

ORIGINAL ARTICLE

Effect of a Symptom Management Program Combined with Acupressure Massage on Recovery of Bowel Function after Open Abdominal Surgery in Colorectal Cancer Patients in the Intensive Care Unit

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KEYWORDS

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ABSTRACT

Postoperative gastrointestinal dysfunction can affect bowel function recovery, particularly in patients undergoing open abdominal surgery for colorectal cancer who are treated in the intensive care unit. This can lead to serious complications and increased treatment costs. This quasi-experimental study aimed to compare bowel functional recovery after open abdominal surgery among patients with colorectal cancer between an experimental group receiving an acupressure massage program combined with symptom management and a control group receiving traditional nursing care. The sample group consisted of 44 colorectal cancer patients (≥ 20 years) who underwent open abdominal surgery and were admitted to the surgical intensive care unit at Thammasat University Hospital. They were divided into a control group ($n=22$) and an experimental group ($n=22$) using convenience sampling. The experimental group received a symptom management program combined with acupressure massage for 5 days after surgery. This involved daily trunk and leg movements for 10–15 minutes, combined with acupressure massage at Zusanli (ST36) twice daily for 10 minutes each time. The control group received standard nursing care. The research instruments included a program of acupressure massage combined with symptom management, a personal information questionnaire, bowel function recovery assessment, and a behavioral assessment for managing postoperative bowel dysfunction. Data were analyzed using the Mann–Whitney U test and Friedman test. The study found that patients with colorectal cancer who underwent open abdominal surgery and subsequently received a symptom management program combined with acupressure massage had significantly higher average scores for bowel function recovery on days 3 to 5 post-operatively compared to the control group receiving only conventional nursing care ($p<0.05$). This results show that this program can effectively aid in the rehabilitation of bowel function after surgery in patients receiving treatment in the critical care unit.

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Introduction

Colorectal cancer is a major public health problem in Thailand. According to the 2023 statistics of the National Cancer Institute, it is the second most common cancer, second to Liver and Bile Duct Cancer, among males at 17.1% and the third most common, second to Breast and Cervical Cancer, among females at 9.7%. The incidence of colorectal cancer has been steadily increasing, with an average of approximately 15 deaths per day, or 5,476 deaths per year. In 2021–2022, there were 256 and 315 patients with colon and rectal cancer, respectively, admitted to Thammasat University Hospital. Currently, treatment options for colon and rectal cancer include surgery, chemotherapy, and radiation therapy. The primary treatment is surgical removal of all affected areas, followed by chemotherapy or radiation

therapy as indicated. According to the Ministry of Public Health statistics in 2023, a total of 990,829 patients were admitted for intestinal diseases, of whom 304,390 (30.72%) underwent surgery. At Thammasat University Hospital during 2021–2022, 56.2% and 59.6% of patients underwent open abdominal surgery. Open abdominal surgery causes injury to intestinal tissue due to direct contact with the intestines during the surgery, resulting in stimulation of the secretion of inflammatory substances that affect the intestinal muscles. This, combined with general anesthesia and opioid painkillers, which have the side effect of reducing intestinal contractions, causes postoperative bowel dysfunction known as postoperative ileus (POI). This condition can occur in any part of the gastrointestinal tract, but is most severe in the large intestine¹. The risk of developing postoperative bowel

dysfunction has been reported to range from approximately 10% to 30%². Among these patients, 170,947 (9.2%) were diagnosed with postoperative bowel obstruction, and the incidence among colorectal cancer patients ranged from 17.4% to 34.9%³. Common signs and symptoms include bloating, no flatulence, no bowel movements, no bowel sounds, abdominal pain, nausea, and vomiting. This results in a delay in starting to eat food by mouth, increased pain from the surgical wound, slow wound healing, and a delay in starting to move or get out of bed after surgery. This can result in collapsed lungs and lung infections. An Australian study found that postoperative bowel obstruction resulted in longer hospital stays (8 vs. 5 days, $p < 0.001$) and a higher rate of complications such as pneumonia (15.2% vs. 8.1%, $p = 0.027$) and a 26.4% higher total cost of inpatient care (AU\$37,690 vs. AU\$29,822, $p < 0.001$)⁴. Therefore, it is important to promote the rapid recovery of intestinal function after surgery.

