

Effect of Early Mobilization on Intestinal Peristaltic Recovery As Prevention of Paralytic Ileus in Post Cesarean Section Patients

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ABSTRACT

Background: The majority of cesarean section deliveries use spinal anesthesia which can have an effect on the deterioration of the gastrointestinal system so that intestinal peristalsis becomes slow. Slow intestinal peristaltic function leads to difficulty defecation and prolongs the day of treatment, in some cases can increase the risk of paralytic ileus. To prevent the risk of complications, intervention can be carried out in postoperative cesarean section patients with early mobilization. This study aims to determine the effect of early mobilization on intestinal peristaltic recovery in post- cesarean section patients.

Subjects and Method: This was a quasy experiment conducted at Islamic Hospital in Demak, Central Java, from July to December 2024. A sample of 58 post-cesarean section mothers was selected using purposive sampling and divided into two groups. Assessment of intestinal peristaltic variables through auscultation examination with a stethoscope and early mobilization using observation sheet instruments. Intestinal peristaltic recovery between two groups were examined logistic regression.

Results: There was a difference in intestinal peristaltic recovery in post- cesarean section patients between the intervention group and the control group ($p=0.000$) with the mean value of intestinal peristalsis in the intervention group of 25.45 (SD=6.07) and in the control group of 11.38 (SD=7.69). Patients who were given early mobilization had a 4.48 times faster chance of recovery of intestinal peristalsis.

Conclusion: Early mobilization had a positive impact on the recovery of intestinal peristaltic ($p<0.05$). Health workers should not only provide education, but also assistance in the implementation of early mobilization, especially in the first 24 hours post- cesarean section.

Keywords: early mobilization, intestinal peristaltics, post cesarean section

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BACKGROUND

Childbirth is the process by which the fetus, followed by the amniotic fluid, exits through

the birth canal (Walyani & Purwoastuti, 2018). However, not all deliveries can proceed normally (Puspitasari, 2023).

Certain conditions may necessitate surgical intervention through a caesarean-section (C-section). The use of the SC method has become increasingly common as a final measure in response to complications such as prolonged or obstructed labor, uterine rupture, fetal distress, macrosomia, and antepartum hemorrhage (Nurul et al., 2023).

The prevalence of C-section from year to year continues to increase, according to WHO in 2022 the prevalence of section caesarea increased by 26% worldwide (WHO, 2022). The proportion of C-section birth delivery methods in Indonesia in 2023 is 17.6% (Ministry of Health of the Republic of Indonesia, 2023). Data in Central Java Province states that the proportion of section caesarean delivery methods is 13.18% (Central Java Health Office, 2023). Cesarean delivery mostly uses spinal anesthesia which can have an effect on the deterioration of the gastrointestinal system in the patient due to the anesthesia affecting the arrangement of peripheral nerves which are then passed to the unconscious (autonomic) nerves where the autonomic nerve activity is affected by the hypothalamus. Stimulation of the lateral and posterior parts of the hypothalamus will decrease the work of the smooth muscles of the digestive tract, so that intestinal peristalsis becomes slow (Wikantara, 2021).

Complications after a cesarean section are the same as other abdominal surgeries such as appendectomy, inguinal hernia surgery, and laparotomy. Among the possible complications are atelectasis, wound infections, paralytic ileus, urinary retention, urinary tract infections, endometriosis, bleeding, postpartum bleeding, adhesions, hematoma, thrombophlebitis, venous and pulmonary embolism, coagulopathy, as well as problems related to anesthesia and urinary tract infections. These problems are also among

the most common problems that occur after cesarean section. These complications are the main cause of maternal morbidity and mortality during the postpartum period (Hassan et al., 2019).

Post-surgical complications in particular ileus which occurs in many post-surgical patients of the abdomen and pelvic area (Leonard, 2018). Ileus is pain that is felt due to decreased movement in the intestines, so that food is unable to move normally. Postoperative bowel peristaltic movements take a long time to return to normal, pelvic or abdominal surgery where return is delayed for 24 to 48 hours, so the patient must refrain from eating and drinking until intestinal peristalsis is heard again (Anwer et al., 2022). In addition, the intestinal peristaltic of postoperative patients returns to normal if the patient can feel mild cramps in the abdomen, have flatus, and feel hungry (Elhady, 2024).

