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The Effectiveness Of Early Mobilization On Intestinal Peristalsis In Post-Caesarean Section Patients Undergoing Spinal Anesthesia At Cilacap Regional Hospital

Dhea Yulianita[1)], Endiyono[2)]
[1,2)] D4 Nursing Anesthesiology Study Program, Muhammadiyah University of Purwokerto

*Corresponding Author
Email : dheayulianita755@gmail.com

Abstract

Caesarean section (CS) with spinal anesthesia often causes paralytic ileus due to intestinal peristalsis inhibition, which slows patient recovery. This study aims to examine the effectiveness of early mobilization on intestinal peristalsis frequency in post-CS patients at Cilacap Regional General Hospital. Using a quasi-experimental pretest-posttest design with a control group, the population was post-CS patients with spinal anesthesia in the Mawar Room (December 2025), a sample of 44 respondents via purposive sampling (Slovin formula, e=5%). Instruments included observation sheets, stethoscopes, and informed consent; data analysis used Shapiro-Wilk, Wilcoxon Signed Rank, and Mann-Whitney. The results showed a significant increase: 4 hours post-CS from 3.66 to 4.59 times/minute (p<0.001, Z=-4.667); 6 hours from 7.09 to 8.48 times/minute (p<0.001, Z=-5.756), with superiority at 6 hours (p=0.000). It was concluded that early mobilization was effective in accelerating the recovery of intestinal peristalsis, especially at 6 hours post-operatively.

Keywords: Spinal Anesthesia, Early Mobilization, Paralytic Ileus, Intestinal Peristalsis, Caesarean Section.

INTRODUCTION

Caesarean section (CS) is a surgical procedure to deliver a fetus through an incision in the abdominal wall and uterus, with spinal anesthesia as the primary choice due to its simple administration technique, rapid onset, high effectiveness, and minimal impact on the neonate (Suhananto & Tarjuman, 2024; Ningrum et al., 2020). Globally, the WHO recorded CS rates ranging from 10-15% of total births, while in developed countries such as the UK and Australia it increased to 24-31% in the period 2004-2009 (A. Herman et al., 2019; Betran et al., 2021, https://doi.org/10.1016/S0140-6736(21)00997-6). In Indonesia, 2021 SKDI and Riskesdas data show a prevalence of 17-17.6%, with a similar trend in Central Java (15.33% in 2022), reflecting an increase in this phenomenon in health facilities (Wulandari et al., 2020; Latifah et al., 2022).

Spinal anesthesia affects the autonomic nervous system via the hypothalamus, causing inhibition of intestinal peristalsis, paralytic ileus, bloating, constipation, and delayed recovery of gastrointestinal function for up to 24-48 hours postoperatively (Ningrum et al., 2020; Kurnia & Yohanes, 2022). CS patients with spinal anesthesia often experience a 3-5 day hospital stay, with delayed recovery due to nutritional, mobilization, and hygiene factors (Wulandari et al., 2020; Ratmiwasi et al., 2022). Early mobilization, starting 6 hours postoperatively with gradual movement (arms, standing, walking at 48 hours), stimulates peristalsis, prevents gas retention, and complications such as ileus (Dinyanti, 2021; Nyoman, 2024).

Nyoman's (2024) study reported a peristaltic frequency of 6.75-6.78 beats/minute after mobilization 6-12 hours, while Noor (2023) found a significant increase (11,200 vs. 1,533; p=0.001) in the laparotomy intervention group (Noor, 2023; Herman, 2021). Herman (2021) confirmed a difference of 4,500 vs. 2,917 beats/minute after mobilization 4-10 hours, although patient concerns about the suture wound remained (Suciawati, 2023; Pratama et al., 2023). At Cilacap Regional Hospital, a preliminary study in September (50 CS cases) showed that 60% of patients (3/5) had only 3 times/minute of peristalsis, with limited midwife education, indicating a gap in early mobilization practices (Kurnia & Yohanes, 2022).