Postoperative bowel function recovery refers to the return of the body's ability to digest and absorb fluids and nutrients, as well as eliminate waste products from the body, through normal bowel movements⁵. In general, in patients undergoing abdominal surgery, functional recovery of the small intestine occurs first within 6-24 hours, followed by gastric recovery within 24-48 hours, and colon within 48-72 hours or 3 days after surgery⁶. Postoperative bowel recovery can be assessed by the rate of bowel movement, bloating, gas, defecation, and the rapid initiation of eating⁷. According to a study by Lluís and Biondo⁸ reported that between 2010 and 2018, the incidence of delayed bowel recovery after colorectal surgery due to intestinal insufficiency ranged from 2% to 54%. Further, Incidents of POI have been reported to vary from 7% to 27%, even when enhanced recovery protocols are implemented⁴. Delayed bowel recovery may prolong postoperative rehabilitation and lead to patient discomfort and psychological stress, particularly among patients admitted to the intensive care unit (ICU), where continuous monitoring and the presence of medical equipment may restrict mobility and interfere with rehabilitation activities. This is a common problem among patients recovering from major abdominal surgery in the ICU. As a result, patients require assistance with self-care and symptom management to facilitate recovery. Nurses play a crucial role in promoting rehabilitation during this phase. Promoting bowel function recovery is largely due to nurses' inability to perform nursing tasks independently. Although pharmacological interventions may be limited, nurses can independently implement non-pharmacological interventions that support recovery, particularly early postoperative mobilization. However, for patients receiving care in the intensive care unit (ICU), physical mobilization is often limited. Most patients are connected to monitoring devices or life-support equipment and may not be physically stable or ready for movement. These conditions significantly restrict the ability to stimulate early physical activity during the postoperative period⁹.

Literature review and first-hand experience. In the care of patients after abdominal surgery, it was found that properly performing activities to promote bowel recovery will reduce complications, lower medical costs, and shorten the length of hospital stay. Proper and consistent postoperative recovery activities are crucial. For post-abdominal surgery patients to properly perform postoperative recovery activities, they must be prepared through systematic

instruction and training. Therefore, the researchers applied the symptom management concept proposed by Dodd et al.¹⁰, in conjunction with a literature review. It consisted of three steps: assessment of the experience of postoperative ileus symptoms, management strategies for postoperative bowel prolapse symptoms (education, skills training, practice), and evaluation of postoperative bowel ileus symptoms. The researchers therefore applied bed mobility promotion and leg exercises to patients in the intensive care unit (ICU). This included systematic movement of the trunk and legs. Rapid postoperative body movement helped reduce bowel prolapse, including side-turning, foot exercises, and Passive Range of Motion (PROM) or active exercise. Body movement activates mechanical receptors that stimulate the parasympathetic autonomic nervous system, including the vagus nerve originating from the medulla oblongata, which enhances motility of the small intestine and proximal colon, and the pelvic splanchnic nerves arising from sacral spinal cord segments S2-S4, which facilitate motility of the distal colon. Both send nerve impulses to stimulate cells in the enteric nervous system, releasing the neurotransmitter acetylcholine, which stimulates intestinal motility¹¹. Combined with the concept of acupressure¹², Acupoint Stomach, also known as ST36 or Zusanli, is part of the stomach meridian, as indicated in the textbook. It plays a crucial role in enhancing gastrointestinal (GI) function. By stimulating ST36, one can help regulate stomach qi and address issues such as stomach pain, vomiting, reduced GI function, abdominal distention, diarrhea, and constipation¹³, resulting in reduced symptoms of bowel dysfunction after surgery and promoting recovery of bowel function. Physical therapy is generally believed to aid recovery and prevent acute complications after surgery. Therefore, non-pharmacological care, an independent and easily implemented role for nurses, involves promoting rapid physical movement after surgery. However, in ICU patients, most of whom have monitoring or life-support equipment and are not physically ready, stimulating movement is limited and requires greater caution in promoting mobility. The researchers therefore sought to integrate alternative medicine with conventional medicine, a significant challenge in patient care. However, there are no well-designed randomized trials specifically studying the effects of early physical therapy interventions on various aspects of health, particularly bowel dysfunction after open-abdominal colon surgery in critically ill patients. Consequently, this program provides nurses with actionable care, integrating acupressure with movements specifically designed for ICU patients. This approach fills a gap in ICU care where patients are unable to walk or move quickly.

