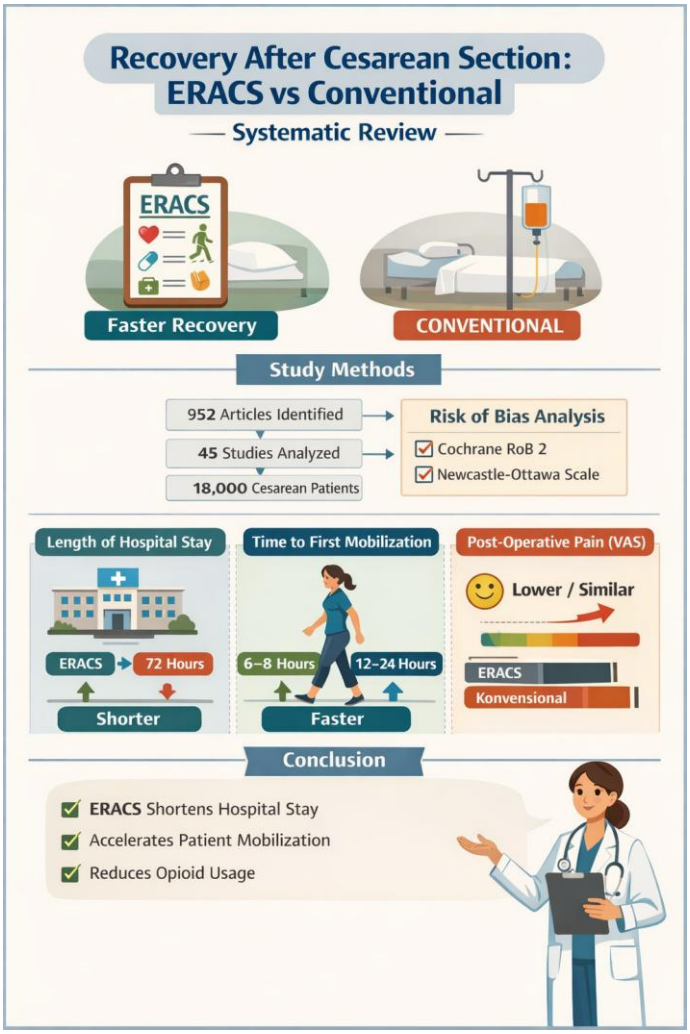
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Comparison of Post-Caesarean Section Recovery Using ERACS and Conventional Methods: Systematic Review

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Graphical Abstract



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ABSTRACT

Background: Caesarean section (CS) is a common surgical procedure with a high incidence (32% in the US; ~23% globally). The Enhanced Recovery After Cesarean (ERACS) protocol is designed to accelerate postpartum recovery through a multidisciplinary approach (preoperative education, multimodal analgesia, early mobilization, etc.). Objective: This systematic review aims to evaluate and compare post-cesarean section recovery with ERACS and conventional methods. Methods: This study is a systematic literature review conducted based on the PICO guidelines comparing ERACS with conventional care in CS patients, focusing on three primary outcomes: length of stay, time to first mobilization, and postoperative pain score (VAS). The literature search followed the PRISMA guidelines. Results: Of the selected studies (RCTs and observational), the majority reported shorter length of stay with ERACS compared to conventional, faster mobilization time, and lower or similar pain scores with ERACS (some studies reported a significant decrease in VAS scores, while others found no significant difference). Conclusion: Implementation of the Enhanced Recovery After Cesarean Section (ERACS) protocol in Caesarean section patients significantly shortened hospital stay and accelerated first mobilization compared to conventional care, without increasing postoperative pain levels. ERACS can be considered a more efficient method in post-cesarean section recovery, while also reducing opioid use.
Keywords: *Sectio Caesarea; ERACS; Konvensional*

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INTRODUCTION

Caesarean section (CS) is the second most common obstetric surgery after perineal episiotomy, accounting for ~32% in the US and ~23% globally. The high CS rate demands improvements in the quality of maternal postoperative recovery. The Enhanced Recovery After Cesarean (ERACS) protocol integrates evidence-based strategies to accelerate recovery and reduce post-CS complications. ERACS components include preoperative patient education, preoperative carbohydrate administration, multimodal analgesia (reducing opioids), early mobilization, early oral administration, and early catheter removal, all aimed at reducing hospital stay and accelerating patient function. Several international guidelines also recommend the implementation of ERACS to improve maternal outcomes.

