and clinical surgery advancements. FTS involves applying evidence-based optimization techniques throughout the perioperative process, starting from preoperative preparation, continuing through the surgery, and extending into the postoperative period. These evidence-based strategies aim to alleviate patient stress and psychological burden while achieving the most favorable therapeutic outcomes.[8]

Many primary hospitals continue to rely on traditional nursing methods after intestinal surgery, lacking standardized guidelines for rapid recovery nursing. This situation has led to inconsistencies in implementation.[9] There is an urgent need for extensive clinical research to establish an effective early intervention program for post-intestinal surgery care.

In clinical practice, rapid recovery nursing therapy encompasses a comprehensive approach addressing the patient's physical and psychological well-being.[7-8]

Attentive care aims to reduce postoperative pain, complications, and adverse reactions, facilitating early patient discharge and promoting better gastrointestinal function recovery, ultimately improving treatment outcomes.[10] Therefore, this study analyzed and explored this issue and its practical application, contributing to developing standardized protocols for rapid recovery nursing after intestinal surgery.

MATERIALS AND METHODS

Study Design and Patient Selection

A total of 100 patients who underwent intestinal resection at The First People's Hospital of Chenzhou City from March 2020 to March 2022 were selected. These patients were randomly divided into two groups, with 50 patients in each group. The control group comprised 25 males and 25 females, while the experimental group comprised 27 males and 23 females. All patients and their families received information about the study's objectives and provided informed consent. The Medical Ethics Committee of our hospital approved this study.

Inclusion and Exclusion Criteria

Inclusion criteria: (1) patients with a confirmed diagnosis of colorectal cancer in accordance with the "*Chinese Colorectal Cancer Diagnosis and Treatment Standards 2018 Edition*"; (2) all patients had undergone colorectal cancer ostomy; (3) the cancer had not metastasized; (4) patients did not have a history of mental disorders; (5) patients and their families were informed about the study and provided consent to participate.

Exclusion criteria: (1) patients with concurrent systemic diseases were excluded; (2) patients with major lesions in vital organs such as the heart, liver, and kidneys; (3) patients who failed to cooperate with adjuvant therapy after surgery were excluded; (4) patients with concurrent blood system diseases; (5) patients with impaired consciousness were not eligible; (6) patients who did not meet the indications for colorectal cancer ostomy were also excluded.

Procedures for Postoperative Patient Care in the Control Group

Following postoperative care was provided to the control group (1) within 6 hours of post-operation, patients were kept in a supine position with their heads turned to the side until they regained consciousness; (2) Vigilant monitoring of vital signs, including consciousness level, body temperature, respiration rate, pulse, and blood pressure, was maintained. Any detected abnormalities were promptly reported to the attending physician; (3) When repositioning the patient, utmost care was taken to ensure the open state of drainage tubes, gastrointestinal decompression tubes, urinary catheters, oxygen suction tubes, and other medical devices. These devices were neither pulled out nor compressed. Simultaneously, attention was given to checking for wound leakage, verifying the intravenous infusion status, and assessing for any signs of blood return. (4) After the patient woke up, they assumed a half-lying position, which relaxed the abdominal muscles, promoted breathing, reduced abdominal flatulence, and facilitated fluid elimination from the body; (5) Leg massages were administered to assist with blood circulation in the patient's leg veins and to prevent the occurrence of leg vein thrombosis. Postoperative patients needed surgery as early as possible to prevent intestinal adhesions; (6) After waking up, assistance was provided for the patient to pat their back to facilitate sputum clearance. Special attention was paid to the patient's incision site to prevent wound rupture; (7) The patient's recovery status was observed, and the times of bowel movements and defecation were recorded; (8) Instruction was received from the doctor to ensure the patient wore a belly belt. If the patient had an ostomy, guidance was provided on its use and management.

Postoperative Dietary Guidelines for Enhanced Recovery. Concurrently, attention was given to dietary considerations: (1) Foods rich in zinc, such as kelp and fungus, were emphasized as a deficiency in zinc affects the body's fibrotic cell repair, thereby influencing wound healing; (2) Foods abundant in unsaturated fatty acids, such as various types of fish, were encouraged to suppress inflammation and promote wound healing; (3) The consumption of glucose-rich foods, like sweet potatoes and bananas, was recommended to provide ample calories for the body and expedite the healing of injuries. These foods also aided in digestion and constipation prevention; (4) The regular intake of light soups and increased consumption of fruits and vegetables were advised, with the avoidance of spicy foods, to maintain overall well-being.