In this study, the researcher applied the symptom management conceptual framework proposed by Dodd et al.¹⁰, in combination with a physiological framework. Assessment is followed by identifying the focus for intervention strategies. The intervention strategies may be targeted at one or more components of the individual's symptom experience to achieve one or more desired outcomes. Symptom management is a dynamic process, often requiring changes in strategies over time or in response to acceptance or lack of acceptance of the strategies devised¹⁴. The researchers applied the symptom management concept proposed by Dodd et al.¹⁰ through a three-step process. This process helps patients gain a clearer understanding of their problems and utilize appropriate symptom

management strategies. Nurses and the overall picture provide knowledge, skills training, and practical application, and evaluate outcomes from bowel function recovery, which includes physical movement. Stimulating mechanical receptors and acupressure increases vagus nerve activity through various methods such as vagus nerve stimulation (VNS), which in turn stimulates the parasympathetic nervous system and increases blood flow to the intestines¹⁵. This leads to increased intestinal contractions, reducing post-surgical bowel dysfunction and promoting recovery of bowel function.

The objective of this study is to compare the mean postoperative bowel function recovery scores between colorectal cancer patients undergoing open abdominal surgery who received a symptom management program combined with acupressure and those who received conventional nursing care in the intensive care unit.

Materials and Methods

This study employed a non-randomized, matched-pair, sequential quasi-experimental study, time series design 5 day after surgery, and included the colorectal cancer patients aged ≥ 20 years who underwent open abdominal surgery and were admitted to the surgical intensive care unit at Thammasat University Hospital, were selected using convenience sampling, 44 people, divided into a control group of 22 people and an experimental group of 22 people, selected specifically according to the specified qualifications. If they meet the requirements, they will be automatically added to a group. Matched-pair techniques were employed to ensure similarity between the control and experimental groups in terms of gender, body mass index, and postoperative blood potassium levels. Participants with comparable characteristics were paired and then allocated accordingly. To prevent contamination between the control and experimental groups, data from the control group were collected first, followed by data collection from the experimental group.

Inclusion criteria were determined as: 1. Underwent open abdominal colon and rectal surgery. 2. Received general anesthesia. 3. Was admitted to the intensive care unit for more than 24 hours. If the patient is intubated, such as with an endotracheal tube, tracheostomy tube, or high-flow nasal cannula, Positive End Expiratory Pressure (PEEP) must be maintained at no more than 5 cmH₂O. 4. There are no contraindications to acupressure, including acute infection, inflammation at the massage site, deep vein thrombosis, contagious skin conditions, severe osteoporosis, fractures, or fractures at the surgical site of metal or artificial joints, or a history of abnormal bleeding or taking blood-thinning medications. 5. Be conscious, able to communicate in Thai, and willing to cooperate in the research. Patients with the following conditions were considered ineligible: 1. Severe complications, including circulatory failure and severe infection. 2. Unable to complete the study program (5 days). 3. If the participant experiences any changes in their symptoms during the study, such as symptoms that constitute contraindications to massage, their participation in the study will be immediately terminated. 4. If the participant fails to cooperate, potentially causing harm. 5. Death.

