The relationship between eracs caesarean section method and early mobilization ability of postpartum mother

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Abstract
Introduction: Postpartum mothers following cesarean section (CS) often experience severe pain, limited mobility, and challenges in performing self-care and infant care. Enhanced Recovery After Cesarean Surgery (ERACS) is an approach developed to accelerate postoperative recovery. **Methods**: This quantitative study employed a cross-sectional design involving 52 postpartum mothers in the An Nisa Ward of RSU PKU Muhammadiyah Bantul. Statistical analysis was conducted to examine the relationship between CS delivery methods and early mobilization ability. **Results:** A total of 96.2% of respondents underwent the ERACS method, with 92.3% of them capable of early mobilization. In contrast, all patients who underwent non-ERACS methods were unable to mobilize early. Statistical analysis revealed a significant relationship between CS method and early mobilization ability ($p < 0.001$), with a strong association ($p = 0.693$). **Conclusion**: The ERACS method is more effective than conventional methods in supporting early mobilization among postpartum mothers. Recommendations include encouraging early mobilization, consistent education and emotional support by healthcare professionals, and integrating these findings into maternal nursing education. Further research with larger samples and broader variables is encouraged to strengthen scientific evidence supporting ERACS implementation

Keywords: ERACS Method, Cesarean Delivery, Early Mobilization

1. Introduction
Cesarean section is a surgical procedure to deliver a baby by making an incision in the abdominal wall and uterus(Sravani et al., 2023). Currently, Cesarean operations have become one of the popular options in the birthing process because they are considered to provide extra protection for both the mother and baby, especially from the risks that arise due to prolonged labor. The causes for performing a Cesarean section include factors such as age, parity, history of delivery, stalled labor, and premature rupture of membranes (Dila *et al.,* 2022). Other factors for performing a Caesarean section include a large fetal head size that does not match the size of the mother's pelvis, severe pregnancy poisoning, severe pre-eclampsia or eclampsia, and the position of the baby (Septiana & Sapitri, 2023).

The rate of Cesarean sections according to the World Health Organization (WHO) in 2020 increased worldwide and exceeded the limit recommended by WHO in efforts to save the lives of mothers and their babies, which is in the range of 10%-15% (Ulfa, 2021). According to the SKI (Indonesian Health Survey) data, the normal delivery rate is 73.2%, and the Caesarean section rate in Indonesia reached 26.8% in 2022. Based on the SKI data, the normal delivery rate is 73.2%, and the Caesarean section rate in Indonesia reached 26.8% in 2022(Tika et al., 2022). The birth rate in Bantul Regency in 2023 reached 1.90 (Central Statistics Agency). The government policy regarding Caesarean section surgery is stated in the Minister of Health Regulation Number 2 of 2025 concerning the Implementation of Reproductive Health Efforts.

Government policies related to the implementation of Caesarea sections include post-operative care, wound care, infection prevention, and more infection prevention. Delivery through cesarean section carries several risks, including a recovery period that requires hospitalization. The incision site may cause pain and leave a scar, while the healing process can take quite some time, ranging from several weeks to months, with prolonged mobilization (Misrina & Lestari, 2024). Another effect of Cesarean Section is that many mothers report difficulties in caring for and raising their babies after undergoing the surgery. After undergoing a Cesarean Section, mothers still experience pain, have to care for incision wounds, and also need sufficient rest after the delivery process (Hanifah *et al*., 2023). The medical field continues to evolve in its services. Currently, there are ERACS for Caesarea sections.

