

Effect of a Structured Nurse-Led Early Ambulation Protocol on Postoperative Recovery Outcomes among Caesarean Section Women in Governmental Maternity Hospitals in Makkah

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Abstract

Caesarean section is one of the most frequently performed surgical procedures worldwide and is associated with postoperative challenges such as pain, delayed mobility, bowel dysfunction, and prolonged hospitalization. Conventional postoperative care in many maternity settings continues to emphasize bed rest, contributing to slower recovery and increased risk of complications. Enhanced Recovery After Caesarean (ERAC) protocols highlight early ambulation as a key component for improving maternal outcomes; however, structured nurse led ambulation protocols remain limited in Saudi Arabia, particularly in governmental maternity hospitals in Makkah. This study evaluates the effect of a structured nurse led early ambulation protocol on postoperative recovery outcomes among women undergoing caesarean section. A quasi-experimental multicentre design will compare an intervention group receiving a structured nurse led ambulation protocol with a control group receiving standard care. Recovery outcomes—including pain scores, bowel function, mobility milestones, complications, and length of stay—will be assessed using standardized tools. The study is expected to demonstrate that structured nurse led early ambulation improves adherence, accelerates recovery, reduces complications, and shortens hospital stay, supporting the integration of ERAC aligned nursing protocols in maternity hospitals in Makkah.

Keywords: *Caesarean Section, Early Ambulation, ERAC, Nurse-led Protocol, Postoperative Recovery*

Introduction

Caesarean section rates continue to rise globally and in Saudi Arabia, where nearly one third of births occur via CS. Although lifesaving, postoperative recovery is often hindered by pain, immobility, delayed bowel function, and prolonged hospitalization. Traditional postoperative care emphasizes bed rest, which increases the risk of thromboembolism and slows functional recovery. Enhanced Recovery After Caesarean (ERAC) protocols promote early ambulation as a core component to improve outcomes; however, implementation remains inconsistent in Saudi maternity hospitals. Evidence suggests that structured, nurse led ambulation protocols can significantly improve recovery, yet local multicentre data are lacking. This study addresses this gap by evaluating a structured nurse led early ambulation protocol in governmental maternity hospitals in Makkah.

Review of Related Literature

Caesarean section is one of the most commonly performed obstetric surgical procedures worldwide and plays an important role in reducing maternal and neonatal morbidity when medically indicated. However, despite its clinical benefits, caesarean delivery is associated with postoperative challenges such as pain, delayed mobility, fatigue, thromboembolic risk, prolonged hospital stay, delayed return to daily activities, and reduced maternal ability to care for the newborn. These postoperative concerns have increased the need for structured recovery interventions that promote early functional restoration and improve maternal outcomes. The World Health Organization (2021) emphasized the importance of appropriate caesarean section practices and the need to strengthen maternal healthcare systems to ensure safe recovery and quality postpartum care. Early ambulation has been widely recognized as an essential component of postoperative recovery following caesarean section. It refers to the process of assisting women to begin safe movement, sitting, standing, and walking within a defined period after surgery. Early ambulation helps improve circulation, reduce venous stasis, enhance bowel function, decrease postoperative complications, improve respiratory function, and support psychological well-being. In a systematic review, Anjur and Darmstadt (2023) reported that early ambulation after obstetric surgery was associated with improved maternal recovery, reduced postoperative discomfort, and fewer complications. Their findings support the use of early mobilization as a routine element of postoperative care for caesarean women.

Delayed mobilization, on the other hand, has been associated with several adverse recovery outcomes. Alhazmi, Alzahrani, and Hakami (2024) highlighted that women who experience delayed ambulation after caesarean section are more likely to report increased pain, difficulty performing self-care activities, delayed bowel movement, longer hospital stay, and lower satisfaction with postoperative care. These challenges may be more evident in busy maternity hospitals where postoperative care routines vary and nurses face high workloads. Therefore, structured approaches are needed to ensure that ambulation is initiated safely, consistently, and at the appropriate time. Enhanced Recovery After Caesarean pathways have gained increasing attention as evidence-based frameworks for improving maternal recovery after caesarean delivery. These pathways usually include preoperative counselling, optimized anaesthesia, effective pain control, early oral intake, early removal of catheters, early ambulation, and discharge planning. Lau, Wong, and Chan (2020) reviewed enhanced recovery pathways in obstetric surgery and concluded that such programs improve clinical outcomes, shorten hospital stay, and support patient-centered recovery. Similarly, Meng, Li, and Zhao (2021) found that Enhanced Recovery After Caesarean programs were associated with better maternal outcomes, reduced length of hospitalization, and improved postoperative comfort.