This is based on concerns about the possibility that early feeding could exacerbate postoperative problems including paralytic ileus. The exact etiology of ileus is unknown, but it is believed to be most common after laparotomy and large abdominal surgical procedures that enter the peritoneal cavity, rather than those involving the intestine. The reason why feeding needs to wait until the flatus or stool comes out in the postoperative period, to date there are two answers to justify this attitude. First, it is believed that one should wait while intestinal motility is restored to normal. Second, early feeding can increase the risk of anastigmatic leakage. Early enteral feeding has been shown to be safe and tolerable, even as early as 4–12 hours after surgery. The logic behind early enteral feeding is that food intake can stimulate reflexes that produce coordinated propulsive activity and give rise to the secretion of gastrointestinal hormones, which has an overall positive impact on

intestinal motility. Rather than waiting for the bowel sound to return after the patient has surgery, we can try to get the bowel to work again faster (Mohamed, 2018).

The impact of intestinal peristaltic disruption is the slow work of the intestines to move food because of this food can not be broken down perfectly, undigested food deposits will eventually harden in the intestines and can result in constipation (Potter and Perry, 2018). Slower intestinal motility function, in addition to causing difficulty defecating and lengthening the day of treatment, can also in some cases increase the risk of paralytic ileus (Weledji, 2020).

To prevent the risk of complications, intervention can be carried out in postoperative SC patients by conducting early mobilization. Early mobilization is one of the non-pharmacological measures that can function to reduce the rate of postoperative complications such as indigestion by improving intestinal motility. Early mobilization is an action that is carried out so that a person is able to get movement freely, which is done with certain actions and is intended to encourage independence and can affect postoperative healing (Arianti et al., 2020).

Early mobilization has been shown to improve circulation and re-stimulate gastrointestinal function by encouraging patients to perform movements such as leg exercises, turning from side to side, sitting up, and initiating ambulation (Sinarmata et al., 2024). Through these activities, the abdominal muscles begin to function normally again, blood circulation improves, and overall metabolism increases—thereby stimulating the return of intestinal peristalsis (Ayamah et al., 2023). A study by Ayamah et al. (2023) demonstrated a significant effect of early mobilization on intestinal peristalsis in postoperative patients ($p < 0.001$), with the mean peristaltic score increasing from 0.67 before mobilization to

8.73 afterward. These findings are consistent with the research of Arianti et al. (2020), which also reported a significant improvement in intestinal peristaltic recovery following early mobilization ($p < 0.001$).

The Islamic Hospital in Demak reports a high rate of cesarean section (C-section) procedures, averaging 60 cases per month—approximately 78% of all deliveries. The hospital is supported by an active obstetrics and gynecology unit, as well as committed health personnel who assist in the structured implementation of early mobilization interventions. In addition, the accessibility of clinical data and the variety of patient cases contribute to the validity and strength of quantitative analysis. The research institution's existing collaboration with the hospital further supports the feasibility and relevance of the study objectives.

Therefore, this study aims to analyze the effect of early mobilization on the recovery of intestinal peristalsis in post-C section patients, as a preventive effort against paralytic ileus.

SUBJECTS AND METHOD

1. Study Design

This was a quasi experiment with control group. This study was carried out at the Demak Islamic Hospital, in July-December 2024.

2. Population and Sample

The target population was post-cesarean section mothers. A number of 58 post C-section mothers was calculated using the Lamesshow formula. Sample was selected purposively based on several criterias: (1) did not have complications or post-saline emergencies, (2) patients with spinal anesthesia, and (3) did not have physical disorders. The study subjects were divided into 2 groups. The intervention group was given early mobilization assistance, while

the control group was given health education related to early mobilization.

3. Study Variables

The dependent variable was intestinal peristalsis. The independent variable was early mobilization

4. Operational Definition of Variables

Early mobilization is defined as movements made by the mother after surgery according to the stages, namely at 6 hours, 10 hours, 12-24 hours of post partum, while intestinal peristaltics is defined as the sound of bowel movements which is assessed by auscultation examination as a marker of postoperative digestive system recovery calculated at a frequency per minute.

