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EARLY MOBILIZATION AND PAIN MANAGEMENT AS DETERMINANTS OF RECOVERY QUALITY AMONG POSTPARTUM MOTHERS FOLLOWING CESAREAN SECTION AT GATOEL HOSPITAL, MOJOKERTO

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ABSTRACT

The increasing rate of cesarean section deliveries contributes to a higher risk of postoperative pain and delayed mobilization among postpartum mothers, which may negatively affect both physical and psychological recovery. Inadequately managed pain and limitations in early mobilization can prolong the recovery period, increase the risk of complications, and reduce the quality of life of postpartum mothers. This study aimed to analyze the correlation between the implementation of early mobilization and pain management and the quality of recovery among postpartum mothers following cesarean section. This study employed a quantitative approach using an observational analytic design with a cross-sectional method. The study subjects were postpartum mothers following cesarean section who were hospitalized at Gatoel Hospital, Mojokerto. Data were collected using standardized instruments to assess pain intensity (Numeric Rating Scale), implementation of early mobilization, and maternal recovery quality. Data analysis was performed using bivariate analysis (Chi-Square test) and multivariate analysis (Ordinal Logistic Regression) to determine the most dominant relationship between early mobilization, pain management, and recovery quality. The results demonstrated a significant relationship between early mobilization and recovery quality ($p = 0.001$; $p < 0.05$). Likewise, a significant relationship was found between pain management and recovery quality ($p = 0.003$; $p < 0.05$). Ordinal logistic regression analysis revealed that early mobilization was the most dominant factor influencing the quality of recovery among postpartum mothers following cesarean section, with an odds ratio (OR) of 5.21. These findings indicate that early mobilization directly contributes to the restoration of physiological functions and enhances patient independence during the hospitalization period. Early mobilization and pain management are important factors influencing the quality of recovery among postpartum mothers following cesarean section. Early mobilization was identified as the most

Keywords

Early Mobilization; Pain Management; Quality of Recovery; Postpartum Mothers Following Cesarean Section

dominant determinant and should therefore become a primary focus of evidence-based nursing care at Gatoel Hospital, Mojokerto.

INTRODUCTION

Cesarean section (CS) is one of the most common operative delivery procedures, with its incidence continuing to increase globally and nationally. The World Health Organization (WHO) reported that the proportion of cesarean deliveries in many countries has exceeded the recommended optimal rate, with a consistent upward trend observed annually. Currently, more than one in five births (21%) worldwide are performed through cesarean section. This figure is projected to continue rising over the next decade, with nearly one-third (29%) of all births expected to occur via cesarean section by 2030 (WHO, 2021). In Indonesia, a similar trend has been observed, driven by advancements in medical technology and improved access to maternal and child healthcare services (Kemenkes, 2024). Although cesarean section is generally considered a safe procedure, postpartum mothers remain at risk of experiencing various postoperative complications, particularly pain and limitations in early mobilization.

Postoperative pain following cesarean section is a major concern that may hinder physical activity, delay physical recovery, and negatively affect the psychological well-being of postpartum mothers (Hussen et al., 2022). Inadequately managed pain often discourages mothers from engaging in early mobilization, despite its crucial role in accelerating physiological recovery, preventing complications such as thromboembolism and postoperative ileus, and enhancing maternal independence in self-care and infant care activities (Xavier et al., 2024). This condition indicates a close relationship between pain, early mobilization, and the quality of recovery among postpartum mothers following cesarean section.

The quality of postoperative recovery encompasses not only physical recovery but also psychological, social, and functional dimensions. Several studies have demonstrated that poor recovery quality may adversely affect patient satisfaction, length of hospital stay, and the overall quality of life of postpartum mothers (Myles et al., 2022). However, in clinical practice, nursing interventions related to pain management and early mobilization are often not optimally integrated and are frequently implemented without a clear understanding of the determinants influencing recovery outcomes.

Based on these considerations, the research problem of this study is formulated as follows: What are the roles of early mobilization and pain management as determinants of recovery quality among postpartum mothers following cesarean section? Addressing this question is expected to provide evidence-based insights that can strengthen maternal nursing practice and improve the quality of postoperative care for postpartum mothers undergoing cesarean section.