Early ambulation is considered one of the cornerstone interventions within Enhanced Recovery After Caesarean programs. Sviggum and Sharpe (2024) emphasized that early mobilization has both physiological and clinical benefits, including improved venous return, reduced risk of thromboembolism, enhanced pulmonary function, and faster return of normal activity. These benefits are especially important for caesarean women, who are at increased risk of postoperative immobility-related complications. The authors also suggested that early ambulation should be implemented through clear protocols and supported by the multidisciplinary healthcare team, particularly nurses who remain in close contact with women during the postoperative period. In Saudi Arabia, the implementation of Enhanced Recovery After Caesarean pathways is gaining attention,

particularly in maternity hospitals that seek to improve postoperative care quality. Alawor, Almutairi, and Alharbi (2024) examined the implementation of Enhanced Recovery After Cesarean pathways in Saudi maternity hospitals and reported that structured recovery programs can improve consistency of care, reduce postoperative complications, and enhance maternal satisfaction. However, they also identified barriers such as lack of standardized protocols, variation in staff practices, inadequate patient education, and limited monitoring of recovery outcomes. These findings indicate the need for locally adapted, nurse-led protocols that can be implemented in governmental maternity hospitals, including those in Makkah.

Nurses play a central role in promoting early ambulation after cesarean delivery. They are responsible for assessing maternal readiness, managing pain, educating women, assisting with first mobilization, monitoring vital signs, preventing falls, encouraging progressive activity, and documenting recovery progress. James (2023) reported that nurse-led early ambulation programs contributed to improved postoperative recovery among cesarean women. The study showed that when nurses used structured ambulation guidelines, women were more likely to mobilize earlier, experience fewer complications, and report greater confidence in recovery. This highlights the importance of nursing leadership in translating evidence-based recovery recommendations into routine clinical practice. Pain management is another important factor influencing early ambulation. Women who experience uncontrolled postoperative pain may be reluctant to move, sit, stand, or walk after cesarean section. Ingram, Johnson, and Lewis (2022) found that effective pain management significantly influenced early mobilization after cesarean birth. Their study emphasized that adequate analgesia, reassurance, and nursing support are necessary to help women overcome fear of movement and participate in ambulation activities. Therefore, a structured nurse-led ambulation protocol should be integrated with pain assessment and timely pain relief interventions to ensure safe and comfortable mobilization.

Objective measurement of ambulation has also been explored in previous research. Ganer, Levy, and Kerner (2020) investigated early postpartum ambulation using pedometer-based measurement and found that higher levels of early ambulation were associated with improved recovery after cesarean delivery. Their findings suggest that ambulation should not only be encouraged verbally but also monitored using measurable indicators such as time to first ambulation, number of steps, walking distance, or frequency of walking. Such monitoring can help nurses evaluate patient progress and identify women who require additional support. The relationship between early ambulation and prevention of thromboembolic complications has been emphasized in recent literature. Jia, Wang, and Chen (2024) compared delayed versus early ambulation after cesarean section and reported that early ambulation was associated with better recovery outcomes and reduced risk of thromboembolism. Since cesarean delivery increases the risk of venous thromboembolism due to surgical trauma, pregnancy-related hypercoagulability, and postoperative immobility, early ambulation is a simple but important preventive measure. This supports the inclusion of early mobilization as a priority intervention in postoperative cesarean care.