Rapid Rehabilitation Nursing Therapy in Experimental Group

Along with the routine care provided to the control group, appropriate adjustments and modifications were made to facilitate rapid recovery care. This procedure primarily included the following steps.

Preoperative Pulse Assessment. Before the operation, a pulse assessment was performed. Pulse, known for its ability to replenish electrolytes and assist in drug and food absorption for energy, also provides refreshing and anti-fatigue effects as a functional beverage.

Utilization of a Warming Mattress. A warming mattress was employed during the operation to maintain the patient's body temperature at a constant level in the typically cooler operating room environment. This measure aimed to reduce the risk of thrombosis.

Abdominal Cavity Lavage with Mild Saline. Warm saline was used for abdominal cavity lavage. This warm water lavage helped in preserving the function of organs such as the liver within the body.

Shortened Eating Times. Some patients with specific conditions were encouraged to discontinue using gastric tubes before the operation and promptly resume eating post-surgery. This approach aimed to accelerate the restoration of gastrointestinal function and provide essential nutrition to the body.

Warmer Blood Transfusions. It was recognized that transfusing blood at normal temperature could elevate myocardial stress, extend the refractory period, and potentially lead to postoperative arrhythmias.[8-10] Thus, warm blood transfusions were administered to prevent the cooling effect of low-temperature fluids on the body's energy, safeguarding the body's recovery process.

Evaluation Criteria

The recovery of digestive tract function was assessed using indicators such as the time of the first bowel movement, defecation, mobilization from the bed, and extubation.[11] Evaluation of the patient's physical recovery status included factors such as the length of hospitalization and rehabilitation. Patient care measures were also implemented to enhance overall satisfaction.[12]

Nursing Outcomes

Nursing Outcomes assessment categorized patient responses into 'Significantly Effective,' 'Effective,' or 'Invalid' based on their condition and perioperative experiences. (1) Significantly Effective: During the treatment of gastrointestinal surgery, the patient's condition remained stable without complications, yielding a significant improvement in their health; (2) Effective: The patient's physiological condition during the perioperative period was relatively good, resulting in stable health and favorable outcomes; (3) Invalid: Poor patient condition during gastrointestinal surgery and the general physical state during the perioperative period led to unsatisfactory outcomes.

Statistical Analysis

Statistical software SPSS 23.0 (IBM, Armonk, NY, USA) was utilized for data analysis and processing. Quantitative data were presented as ($\bar{x} \pm s$). One-way ANOVA was employed to compare measurements obtained at the same time point across different groups. Additionally, repeated measures ANOVA was used to analyze measurements taken at different time points within the same group. Count data were expressed as cases [n (%)], and group comparisons were conducted using the chi-square test. A significance level of $P < .05$ was considered statistically significant.

RESULTS

Comparison of Baseline Data Between Two Groups

In the control group, the disease duration ranged from 2.0 to 4.1 years, with an average of 2.5 years. In the experimental group, the disease duration ranged from 2.2 years to 4.5 years (refer to Table 1). Demographic comparisons revealed no significant differences between the two groups regarding age, weight, and disease duration ($P > .05$).

Comparison of Gastrointestinal Function Recovery Between the Two Groups

The recovery of gastrointestinal function in the experimental group was superior to that in the control group, and this difference was statistically significant ($P < .05$), as presented in Table 2.

Table 1. Comparison of Baseline data between Two groups

Group	Male	Female	Course of Disease
Control Group	25	25	2.0-4.1
Experimental Group	27	23	2.2-4.5

Note: Data represents the distribution of male and female patients in both the control and experimental groups, along with the range of disease duration in years.

