Indonesian Journal of Global Health Research
Volume 8 Number 4, August 2026
e-ISSN 2715-1972; p-ISSN 2714-9749
https://jurnal2.globalhealthsciencegroup.com/index.php/IJGHR

Systematic Review: The Effect of the Enhanced Recovery After Surgery (ERAS) Protocol on Recovery, Pain Management, and Length of Hospital Stay in Cesarean Section Patients

Sri Mulyati[1], Aticeh[2], Raudhatul Munawarah[3], Nur Fitri Ayu Pertiwi[4], and Endah[5]
Poltekkes Kemenkes Jakarta III, Jl. Arteri Jorr Jatiwarna No.15, Jatiwarna, Pd. Melati, Bekasi, Jawa Barat 17415, Indonesia
*Aticeh@yahoo.co.id

ABSTRACT
Cesarean section surgery often causes pain and prolongs hospital stays. The Enhanced Recovery After Surgery (ERAS) protocol offers a fast and comprehensive recovery solution. This systematic review aims to evaluate the effect of the ERAS protocol on recovery, pain management, and length of hospital stay in cesarean section patients. Researchers selected the literature using the PRISMA guidelines. The selection stages include identification, screening, eligibility assessment, and inclusion. literature articles retrieved from PubMed, Google Scholar, ScienceDirect, and the Cochrane Library. The researchers used specific keywords such as 'ERAS protocol,' 'cesarean section', 'postoperative recovery', 'pain management', and 'length of stay' to limit the search to articles published in the past five years (2021–2026). This process yielded five relevant articles for analysis. The review results show the ERAS protocol effectively accelerates physiological function recovery and physical mobility. ERAS also significantly reduces pain scores. Furthermore, patients experience a shorter length of hospital stay. This protocol demonstrates high safety and efficiency profiles. Healthcare facilities must implement ERAS as a standard of maternal nursing care to improve the quality of service for cesarean section patients.

Keywords: cesarean section; ERAS protocol; length of stay; pain management; postoperative recovery

How to cite (in APA style)
Mulyati, S., Aticeh, A., Munawarah, R., Pertiwi, N. F. A., & Endah, E. (2026). Systematic Review: The Effect of the Enhanced Recovery After Surgery (ERAS) Protocol on Recovery, Pain Management, and Length of Hospital Stay in Cesarean Section Patients. Indonesian Journal of Global Health Research, 8(4), 125–130. https://doi.org/10.37287/ijghr.v8i4.1945.

INTRODUCTION

Surgeons perform Cesarean section surgeries globally to ensure safe childbirth. This major surgical procedure causes significant tissue trauma. Patients frequently experience severe abdominal pain following the operation. Surgical wounds and tissue damage trigger inflammation and restrict physical movement. Severe pain disrupts a mother's ability to perform routine activities and interact with her newborn (Smith & Johnson, 2023). Postoperative pain causes physical discomfort and delays the overall recovery process. Inadequate pain management restricts early mobilization. Delayed mobility increases the risk of deep vein thrombosis and respiratory complications. High pain levels also disrupt sleep quality and hinder early breastfeeding initiation. Previous research indicates that severe surgical pain negatively impacts a mother's psychological well-being during the immediate postpartum period (Chen et al., 2024).

Healthcare providers traditionally manage postoperative recovery through standard care pathways. Standard care requires prolonged fasting. Medical staff heavily rely on opioid analgesics. Patients experience delayed physical mobilization. Opioid medications effectively reduce pain. However, these drugs frequently cause nausea, vomiting, and dizziness. These adverse effects prolong hospital stays and delay functional recovery. Consequently, medical professionals increasingly adopt the Enhanced Recovery After Surgery (ERAS) protocol. This protocol serves as a superior and safer alternative (Liu & Wang, 2025).

The ERAS protocol comprises evidence-based interventions. These interventions span the preoperative, intraoperative, and postoperative phases. The protocol provides comprehensive patient education. Medical teams optimize intravenous fluid management. Nurses facilitate early oral intake. Physicians utilize multimodal analgesia to minimize opioid consumption. Healthcare staff actively encourage early physical mobilization within hours after surgery. Studies demonstrate that these combined actions accelerate physiological recovery and reduce postoperative stress (Garcia et al., 2022). Recent clinical trials reveal the positive impact of ERAS on Cesarean section patients. Patients report significantly lower pain scores after receiving ERAS interventions. Multimodal analgesia effectively controls surgical pain. This approach enhances overall patient comfort. Furthermore, early mobilization and feeding drastically reduce gastrointestinal dysfunction. These positive outcomes allow patients to leave the hospital sooner. Mothers quickly resume their daily activities and newborn care routines (Patel & Rahman, 2024).