ERACS (Enhanced Recovery After Caesarian Surgery) is a fast recovery program after cesarean surgery that includes a series of treatments ranging from preoperative preparation, intraoperative care,

and postoperative care to patient discharge. The ERACS concept is an evolution of the Enhanced Recovery After Surgery (ERAS) concept, which was initially used in digestive surgery. The ERAS concept has been proven to reduce the length of hospital stay, decrease postoperative complications, and increase patient satisfaction. Therefore, the ERAS concept was further developed for surgical procedures in other fields, including obstetrics (Pujiwati *et al*., 2023). The ERACS method (Enhanced Recovery After Cesarean Section) is a delivery method aimed at accelerating the recovery process after a Cesarean section (Tika *et al*., 2022). ERACS is a perioperative management protocol to achieve immediate recovery in the patient's condition after surgery while maintaining preoperative organ function and reducing stress response during surgery. The key components of this protocol include preoperative counseling, optimization of nutrition, the use of standard anesthetics and analgesia, and early mobilization (Sidharti *et al.,* 2023).

The ERACS delivery method has now become phenomenal in society, especially for pregnant mothers (Warmiyati & Ratnasari, 2022). Another benefit of the ERACS method is minimizing complications and reducing hospitalization time (Humaira *et al*., 2022), as well as accelerating early mobilization of postpartum mothers (Millizia *et al.,* 2023). Mobilization also prevents thromboembolic events (Pujiwati *et al.,* 2023). ERACS also reduces postoperative pain on the first and second days, leading to a shorter hospital stay and early catheter removal. In terms of oral intake, ERACS patients are significantly better than Non ERACS patients (Hanafi *et al*., 2025). Another benefit of ERACS is improving the bonding relationship between mother and baby, enabling the mother to initiate early breastfeeding and facilitate breast milk provision (Marlinda & Widayati, 2024). PKU Muhammadiyah Bantul Hospital serves more ERACS than non-ERACS. Over a period of 3 months from September to November 2024, there were 107 ERACS cases and 20 Non-ERACS Caesarean sections. The duration of ERACS patient care is shorter than that of non-ERACS; ERACS patients can go home 24 hours post-operation, while non-ERACS patients can only go home 2 days post-operation.

Based on the research results, it is known that mothers undergoing the ERACS method experience postoperative pain from a cesarean section with an average intensity that is lower (3.45) compared to the non-ERACS method (6.40). This difference is statistically significant (p-value 0.000), with an average pain difference of 2.95. This means that the ERACS method is proven to be more effective in reducing postoperative pain from SC in mothers compared to the non-ERACS method (Sriwahyunita & Futriani, 2024). A high level of pain after surgery can hinder early mobilization of patients, slow down the healing process, and delay the discharge time from the hospital. This pain generally arises due to tissue damage and contractions in the uterus that occur during the uterine involution process (Hanafi *et al*., 2025).

Early mobilization is a prominent factor in accelerating post-surgical recovery and can prevent post-surgical complications. Many benefits can be achieved from bed exercises and walking in the early post-surgical period (Khairana, et al. 2023). Early mobilization is a factor that accelerates recovery after a Caesarean section, which facilitates blood circulation, speeds up the function of breast milk (ASI), expels metabolic waste from the body, lochia, aids in the healing process of wounds, involution of the reproductive organs, smooths gastrointestinal and urinary tract functions, and improves (Yulisetyaningrum et al., 2021). The improvement of maternal independence in the recovery of mothers after a Caesarean section is more successful when early mobilization is performed. Independence after surgery allows mothers to adapt more quickly to their roles. Early mobilization can improve uterine contractions so that the involution process works well and restores the mother's condition to that before pregnancy. Quick physical activity after this surgery can stimulate breast milk production because mobilization increases blood flow to the breasts (Gasali *et al*., 2023).