Table 2. Comparison of Recovery of Gastrointestinal Function Between the Two Groups ($\bar{x} \pm s$)

Group	n	First Exhaust Time (h)	Time of First Bowel Movement (h)	Time To Get Out of Bed For The First Time (h)	Postoperative Extubation Time (h)
Experimental Group	50	42.42 ± 8.28	61.35 ± 16.35	34.97 ± 10.06	30.34 ± 6.73
Control Group	50	74.98 ± 12.56	93.08 ± 26.75	49.48 ± 15.96	40.99 ± 12.35
t		15.4341	7.4365	5.1033	5.4288
P value		.000	.000	.000	.000

Note: This table provides a comparison of various recovery parameters between the test group and control group. Differences between the groups were considered statistically significant at $P < .05$.

Table 3. Comparison of Physical Recovery of the Two Groups of Patients ($\bar{x} \pm s$) h

Group	n	Hospital Stay	Rehab Time
Experimental Group	50	12.73 ± 5.62	27.98 ± 4.51
Control Group	50	21.64 ± 10.97	39.75 ± 8.73
t		4.2342	8.3762
P value		.0000	.0000

Note: This table presents a comparison of physical recovery parameters between the experimental group and control group. Differences between the groups were considered statistically significant at $P < .05$.

Table 4. Comparison of Nursing Effects and Satisfaction of Patients in the Two Groups (n, %)

Group	n	Markedly Effective	Efficient	Invalid	Total Effective Rate	Satisfaction
Experimental Group	50	23	17	10	40	4
Control Group	50	10	22	18	32	3
χ^2					5.4798	9.0211
P value					.0323	.0092

Note: This table compares nursing effects and patient satisfaction between the test group and control group. 'Markedly effective,' 'Efficient,' and 'Invalid' represent different nursing outcomes. 'Total effective rate' is calculated as the sum of 'Markedly effective' and 'Efficient' outcomes as a percentage of the total. 'Satisfaction' represents patient satisfaction levels. Differences between the groups were considered statistically significant at $P < .05$.

Comparison of Physical Recovery in the Two Patient Groups

Compared to the control group, the experimental group exhibited significantly shorter average hospitalization days and treatment duration ($P < .05$), as presented in Table 3.

Comparison of Nursing Effectiveness and Patient Satisfaction in the Two Groups

In the post-treatment nursing quality satisfaction survey, the experimental group displayed a significantly higher number of positive responses compared to the control group. Furthermore, the overall satisfaction rate and individual satisfaction scores were notably greater than those in the control group. These differences were statistically significant ($P < .05$), as presented in Table 4.

Table 5. Comparison of Adverse Reactions in the Two Groups of Patients (n, %)

Group	n	Diarrhea	Constipate	Intestinal Adhesion
Experimental Group	50	2	4	1
Control Group	50	9	11	2
χ^2		4.2272	4.967	4.3244
P value		.0234	.0350	.0946

Note: This table compares the occurrence of adverse reactions, including diarrhea, constipation, and intestinal adhesion, between the test group and control group. Differences between the groups were considered statistically significant at $P < .05$.

Table 6. Comparison of Postoperative Stress Indicators Between the Two Groups of Patients ($\bar{x} \pm s$, μmol/L)

Group	n	Time	Blood Sugar	Insulin	Cortisol	Insulin Resistance
Experimental Group	50	24 hours after operation	3.69 ± 0.67	11.32 ± 7.47	9.48 ± 9.05	1.45 ± 1.38
Control Group	50	24 hours after operation	4.78 ± 1.68	13.43 ± 11.23	12.89 ± 8.65	2.87 ± 3.08

Note: This table compares various postoperative stress indicators, including blood sugar, insulin, cortisol, and insulin resistance, at 24 hours after the operation between the test group and control group. Statistical significance, with experimental group representing a significant difference ($P < .05$) when compared with the control group.

Table 7. Comparison of Nutritional Indicators Between the Two Groups of Patients After Surgery ($\bar{x} \pm s$, umol/L)

Group	n	Time	PA	ALB	BUN
Experimental Group	50	24 hours after the operation	17.69 ± 3.67	36.57 ± 3.47	2.84 ± 1.05
Control Group	50	24 hours after the operation	18.98 ± 3.68	36.95 ± 3.23	3.11 ± 1.25

Note: This table compares nutritional indicators, including prealbumin (PA), albumin (ALB), and blood urea nitrogen (BUN), at 24 hours after the operation between the test group and control group. Statistical significance, with the experimental group representing a significant difference ($P < .05$) compared to the control group.