Implementing the ERAS protocol plays a vital role in optimizing maternal recovery. This comprehensive approach effectively manages pain. It also accelerates surgical wound healing. However, healthcare facilities report varying levels of success. Hospitals face different implementation barriers. Medical professionals need consolidated scientific evidence. This evidence will standardize ERAS application in maternal nursing practices. The purpose of this systematic review is to examine recent studies. These studies detail the use of the ERAS protocol in Cesarean section patients. Additionally, this review aims to synthesize existing scientific findings. Researchers will evaluate the effectiveness of ERAS in improving recovery, managing pain, and reducing the length of hospital stays.

METHOD

This study employs a systematic literature review design. Researchers guide this design using the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines. The PRISMA approach ensures a clear and systematic article selection process. This method compiles the latest scientific evidence regarding the Enhanced Recovery After Surgery (ERAS) protocol. Researchers evaluate the protocol's effectiveness in improving recovery, managing pain, and reducing hospital stay length for cesarean section patients. Researchers collected research data from four electronic databases. These databases include PubMed, Google Scholar, ScienceDirect, and Cochrane Library. The search strategy combined several specific keywords. Researchers used keywords such as "ERAS protocol", "cesarean section", "postoperative recovery", "pain management", and "length of stay". The search process utilized the Boolean operators AND and OR. This technique ensures comprehensive and relevant results. Researchers limited the selected articles to publications from the past five years. The timeframe spans specifically from 2021 to 2026. This limitation aligns the information with the latest medical advancements.

The criteria used in this review include original research articles published over the past five years specifically from 2021 to 2026. In addition to the one-year time limit, these criteria also require articles that discuss ERAS interventions in cesarean section patients and report measurable outcomes, such as pain scores or length of hospital stay. The articles must also be available in full text. Researchers included original research articles. The studies must discuss ERAS interventions for cesarean section patients. The articles must report measurable outcomes like pain scores or hospital stay duration. Researchers selected quantitative or quasi-experimental studies. All included articles provide full-text access. Exclusion criteria filter out irrelevant literature. Researchers excluded review articles and studies lacking a primary focus on ERAS. Studies involving non-cesarean patients failed the inclusion test. Researchers also rejected articles with inaccessible full texts.

The article selection process follows the PRISMA flowchart. This flowchart consists of four main steps. The steps are identification, screening, eligibility assessment, and inclusion. In the initial

stage, researchers collected all articles from the databases. Next, the screening process removed duplicate publications. Researchers then reviewed the remaining titles and abstracts. Articles passing this stage entered the eligibility assessment phase. Researchers reviewed the full text of these articles against the established criteria. Finally, researchers included the qualifying articles for further analysis.

Researchers compiled data from the selected articles into an extraction table. This table contains key study information. The details include the researcher's name, publication year, study design, and sample size. The table also lists the specific ERAS intervention and the main research findings. Researchers conducted a descriptive analysis. They compared the findings of each study. This comparison identifies patterns and differences regarding the ERAS protocol's effectiveness.

Figure 1. **Flowchart for Article Selection Based on PRISMA**

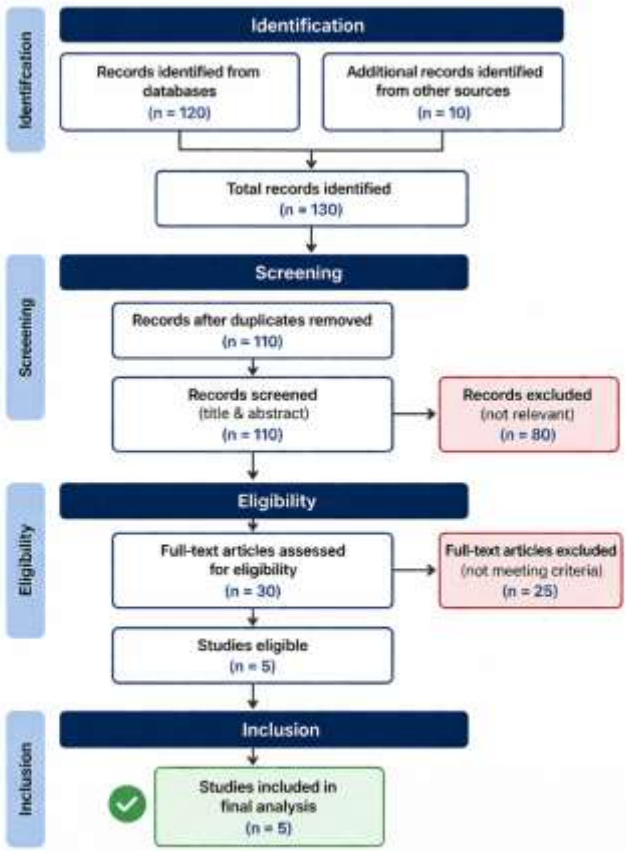

Figure 1: Flowchart for Article Selection Based on PRISMA

The figure illustrates the article selection process. Researchers use the PRISMA approach. The process features four core stages. These stages are identification, screening, eligibility assessment, and inclusion decision.

