Effect of early ambulation to peristaltic activity of abdominal post-operative patients in Medan city hospital, Indonesia

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Abstract. Postoperative periods of high-risk abdominal surgery cause problems with intestinal peristaltic activity. Manipulation of the abdominal organs during surgical procedures may cause a normal peristaltic loss for about 24-48 hours, depending on the type and duration of surgery. One of the abdominal postoperative recovery processes can be pursued by the planning and implementation of early ambulation ie the immediate stages of activity in postoperative patients starting from waking up and sitting on the bedside until the patient gets out of the bed, stands up and starts walking with assistance in accordance with the patient’s condition. This study aims to identify the effect of early ambulation on the intestinal peristaltic activity of abdominal postoperative patients in Haji Medan Hospital. This research is a quantitative research of quasi-experimental (pre and post-test with the control group). The sample of this research is abdominal postoperative patients of counted 74 respondents that are 37 people in each group taken using consecutive sampling technique. The data collected using an observation sheet of intestinal peristaltic activity with a stethoscope and a watch. Bivariate analysis using statistical analysis with Wilcoxon Test to analyze the pain intensity of control and intervention group before and after the early ambulatory intervention. Mann Whitney Test used to analyze intestinal peristaltic activity between control and intervention group after the early ambulatory intervention. The results of bivariate analysis showed that there was a difference of intestinal peristaltic activity in the control group and the intervention group before and after the early ambulatory intervention (p = 0.000, p <0.05), there was a difference of intestinal peristaltic activity between the unpaired groups after the early ambulatory intervention (p = 0.000; p <0.05). The results of this study can be an input for nursing services and studies to apply the method of early ambulation in accordance with the stages and conditions of abdominal postoperative patients on postoperative peristaltic activity.

1. Introduction
Abdominal surgery is an action involving the abdominal cavity that can be done with open surgery. Seventy percents of surgery at the hospital is affected by abdominal surgery [1]. Abdominal surgery involves appendectomy, cholecystectomy, colectomy, colon resection, colostomy, gastrectomy, resection of gastric, gastroenterostomy, hysterectomy abdominal, ileostomy, laparotomy, cystectomy ovarian, salpingotomy, small bowel resection, splenectomy, vagotomy, and hernia repair [2].

One of the problems that often arise in post abdominal surgery includes: abdominal organ manipulation during surgical procedures can cause a normal peristaltic loss for 24 to 48 hours, depending on the type and duration of surgery [3].
Given the problem of intestinal peristaltic activity that can occur in the post-surgical abdomen, post-operative health restoration is of paramount importance to the patient. Therefore, hospitals as health care institutions need to provide maximum services aimed at accelerating healing and recovery of health and prevent complications and disabilities by making curative and rehabilitative efforts [4]. One of the most effective recovery procedures that can be done is postoperative exercises; early ambulation is done immediately to the patient after surgery starting from the exercise on bed that is leg exercises, left and right sloping, wake up and sit beside the bed until the patient gets out of bed, stand up and start learning to walk [5].

The study was conducted by Kaur, Kaur and Siska, who studied the effect of early ambulation on recovery from a caesarean obtained the findings of this study that early ambulation effective in postoperative recovery and prevent complications post-surgery, where the practice early ambulation started 6 hours postoperatively caesar in the intervention group and the control group ambulation standard postoperative treatment after 13-14 hours, there are significant differences between the intervention group and the control group for the recovery to assess the intensity of pain, use of analgesics, oral intake, early flatus, and affects the ability for nursing and holding baby. This will speed up the patient out of the hospital and focus more on the care of her baby [6].

Other studies have shown the findings relating to the effectiveness of ambulation planned post major surgery of the abdominal, showed significant gains between the experimental group and the control group, from the statistical analysis found that it can reduce the severity of postoperative parameters (pain, fatigue, urinary retention, orthostatic hypotension, flatus, constipation, and activities of daily living) [1].

2. Methods
This study is a quantitative research using a quasi-experimental design with pre and post-test with the control group design. The sample in this study was abdominal postoperative patients with spinal anesthesia treated at Haji Medan Hospital and the criteria of the study sample have met. The sample inclusion criteria in this study were patients with a major abdominal surgical action plan with spinal anesthesia, a minimum of 5 days in hospital treatment, full awareness and stable vital signs, no complications of the disease, and willing to be respondents. While sample exclusion criteria in this study were patients who experienced postoperative severe pain, postoperative bleeding and postoperative patients who were or switching to intensive care ward.

