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THE RELATIONSHIP BETWEEN PAIN INTENSITY AND EARLY MOBILIZATION IN POST LAPAROTOMY PATIENTS

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ABSTRACT

Postoperative pain is a common physiological response in post-laparotomy patients and can affect their ability to perform early mobilization. Early mobilization plays a crucial role in accelerating recovery and preventing post-surgical complications, but is often delayed due to the intensity of pain experienced by patients. This study aimed to determine the relationship between pain intensity and early mobilization in post-laparotomy patients. This study used a quantitative design with an observational approach. A sample of 20 respondents was drawn using a total sampling technique. Pain intensity was measured using the Numeric Rating Scale (NRS), while early mobilization was assessed through an observation sheet. Data analysis used the Spearman Rank test with a significance level of 0.05. The results showed a significant relationship between pain intensity and early mobilization ($p = 0.002$) with a correlation coefficient of $r = -0.644$, indicating a strong and negative relationship. This indicates that the higher the pain intensity experienced by the patient, the longer the early mobilization will take. Thus, optimal pain control is an important factor in supporting the success of early mobilization in post-laparotomy patients.

Keywords: pain intensity; early mobilization; post laparotomy.

Introduction

Postoperative pain is one of the most common physiological responses following abdominal surgery, including laparotomy. Tissue injury caused by surgical procedures triggers inflammatory responses and nociceptive stimulation, which may lead to moderate to severe pain during the early postoperative period [1,7]. Uncontrolled postoperative pain may result in delayed recovery, respiratory complications, prolonged hospitalization, and decreased patient mobility [2,8].

Early mobilization is a crucial component of postoperative care. It plays an important role in improving circulation, enhancing lung expansion, preventing thromboembolic events, and accelerating wound healing [3,8]. Clinical guidelines emphasize that early mobilization within the first 24 hours after surgery contributes significantly to reducing postoperative complications and improving functional outcomes^{4,9}. However, in clinical practice, many patients delay mobilization due to fear of pain or discomfort at the surgical site.

Previous studies have demonstrated that effective pain management contributes to improved postoperative functional recovery [5]. Research has shown that higher pain intensity is associated with reduced physical activity and delayed ambulation in surgical patients [6,10]. Nevertheless, most existing studies focus on pain management interventions rather than specifically examining the correlation between pain intensity and early mobilization behavior, particularly in post-laparotomy patients. Despite the recognized importance of early mobilization, limited evidence is available regarding the strength and direction of the relationship between pain intensity and early mobilization in postoperative abdominal surgery patients at regional hospital settings.

This gap indicates the need for further investigation to provide empirical evidence supporting integrated postoperative pain and mobility management. Understanding the relationship between pain intensity and early mobilization is essential for developing effective nursing and anesthesiology care strategies aimed at enhancing postoperative recovery. Therefore, this study aims to determine the correlation between pain intensity and early mobilization in post-laparotomy patients.

Methods

This quantitative observational study with a cross-sectional design was conducted in the surgical ward of a regional public hospital in Central Java, Indonesia, from May to June 2025. The population included all post-laparotomy patients during the study period, and total sampling was applied, resulting in 20 respondents who met the inclusion criteria (adult, conscious, communicative, and willing to participate). Patients with postoperative complications requiring intensive care or cognitive impairment were excluded.

Pain intensity was measured using the Numeric Rating Scale (0–10), and early mobilization was assessed using a standardized postoperative mobilization observation checklist within the first 24 hours. Data were analyzed descriptively and using the Spearman Rank correlation test, with statistical significance set at $p < 0.05$.

Ethical approval was obtained from the Health Research Ethics Committee of Universitas 'Aisyiyah Yogyakarta (No. 060/KEPK/15/2025). Written informed consent was obtained from all participants.

Results and Discussion

A total of 20 post-laparotomy patients were included in this study. Based on univariate findings, most respondents experienced moderate to severe pain within the first 24 hours after surgery. In terms of mobilization, some patients were able to perform early mobilization stages, while others experienced delays and only performed limited movements such as turning in bed or sitting.

The distribution of pain intensity and early mobilization among respondents is presented in Table 1.