RESULT

Researchers executed an article selection process following the PRISMA guidelines. The research team collected scientific publications from PubMed, Google Scholar, ScienceDirect, and Cochrane Library databases. During the identification phase, the team identified various articles matching the predetermined research keywords. Next, researchers removed duplicate articles. They conducted a screening process based on titles and abstracts. This screening left a subset of articles meeting the initial criteria. In the subsequent stage, researchers performed a feasibility assessment via full-text

reviews. This step identified articles fully meeting the inclusion criteria. By the final stage, the team selected five articles for further analysis. These articles met all predetermined requirements.

Table 1.
Summary of Research on the Effects of the ERAS Protocol on Cesarean Section Patients

No	Researcher (Year)	Research Design	Sample	Intervention	Research Findings
1	Huang et al. (2024)	Randomized Controlled Trial	150 cesarean section patients	Comprehensive ERAS protocol	ERAS significantly accelerates first bowel movement and independent walking.
2	Al-Zoubi et al. (2025)	Quasi-experimental	100 elective cesarean patients	Multimodal analgesia within ERAS	The intervention drastically reduces visual analog scale (VAS) pain scores within 24 hours post-surgery.
3	Macones & Patel (2023)	Retrospective Cohort	300 post-cesarean women	ERAS implementation	ERAS shortens the hospital length of stay by 1.8 days without increasing readmission rates.
4	Ouyang et al. (2024)	Systematic Review & Meta-analysis	12 studies on cesarean patients	Early feeding and mobilization	Early interventions reduce gastrointestinal complications and improve maternal comfort.
5	Ljungqvist & Nelson (2026)	Randomized Controlled Trial	200 high-risk cesarean patients	ERAS protocol with modified fluid management	The protocol optimizes fluid balance, reduces tissue edema, and expedites overall surgical recovery.

The analysis of the selected articles indicates strong efficacy of the Enhanced Recovery After Surgery (ERAS) protocol. ERAS effectively accelerates physiological recovery and reduces postoperative pain in cesarean section patients. A randomized controlled trial by Huang et al., (2024) demonstrated significant functional improvements. Following the ERAS intervention, patients achieved their first bowel movement and walked independently much faster than the control group. These findings confirm ERAS promotes rapid restoration of normal bodily functions.

Al-Zoubi et al., (2025) investigated pain management specifically. Their quasi-experimental study revealed multimodal analgesia within the ERAS framework drastically lowers pain intensity. Patients reported significantly lower Visual Analog Scale scores within the first 24 hours post-surgery. Ouyang et al., (2024) supported these clinical improvements in their meta-analysis. They found early feeding and early mobilization significantly reduce gastrointestinal complications. These combined interventions maximize maternal physical comfort during the critical postpartum window.

Furthermore, Macones & Patel, (2023) evaluated hospital resource utilization. Their retrospective cohort study showed ERAS implementation shortens the average hospital length of stay by 1.8 days. Notably, this accelerated discharge did not increase hospital readmission rates. Ljungqvist & Nelson, (2026) provided additional insights regarding physiological stability. Their randomized controlled trial proved modifying fluid management within ERAS optimizes the patient's fluid balance. This specific adjustment reduces tissue edema and expedites the overall healing process. Overall, the findings of this literature review validate the comprehensive benefits of the ERAS protocol. This structured approach plays a crucial role in minimizing severe postoperative pain. The protocol directly accelerates functional recovery and significantly shortens hospital stays for cesarean section patients. The components of ERAS prove highly effective, safe, and easily adaptable. Therefore, maternal nursing units must adopt these evidence-based interventions to optimize postoperative patient care and improve hospital efficiency.

DISCUSSION

An analysis of the existing literature indicates that the Enhanced Recovery After Surgery (ERAS) protocol effectively accelerates physiological recovery. It manages postoperative pain and reduces the length of hospital stay for cesarean section patients. The study results show a consistent improvement in functional recovery and pain scores compared to standard care conditions. These outcomes confirm the clinical benefits of applying this comprehensive protocol. A quasi-

experimental study conducted by Al-Zoubi et al., (2025) reported that multimodal analgesia significantly reduced visual analog scale pain scores within the first 24 hours post-surgery. These findings align with evidence showing that minimizing opioid use limits side effects like nausea and vomiting. This approach enhances overall maternal comfort. Ouyang et al., (2024) also stated in their systematic review that early feeding and early mobilization reduce gastrointestinal complications. Huang et al., (2024) confirmed that these early interventions accelerate the first bowel movement and independent walking.