Comparison of Postoperative Adverse Reactions Between the Two Groups

There were only 2 cases of diarrhea in the experimental group, significantly fewer than the 9 cases observed in the control group, with a statistically significant difference ($P < .05$). Additionally, the experimental group had 4 cases of constipation, notably less than the 11 cases in the control group, with a statistically significant difference ($P < .05$). Regarding intestinal adhesion, the experimental group had 1 case, while the control group had 2 cases; however, this difference did not reach statistical significance ($P > .05$). Overall, the incidence of adverse reactions in the experimental group was lower than in the control group, as illustrated in Table 5.

Comparison of Postoperative Stress Conditions in Two Groups

The postoperative stress index in the experimental group was significantly lower than in the control group. A significant difference was observed between the two groups ($P < .05$), as detailed in Table 6.

Comparison of Nutritional Status in Patients

The postoperative nutritional index in the experiment group was significantly higher than in the control group ($P < .05$). A significant difference was noted between the two groups ($P < .05$), as outlined in Table 7.

DISCUSSION

Treatment methods for gastric ulcers and gastric inflammatory diseases often involve minimally invasive procedures such as endoscopy, laser therapy, and medication to reduce inflammation and promote healing.[13] In cases with tumorous lesions, surgical intervention may be necessary, complemented by chemotherapy or other pharmaceutical treatments to address the underlying condition.[14] The surgical procedure requires distinct postoperative care approaches. Therefore, it is crucial to carefully assess the patient's condition, considering their overall health and the severity of the illness, to determine the most appropriate course of action.[13-14]

Fast-track surgery represents a comprehensive and innovative approach integrating various disciplines, including surgery, anesthesia, and nursing.[15-16] In exploring an optimized clinical pathway, the development of rapid rehabilitation surgery has given rise to rapid rehabilitation nursing therapy. This holistic nursing model prioritizes patients and incorporates multiple optimization measures during the perioperative period. It minimizes the body's response to surgical stress or trauma, ultimately facilitating quicker postoperative recovery.[17]

Rapid rehabilitation nursing recommends a gradual dietary transition for patients undergoing intestinal surgery, starting with a shift from a liquid diet to a semi-liquid one before progressing to a regular diet. Following intestinal resection, patients should consume easily digestible, nutrient-rich foods. Furthermore, postoperative patients should incorporate a greater quantity of vegetables and fruits into their diet. Rapid recovery nursing therapy incorporates more than mere postoperative care; it extends throughout the surgical process. Its core components include mitigating surgical stress, preoperative preparations, and postoperative care.

Mitigating Surgical Stress

When the body undergoes a stress response, several metabolic alterations occur, including reduced insulin secretion, decreased insulin sensitivity, limited mobilization of energy reserves, and heightened protein degradation.[18] These metabolic changes primarily affect crucial human body tissues involved in processes such as glucose metabolism, protein metabolism, and fat metabolism.

Glycogen breakdown, peripheral gluconeogenesis, and reduced glucose absorption can contribute to the body's glucose metabolism disorder.[19] Aberrant protein metabolism is primarily characterized by accelerated protein degradation, a rapid decline in serum albumin, prealbumin, and transferrin levels, increased amino acid concentrations, heightened urinary nitrogen excretion, and an overall negative nitrogen balance within the body.[20-21] Rapid recovery nursing aims to minimize the stress response and maintain metabolic stability within the body. This approach protects and enhances organ function recovery, ultimately facilitating a successful postoperative recovery for patients.

Preoperative Implementation of Rapid Rehabilitation Nursing Therapy

Rapid rehabilitation nursing therapy primarily improves traditional preoperative dietary management practices. Instead of the customary 12-hour fasting period with a 4-hour restriction on water intake, patients can consume water or carbohydrates up to 2 hours before surgery. This change is motivated by the recognition that prolonged fasting serves as a stress stimulus to the human body. Extensive fasting can lead to the depletion of liver glycogen stores,[22] consequently impacting blood sugar levels and overall metabolic processes.