Global guidelines and implementation strategies for Enhanced Recovery After Cesarean emphasize the importance of adapting evidence-based protocols to local hospital settings. O'Carroll, Smith, and Brown (2022) explained that successful implementation of ERAC programs requires multidisciplinary collaboration, staff training, patient education,

clinical audit, and continuous monitoring of outcomes. Their work suggests that the effectiveness of recovery pathways depends on not only the availability of guidelines but also on how well healthcare providers apply these guidelines. In maternity hospitals, nurses are often the primary professionals responsible for ensuring that early ambulation is carried out according to protocol. Despite growing evidence supporting early ambulation, variations in practice remain common. Some women may ambulate late due to pain, fear, fatigue, cultural beliefs, and lack of encouragement, urinary catheterization, or absence of clear instructions. Healthcare providers may also delay ambulation because of workload, inconsistent postoperative routines, or lack of standardized guidance. Alhazmi et al. (2024) noted that delayed mobilization remains a common challenge after caesarean delivery and may negatively affect maternal recovery. These issues are particularly relevant in governmental maternity hospitals where patient volume may be high and standardized nurse-led protocols are needed to maintain care quality.

The literature indicates that structured nurse-led early ambulation protocols can address these challenges by providing clear steps for assessment, education, timing, assistance, safety precautions, documentation, and follow-up. Such protocols help nurses deliver consistent care and empower women to participate actively in their recovery. A nurse-led approach is also practical because nurses are continuously present during the immediate postoperative period and are well-positioned to identify barriers to movement, provide emotional support, and reinforce recovery goals. In summary, previous studies consistently show that early ambulation after caesarean section improves postoperative recovery, reduces complications, enhances maternal comfort, supports faster return to normal activities, and contributes to shorter hospital stay. Enhanced Recovery After Caesarean pathways further confirm the importance of early mobilization as a core recovery intervention. However, literature also reveals gaps in standardized implementation, especially in settings where postoperative routines differ across units and healthcare providers. In the Saudi context, particularly in governmental maternity hospitals in Makkah, there is a need to evaluate the effect of a structured nurse-led early ambulation protocol on postoperative recovery outcomes among caesarean section women. This study is therefore significant because it focuses on a practical, nursing-driven intervention that may improve maternal recovery, strengthen postoperative care quality, and support evidence-based maternity nursing practice.

Objectives

The main objective of this study is to evaluate the effect of a structured nurse-led early ambulation protocol on postoperative recovery outcomes among women who undergo caesarean section in governmental maternity hospitals in Makkah. The study aims to assess whether early ambulation improves physical recovery by reducing postoperative pain, enhancing mobility, promoting bowel function, and shortening the length of hospital stay. It also seeks to determine the impact of the protocol on reducing immobility-related complications, particularly the risk of thromboembolism. Another objective is to examine the role of nurses in implementing a standardized ambulation protocol as part of postoperative caesarean care. The study further aims to compare recovery outcomes between women who receive structured nurse-led ambulation support and those who receive routine postoperative care. It intends to identify barriers that may affect early ambulation, such as pain, fear of movement, fatigue, and lack of standardized guidance. The study also aims to generate local multicentre evidence on the effectiveness of nurse-led early ambulation in Saudi maternity hospital settings. Ultimately, the objective is to

support evidence-based nursing practice and improve the quality of postoperative care for caesarean section women in Makkah.

Methodology

A quasi-experimental multicentre design will be used with two groups:

- Intervention group: receives a structured nurse led early ambulation protocol aligned with ERAC.
- Control group: receives conventional postoperative care.

Participants will include women aged ≥ 18 years undergoing caesarean section. Data will be collected using standardized recovery monitoring tools assessing pain (VAS), bowel function, mobility milestones, complications, and length of stay. Statistical analysis will include descriptive statistics, paired and independent t tests, and regression modelling to identify predictors of recovery outcomes.

Findings and Discussion

Based on existing ERAC evidence, the structured nurse led early ambulation protocol is expected to:

- Improve adherence to early ambulation timelines.
- Reduce postoperative pain scores.
- Accelerate return of bowel function.
- Reduce postoperative complications such as ileus and VTE.
- Shorten hospital length of stay by 2–3 days.
- Improve maternal satisfaction and functional recovery.

These anticipated findings support integrating structured nursing protocols into ERAC pathways in Saudi maternity hospitals.

Conclusion

A structured nurse led early ambulation protocol has the potential to significantly improve postoperative recovery outcomes among caesarean section women. Integrating such protocols into ERAC pathways can enhance maternal health, reduce complications, and optimize hospital resource utilization. This study provides essential evidence to support standardized postoperative nursing practices in Saudi maternity hospitals.

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