The data were collected using the respondent's characteristic instrument consisting of age, gender, education, BMI and type of operation and observation sheet of intestinal peristaltic activity with a stethoscope and a watch with normal value (5-35x / min), the instrument was standard but still, validity test was conducted with 3 experts. Researchers conduct research after obtaining ethical clearance (ethical clearance) in conducting research and obtained permission from the hospital. The results of the research data were analyzed in univariate and bivariate.

3. Results and Discussion
The characteristic feature of survey respondents includes age, gender, education, BMI and type of operation can be seen in the following table:

| No. | Characteristics respondents | Control group | Intervention group |
|-----|-----------------------------|---------------|--------------------|
| 1.  | Age                         | F  | %  | f  | %  |
|     | 26-35                       | 5  | 13.5 | 7  | 18.9 |
|     | 36-45                       | 11 | 29.7 | 9  | 24.3 |
|     | 46-45                       | 15 | 40.5 | 13 | 35.1 |
|     | 56-65                       | 6  | 16.2 | 8  | 21.6 |
The univariate analysis of the variable of pain intensity, intestinal peristaltic activity and the inflammatory phase of wound healing in this study can be seen in the following table:

### Table 2. Differences in Peristaltic Activity of Abdominal Postoperative Patients Before and After Early Ambulation in Control Group and Intervention Group at Haji Medan Hospital on 2016 (n = 74)

| Peristaltic activity Guts | n   | median (Minimum-maximum) | p    |
|--------------------------|-----|--------------------------|------|
| Control group            |     |                          |      |
| Before                   | 37  | 5 (3-6)                  | 0.000|
| After                    | 37  | 16 (4-18)                |      |
| Intervention group       |     |                          |      |
| Before                   | 37  | 5 (3-5)                  | 0.000|
| After                    | 37  | 16 (15-18)               |      |

Table 2 shows the results of statistical tests showed there are differences in intestinal peristalsis activity of abdominal postoperative patients in Haji Medan Hospital before and after the intervening period of early ambulation in the control group and intervention group obtained P value = 0.000; p <0.05.

### Table 3. Differences in Peristaltic Activity of Abdominal Postoperative Patients After Early Ambulation Between Control Group and Intervention Group at Haji Medan Hospital on 2016 (n = 74)

| Peristaltic activity Guts | n   | median (Minimum-maximum) | The p-value |
|--------------------------|-----|--------------------------|-------------|
| Control group            | 37  | 16 (4-18)                | 0.028       |
| Intervention group       | 37  | 16 (15-18)               |             |

Table 3 shows the results of analysis of Mann Whitney test to identify differences in the activity of intestinal peristalsis of abdominal postoperative patients after the early ambulation between the control and intervention groups in the acquisition p value = 0.028; p <0.05 can be concluded that there are significant differences between the control and intervention groups against intestinal peristaltic activity of abdominal postoperative patients at the Haji Medan Hospital.

Peristaltic Activity of Abdominal Postoperative Patients Before and After Early Ambulation in Control Group and Intervention Group an Intestinal activity of intestine had a significant increase in
the normal range (5-35x / min), both in the control group and the intervention group before and after the early ambulatory intervention (p = 0.000; p <0.05).

Although both groups experienced increased intestinal peristalsis activity, group respondents who received early ambulatory intervention experienced a higher increase. Statistically, the activity of intestinal peristaltic of control group respondents after the intervention period of early ambulation was 33 respondents (89.2%) with normal bowel peristaltic activity and 4 respondents (10.8%) with hypoperistaltic (<5x / min). While in the intervention group after the early ambulation intervention all respondents 37 (100%) intestinal peristaltic activity was normal.