According to research conducted at the Mobagu City Hospital, early mobilization affects the healing process of wounds from a Caesarean section. Mobilization also facilitates normal blood circulation, thus reducing the risk of thrombosis and thromboembolism(Irnawati *et al.,* 2023). The good early mobilization activities of postpartum mothers after this surgery can stimulate breast milk production, as mobilization increases blood flow to the breasts (Gasali *et al*., 2023). Based on a literature review of 8 journals, it is stated that ERACS is effective for quicker early mobilization, making the length of hospital stay shorter (Rudiantoro & Wardani, 2024). Early mobilization also enhances vascularization, thereby speeding up the wound healing process (Trisnawati *et al*., 2023). Given the significant benefits of early mobilization for postpartum mothers following a Caesarean section, it is

essential to practice early mobilization. The purpose of this study is to determine the relationship between the ERACS Caesarean section method and mobilization abilities. Early mobilization also facilitates vascularization, thereby accelerating the wound healing process (Trisnawati *et al.,* 2023).

The impact of not performing early mobilization on post-Cesarean section patients gradually after SC leads to an increase in body temperature caused by the uterine involution process not proceeding optimally. This condition will result in residual blood not being expelled optimally and can potentially cause infection, indicated by an increase in body temperature and abnormal bleeding (Nurani et al., 2024). Given the significant benefits of early mobilization for postpartum mothers after a Cesarean section, it is essential to implement early mobilization. The aim of this study is to investigate the relationship between the ERACS method of Cesarean section and the ability of postpartum mothers to mobilize early, as well as the strength of that relationship.

2. Methods

This research uses a quantitative method with a cross-sectional correlation. The independent variable in this study is the ERACS method, while the dependent variable is the early mobilization ability. The population in this study includes all postpartum mothers post-Sectio Caesarea (24 hours post-operation) who were treated in the An Nisa ward of RSU PKU Muhammadiyah Bantul in May 2025, with no bleeding or hemodynamic disturbances, totaling 54 respondents; 2 respondents did not meet inclusion criteria due to post-Sectio Caesarea bleeding. The sample in this study used total sampling, which is a sampling technique where all eligible members of the population are included as samples, with a total sample size of 52 respondents. This research was conducted in the An Nisa ward of RSU PKU Muhammadiyah Bantul in May 2025.

The research instrument used a questionnaire for mobility ability using a Likert scale with the criteria: 1: very difficult, 2: difficult, 3: fairly easy, 4: easy, and 5: very easy in mobilizing, starting from changing sleeping positions, waking up (sitting/standing), walking to the toilet, taking care of the baby, picking up items near the bed. After obtaining the data values, they are then categorized based on the values into capable and incapable categories. The content validity test was conducted by involving a panel showing above values.

Data analysis used univariate and bivariate analysis using the Chi Square test and the strength of the relationship using the Cramer's Phi test. In the Chi-square test, The testing criterion uses p value distribution. If the statistical test result $p \leq 0.05$, it means there is a significant relationship (Ho is rejected and Ha is accepted). Conversely, if p value > 0.05, then Ho fails to be rejected, meaning there is no relationship. between the delivery method and the early mobilization. The researcher used research ethical approval letter No: 061/EC.KEPK/C04.25, issued on April 22, 2025.

3. Results and Discussion

3.1. Results

Table 1. Frequency Distribution Based on Age and Parity

No	Characteristics	Frequency	Persentage (%)
1	Under 20 years	0	0%
	20-35 years	46	88,54%
	Above 35 years	6	11,5%
2	Paritas		
	Primipara	19	36,5%
	Secundipara	25	48,1%
		8	15,4%
	TOTAL	52	100%

Based on table 1, according to age characteristics, there are no respondents under 20 years old, 20-35 years old totaling 46 patients (88.5%), and the second order is over 35 years old with 6 patients. (11.5%). Table 1 also shows that the most common parity characteristic in this study is the second child, with a total of 25 patients (48%), followed by the first child with 19 patients (36.5%), and the third child with 8 patients (15.5%).

Table 3. Description of the correlation between the Caesarean section delivery method and the early mobilization ability of postpartum mothers after Caesarean section at PKU Muhammadiyah Bantul Hospital.