This study aims to examine the effect of early mobilization on intestinal peristalsis in CS patients with spinal anesthesia at Cilacap Regional General Hospital, specifically measuring the average pre-post intervention and analyzing its effects. Its urgency lies in the high incidence of post-CS ileus in Indonesia (17%+), which delays discharge and increases care costs. While its novelty lies in the local approach at Cilacap Regional General Hospital with the latest medical record data, complementing national studies limited to 4-12 hour timing (Nyoman, 2024; Betran et al., 2021). The results are expected to enrich anesthesia nursing practice, institutional references, and education (Suhananto & Tarjuman, 2024; Latifah et al., 2022).

RESEARCH METHODS

Types and Methods of Research

This quantitative study used a quasi-experimental pretest-posttest with a control group design to examine the effect of early mobilization on intestinal peristalsis frequency in post-cesarean section (CS) patients with spinal anesthesia at Cilacap Regional General Hospital (RSUD Cilacap) (Sugiyono, 2022; Karimuddin et al., 2022). This approach allows for measurement of changes in the dependent variable (intestinal peristalsis) before (O1) and after (O2) the intervention (X1: early mobilization), as defined by quantitative research that tests hypotheses through numerical data and statistical analysis (Creswell & Creswell, 2023; Emzir, 2021). The independent variable was early mobilization as a predictor of gastrointestinal recovery, while the dependent variable included intestinal peristalsis frequency measured through abdominal auscultation for one minute using a stethoscope (Machali, 2021; Sudaryono, 2022).

Data Analysis Instruments and Techniques

The research instruments included an observation sheet to record the frequency of intestinal peristalsis pre- and post-intervention, a request form and informed consent for ethical participation, and a stethoscope as the primary measuring tool, ensuring that primary data from auscultation and secondary data from medical records were accurate and structured (Permatasari et al., 2025; Hakimah, 2023). Data management was carried out through editing, coding (e.g., respondent codes), sorting, entry, and cleaning for validity, followed by univariate analysis (frequency distribution and mean intestinal peristalsis) and bivariate analysis (Shapiro-Wilk test for normality, followed by Wilcoxon Signed Rank Test because some data were non-normal, $p<0.05$ at 4 hours) (Julkarnain, 2020; Sugiyono, 2022). The Mann-Whitney test complemented the intergroup comparisons, ensuring robust interpretation of the intervention effect according to non-parametric statistical standards (Creswell & Creswell, 2023; Emzir, 2021).

Population and Sample

The study population was all post-CS patients with spinal anesthesia in the Mawar Room of Cilacap Regional Hospital in December 2025, with a sample of 44 respondents determined using the Slovin formula ($n=N/(1+Ne^2)$, $e=5\%$) and a non-probability purposive sampling technique based on inclusion criteria (post-CS spinal anesthesia, Bromage score <2, stable hemodynamics, willingness, no depression) and exclusion criteria (CITO, comorbidities, emergency) (Sugiyono, 2022; Machali, 2021). This purposive approach targeted representative subjects to test specific interventions, consistent with the definition of a sample as part of a population of equal quality (Sudaryono, 2022). The operational definition of early mobilization included gradual movements (inhale 5x at 4 hours; tilt right-left 3x at 6 hours), while intestinal peristalsis was measured at intervals (frequency/minute) for data scalability (Emzir, 2021).