5. Study Instrument

Data collection was carried out by observation sheets and medical records. Early mobilization was carried out by post-C section mothers with the assistance of health workers at the 6th, 10th and 12th-24th hours post-surgery which were then written in the observation sheet. Meanwhile, intestinal peristaltics was assessed by listening to the sound of bowel movements through a physical examination of auscultation on the abdomen of post C section patients using a stethoscope and recorded in an observation sheet.

6. Data Analysis

Sample characteristics were described in frequency and percent. Mean difference between groups were examined using independent t test. Effect of early mobilization on intestinal peristaltics was measured using a simple logistic regression.

7. Research Ethics

Research ethical issues including informed consent, anonymity, and confidentiality, were addressed carefully during the study process. The research ethical clearance approval letter was obtained from the Research Ethics Committee at Universitas Muhammadiyah Kudus, Kudus, Indonesia, No. 342/Z-7/KEPK/UMKU/VI/2025, on June 21, 2025.

RESULTS

1. Sample Characteristics

Most participants were aged 20–35 years old (67.2%), followed by those over 35 (20.7%), and a small proportion under 20 (12.1%). In terms of education, over half had completed senior high school (53.4%), and 37.9% held a bachelor's degree, while very few had only elementary or junior high education. Regarding childbirth history, a greater proportion had undergone cesarean section (56.8%) compared to vaginal birth (43.2%).

Table 1. Frequency Distribution of Respondent Characteristics

Characteristic	Category	Frequency	Percentage
Age	<20 years old	7	12.1%
	20-35 years old	39	67.2%
	>35 years old	12	20.7%
Education	Elementary school	3	5.1%
	Junior high school	2	3.4%
	Senior high school	31	53.4%
	Bachelor	22	37.9%
Previous Childbirth History	Cesarean section	33	56.8%
	Vaginal birth delivery	25	43.2%

2. Bivariate Analysis

The mean intestinal peristaltic activity in the intervention group 25.45 (SD= 6.07)

was higher than the control group (Mean= 11.38; SD= 7.69), with p-value <0.001.

Table 2. Mean differences between groups on intestinal peristaltics recovery in post caesarean section patients

Intestinal peristaltics	Mean	SD	p
Intervention groups	25.45	6.07	<0.001
control group	11.38	7.69	

In order to explore the predictive model, a logistic regression test was considered to analyze the effect of early mobilization on the chance of recovery of normal intestinal peristaltic in post sectio caesarean patients. From the results of the test, the results were obtained that early mobilization had a sig-

nificant influence ($p = 0.001$; $OR = 4.48$; $95\% CI = 1.82-11.13$), on the recovery of intestinal peristalsis. Patients who were given early mobilization had a 4.48 times faster chance of experiencing normal recovery than those who were not given.

Table 3. Simple logistic regression of the effect of early mobilization on the intestinal peristaltic recovery after caesarean section

Variable	b	OR	95% CI		p
			Lower limit	Upper Limit	
Early mobilization	1.5	4.48	1.82	11.13	0.001
Konstanta	-1.2	0.30	0.10	0.89	0.029

N observation = 58
Log Likelihood = 52.70

DISCUSSION

The results showed that early mobilization had an effect on the recovery of intestinal peristaltics in post sectio caesarea patients. In line with research by Paul et al. (2019) where the experimental group showed a gradual improvement in postoperative recovery from day I which was $23.77 \pm 2,763$, day II which was $35.37 \pm 2,498$ and day III which was $45.67 \pm 2,564$, while in the control group there was also an improvement in postoperative recovery on day I which was $18.17 \pm 1,147$, day II which was $22.53 \pm 2,776$ and day III which was $32.97 \pm 2,671$. When compared to the control group, postoperative recovery in the experimental group was much faster ($p=0.001$).