Method of delivery *Sectio Caesarea*	**Early Mobilization**	**Frequency**	**Percentage**	***Person df Asymp.sig***	
Eracs	Able	48	92,3%	24,960	0,001
	Un able	2	3,85%		
Non Eracs	Able	0	0%		
	Unable	2	3,85%		

Based on the correlation distribution table of the Sectio Caesarea delivery method with the early mobilization ability of postpartum mothers, it can be seen that out of 50 postpartum mothers post ERACS, 48 patients were able to mobilize and 2 patients were unable to mobilize. There were 2 non-ERACS postoperative patients, both of whom fell into the category of unable to mobilize.

Based on the bivariate analysis using Chi Square, the significance value (p) is less than 0.001. This significance value is far below the threshold of 0.05 or $p < 0.05$, which means that statistically there is a relationship between the ERACS Sectio Caesarea method and the early mobilization ability of mothers postpartum after Sectio Caesarea in the An Nisa ward of RSU PKU Muhammadiyah Bantul, with an Asymp sig. value of < 0.0001 ($p < 0.05$).

Table 4. Description of the correlation between the Sectio Caesarea delivery method and the early mobilization ability of postpartum mothers after Sectio Caesarea at PKU Muhammadiyah Hospital Bantul.

Method of delivery *Sectio Caesarea*	Early Mobilization	Frequency	*p Value*
Eracs	Able	48	0,693
	Un able	2	
Non Eracs	Able	0	
	Un Able	2	

Based on the Cramer's analysis, the significance result (p) obtained is 0.693, which indicates a strong association between the categories.

1. Discussion

Based on the characteristics, the largest number of respondents were aged 20 to 35 years old, as this is the productive age that is safe for reproduction. There are no respondents under the age of 20 because the current trend is for marriage to occur after the age of 20, and society is increasingly aware of the risks of giving birth at a young age. Similarly, there are few respondents over the age of 35 because of the awareness and level of knowledge among the Indonesian population regarding the risks of giving birth after the age of 35, which pose risks to both the mother and the baby. The majority age group is below 20 to 35 year (Nuraeni & Widiasih, 2024). This research aligns with the study by Prihatin and colleagues based on the age characteristics of respondents, where the majority of mothers are aged 20-35 years, which accounts for 89.8% (Prihatin et al., 2023) (Prihatin *et al*., 2023). Mothers undergoing cesarean sections have a risk age of 28.2%, while the age that is not at risk is a certain number a total of 71.8% (Siregar *et al*., 2023).

Based on the parity characteristics in this study, the majority are second children (scundipara) totaling 25 patients (48.1%) due to indications for Caesarean Section such as fetal compromise, fetal distress, transverse lie, premature rupture of membranes, and many patients have a history of Caesarean Section with their first child, leading to subsequent Caesarean Sections as well, although it is still possible to try for a spontaneous delivery but without manipulation, such as being given labor-inducing medication. This study aligns with Nuraeni and colleagues' research, 2024, which reported that the number of primiparous respondents was 35.5% and multiparous 62% (Nuraeni & Widiasih, 2024). The majority of mothers giving birth are multigravida, at 77.8%, and the remaining 22.2% are primigravida (Krismayanti *et al*., 2024). This is in line with Simanjuntak's research, 2024 that grandmultiparous mothers have higher rates of cesarean sections than normal deliveries, because grandmultiparous mothers are those with high-risk age, namely over 35 years, thus necessitating the delivery by Cesarean section (Simanjuntak, 2024).