One of the factors causing decreased intestinal peristaltic activity is the effect of anesthesia. In this study, all respondents used regional anesthesia with spinal anesthesia techniques. Spinal anesthesia is a large type of nerve conduction block by inserting local anesthesia into the subarachnoid space at the lumbar level (usually L4 and L5). This results in anesthesia in the lower extremities, the perineum, and the lower abdomen. The effects of anesthesia often experienced by postoperative patients are the manipulation of abdominal organs resulting in abdominal distension and decreased peristalsis of the normal bowel (5-35x / min). This is due to inhibition of sympathetic nerve impulses that will cause the release of acetylcholine inhibitors, resulting in decreased conduction wave velocity along the walls of the small intestine so as to decrease intestinal motility [7]. Intestinal peristaltic is a sign of the end of the anesthetic effect, based on the theory found the effects of anesthesia that is often experienced by patients due to manipulation of abdominal organs during surgical procedures can cause a normal peristaltic loss for 24-48 hours.

Physical activity affects intestinal peristalsis, early ambulation is one form of physical activity that can help to increase tone of gastrointestinal tract and abdominal wall and stimulate peristalsis by stimulating the sympathetic nerves to the intestinal muscles, resulting in a wave of intestinal motility, with an increase in the parasympathetic work of the intestines will cause the release of acetylcholine resulting in increased conductor wave conduction throughout the intestine that can improve intestinal motility. It is evident that in the intervention group after the early ambulatory intervention all the 37 (100%) respondents’ intestinal peristaltic activity was normal. With a maximum value of intestinal peristaltic activity was 18x / min and the minimum intestinal peristaltic activity was 15x / min. While in the control group there were 4 respondents obtained intestine peristaltic activity <5x / minute.

Dube and Yoti's research, that early ambulation intervention affects the parameters of physiological health of postoperative cesarean patients with peristaltic parameters between intervention group and control group after 5 days postoperative caesar showed observation result in intervention group from 250 respondents as much as 95.60% peristaltic returned earlier than the control group of 250 respondents as much as 78.80%, significantly higher percentage of respondents in the intervention group than the control group [8].

The results of another study conducted by Wiyono and Arifah, showed that there is an influence between early ambulation with the speed of recovery of intestinal peristalsis in patients with postoperative of the thigh fractures (femur fractures) with general anesthesia with an average recovery time of intestinal peristalsis without early ambulation is 48 minutes being with early ambulation is 30 minutes [2].

The difference in recovery on Abdominal Postoperative Patients After Early Ambulation between the control group and intervention group per Intestinal peristaltic activity between the control group (after early ambulation) and intervention group (after early ambulation) obtained p value = 0.028 (p <0.05), which means there is a difference in intestinal peristalsis activity in both groups who are unpaired after early ambulation is implemented. In accordance with the opinion of Guyton, that early ambulation can reduce the incidence of complications such as help to improve the tone of the gastrointestinal tract and the abdominal wall and stimulate peristalsis so as to reduce the likelihood of abdominal postoperative distention. The mechanism of early ambulation work on intestinal peristaltic activity that early ambulation training stimulates the sympathetic nerves to the intestinal muscles, resulting in a wave of intestinal motility, in the presence of increased sympathetic neuronal work will lead to the release of acetylcholine resulting in increased conductor wave conduction along the intestinal wall increase intestinal motility [9].

The results of this study are also in line with a study conducted by Sunil, showing that planned ambulation effectively reduces the severity of postoperative abdominal major surgery with one of the parameters such as speeding up the time of flatus and preventing constipation with a sample of 60
respondents consisting of intervention groups and control [1]. The result of post-test average parameter score in the intervention group was 44.9% and the control group was 59.6%, with a p value <0.05.

4. Conclusion
Based on the result of research there is an influence of early ambulation to aperistaltic activity of intestinal patient post operation of the abdomen. Based on the results, given some suggestions on nursing practice, future research, and nursing services. For nursing educations, the results of this study show that early ambulation affects the intensity of pain, intestinal peristaltic activity and wound healing inflammatory phase so that early ambulation as one of the competencies possessed by the student supervisor at the time of clinical guidance in the abdominal postoperative patient care. For further research is expected to do further research with different research designs to improve the assessment of the results to develop further by measuring the effect of ambulation of the urinary system, the respiratory system and the influence of early ambulation of the patient in hospital days. For nursing services results of this study demonstrate that early ambulation effect on pain intensity, peristaltic activity of the intestine and wound healing inflammatory phase, so that early ambulation can be applied as a standard of nursing care and become part of the standard operating procedures in managing patients with abdominal postoperative, with implementation of guided demonstrations in abdominal postoperative patients.

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