Table 1. Distribution of Pain Intensity and Early Mobilization (n= 20)

Variable	Category	n	%
Pain Intensity	No Pain	0	0%
	Mild Pain	0	0%
	Moderate Pain	10	50%
	Severe Pain	10	50%
Early Mobilization	Passive Mobilization	3	15%
	Active Assistive Mobilization	12	60%
	Active Mobilization	5	25%
	Full Mobilization	0	0%

Table 1 shows that all respondents (100%) experienced moderate to severe postoperative pain within the first 24 hours after laparotomy, with 50% reporting moderate pain and 50% reporting severe pain. None of the patients reported no pain or mild pain.

Regarding early mobilization, patients demonstrated varying levels of mobility ranging from passive to full mobilization. The variation in mobilization levels reflects differences in pain perception, physical readiness, and postoperative recovery response.

To determine the relationship between pain intensity and early mobilization, Spearman Rank correlation analysis was performed. The results are presented in Table 2.

Table 2. Correlation between Pain Intensity and Early Mobilization (n= 20)

Variables	r (Spearman)	P-value
Pain Intensity	-0.644	0.002
Early Mobilization		

The analysis demonstrated a statistically significant correlation between pain intensity and early mobilization ($p=0.002$), with a correlation coefficient of $r= -0.644$ indicating a strong negative relationship. This finding means that higher pain intensity is associated with delayed early mobilization among post laparotomy patients.

Scientifically, postoperative pain occurs as a consequence of tissue trauma and inflammatory mediator release that activate peripheral nociceptors following surgical incision [1]. This nociceptive stimulation increases sympathetic activity and triggers protective muscle guarding around the surgical site, limiting voluntary movement⁵. As pain intensity increases, patients tend to restrict movement to avoid discomfort or perceived injury, which explains the negative trend identified in this study.

The strong negative correlation suggests that pain intensity is not merely a subjective symptom but a clinically meaningful predictor of functional recovery. Previous studies have shown that inadequate postoperative pain control is associated with

delayed ambulation, impaired pulmonary function, and prolonged hospitalization [2,8].

Furthermore, Enhanced Recovery After Surgery (ERAS) guidelines emphasize that adequate analgesia is essential to facilitate early mobilization and optimize postoperative outcomes [9]. Without sufficient pain control, early mobilization programs may not achieve their intended benefits.

In addition to physiological mechanisms, psychological factors may also contribute to delayed mobilization. According to the fear-avoidance model, patients who anticipate increased pain during movement may consciously avoid activity, leading to reduced mobility [11]. This behavioral response strengthens the observed association between higher pain scores and delayed mobilization.

Compared with prior interventional studies that evaluated the effectiveness of multimodal analgesia, this study specifically quantified the strength and direction of the relationship between pain intensity and mobilization behavior. The correlation coefficient ($r= -0.644$) indicates a strong association, supporting the hypothesis that pain intensity plays a significant role in postoperative functional limitation.

However, this study did not evaluate the type or adequacy of analgesic therapy received by patients, which may influence both pain intensity and mobilization outcomes. The relatively small sample size ($n= 20$) and single-center design may also limit generalizability. Future studies are recommended to explore interventional pain management strategies and their direct impact on mobilization time and recovery indicators.

Overall, these findings highlight the importance of structured pain assessment using validated tools such as the Numeric Rating Scale (NRS) and timely analgesic

management to support early mobilization protocols. Integrating effective pain control into postoperative care planning is crucial to enhance recovery in post laparotomy patients.

Conclusion

This study aimed to determine the correlation between pain intensity and early mobilization in post-laparotomy patients. The findings show a statistically significant and strong negative correlation ($r = -0.644$; $p = 0.002$), indicating that higher postoperative pain intensity is associated with delayed early mobilization. These results confirm that pain intensity is a key determinant of functional recovery in the early postoperative period.

Effective pain control should therefore be prioritized to facilitate early mobilization and prevent postoperative complications. Systematic pain assessment and appropriate analgesic management are essential to support optimal recovery. Future studies are recommended to evaluate interventional pain management strategies and their impact on mobilization outcomes and broader postoperative indicators in larger populations.

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