The Research of Medical Science Review
ISSN: 3007-1208 & 3007-1216 Volume 3, Issue 6, 2025

EFFECT OF LABOR CARE GUIDE ON FREQUENCY OF LOWER SEGMENT CESAREAN SECTION

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DOI: https://doi.org/10.5281/zenodo.23611171

Keywords
Labor Care Guide, Cesarean Section Rate, Obstetric Outcomes, Intrapartum Care, Labor Management, Maternal Health, Evidence-Based Obstetrics.

Article History
Received: 06 June 2025
Accepted: 22 June 2025
Published: 30 June 2025

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Abstract

Objective: *To compare the effect of the Labor Care Guide versus standard intrapartum care on the frequency of cesarean section among women in labor.*

Study Design: *Non-randomized comparative study*

Place & Duration of Study: *Department of Obstetrics & Gynecology, Ghurki Trust Teaching Hospital, Lahore w.e.f 01-12-2024 to 31-05-2025.*

Methodology: *After approval from the Ethical Review Committee, 124 women in active labor fulfilling inclusion criteria were enrolled from the Obstetrics & Gynecology Department of Ghurki Trust Teaching Hospital, Lahore. Written informed consent and detailed history were obtained. Participants were allocated into two groups: Group A (LCG, n=62) and Group B (standard care, n=62) using even–odd allocation method. All patients were monitored until delivery, and cesarean section outcome was recorded. Data were entered and analyzed using SPSS version 23.*

Results: *The study included 124 women with a mean age of 28.57 ± 4.58 years. Most were 18–30 years (62.9%), with mean gestational age 38.98 ± 1.39 weeks. Mean BMI was 26.09 ± 3.62 kg/m². Nulliparous women were 34.7% and multiparous 65.3%. Cesarean section rate was significantly lower in the intervention group (14.5% vs 32.3%, p=0.020). Group A consistently showed lower cesarean section rates than Group B across all subgroups; however, these differences did not reach statistical significance due to the small sample size in subgroup analyses.*

Conclusion: *The Labor Care Guide demonstrated a significant reduction in cesarean section rates compared with standard intrapartum care, while maintaining consistent outcomes across maternal subgroups. It proved to be an effective, structured tool for labor monitoring and decision-making, supporting safer obstetric practice and promoting evidence-based reduction of unnecessary operative deliveries.*

INTRODUCTION

Cesarean section (CS) is an essential obstetric procedure in modern clinical practice. It has become increasingly safe due to advancements in anesthesia, blood transfusion services, fluid and electrolyte management, surgical techniques, suture materials, and infection control measures, making it a lifesaving intervention for obstructed

ISSN: 3007-1208 & 3007-1216 Volume 3, Issue 6, 2025

labor and other obstetric complications.[1,2] However, despite its clinical utility, CS rates have risen globally, often beyond medically justified indications.[3] In some regions, more than half of pregnant women undergo cesarean delivery as a primary mode of birth. Although CS can be lifesaving, it is associated with increased maternal morbidity compared to vaginal delivery and carries risks that extend beyond the index pregnancy.[4,5]

CS is linked with both short- and long-term complications, including infection, hemorrhage, thromboembolic events, and anesthesia-related risks.[6,7] It also increases hospital readmissions and poses significant risks in subsequent pregnancies such as uterine rupture and placenta accreta spectrum disorders.[8] The risk of obstetric complications rises with each successive cesarean, highlighting the importance of limiting unnecessary procedures.[9] Overuse of CS has therefore become a major global concern requiring evidence-based strategies to optimize labor management and reduce avoidable surgical deliveries.[10]

The World Health Organization (WHO) recommends intrapartum monitoring using structured tools such as the partograph to improve decision-making during labor.[11] To strengthen labor surveillance, WHO developed the Labor Care Guide (LCG) in 2020 as an updated tool to improve documentation, support timely identification of abnormal labor, standardize clinical interventions, and enhance quality of intrapartum care. The LCG is also designed to reduce unnecessary interventions, promote respectful maternity care, and improve maternal and neonatal outcomes through evidence-based monitoring and timely clinical response.[12,13,14]

Pandey et al.[13] reported a significantly lower CS rate in the LCG group compared to standard care (1.5% vs. 17.8%; p<0.001). However, contrasting findings were reported by Pravallika et al.[14], where CS reduction was observed but not statistically significant (14.0% vs. 22.0%; p=0.370).[16] In another randomized controlled trial, Memon et al. also found a significant reduction in cesarean rates with LCG use (12.3% vs. 25.4%; p=0.007).[17] These inconsistent findings across studies suggest variability in effectiveness across settings and highlight the need for further local evidence. Therefore, this study was planned to evaluate the impact of the WHO Labor Care Guide on reducing cesarean section rates in our tertiary care setting.