Early mobilization is an action that a person takes freely. It is carried out with certain movements and has the purpose of encouraging the independence of the mother post sectio caesarea (Santika et al, 2020). Early mobilization can lead to physical improvement in the mother, affect the car-

diovascular system by increasing cardiac output, strengthen the heart muscle, ensure smooth circulation, improve the body's metabolic regulation, restore physical work function and keep vital signs within normal limits, reduce the risk of infection not occurring, prevent stiffness in the digestive system, improve gastric mobility and increase abdominal muscle tolerance (Herman et al, 2020). (Alphones and Miranda, 2023) Previous studies reported that post SC women with early mobilization had faster bowel function return including bowel sound and flatulence time compared to the control group, these interventions may stimulate reflexes leading to coordinated booster activity and expand the release of gastrointestinal hormones. Early ambulation has a clear effect of improving urination after catheter removal and the first flatus exit. With regard to the average running time, in this study post-caesarean section women in the intervention group walked six hours post-caesarean section while women in

the control group walked thirteen to fourteen hours after cesarean section. The mean postoperative pain score was significantly reduced post-intervention (8.48 ± 1.05 , 7.52 ± 1.54) at ($P=0.001$). In addition, there were significant differences between the two groups regarding the duration of catheterization after cesarean section (15.94 ± 3.825 , 13.68 ± 4.088), self-urination after catheter removal (2.16 ± 0.997 , 1.32 ± 0.653), initiation of breastfeeding and carrying the baby (11.50 ± 3.57 , 6.48 ± 0.735), oral hydration (8.24 ± 2.825 , 6.24 ± 0.657) and the first flatus expelled after cesarean section (12.28 ± 5.338 , 6.60 ± 7.910) in favor of the intervention group ($P=0.001$) (El-Sayed et al., 2020).

Mobilization is important to be carried out in the postoperative period to prevent various complications, especially to improve blood circulation and stimulate intestinal peristaltics so that gas or air trapped in the intestine can escape (Erlin et al, 2016). Early mobilization is important for quick recovery and is one of the most effective methods for the initiation of early bowel movements. Early mobilization is considered one of the cornerstones of the Enhanced Recovery After Surgery (ERAS) protocol. According to the ERAS protocol, patients must perform activities from the bed for at least two hours on the day of surgery and at least six hours per day until discharge from the hospital. Practicing early mobilization and proper nutrition during the perioperative period can slow the catabolic processes that increase after surgery, reduce the risk of surgery-related stress and ileus responses, and speed recovery. Postoperative constipation, abdominal distension, and abdominal pain were also reduced in early mobilized surgical patients, and postoperative nausea and vomiting rates also decreased. An early and planned mobilization program shortens the time for the

patient's first stool to come out after abdominal surgery. This application accelerates the process of returning the gastrointestinal tract to a normal state. (Öztaş, et al., 2024).

Research conducted by Ayamah et al (2023), showed that the results of intestinal peristaltic measurements before early mobilization showed that out of 30 respondents, 30 respondents (100%) were hypoactive intestinal peristaltic ($<5x/\text{minute}$). Then after early mobilization, it showed that from 30 respondents, most of the number of normal intestinal peristalsis ($5-35x/\text{minute}$) was 28 respondents (93.3%). Research by Budiarti and Marlina (2019) proves that the healing process with mobilization takes an average of 3.75 days (4 days), while the wound healing process with no mobilization takes an average of 6.75 days (7 days). Research by Simangunsong, Rottie and Hutaeruk (2018) that if mobilization is carried out, it will help the surgical wound healing process quickly, as evidenced by the results of this study with many who mobilize postoperative Sectio Caesaria patients tend to be faster in the wound healing process. Mobilization is a person's ability to move freely, easily, regularly, and has the goal of meeting the needs of a healthy life. Mobilization is needed to increase self independence, improve health, slow down disease processes (especially degenerative diseases), and self-actualization (Eriyani et al., 2018). The benefits of mobilization include: Maintaining body functions, improving blood circulation so as to accelerate wound healing, helping breathing to be better, maintaining muscle tone, facilitating the elimination of alvi and urine, restoring certain activities, so that patients can return to normal and/or can meet daily movement needs and provide opportunities for nurses and patients to interact or communicate and shorten the hospitalization time ($p=0.007$) (Ali et al., 2022).