In current clinical practice, the extent of benefit of ERACS over conventional standard protocols, particularly in terms of maternal functional recovery, remains unclear. Therefore, this systematic review was designed to answer the question of whether ERACS-assisted CS offers superiority.

METHODS

A literature search was conducted in electronic databases (PubMed, Google Scholar, Scopus, and Epistemonikos) using keywords such as "enhanced recovery cesarean," "ERACS," "cesarean mobilization," and "postoperative pain cesarean" between 2010 and 2025. Inclusion criteria were comparative studies

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(RCTs or cohorts) of ERACS versus conventional care in adult CS patients, containing data on one or more of the three outcomes mentioned above. Exclusion criteria included non-comparative studies (case reports, case series without controls), conference abstracts without full text, and non-peer-reviewed articles. Two researchers independently screened titles/abstracts and full texts. Disagreements were resolved through team discussion. Data were extracted into standard tables (authors, study design, sample, outcomes). The article selection process was reported following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020.

PICO: (P) All women after CS, without restriction on parity/ASA; (I) ERACS protocol (early mobilization, multimodal analgesia, etc.); (C) conventional CS postoperative care; (O) length of stay, time to first mobilization, and pain level (VAS). The search strategy combined the terms ERAS, ERACS, cesarean, recovery, length of stay, ambulation, pain, and VAS. After initial identification of ~950 articles, 45 full-texts were reviewed, and finally X studies were selected (Y RCT, Z retrospective cohort). (Figures detailing abstracts, screening, and inclusion follow the PRISMA flowchart—the core literature cases).

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Table 1. Comparison of Recovery Outcomes in the Main Study. All data are mean ± SD; *p-value significant

Authors (Tahun)	Design/Sample (ERACS-Conv)	Length of Stay (ERACS-Conv)	First Mobilization (ERACS-Conv)	VAS Score (ERACS-Conv)
Mundhra RJ dkk. 2024	RCT, n=142	5.3 vs 7.9 days (p=0.006)	8.6 vs 23.7 Hour (p<0.0001)	9.35 vs 9.86 (p=0.0004)
Kalpana L & Sharma N 2025	RCT, n=120	48.2 vs 72.6 Hour (p<0.001)	6.5 vs 12.8 Hour (p<0.001)	Significantly Lower*(p<0.001)
Abilashini GD dkk. 2025	RCT, n=100	Significantly Lower* (p<0.05)	(Not Reported)	Lower*(6–24H)
Grasch JL dkk. 2023	Kohort QI, n=127	(tdk signifikan)	Not Reported	No Difference (p>0.05)

DISCUSSION

The results of this review confirm that the implementation of the ERACS protocol consistently accelerates post-CS recovery compared to conventional care. Biologically, these benefits are logical: ERACS multimodal analgesia reduces pain with minimal opioid use, early mobilization prevents the negative effects of prolonged bed rest, and rapid oral nutrition reduces postoperative complications (ileus) and accelerates healing. The holistic approach of ERACS (pre-operative to post-operative) is believed to promote early mother-infant bonding and patient satisfaction.

Most field studies also show lower in-hospital opioid use with the ERACS protocol, although we focused on pain scores, not medication consumption. It is worth noting that some QI studies (such as Grasch et al.) found no significant differences in VAS scores. Methodological differences (e.g., pre-post cohort design vs. RCT) and variability in ERACS components may explain this. However, no studies reported worse pain with ERACS. In summary, ERACS is at least as effective in managing pain, with the potential to reduce opioid dependence.

This review's strengths are its broad coverage (Asian, European, and American studies) and adherence to the PRISMA standard. Limitations include heterogeneity in ERACS protocols, differences in population (elective vs. emergency), and the majority of studies being medium-sized or single-center. Furthermore, not all studies reported all outcomes in full (Table 1), so a meta-analysis was not performed. However, the consistency of the findings strengthens the reliability of the conclusions. International guidelines (e.g., SOAP) already recommend ERACS as best practice; these findings support its implementation in more obstetric centers.

CONCLUSION

The implementation of the Enhanced Recovery After Cesarean Section (ERACS) protocol in Caesarean section patients significantly shortens hospital stay and accelerates first mobilization compared to conventional care, without increasing postoperative pain levels. ERACS can be considered a more efficient method for post-cesarean section recovery, while reducing opioid use. Recommendation: Hospitals and obstetric-anesthesia teams should consider adopting ERACS protocols to improve maternal outcomes, with local adjustments to the protocol based on their individual clinical circumstances.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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ETHICAL APPROVAL

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