METHOD

This study employed a quantitative analytical design using a cross-sectional approach. This design was selected to examine the relationship between early mobilization, pain management, and the quality of recovery among postpartum mothers following cesarean section (CS). The study was conducted in the Jasmine Ward of Gatoel Hospital, Mojokerto.

The study population consisted of all postpartum mothers who underwent cesarean section at Gatoel Hospital, Mojokerto. The sample was selected using a consecutive sampling technique, resulting in a total of 60 respondents. The inclusion criteria were postpartum mothers on the first day following cesarean section, those with stable hemodynamic conditions, willingness to participate in the study, and the ability to communicate effectively. The exclusion criteria included severe postoperative complications and specific medical conditions that could hinder mobilization.

An initial assessment of the mothers' early mobilization ability following cesarean section was conducted by measuring pain intensity using the Numeric Rating Scale (NRS). Subsequently, the implementation of early mobilization and pain management interventions was observed according to established standards of care. The quality of recovery outcome among postpartum mothers following cesarean section was measured after observing the implementation of these interventions throughout the hospitalization period using the Quality of Recovery (QoR) questionnaire.

The determinants of recovery quality among postpartum mothers following cesarean section were analyzed using multivariate statistical analysis, specifically ordinal logistic regression. This study received ethical approval and official authorization from the relevant ethics committee (Approval Number: 180/KEP/UBS-PPNI/VI/2026). Participant protection was ensured through the provision of informed consent and the guarantee of data anonymity and confidentiality.

RESULTS

Table 1. Respondents' Characteristics Based on Demographic Data in the Study of Early Mobilization and Pain Management as Determinants of Recovery Quality Among Postpartum Mothers Following Cesarean Section

Characteristics	Frequency	Percentage (%)
1. Age		
– < 20 years	4	7
– 20–35 years	43	72
– > 35 years	13	21
2. Education		
– Primary education (elementary and junior high school)	7	12
– Secondary education (senior high school)	35	58
– Higher education (diploma, bachelor's, master's degree)	18	30
3. Paritas		
– Primiparous	24	40
– Multiparous	36	60
4. Skala Nyeri		
– Mild pain	2	3
– Moderate pain	48	80
– Severe pain	10	17
Total	78	100

Source: Primary Data

Based on Table 1, the distribution of respondents by age group was predominantly within the 20–35 years category, comprising 43 respondents (72%). This was followed by respondents aged over 35 years with 13 individuals (21%) and

those aged under 20 years with 4 individuals (7%). These findings indicate that most respondents were within the healthy reproductive age range, which is generally associated with better physiological adaptation and recovery capacity compared with other age groups.

In terms of educational background, the majority of respondents had completed secondary education (senior high school), accounting for 35 individuals (58%). Meanwhile, 18 respondents (30%) had attained higher education, and 7 respondents (12%) had completed only primary education. Educational level may influence an individual's ability to understand and adhere to health information and medical instructions during the recovery period.

Regarding parity, the multiparous group represented the largest proportion of respondents, consisting of 36 individuals (60%), while 24 respondents (40%) were categorized as primiparous. The higher proportion of multiparous mothers suggests that previous childbirth experience may contribute to greater mental preparedness and facilitate compliance with nursing interventions during the postpartum recovery period.

With respect to postoperative pain intensity following cesarean section, the majority of respondents experienced moderate pain, reported by 48 individuals (80%). Severe pain was reported by 10 respondents (17%), while only 2 respondents (3%) experienced mild pain. The intensity of postoperative pain may reduce patients' motivation and willingness to engage in early mobilization activities, potentially affecting the overall recovery process..

Table 2. Univariate and Bivariate Analysis of Early Mobilization, Pain Management, and Quality of Recovery Among Postpartum Mothers Following Cesarean Section

Source: Primary Data

Variables	Frequency	Percentage (%)	p-Value
1. Early Mobilization			
– Appropriate	38	63	0,001
– Inappropriate	22	37	
2. Pain Management			
– Adequate	41	68	0,003
– Inadequate	19	32	
3. Quality of Recovery			
– Good	35	58	
– Fair	18	30	
– Poor	7	12	

Based on Table 2, the findings regarding early mobilization indicate that the majority of respondents performed early mobilization appropriately, accounting for 38 respondents (63%). This finding suggests that most postpartum mothers were physically prepared to engage in early mobilization and received adequate support and guidance from healthcare professionals during the postoperative recovery period. The results of the Chi-Square test revealed a p-value of 0.001 ($p < 0.05$), indicating a statistically significant relationship between early mobilization and the quality of recovery among postpartum mothers following cesarean section. Respondents who performed early mobilization appropriately tended to demonstrate better recovery quality than those who did not.