METHODOLOGY

This was a non-randomized comparative study conducted in the Department of Obstetrics & Gynecology, Ghurki Trust Teaching Hospital, Lahore. The study was carried out over a period of six months, from 01-12-2024 to 31-05-2025, after approval of the synopsis from CPSP. A total of 124 pregnant women were included in the study. The sample size consisted of 62 women in each group, calculated with a 95% confidence level and 80% power of test, taking expected cesarean section rates of 1.5% in the Labor Care Guide group and 17.8% in the standard care group.[14] Non-probability consecutive sampling technique was used for patient recruitment.

Pregnant women aged between 18 and 40 years with singleton, live, cephalic pregnancies at 37 to 42 completed weeks of gestation and admitted in active labor were included in the study. Only women who provided informed written consent were enrolled. Women with previous cesarean section, multiple pregnancy, non-cephalic presentation, fetal anomalies, placenta previa, placental abruption, intrauterine fetal demise, or severe maternal medical disorders requiring elective cesarean section were excluded from the study.

After enrollment, participants were allocated into two groups using an even-odd basis, with the first patient assigned to Group A. Group A was managed using the WHO Labor Care Guide, while Group B received standard intrapartum care according to routine hospital protocol. The Labor Care Guide was used to ensure structured monitoring of labor progress, maternal condition, and fetal well-being, whereas standard care followed conventional clinical practice without structured LCG documentation. All participants

ISSN: 3007-1208 & 3007-1216 Volume 3, Issue 6, 2025

were followed from admission in active labor until delivery. The primary outcome was frequency of cesarean section, which was recorded as either present or absent. Data were collected on a pre-designed proforma by the researcher to minimize bias. All confounding variables were controlled through strict exclusion criteria.

The collected data were entered and analyzed using SPSS version 23. Numerical variables such as age, gestational age, and BMI were expressed as mean and standard deviation. Categorical variables including parity and cesarean section frequency were presented as frequencies and percentages. Chi-square test was applied to compare cesarean section rates between the two groups, and a p-value of ≤0.05 was considered statistically significant. Stratification was performed for age, BMI, and gestational age to control effect modifiers. Post-stratification chi-square test was applied to assess the impact of these variables on cesarean section frequency, with $p \leq 0.05$ taken as statistically significant.

RESULTS

The study included 124 women with a mean age of 28.57 ± 4.58 years. Most participants were in the younger age group, with 62.9% aged 18–30 years and the remaining 37.1% between 31–40 years. The mean gestational age was 38.98 ± 1.39 weeks, with 62.1% of women between 37–39 weeks of gestation and 37.9% at or beyond 40 weeks. The mean BMI was 26.09 ± 3.62 kg/m², with 42.7% of participants falling in the normal weight category, while 57.3% were classified as overweight or obese. In terms of parity, 34.7% of women were nulliparous, whereas the majority (65.3%) were multiparous. Data is given in Table I.

Baseline characteristics were comparable between both groups. Age distribution showed no significant difference between groups (p=0.265). Gestational age categories, BMI distribution, and parity status were also statistically similar in both groups (all p>0.05), indicating well-balanced baseline characteristics without any significant intergroup variation as given in Table II.

Cesarean section rates differed significantly between the two groups. Group B showed a higher frequency of cesarean delivery (32.3%) compared to Group A (14.5%), with a statistically significant difference (p=0.020), indicating reduced cesarean section rates in Group A. Data is given in Table III. Stratified analysis based on age, gestational age, parity, and BMI showed that Group A consistently had a lower frequency of cesarean section compared to Group B across all subgroups. However, the differences within each stratum did not reach statistical significance, likely due to the limited sample size in each subgroup analysis.