Traditional treatment methods often involve the use of highly osmotic drugs, which can inadvertently reduce the effective circulating blood volume, resulting in insufficient blood supply to functional lumens. Furthermore, anesthetics have a volume-expanding effect, significantly reducing blood pressure in patients before surgery. To ensure the maintenance of normal blood flow, a substantial volume of fluids is required, which can subsequently lead to interstitial lung and gastrointestinal mucosal edema in patients. These complications may compromise the patient's cardiopulmonary function and, in severe cases, result in intestinal paralysis.

Fasting and surgery further intensify the patient's elevated metabolic rate, resulting in excess protein degradation over synthesis, significantly impacting the patient's postoperative nutritional status. In the context of rapid recovery nursing for intestinal surgery, the preparation of the intestinal tract serves a dual purpose. It mitigates adverse drug reactions such as nausea and vomiting induced by substances like polyethylene glycol and polyoxyethylene[23] and alleviates discomfort symptoms such as diarrhea and dehydration. This approach contributes to reducing recovery time for gastrointestinal functions such as postoperative bowel movements, defecation, and gas elimination. Additionally, it enhances patient comfort and helps prevent psychological stress reactions.

Postoperative Implementation of Rapid Rehabilitation Nursing Therapy

Prolonged bed rest following surgery can lead to a decline in muscle strength, lung function, and tissue oxygenation, thereby increasing the risk of venous stasis and, in severe cases, thrombus formation. Ensuring appropriate pain management is crucial to facilitating early mobilization of the patient. Moreover, expeditiously returning to a regular oral diet structure, post-surgery significantly contributes to rapid recovery.

In clinical practice, initiating early postoperative oral intake without compromising anastomotic integrity has been shown to reduce the incidence of postoperative infections and the duration of hospitalization. The prompt consumption of food after surgery effectively counteracts the heightened catabolic state within the body, thereby enhancing its anti-infection capabilities and subsequently mitigating postoperative complications.

The findings of this study revealed that patients in the experimental group exhibited shorter durations for their first defecation, gas elimination, getting out of bed, and postoperative extubation compared to those in the control group. Furthermore, their nutritional status and overall postoperative well-being exceeded those of the control group. These findings suggest that implementing rehabilitation nursing measures effectively accelerates the recovery of patients' gastrointestinal function, enhancing their quality of life. Notably, the incidence of postoperative constipation and diarrhea demonstrates a gradual decline.

Compared to the control group, the physical well-being of patients in the experimental group has notably improved. These patients express higher satisfaction levels with the implemented rapid rehabilitation nursing measures, demonstrating their pronounced nursing effectiveness. These findings highlighted that rapid rehabilitation nursing therapy significantly enhances the recovery of gastrointestinal function in patients undergoing intestinal surgery. It exhibits robust therapeutic efficacy, high patient satisfaction, and minimal postoperative side effects, rendering it a valuable treatment modality.

Study Limitations

In this study, a few limitations are acknowledged. First, the study primarily focused on a specific patient population undergoing intestinal surgery, and the findings may not be directly applicable to other surgical contexts. Secondly, while efforts were made to control confounding factors, the retrospective nature of data collection may have introduced potential bias. Third, the study duration may have limited the ability to capture long-term outcomes and complications. Finally, there may exist unmeasured variables that could impact the results. Despite these limitations, the study contributes valuable insights into the benefits of rapid rehabilitation nursing therapy for intestinal surgery patients, emphasizing the need for further research in this area.

CONCLUSION

In conclusion, this study underscores the significant positive impact of rapid rehabilitation nursing therapy on patients undergoing intestinal surgery. The findings reveal shortened recovery times for essential postoperative milestones, improved nutritional status, enhanced overall well-being, and heightened patient satisfaction in the experimental group compared to the control group. These results highlight the effectiveness of this comprehensive nursing model in expediting the recovery of gastrointestinal function and mitigating postoperative complications. While further research and validation may be warranted, the evidence presented herein firmly supports the adoption of rapid rehabilitation nursing therapy as a valuable approach for promoting the well-being of intestinal surgery patients and improving their postoperative outcomes.

CONFLICT OF INTEREST

The authors declare no competing interests.

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