The distribution of pain management showed that most respondents received adequate pain management, with 41 respondents (68%) categorized in this group. This finding indicates that the majority of postpartum mothers following cesarean section received appropriate pain management interventions, including both pharmacological and non-pharmacological therapies, enabling more effective pain control throughout the hospitalization period. The Chi-Square test yielded a p-value of 0.003 ($p < 0.05$), demonstrating a statistically significant relationship between pain management and the quality of recovery among postpartum mothers following cesarean section. Respondents who received adequate pain management exhibited better recovery quality than those who received inadequate pain management.

The findings related to the quality of recovery following cesarean section revealed that the majority of respondents achieved a good level of recovery quality, comprising 35 respondents (58%). This result indicates that most mothers experienced an optimal recovery process, characterized by satisfactory levels of physical activity, mobility, comfort, and overall physical condition during the postoperative postpartum period.

Table 3. Ordinal Logistic Regression Analysis of Dominant Factors Influencing Recovery Following Cesarean Section

	Variables	p-Value	OR
1.	Early Mobilization	0,001	5,21
2.	Pain Management	0,009	3,84

Source: Primary Data

Based on Table 3, the results of the ordinal logistic regression analysis indicate that early mobilization was the most dominant factor influencing the quality of recovery among postpartum mothers following cesarean section, with an odds ratio (OR) of 5.21. This finding suggests that mothers who performed early mobilization appropriately were 5.21 times more likely to experience a better quality of recovery compared to those who did not perform early mobilization appropriately.

Although pain management was also found to be significantly associated with recovery quality ($p = 0.009$; $OR = 3.84$), the magnitude of its effect was lower than that of early mobilization. These results indicate that while effective pain management contributes substantially to postoperative recovery, the implementation of appropriate early mobilization plays a more prominent role in improving recovery outcomes among postpartum mothers following cesarean section

DISCUSSION

1. The Relationship Between Early Mobilization and the Quality of Recovery Among Postpartum Mothers Following Cesarean Section

The findings of this study showed that the majority of respondents performed early mobilization appropriately, with 38 respondents (63%) categorized in this group. This finding indicates that most postpartum mothers had adequate physical readiness to engage in early mobilization and received sufficient support and guidance from healthcare professionals during the postoperative recovery period. Respondents who performed early mobilization appropriately tended to demonstrate better recovery quality than those who did not. Early mobilization is an essential component of post-cesarean care because it plays a significant role in accelerating maternal physiological recovery. Mobilization initiated within 6–24 hours after surgery can improve blood circulation, enhance gastrointestinal function, prevent deep vein

thrombosis, and accelerate surgical wound healing. Furthermore, early mobilization helps improve mothers' functional capacity, enabling them to resume self-care activities and infant care more rapidly.

The findings of this study are consistent with those reported by Ningrum et al (2023), who demonstrated that early mobilization has a positive effect on uterine involution among mothers following cesarean section. Their study explained that mothers who engaged in early mobilization experienced better physiological recovery than those who delayed mobilization. The present findings are also supported by Lucin et al(2020), who found that early mobilization accelerates surgical wound healing by increasing blood flow and oxygen delivery to tissues undergoing the healing process.

The results of the Chi-Square test revealed a p-value of 0.001 ($p < 0.05$), indicating a statistically significant relationship between early mobilization and the quality of recovery among postpartum mothers following cesarean section. The analysis confirmed that mothers who performed early mobilization appropriately experienced better recovery outcomes compared to those who did not. From a physiological perspective, early mobilization enhances tissue perfusion, accelerates oxygen distribution to the surgical wound area, and facilitates the restoration of normal organ function. Gradual physical activity also reduces the risk of postoperative complications, including thromboembolism, constipation, and urinary retention.

These findings are consistent with the study conducted by Lou & Guo, (2026), which reported that planned early ambulation significantly improves postoperative recovery among mothers following cesarean section. Their study demonstrated increased functional activity and reduced postoperative complications among patients who participated in an early ambulation program compared with those in the control group. Furthermore, the present findings support the concept of Enhanced Recovery After Cesarean (ERAC), which identifies early mobilization as one of the key components in accelerating postoperative recovery and improving patient outcomes following cesarean section (Meng et al., 2021).