Research Procedures

The procedure begins with the preparation stage with initial observation, proposal preparation, permission from the Faculty of Health Sciences, Muhammadiyah University of Purwokerto (No. C9.II/968-S.Ph/FIKES/UMP/X/2025) and Cilacap Regional General Hospital, and ethics committee; followed by implementation at 4 hours post-SC (pre-auscultation, 5x deep breathing intervention, post-auscultation) and 6 hours (pre-auscultation, 3x right-left tilt for 3 minutes, post-auscultation), with midwife coordination and voluntary informed consent (Notoatmodjo, 2021; Adiputra et al., 2021). The completion stage includes data documentation, analysis, and reporting, upholding ethics such as privacy (code anonymity), non-maleficence (pre-intervention vital check), beneficence (recovery education), and justice (fair treatment) (Sugiyono, 2022; Creswell & Creswell, 2023). This flow ensures respondent safety and the validity of the results, in line with similar mobilization intervention studies (Karimuddin et al., 2022; Sudaryono, 2022).

RESULTS AND DISCUSSION

Respondent characteristics

Table 1. Frequency of Respondent Characteristics (n=44)

Characteristics	F	%
Age		
17 – 25 = Late Teenagers	11	**25%**
26 – 35 = Early Adulthood	22	**50%**
36 – 45 = Late Adulthood	11	**25%**
Level of education		
Elementary School	4	**9.1%**
JUNIOR HIGH SCHOOL	13	**29.5%**
SENIOR HIGH SCHOOL	21	**47.7%**
College	6	**13.6%**
Work		
Work	43	**97.7%**
Doesn't work	1	**2.3%**

Based on table 1, out of a total of 44 respondents aged 17-25 years or late adolescence, there were 11 (25%), 22 (50%) aged 26-35, and 11 (25%) aged 36-45. In terms of education level, the majority had education up to high school level, 21 people (47.7%), and 43 (97.7%) were employed.

Frequency of Intestinal Peristalsis in Post-Caesarean Section Patients with Spinal Anesthesia Before and After Early Mobilization

Table 1. Frequency of intestinal peristalsis after caesarean section with spinal anesthesia before and after early mobilization intervention

Variables	Pre (Mean)	Post (Mean)
4 hours post SC	3.66	4.59
6 hours post SC	7.09	8.48

Based on Table 2, it can be seen that the frequency of intestinal peristalsis in patients 4 hours post-cesarean section is with an average of 3.66, while 4 hours after early mobilization is 5.59. The frequency of intestinal peristalsis at 6 hours post-cesarean section before the intervention is an average of 7.09 and after the early mobilization intervention reaches an average of 8.48.

Table 3. Effect of early mobilization intervention

Early Mobilization	N	Z Value	p-velue
Before and after intervention was given at 4 hours	44	-4,667	<0.000
Before and after intervention was given at 6 hours	44	-5,756	<0.000

The Wilcoxon test results showed p = 0.000 or a 2-tailed probability value (significance) of p < 0.05, thus H0 was rejected. This indicates that early mobilization has an effect on intestinal peristalsis in post-cesarean section patients with spinal anesthesia.

Table 4. Mann-Whitney Test Comparing 4 hours post sc and 6 hours post sc

Group	Mean Rank	*P-Value*
4 hours post SC	24.83	0,000
6 hours post SC	64.17	

The Mann-Whitney test results obtained with a p-value <0.5, namely 0.000, indicate that there is an effect of early mobilization on intestinal peristalsis. The average value in the 4-hour group is 28.83, while in the 6-hour group, the average is 64.17, which means that the 6-hour intervention is more significant than the 4-hour one because the average value of 6 hours is higher than that of 4 hours with an average difference of 39.34.

Discussion

1. Respondent Characteristics

Based on the research results, respondents aged 17-25 years or so-called late adolescence (25%), and the majority of respondents who experienced increased frequency of intestinal peristalsis were aged 26-35 years or early adulthood (50%), while those aged 26-45 years were in the late adulthood group (25%). Viewed from the aspect of age affects the tissue structure and function of the body so that it is related to intestinal peristalsis movement. As age increases, muscle strength in patients usually decreases, causing a decrease in the ability of intestinal peristalsis movement. This study is in line with (Kurnia & Yohanes, 2022) that older age will experience increased intestinal peristalsis longer than younger age due to decreased organ function. In the study (Ghina Mariyani et al., 2024), on the other hand, at a younger age, increased frequency of intestinal peristalsis movement often occurs, because the body's physiological functions are better able to adapt during the process of intestinal peristalsis recovery after surgery.