The researcher selected a sample group based on the specified criteria. Upon admission to the hospital, the patient was informed of the objectives, procedures, and duration of the program. The researcher collected data by building rapport, explaining the objectives, and requesting cooperation. The researcher divided the sample group into two groups: a control group and an experimental group. Data was collected from the control group first, followed by the experimental group, to prevent contamination. During the data collection process, the researcher performed all activities, and the research assistant was only responsible for assessing bowel function recovery using the assessment tool.

The experimental group received comprehensive knowledge about the meaning, causes, and factors contributing to symptoms, effects, and methods to promote bowel recovery (trunk and leg exercises) during ICU treatment. Additionally, the benefits of acupressure were explained, along with the steps and methods researchers would use with patients one day prior to surgery. Following this, the researchers conducted the following activities:

On the first day after surgery, turn the patient's side every two hours. Since the wound will be very sore during the first 24 hours, it encourages movement that does not exacerbate pain.

On the second day after surgery, I perform foot and ankle exercises. Perform ankle flexion and extension for 5 minutes on each side at a rate of 15 times per minute and perform 15 circular movements of the ankle once daily.

On the third and fifth days after surgery, perform passive range of motion (PROM) exercises on both legs for 10-15 minutes once daily.

For patients who can move their bodies, perform active exercises. For patients who cannot exercise or move their bodies, nurses perform passive exercises, particularly on the legs and lower body. Together with the researcher, acupressure was performed on the Zusanli (ST-36) area, beginning on the first day after surgery. The massage lasted 3-5 minutes per side, twice daily, starting on the first day after surgery (between 8:00 AM and 10:00 AM and 3:00 PM and 5:00 PM). The study was conducted for five consecutive days. Afterward, the subjects were allowed to ask questions. During the process, vital signs (heart rate and blood pressure level on bedside monitors, if available) and patients' reports of discomfort were carefully monitored to ensure patients' safety.

Patients in the control group received routine nursing care provided by professional nurses in the surgical intensive care unit at Thammasat University Hospital. The researcher established a rapport and collected personal data. The researcher assessed recovery of bowel function using the Bowel Function Recovery Assessment. The control group was evaluated at 5 p.m. five days after surgery. On the fifth day after surgery, the researcher provided education, skills training, and a manual for symptom management, along with acupressure, for patients with colon and rectal cancer undergoing open abdominal surgery.



Figure 1 Location of ST36 (Stomach 36 or Zusanli).

Note: ST36 is located at lateral to the tibia, and three cun (equal to the width of the patient's four fingers) at the level of proximal interphalangeal joint of the index finger) down from the patella. Photo by Kanyarat Atthasing.

Data for analysis was extracted from the hospital's electronic records and recorded in a structured data collection form, including:

Part 1: Data collection tools consisted of:

1. Personal data questionnaire. The researcher developed this questionnaire based on a review of relevant literature. The questionnaire consists of short answers and a checklist of 15 items. Questions included age, gender, underlying medical conditions, weight, height, body mass index (BMI), type of surgery, history of abdominal surgery, amount of blood loss during surgery, duration of surgery, anesthesia received, pain medication received after surgery, use of a ventilator, restriction or immobility after surgery for more than 24 hours, and serum potassium level one day after surgery. The researcher interviewed the sample and the patient's file. The questionnaire was completed within one day after surgery.

2. Intestinal function recovery assessment by Phomphon⁵. The questionnaire consists of a checklist of 4 items. The results of the four intestinal function assessments were then summed up. The lowest score was 4 points, while the highest score was 16 points. A score of 4-7 points indicated poor bowel function recovery, a score of 8-11 points indicated medium bowel function recovery, and a score of 12-16 points indicated good intestinal function recovery.

Part 2: The experimental instrument consisted of a program of acupressure combined with symptom management for functional bowel recovery after open abdominal surgery. The activity steps included education about surgery, postoperative complications, postoperative behavior, patient care in the intensive care unit, acupressure to promote functional bowel recovery, and evaluation of activity results. functional bowel recovery, and evaluation of activity outcomes.