Early mobilization helps to restimulate intestinal activity that may be disrupted by the effects of anesthesia and surgical measures, thus speeding up recovery and reducing the risk of constipation or paralytic ileus. Sufficient education can help mothers to mobilize early well after childbirth, especially after cesarean delivery so as to help the recovery of intestinal peristaltic in post-sectio caesarea patients (Mustikarani et al., 2019). Therefore, it is necessary to continue to improve and always provide guidance to both post-SC mothers and their families to understand and guide mobilization, because mobilization affects the intestinal peristaltics of SC patients.

Astuti and Hartinah (2021), stated that there is a relationship between early mobilization and post-episiotomy wound healing rate in postpartum mothers at the Srikandi clinic (0.001). In accordance with research by Karyati, Hanafi and Astuti (2018), it shows that early mobilization is effective in reducing the scale of pain after sectio cesarean section surgery at Kudus Hospital (0.000). Early mobilization is important because it has been made a standard in procedures Enhanced Recovery After Surgery (ERAS) (Dolgun et al., 2017). Early mobilization is able to smooth the circulatory system and help the body system return to normal quickly. Guyton explained that early mobilization movements can contract smooth muscles due to the calcium ion process that enters the muscles. These calcium ions will bind to calmodulin ions (as protein regulators). The combination of the two ions will activate myosin kinase which will phosphorylate the head of myosin and then bind to the actin filament, which then actively acts on the entire cycle, including intestinal contractions. Intestinal contractions will further stimulate the peristaltic of the intestinal smooth muscles, flatus and minimize distension in the body system.

(Kavya, Kunamneni and Uma, 2025). Based on the results of the study, it is known that early mobilization has benefits that can affect the recovery of intestinal peristaltics in patients after lipoplasty surgery. Early mobilization can help post-surgery patients to recover quickly and return to activities gradually. Early mobilization performed with bedtime exercises such as left tilt right and moving the extremities makes air bubbles move from the lower right part upwards towards the hepatic flex, leading to the left spleen flex and down to the lower left towards the rectum which can facilitate the discharge of the flatus and stimulate intestinal peristaltics (Tumiur.,2021).

Early mobilization will improve circulation and re-stimulate gastrointestinal function by training the patient to move the legs, tilt right and tilt left, as well as sit and learn to walk (Sinarmata.,2024).

Mobilization leads to improved circulation, and re-stimulates gastrointestinal function with exercises to move the legs, tilt right and tilt left, sit exercises and learn to walk. With the mobilization of the abdominal muscles will return to normal, thus the patient feels healthy and helps to gain strength, speeding up recovery. The function of intestinal motility and bladder becomes better, this is because mobilization will stimulate intestinal peristalsis to return to normal. A study by Terzioglu 2015, comparing the impact of chewing gum, early oral hydration and early mobilization on the recovery of intestinal motility after cesarean section found that all of them improved bowel movements, and could be applied during routine postoperative care to shorten hospitalizations and avoid postoperative ileus ($p=0.01$) (Hassan et al., 2019). In line with research by Ayamah et al (2023), showing that the mean value of intestinal peristaltic before and after early mobilization action showed that of 30 respondents,

the mean value of intestinal peristaltic before early mobilization was 0.67 with a standard deviation of 0.922 and the mean value of intestinal peristaltic after early mobilization was 8.73 with a standard deviation of 2.420, then, From the average results of the increase in the number of intestinal peristalsis before and after the intervention, a score of 8.06 was obtained.

AUTHOR CONTRIBUTION

The first author plays a role in compiling research ideas, compiling proposals, collecting data, and writing article manuscripts. The second author is responsible for the implementation of interventions in the field and the coordination of data collection in the obstetrics inpatient unit of Demak Islamic Hospital. The third author assists in data analysis and interpretation of results. The fourth and fifth authors contribute to the literature review, the writing of the discussion section, and the final editing of the manuscript. All authors read and approve the final manuscript for publication.

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CONFLICT OF INTEREST

The authors declare that the study was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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