Respondents' characteristics with their educational level or last education help patients in receiving information or advice given by others until their awareness to do early mobilization, the higher the education level, the more they will understand what should be done after being given education about early mobilization (Setyowati, 2023). Basically, when the research was conducted in the rose room, the level of education had no relationship or influence on early mobilization, patients followed the directions of the officers or researchers to do early mobilization.

Based on occupation, there is a relationship between work and independence in post-cesarean section patients with spinal anesthesia. Housewives tend to fulfill their roles, including caring for children and managing the home, thus having stronger motivation and independence.

2. Average Frequency of Intestinal Peristalsis Before Early Mobilization

Based on Table 4.2, the average frequency of intestinal peristalsis at 3.66 hours postoperatively and 7.09 hours postoperatively indicates that the patient experienced decreased intestinal peristaltic function. One factor contributing to decreased intestinal peristaltic function is age, as reported by (Yuliana, 2024), indicating that increasing age can slow esophageal emptying. Furthermore,

anesthetics administered during surgery temporarily halt intestinal peristalsis. Surgery involving direct intestinal manipulation will halt intestinal peristalsis.

Caesarean section surgery can cause disruption to abdominal organs and reduce bowel movements, resulting in abdominal swelling. The recovery process and frequency of bowel movements vary between patients, types of surgery, and hospitals. The anesthesia used during a Caesarean section prevents full digestive function from returning. The effects of anesthesia can inhibit parasympathetic nerve signals to the intestinal muscles. This causes bowel movements to slow or even stop, a condition commonly known as paralytic ileus (Pande Nyoman, 2024). Early mobilization is an approach to support the recovery of bowel movements after surgery.

Therefore, it can be concluded that this is due to the effect of spinal anesthesia on the parasympathetic nervous system, which plays a role in regulating bowel activity. As a result, the waves of bowel movements that normally propel food through the digestive system slow or even stop. The effects of spinal anesthesia during a cesarean section will diminish with time and the patient's activity levels.

3. Average Frequency of Intestinal Peristalsis After Early Mobilization

After early mobilization intervention at 4 and 6 hours post-cesarean section, the average result was an increase in intestinal peristalsis frequency of 4.59 at 4 hours and 8.48 at 6 hours. This increase in intestinal peristalsis function was due to patients carrying out early mobilization in accordance with Standard Operating Procedures and following instructions precisely. Early mobilization can increase blood flow, promote deep breathing, and stimulate digestive function.

Early mobilization to restore intestinal peristalsis after surgery can accelerate recovery. This occurs because abdominal manipulation causes decreased intestinal peristalsis and abdominal distension, or swelling. The effects of anesthesia will gradually subside over time, and physical activity such as early mobilization, both passive and active, contributes to this recovery (Sitepu et al., 2021).

Mobilization requires the role of health workers in providing health education or knowledge on how to mobilize. In this case, health workers must provide a concise, clear, and detailed explanation to the mother about the steps to take after a cesarean section. The disadvantage of not mobilizing early is that it takes a long time for intestinal peristalsis to return to normal, resulting in the mother having to endure hunger for longer.

The results of this study are in line with a study conducted by Ningrum et al., 2020, which showed that the average time for the emergence of intestinal peristalsis in the first stage was 4-6 hours after surgery, namely 355.97. In the group given the intervention, normal intestinal peristalsis occurred 4-8 hours after surgery, namely 5x/minute, so there was a very significant effect of early mobilization on intestinal peristalsis with a value of ($p = 0.001$).