Part 3: The experimental control instrument consisted of the postoperative bowel syndrome management behavior assessment. This researcher-developed assessment was used to evaluate patients' behaviors related to the management of postoperative bowel syndrome. It covered postoperative

behavioral strategies, including turning, leg exercises, and six multiple-choice questions. The assessments were conducted daily after surgery, days 1-5, at 5:00 PM. Compliance criteria were defined as follows: a pass was defined as achieving at least 80% compliance, equivalent to successful completion of at least 5 out of 6 activities, whereas a failure was defined as achieving less than 80% compliance. This instrument was used by researchers to monitor adherence to the symptom management and acupressure program. Actual performance was recorded. In cases where participants were unable to perform the activities independently, the researchers helped ensure proper implementation of the program.

After data collection was completed, statistical analysis was performed. Data was analyzed using the Statistical Package for Social Sciences (SPSS). Descriptive statistics, including frequency, percentage, mean, and standard deviation (SD), were used to analyze general characteristics as well as disease- and treatment-related data. Differences in general characteristics and disease and treatment-related variables between the experimental and control groups were analyzed using the Chi-square test. Data normality was assessed using the Shapiro-Wilk test, which indicated that the data were not normally distributed. Therefore, differences in postoperative bowel function recovery between the experimental and control groups were analyzed using the Mann-Whitney U test, with a significance level of 0.05. Changes in postoperative bowel function recovery from postoperative days 1 to 5 within and between groups after receiving the intervention were analyzed using the Friedman test.

Results

The distribution of gender was equal between the two groups, with males accounting for 50% of the participants. The most common age group in the experimental and control groups was 60 years and above. When comparing the characteristics of the two patient groups, there was no statistically significant difference between the experimental and control groups ($p > 0.05$), as shown in Table 1.

Table 1 Comparisons of demographic and clinical characteristics between experimental and control groups

Variables	Experimental group (n = 22)	Control group (n = 22)	p-value
Gender			
Male	11 (50%)	11 (50%)	1.000 ^a
Female	11 (50%)	11 (50%)	
Age, Mean $\pm$ SD, years	61.8 $\pm$ 13.0	55.2 $\pm$ 13.2	0.185 ^b
BMI (kg/m ²) Mean $\pm$ SD	22.21 $\pm$ 3.6	21.95 $\pm$ 3.3	0.557 ^b
Comorbidity			
do not have	6 (27.3%)	5 (22.7%)	0.324 ^b
1 disease	4 (18.2%)	8 (36.4%)	
2 diseases	5 (22.7%)	6 (27.3%)	
3 diseases	4 (18.2%)	3 (13.6%)	
4 or more diseases	3 (13.6%)	-	
Previous abdominal surgery	8 (36.4%)	14 (63.6%)	0.070 ^a
Duration of surgery (min)			
More than 180 minutes	20 (90.9%)	20 (90.9%)	1.000 ^a
Less than 180 minutes	2 (9.1%)	2 (9.1%)	
Blood loss during surgery			
More than 500 ml	4 (18.2%)	7 (31.8%)	0.296 ^a
Less than 500 ml	18 (81.8%)	15 (68.2%)	
Pain relievers			
Fentanyl	9 (40.9%)	15 (68.2%)	0.067 ^b
Morphine	10 (45.5%)	3 (13.6%)	
Local anesthetic	3 (13.6%)	4 (18.2%)	
How to take painkillers			
Intravenous injection	19 (86.4%)	18 (81.8%)	0.680 ^b
Epidural	3 (13.6%)	4 (18.2%)	
Use of a ventilator			
Yes	6 (27.3%)	11 (50%)	0.215 ^a
No	16 (72.7%)	11 (50%)	
Limited or no physical movement for more than 24 hours after surgery			
No physical activity for $\geq$ 24 hours	11 (50%)	15 (68.2%)	0.358 ^a
There was physical activity $\leq$ 24 hours	11 (50%)	7 (31.8%)	
Blood potassium level 1 day after surgery			
< 3.5 mEq/L	5 (22.7%)	6 (27.3%)	0.805 ^b
3.5-5 mEq/L	15 (68.2%)	14 (63.6%)	
> 5 mEq/L	2 (9.1%)	2 (9.1%)	