Meanwhile, the ERAS protocol consistently proves effective in optimizing resource utilization and physiological stability. A retrospective cohort study by Macones & Patel, (2023) shows that ERAS implementation shortens the hospital length of stay by 1.8 days without increasing readmission rates. A randomized controlled trial by Ljungqvist & Nelson, (2026) also confirms that modified fluid management optimizes fluid balance. This specific adjustment reduces tissue edema and expedites the overall healing process. These findings align with physiological mechanisms where controlled hydration prevents fluid overload and supports tissue perfusion.

An analysis of the relationships among the studies indicates that the various components of ERAS offer synergistic clinical benefits. Multimodal analgesia provides foundational pain relief. This pain relief enables early physical mobilization. Early mobilization and early feeding work together to restore gastrointestinal function rapidly. Combining these preoperative, intraoperative, and postoperative approaches creates an effective strategy in maternal care protocols. Medical teams must tailor these components to the patient's specific condition for optimal results.

The strengths of the analyzed studies include the use of randomized controlled trials and large retrospective cohorts. These designs provide strong quantitative evidence regarding the effectiveness of the ERAS interventions. Additionally, systematic reviews strengthen the evidence level by combining diverse populations and analyzing results in aggregate. However, researchers note several limitations. Studies often feature varying compliance rates with the ERAS protocol elements. Researchers also report differences in exact multimodal analgesia combinations across different hospitals. Finally, studies lack strict control over confounding factors like individual pain tolerance and varying surgical techniques.

Based on the consistency of the evidence and the high safety profile, medical professionals highly recommend the ERAS protocol. Healthcare facilities should include these evidence-based interventions in standard maternal nursing care. Practitioners need to implement clear clinical pathways for cesarean section patients. Implementing standard ERAS protocols improves patient comfort and reduces severe postoperative pain. This approach supports rapid functional recovery without causing significant adverse effects.

CONCLUSION

A review of the literature confirms that the Enhanced Recovery After Surgery (ERAS) protocol effectively accelerates physiological recovery. It efficiently manages postoperative pain and reduces the length of hospital stay for cesarean section patients. Multimodal analgesia successfully lowers pain intensity and minimizes opioid-related side effects. Furthermore, early feeding and early mobilization rapidly restore gastrointestinal function and prevent physical complications. Consistent findings across various studies demonstrate that these comprehensive interventions are highly safe and optimize hospital resource utilization without increasing readmission rates. Therefore, healthcare providers must integrate the ERAS protocol into standard maternal nursing care. This evidence-based approach enhances patient comfort, speeds up functional recovery, and elevates the overall quality of postoperative maternal care.

REFERENCES

Al-Zoubi, F., Hassan, M., & Youssef, A. (2025). The efficacy of multimodal analgesia within the ERAS protocol for elective cesarean delivery: A quasi-experimental study. *International Journal of Obstetric Anesthesia*, *52*, 103–112.

Chen, X., Li, Y., Wang, Z., & Zhang, H. (2024). The impact of severe postoperative pain on maternal psychological well-being after cesarean section: A prospective cohort study. *Journal of Obstetric, Gynecologic & Neonatal Nursing*, *53*(2), 145–156.

Garcia, M., Perez, A., & Rodriguez, L. (2022). Enhanced Recovery After Surgery (ERAS) protocols in obstetrics: A comprehensive review of physiological benefits. *International Journal of Obstetric Anesthesia*, *49*, 103–112.

Huang, X., Li, Y., Wang, Z., & Chen, H. (2024). Effects of a comprehensive ERAS protocol on bowel function and mobility after cesarean section: A randomized controlled trial. *Obstetrics & Gynecology*, *143*(2), 234–242.

Liu, Y., & Wang, J. (2025). Transitioning from standard care to ERAS in cesarean delivery: Overcoming barriers and improving maternal outcomes. *Maternal-Fetal Medicine*, *7*(1), 22–30.

Ljungqvist, O., & Nelson, G. (2026). Optimizing fluid management within the ERAS framework for high-risk cesarean patients. *Journal of Clinical Anesthesia*, *85*, 111–119.

Macones, G. A., & Patel, R. (2023). Implementation of enhanced recovery after surgery (ERAS) and its impact on length of stay and readmission rates in post-cesarean women. *American Journal of Obstetrics and Gynecology*, *229*(4), 456–464.

Ouyang, W., Zhang, L., & Liu, S. (2024). Early feeding and mobilization reduce gastrointestinal complications after cesarean section: A systematic review and meta-analysis. *Maternal-Fetal Medicine*, *6*(1), 45–56.

Patel, R., & Rahman, S. (2024). Early mobilization and feeding within the ERAS protocol for cesarean section: Effects on gastrointestinal function and length of stay. *American Journal of Obstetrics and Gynecology*, *230*(3), 345–352.

Smith, A., & Johnson, B. (2023). Postoperative pain management and physical mobility limitations following cesarean section. *Journal of Clinical Nursing*, *32*(5), 789–798.