4. Analysis of the Effect of Early Mobilization Intervention on Intestinal Peristalsis in Post-Caesarean Section Patients Under Spinal Anesthesia

The Wilcoxon Signed Rank Test showed a significance value (p-value) of 0.000 (p-<0.05). The results of this statistical test indicate that early mobilization intervention has an effect on intestinal peristalsis after a cesarean section with spinal anesthesia at Cilacap Regional Hospital.

Based on the results of the Mann-Withney test (p value 0.000) or <0.05, that early mobilization between 4 hours post-cesarean section and 6 hours has a greater effect of 6 hours, seen from the results of the Mann-Withney test, the average of 4 hours is 24.83 and 6 hours with an average of 64.17 there is a difference of 39.34.

Respondents were given early mobilization intervention in accordance with the SOP (Standard Operating Procedure) at stage 1 or 4 hours post-surgery, inhaling through the nose and exhaling through the mouth 5 times. At stage 2 or 6 hours post-surgery, cesarean section was performed on the right side 3 times and left side 3 times to prevent thrombosis and thromboembolism and to stimulate the abdominal muscles to accelerate the recovery of intestinal peristalsis.

The results of this study indicate that some respondents' intestinal peristalsis did not improve during early mobilization. This was due to the effects of spinal anesthesia not yet fully wearing off and the manipulation of abdominal organs, which prevented intestinal peristalsis from returning to normal. The success of early mobilization was influenced by respondents following the officer's instructions during early mobilization in accordance with standard operating procedures (SOPs).

Early postoperative mobilization in post-cesarean section patients aims to accelerate the recovery of bowel function and physiology. At 4 hours postoperatively, the patient's physiological condition is generally still in the recovery phase from anesthesia. The effects of spinal anesthesia can affect hemodynamics, lower extremity muscle strength, and pain. This condition causes the body to respond less optimally to early mobilization, resulting in limited activity and less effective stimulation of the musculoskeletal system, blood circulation, and gastrointestinal tract (HG Herman et al., 2020).

Early mobilization at 6 hours postoperatively, the recovery process of the effects of anesthesia and hemodynamics has stabilized. In this phase, neuromuscular function begins to return to normal, pain levels begin to be controlled, and the patient's condition is more stable. This condition allows the patient to mobilize early with more adequate movement, so that early mobilization can increase peripheral blood flow, accelerate the return of intestinal peristalsis, and accelerate the recovery of overall organ function (Sulistiawati et al., 2024). Therefore, it can be concluded that early mobilization at 6 hours postoperatively provides a more optimal physiological response than mobilization at 4 hours postoperatively. This is due to the patient's better physiological readiness, allowing for maximum mobilization.

This is in line with the theory put forward by Potter (2015), which states that patients undergoing spinal anesthesia tend to experience decreased colonic motility due to inhibited parasympathetic stimulation of the colonic muscles. Furthermore, abdominal surgery can also affect intestinal peristalsis. According to Wikantara (2021), early mobilization plays a role in improving blood circulation and re-stimulating gastrointestinal function through exercise or lateral and lateral positioning. This mobilization helps restore abdominal muscle function, accelerates recovery, and improves bowel and bladder motility.

Early mobilization is an essential component closely related to a patient's physiological function. Early mobilization is an initiative to maintain independence as quickly as possible by guiding patients in maintaining their physiological function. The concept of early mobilization stems from early ambulation, a gradual recovery process to prevent complications (A. Herman et al., 2021).

The results of this study are in line with (Kurnia & Yohanes, 2022) which showed that early mobilization has a significant impact on intestinal peristalsis in post-laparotomy patients, where the results of the study $p = 0.000$ indicating a significant effect on intestinal peristalsis before and after the implementation of early mobilization in post-laparotomy patients. Then according to research (Livana et al., 2020), it was found that before the early mobilization intervention, intestinal peristalsis was still below normal and after the early mobilization intervention, intestinal peristalsis reached a normal state (5-30x/minute). This shows that early mobilization given after surgery can improve intestinal peristalsis, thereby accelerating patient recovery from the effects of anesthesia.