BMI, body mass index, a = Fisher's Exact Test, b = Pearson Chi-Square

A comparison of postoperative bowel function recovery between the experimental and control groups showed no statistically significant differences on postoperative days 1 and 2 among colorectal cancer patients who underwent open abdominal surgery. The Mann-Whitney U values were 208 and 199, with Asymp. Sig. (2-tailed) values of 0.210 and 0.298, respectively. In contrast,

postoperative bowel function recovery scores on days 3, 4, and 5 differed significantly between the experimental and control groups among colorectal cancer patients who underwent open abdominal surgery (Mann-Whitney U = 47.50, 49.00, and 30.50, respectively; Asymp. Sig. (2-tailed) < 0.001), indicating statistical significance at the 0.05 level.

The results demonstrated that colorectal cancer patients who underwent open abdominal surgery and received the symptom management program combined with acupressure showed significantly higher mean postoperative

bowel function recovery scores on postoperative days 3 to 5 compared with those who received standard nursing care ($p < 0.05$), as shown in Tables 2 and 3.

Table 2 Comparison of postoperative bowel function recovery between the experimental and control groups

Postoperative bowel function recovery	Experimental group		Control group		Mann-Whitney U	z	p-value
	Mean rank	Sum of rank	Mean rank	Sum of rank			
Day 1 after surgery	24.05	529	20.95	461	208	-1.254	0.210
Day 2 after surgery	24.45	538	20.55	452	199	-1.041	0.298
Day 3 after surgery	31.34	689.50	13.66	300.50	47.50	-4.784	< 0.001
Day 4 after surgery	31.27	689.50	13.73	302	49	-4.632	< 0.001
Day 5 after surgery	32.11	706.50	12.89	283.50	30.50	-5.052	< 0.001

Statistical significance level at 0.05

Table 3 Comparison of mean rank of bowel function recovery scores from days 1 to 5 between the experimental and control groups

Group	Mean bowel function recovery score					χ^2	<i>p</i> -value
	Mean rank						
	POD 1	POD 2	POD 3	POD 4	POD 5		
Experimental group	1.16	1.84	3.27	3.98	4.75	82.13	< 0.001
Control group	1.30	2	3.20	3.91	4.59	75.62	< 0.001

POD = Postoperative Day, Statistical significance level at 0.05

χ^2 และ p-value เป็นผลของการวิเคราะห์ภายในกลุ่ม (Friedman test)

Discussion

A study on the effects of a symptom management program combined with acupressure massage after open abdominal surgery in colorectal cancer patients in the Intensive Care Unit found a statistically significant ($p < 0.05$) difference in bowel function recovery scores between the experimental group receiving the symptom management program and the control group receiving standard nursing care on days 3 to 5 after surgery ($p < 0.05$). This study also observed no statistically significant difference between groups on days 1–2 after surgery. This is attributed to the immediate post-operative period encompassing a neuroactive phase characterized by autonomic nervous system dysfunction and initial suppression of gastrointestinal motility. This process begins with surgical stress and bowel manipulation, activating various neural pathways and ultimately leading to temporary bowel motility dysfunction. Following this initial neural inhibition, an inflammatory phase emerges within the first 24 hours and can last up to 72 hours. This phase is triggered by the surgical wound in the intestine, leading to the activation of intestinal immune cells and the influx of inflammatory mediators or cytokines. These inhibit smooth muscle contraction by modulating the function of myenteric neurons, resulting in prolonged bowel stasis. Along with the use of opioids as the primary pain management medication for wound pain in the first 72 hours after surgery, it also contributes significantly to postoperative ileus (POI) due to its effects on opioid receptors in the gastrointestinal tract¹¹. Previous studies have shown that patients experience