The Cesarean delivery method among respondents in this study is predominantly the ERACS method compared to non-ERACS, from the respondents many hospitals implement ERACS because of hospital policies, recommendations from operating doctors and anesthesiologists to perform ERACS if possible, considering the many benefits obtained from ERACS for both patients and hospitals, including faster recovery, reduced pain, quick mobilization, and quicker discharge. Hospitals also benefit not only by increasing hospital profits, but ERACS can also reduce the length of stay in hospitals, commonly known as LOS (Length Of Stay). This is in line with Hanifah's research which shows that 45 mothers (81.8%) underwent Cesarean section using the ERACS method and 10 mothers (18.2%) underwent Cesarean section using the non-ERACS method. The ERACS method better controls pain and nausea/vomiting after surgery. The non-ERACS method requires longer care (Hanifah *et al*., 2023). Patients' preferences and experiences in choosing a delivery method are influenced by patient characteristics, access to delivery facilities, delivery methods, delivery attendants, and family experiences with childbirth (Sriwahyunita & Futriani, 2024). According to the researchers' trend analysis, information and communication have led many mothers to prefer the ERACS Cesarean section method, while those who did not undergo the ERACS method cited indications, duration, and complications at the time of the procedure.

The ability for early mobilization in postpartum mothers after ERACS is more effective than that of non-ERACS. The ERACS method experiences a lower level of pain compared to mothers who give birth through non-ERACS methods. In Caesarean operations with the ERACS method, the type of anesthesia used is spinal anesthesia, which is combined with pain relief medications such as morphine or fentanyl. Fentanyl itself is a synthetic opioid agonist derived from phenylpiperidine. As an analgesic, fentanyl has a potency 75 to 125 times stronger than other analgesics, making early mobilization easier (Nisak *et al.,* 2023). The results of this study are in line with the research conducted by Prihatin and colleagues, which indicates that recovery after ERAS surgery is faster; patients can be discharged 24 hours after surgery, whereas in conventional SC recovery after surgery takes longer, requiring at least 3 days before patients are allowed to go home (Prihatin *et al*., 2023). ERACS patients who were unable to mobilize in this study were due to feeling pain and some because of night surgery, so they rested in the morning before mobilization.

The ERACS method has proven to be effective in accelerating early mobilization of postpartum mothers. Patients with ERACS in this study were also able to be discharged faster, within 24 hours post ERACS if there were no other complications. ERACS has several advantages including faster recovery, better pain management, increased comfort and patient satisfaction, and a reduction in morbidity and mortality rates among mothers (Prayanangga & Nilasari, 2022). This is also consistent with research by Hanifah and colleagues, which showed that the results indicate 46 (83.6 %) postpartum mothers after a cesarean section using the ERACS method were able to mobilize early within 2, 4, and 6 hours after the cesarean section. Early mobilization includes turning to the right and left, sitting in bed, and even walking to the bathroom after the catheter is removed (Hanifah *et al.,* 2023).

The effects or impacts of not implementing early mobilization in postoperative patients can lead to physiological and psychological dangers. The physiological dangers caused by the inability to mobilize early include the potential to affect normal metabolic function, decrease metabolic rate, disrupt carbohydrate, fat, and protein metabolism; electrolyte and calcium imbalance; and gastrointestinal disturbances such as appetite issues, decreased peristalsis resulting in constipation and fecal impaction

(Sriwahyunita & Futriani, 2024). In addition, immobilization can also pose a high risk of respiratory complications, such as atelectasis (collapse of alveoli) and hypostatic pneumonia (inflammation of the lungs due to static or piled-up secretions), pulmonary embolism, increased risk of urinary tract infections and resulting in joint contractures and muscle atrophy. Immobilization is also dangerous for the psychological state of patients, leading to a decline in sensory function, changes in emotional responses and behavior, such as hostility, feelings of dizziness, fear, and helplessness up to mild anxiety and even psychosis; depression due to changes in roles and self-concept, sleep pattern disturbances due to changes in routine or environment, and changes in coping (Irmadhani, 2021).