In a study (Katuuk & Bidjuni, 2021), it was assumed that intestinal peristalsis in the control group, which was only given education about early mobilization, showed average pre- and post-test results that were still below normal limits. This condition is suspected to be caused by respondents still being under anesthesia and experiencing post-operative paralytic ileus. Meanwhile, in the intervention group, the average intestinal peristalsis in the pre-test phase was also below normal limits. However, after early mobilization, the average post-test results showed improvement, reaching normal values.

Early mobilization in post-cesarean section patients is a non-pharmacological therapy that can be applied to improve intestinal peristalsis and thus accelerate the expulsion of flatus. Movement

activity will stimulate intestinal peristalsis to return to normal conditions and help the body's organs return to optimal function. Improved intestinal peristalsis can be influenced by early mobilization in post-cesarean section patients at Kendari City Hospital. This is because early mobilization can stimulate the sympathetic nerves of the intestinal muscles, resulting in waves of intestinal motility with increased sympathetic nerve activity, thus increasing acetylcholine release and conduction of contraction waves along the intestinal wall, which can improve intestinal motility (Herman et al., 2022).

This study is consistent with the findings of (Agustini & Pramono, 2021), which showed an improvement in intestinal peristalsis before early mobilization intervention, from a hypoactive condition (<5x/minute) to a normal 5-30x/minute. The mobilization actions implemented included right and left tilt movements. These findings are also in line with research (Sari, 2023), which stated that early mobilization is one of the interventions given to postoperative patients to improve intestinal peristalsis. The results of the study showed a comparison of the increase in intestinal peristalsis in the control group and the intervention group. It can be concluded that intestinal peristalsis in patients who received early mobilization experienced a faster increase compared to patients who did not receive early mobilization, with identical time intervals and measurement methods between the two groups. This study is in line with (Wahyuni et al., 2022) that there is an effect of early ambulation on intestinal peristalsis in postoperative patients showing significant results ($p=0.000$) with $p<0.05$.

Based on a study by (Chen et al., 2021) that early postoperative mobilization can accelerate physiological recovery, however in patients after cardiac surgery showed no significant difference in the duration of hospitalization so the effectiveness of early mobilization needs to be reviewed based on the type of surgery and the patient's clinical condition. In addition, according to (Willner et al., 2023) evidence from gastrointestinal studies also shows that the implementation of early mobilization does not always reduce morbidity or length of hospitalization significantly despite an increase in peristaltic function.

CONCLUSION

This study concluded that early mobilization significantly increased the frequency of intestinal peristalsis in post-cesarean section patients with spinal anesthesia at Cilacap Regional General Hospital, with an average increase from 3.66 to 4.59 times/minute at 4 hours post-operatively ($p<0.001$, Wilcoxon $Z=-4.667$) and from 7.09 to 8.48 times/minute at 6 hours ($p<0.001$, $Z=-5.756$), as well as a superior inter-time difference at 6 hours (Mann-Whitney $p=0.000$, mean rank 64.17 vs 24.83). The majority of respondents were aged 26-35 years (50%), had a high school education (47.7%), and were employed (97.7%), which supported intervention compliance. This finding is in line with the studies of Nyoman (2024) and Kurnia & Yohanes (2022), confirming the role of mobilization in overcoming paralytic ileus after spinal anesthesia.

However, limitations include the small sample size (n=44), the quasi-experimental design without full randomization, and subjective auscultation measurements that are prone to interobserver variability, thus limiting generalizability to the context of Cilacap Regional General Hospital. Suggestions for future research include a multi-center RCT with a larger sample size, objective measurements (e.g., sonography), and confounding variables such as nutrition. Practically, these results recommend the integration of early mobilization (breathing within 4 hours; tilt within 6 hours) into the anesthesia nursing SOP to expedite discharge, reduce inpatient costs, and improve the quality of patient recovery in similar facilities.

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