improved bowel function recovery in 3 days after surgery. Consistent with the study by Koesanthia et al.¹ reported that physical movement within the first 72 hours post-surgery improved bowel function recovery in patients, with better bowel function recovery scores on day 3 compared to day 1 after surgery. Previous studies have shown that early physical movement plays a crucial role in improving gastrointestinal function after surgery by stimulating several neurohormonal mechanisms. These mechanisms include increased vagus nerve activity, increased parasympathetic nervous system activity, modulation of sympathetic nervous system function, and influence on hormonal mechanisms. Understanding these physiological effects, researchers can apply physical movement strategies to reduce postoperative ileus (POI) and accelerate bowel function recovery. Numerous studies have shown that gastrointestinal (GI) symptoms are common in ICU patients, with up to 62% experiencing at least one gastrointestinal problem for at least one day. Bowel dysfunction is a significant prognostic factor in critically ill patients. This dysfunction can lead to various complications, including longer hospital stays, delayed recovery, higher morbidity and mortality rates, and can negatively impact the patient's quality of life after discharge. Because patients in the ICU have greater mobility limitations, physical movement can be particularly effective in addressing these issues. Therefore, the researchers focused on the movement of the trunk and legs. A study by Morisawa et al.¹⁷ reported that passive exercise of the trunk and legs in cardiac surgery patients in the critical care unit significantly increased the mean bowel motility sound. Furthermore,

previous studies have shown that increased health education can reduce postoperative complications¹⁷. The researchers integrated education, physical activity promotion, and acupressure massage to improve bowel function. This aligns with the study by Zia et al.¹⁹ reported that early patient education, breathing exercises, physical activity, connective tissue massage, and transcutaneous electrical nerve stimulation in patients after open hysterectomy significantly improved the time to flatulence and defecation. However, due to limitations in the nursing context, connective tissue massage and electrical nerve stimulation were applied by nurses, demonstrating the positive effect of ST36 acupressure on early postoperative gastrointestinal function in patients undergoing colorectal cancer surgery. This is consistent with the study by Chao et al.²⁰ reported that ST-36 acupressure reduced the time to the first flatulence and promoted gastrointestinal function in patients after abdominal surgery, with the experimental group showing better bowel motility than the control group within 2-3 days post-surgery. Furthermore, a study by Liu et al.¹² reported that acupressure significantly reduced the time to the first flatulence after surgery and improved bowel motility in the experimental group. Therefore, it can be concluded that a symptom management program combined with acupressure massage significantly contributed to bowel function recovery after open abdominal surgery in colorectal cancer patients in the Intensive Care Unit. Patients receiving the program had significantly higher bowel function recovery scores than those receiving standard nursing care ($p < 0.05$).

When analyzing these promising results, several limitations of this study should be taken into consideration. Firstly, it's a single-center study, which might limit the applicability of the findings to other settings. Secondly, due to the multifactorial nature of the subject, we suggest conducting future subgroup analyses based on factors such as the type of surgery and its location to reduce variability. Thirdly, the severity of abdominal distention was self-reported, making it somewhat subjective and dependent on timing, which could introduce potential bias. Furthermore, we did not assess the precise percentage of ERAS adherence at the research hospital, which might affect the robustness of the acupressure effect size. Lastly, we did not follow up with participants post-discharge to explore the long-term impacts of acupressure on gastrointestinal function. Future investigations should address these limitations, ideally utilizing a multicenter approach with a larger sample size. Additionally, conducting a longitudinal study with follow-ups is crucial for evaluating the long-term effects and potential complications.

Conclusions

This study provides evidence that leg and trunk movements combined with nurse-administered acupressure positively influence gastrointestinal function in the early post-operative CRC surgery period. Hospitals should consider incorporating nurse-administered acupressure into clinical practice to enhance early recovery for patients. This program may be an option for colorectal cancer patients after open abdominal surgery who are admitted to the ICU and show noticeable improvement during postoperative days 3–5.

Ethical statement

This study was conducted in accordance with the Declaration of Helsinki and was approved by the Institutional Human Research Ethics Committee of Thammasat University Hospital (protocol code TUH-EC-OO-0-004/68; approval date: 21 March 2025). Informed consent was obtained from all participants or their legal representatives.

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