Based on the chi-square cross-sectional analysis, there is a relationship between the ERACS Caesarean section method and the early mobilization ability of postpartum mothers after a Caesarean section with a significance result (of < 0.001). This significance value is well below the threshold of 0.05 or a significance value < 0.05, which means there is a statistically significant relationship between the Caesarean section delivery method and the early mobilization ability of postpartum mothers after ERACS and non-ERACS in the An Nisa ward of Muhammadiyah PKU Bantul Hospital, with an Asymp sig. value of <0001 (p<0.05). Based on the closeness of relationship tested with Cramer's, a strong relationship between the Caesarean section delivery method and the early mobilization ability of postpartum mothers after Caesarean section was found with a p value of 0.693.

The ERACS method aims to accelerate post-operative mobilization and has been proven effective in controlling pain and speeding up the mobilization ability of postpartum mothers after a Cesarean section. The ERACS method for accelerating post-operative mobilization after a Cesarean section is considered more effective, resulting in reduced patient hospitalization time (Humaira *et al.,* 2022). This study is in line with the research by Prihatin and colleagues, where the statistical test using the Mann Whitney test showed a p value of ≤ 0.05, specifically 0.038, indicating a difference in mobilization acceleration in Cesarean delivery between the non-ERACS method and the ERACS method in the Obstetrics Room of RSUP DR Kariadi Semarang (Prihatin *et al*., 2023). This study is also in line with the research by Pujiwati and colleagues, 2023, where among 94 respondents, the results showed that researchers conducted a non-parametric Mann-Whitney test to determine if there were differences, resulting in a p value of 0.000, or < 0.05, , which means there is a difference in the duration of mobilization between the SC ERACS and Non-ERACS methods in patients who underwent Caesarean Section at Kartini General Hospital, Jakarta in 2022 (Pujiwati *et al.,* 2023).

Researchers argue that mobilization is very important for mothers after a Cesarean section to prevent complications. Prolonged total rest can increase the risk of muscle weakness and infection, leading to prolonged hospital stays. The application of ERACS methods helps accelerate the mobilization process for mothers, improves blood circulation, and reduces risks such as fever, abnormal bleeding, thrombosis, impeded involution, and excessive pain. With optimal mobilization, mothers can breastfeed soon and have the chance to go home faster from the hospital.

The researchers concluded that the ERACS method can help accelerate early mobilization capabilities in postpartum mothers after a Cesarean section within 2, 4, and 6 hours post Cesarean section. The reason postpartum mothers find it difficult to mobilize is due to still experiencing pain when moving, and during the first 2 hours, their legs feel heavy, making mobilization challenging. The reason postpartum mothers after ERACS are delayed in early mobilization is that they still feel pain when moving. On average, the implementation of mobilization in postpartum mothers after a Cesarean section (SC) using the ERACS method is faster than non-ERACS.

ERACS is a new breakthrough developed based on the concepts used in digestive surgery operations, known as ERACS (Enhanced Recovery After Surgery), which has been proven to reduce postoperative complications and the length of patient stay in hospitals. Therefore, with these advantages, the ERAS concept was further developed for surgical procedures in other fields, including mid wifery (Tika *et al*., 2022).

The limitation of this study is the imbalance in the number of respondents post ERACS and non-ERACS. Anesthetic Effects Not Specifically Assessed, the duration and type of anesthesia used in each patient were not analyzed as separate variables. Residual anesthetic effects in non-ERACS patients, which are generally longer-lasting, may be an important distinguishing factor in readiness for early mobilization, pain Not Included as an Assessment Variable. The level of pain experienced by patients

after cesarean section, both in the ERACS and non-ERACS groups, was not measured quantitatively, even though pain perception can influence motivation and ability to move.

4. Conclusion

There is a relationship between the ERACS method and the early mobilization capability of postpartum mothers in the An Nisa ward of RSU PKU Muhammadiyah Bantul with a strong bond category. It is recommended for mothers undergoing cesarean section to use the ERACS method and actively perform early mobilization to reduce surgical stress responses, enhance functional recovery, and accelerate healing. Because the limitation in this study is the imbalance in the number of ERACS and Non-ERACS respondents, it is recommended for future researchers to seek respondents with a balanced number.

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