2. The Relationship Between Pain Management and the Quality of Recovery Among Postpartum Mothers Following Cesarean Section

The findings of this study revealed that the majority of respondents received adequate pain management, accounting for 41 respondents (68%). This result indicates that most postpartum mothers following cesarean section received appropriate pain management interventions through both pharmacological and non-pharmacological approaches, allowing pain to be controlled more effectively during the recovery period. Respondents who received adequate pain management demonstrated better recovery quality than those who received inadequate pain management. Post-cesarean pain is a physiological consequence of surgical intervention that may interfere with mobilization, daily activities, breastfeeding, and the quality of maternal rest. Therefore, effective pain control is an essential component in facilitating a faster recovery process.

According to pain management theory, a multimodal approach that combines pharmacological and non-pharmacological therapies is more effective in reducing pain intensity than the use of a single intervention alone. Effective pain control enables patients to initiate mobilization earlier and enhances comfort throughout the hospitalization period. These findings are consistent with those reported by Ruspita & Rosyidah, (2022), who found that optimal pain management through the Enhanced Recovery After Cesarean Surgery (ERACS) approach was associated with improved recovery quality among post-cesarean patients. Patients with lower pain

scores demonstrated better recovery outcomes than those with higher pain scores. Similarly, Hooda et al. (2023) reported that postoperative pain control significantly influences the ability to perform early ambulation and successfully initiate postoperative activities following cesarean section. Uncontrolled pain may delay mobilization and consequently slow the overall recovery process (Sangkum et al., 2021).

The results of the Chi-Square test showed a p-value of 0.003 ($p < 0.05$), indicating a statistically significant relationship between pain management and the quality of recovery among postpartum mothers following cesarean section. The findings suggest that the more adequate the pain management provided, the better the quality of recovery achieved by the mother. Effective pain control enables patients to perform activities independently, obtain sufficient rest, and actively participate in postoperative care. In contrast, inadequately controlled pain may increase physiological stress, impair sleep quality, and delay wound healing.

The findings of Fowler et al., (2024) demonstrated that the implementation of a multimodal analgesia approach among post-cesarean patients effectively reduced postoperative pain and improved patient comfort during the recovery period. Furthermore, Ubom et al., (2023) reported that an Enhanced Recovery After Cesarean (ERAC) protocol contributed to reduced opioid requirements and improved patients' perceptions of recovery following cesarean section. These findings further support the importance of comprehensive pain management as a key strategy for enhancing recovery outcomes among postpartum mothers undergoing cesarean section.

3. Determinants of Recovery Quality Among Postpartum Mothers Following Cesarean Section

The results of the ordinal logistic regression analysis revealed that **early mobilization** was the most dominant determinant influencing the quality of recovery among postpartum mothers following cesarean section, with an odds ratio (OR) of **5.21**. This finding indicates that mothers who performed early mobilization appropriately were **5.21 times more likely** to achieve a better quality of recovery compared to those who did not perform early mobilization appropriately. Although pain management contributed significantly to the recovery process, the mother's ability to engage in early mobilization exerted a greater influence on overall recovery outcomes.

Early mobilization not only affects physical recovery but also enhances maternal self-confidence, independence, and the ability to perform the role of infant caregiver. Therefore, educational programs and supportive interventions aimed at promoting early mobilization should be prioritized within maternal nursing services.

CONCLUSIONS

This study concludes that early mobilization and pain management are important determinants in improving the quality of recovery among postpartum mothers following cesarean section. Therefore, both interventions should be considered integral components of maternal nursing care.

To improve the quality of recovery among mothers following cesarean section, hospitals are encouraged to maintain and strengthen the implementation of standardized early mobilization and pain management programs for postpartum mothers. In addition, regular monitoring and evaluation should be conducted to ensure healthcare professionals' adherence to these procedures, thereby supporting optimal patient recovery outcomes.

Postpartum mothers following cesarean section are encouraged to comply

with healthcare professionals' recommendations regarding early mobilization and pain management. Adherence to these recommendations may accelerate the recovery process, enhance maternal independence, and reduce the risk of postoperative complications.

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