Table I: Demographic Characteristics of Women Included in the Study

Characteristics	Total (n=124)
Age (years)	28.57±4.58
• 18-30 years	78 (62.9%)
• 31-40 years	46 (37.1%)
Gestational Age	38.98±1.39
• 37-39 weeks	77 (62.1%)
• ≥40 weeks	47 (37.9%)
BMI (kg/m²)	26.09±3.62
• Normal Weight	53 (42.7%)
• Overweight / Obese	71 (57.3%)
Parity	
• Nulliparous	43 (34.7%)

• Multiparous	81 (65.3%)

Table II: Comparison of Baseline Characteristics between the Study Groups

Characteristics	Group A (n=62)	Group B (n=62)	p-value
Age (years)	28.08±4.46	29.06±4.67	0.233
• 18-30 years	42 (67.7%)	36 (58.1%)	0.265
• 31-40 years	20 (32.3%)	26 (41.9%)	
Gestational Age	39.10±1.36	38.85±1.42	0.336
• 37-39 weeks	36 (58.1%)	41 (66.1%)	0.355
• ≥40 weeks	26 (41.9%)	21 (33.9%)	
BMI (kg/m^2)	25.94±3.44	26.24±3.81	0.647
• Normal Weight	25 (40.3%)	28 (45.2%)	0.586
• Overweight / Obese	37 (59.7%)	34 (54.8%)	
Parity			
• Nulliparous	21 (33.9%)	22 (35.5%)	0.850
• Multiparous	41 (66.1%)	40 (64.5%)	

Chi Square test/ Independent sample t test, taking p-value ≤0.05 as significant.

Table III: Comparison of Frequency Cesarean Section between the Groups

Characteristics	Group A (n=62)	Group B (n=62)	p-value
Cesarean Section			
• Yes	9 (14.5%)	20 (32.3%)	0.020
• No	53 (85.5%)	42 (67.7%)	

Chi Square test, taking p-value ≤0.05 as significant.

DISCUSSION

Cesarean section rates remain a major concern in obstetric practice, contributing to increased maternal risk and healthcare burden. Standard care has long been used for intrapartum management; however, its effectiveness in consistently reducing cesarean delivery rates remains controversial in the literature.[16,17] In contrast, the Labor Care Guide (LCG) has been introduced as a structured, evidence-based approach to improve labor monitoring and decision-making.[18] Despite its proposed benefits, existing studies show inconsistent results regarding its impact on cesarean reduction.[14,15] Therefore, this study was designed to compare the effectiveness of LCG versus standard care in reducing cesarean section rates and improving obstetric outcomes.

The mean age in the present study was 28.57 ± 4.58 years, which is comparable to previously reported studies evaluating the Labor Care Guide (LCG). Jabbar et al.[19] reported a slightly lower mean age in the LCG group (26.8 ± 4.1 years), while Memon et al.[20] observed a similar mean age of 27.9 ± 4.3 years in the intervention arm. Pravalika et al.[15] also demonstrated comparable age distributions between study groups, with no statistically significant differences. Overall, these findings indicate that the study population in the present research is consistent with previously published cohorts.

The mean gestational age in the current study was 38.98 ± 1.39 weeks, which is closely aligned with the gestational age reported by Jabbar et al.[19] (38.4 ± 0.9 weeks in LCG group) and Memon et al.[20] (38.5 ± 0.6 weeks in LCG group). These values

indicate that participants across studies were predominantly term pregnancies with minimal inter-study variation, supporting comparability of obstetric profiles.

In terms of parity, the present study included 34.7% nulliparous and 65.3% multiparous women, which is broadly consistent with prior literature. Jabbar et al.[19] reported a nearly similar distribution (54% vs 52% parity-related grouping), while Memon et al.[20] observed nulliparity in 55.4% of the LCG group. Pravalika et al.[15] also demonstrated comparable parity distribution between study groups (p=0.65), further supporting baseline homogeneity across studies.

Regarding cesarean section outcomes, the present study demonstrated a significantly lower cesarean rate in the LCG group (14.5%) compared to the standard care group (32.3%) (p=0.020). This finding is consistent with Jabbar et al.[19], who reported a lower cesarean rate in the LCG group (12.7%) compared to standard care (23.9%). Similarly, Memon et al.[20] demonstrated cesarean rates of 12.3% versus 25.4% (p=0.007), showing a comparable reduction. A more pronounced reduction was observed in Pandey et al.[15], where cesarean rates decreased to 1.5% in the LCG group compared to 17.8% in controls (p=0.0001), indicating an even stronger effect of structured labor monitoring.

Stratified analysis in the present study showed a consistent trend of lower cesarean section rates in the LCG group across all subgroups of age, gestational age, BMI, and parity; however, these differences did not reach statistical significance, likely due to limited sample size and reduced subgroup power. Similar patterns of consistent but non-significant subgroup effects have also been observed in earlier studies.

Overall, the present findings are in strong agreement with existing literature, collectively demonstrating that the Labor Care Guide is associated with reduced cesarean section rates without compromising maternal or fetal safety. Variations in effect magnitude across studies may be attributed to differences in sample size, clinical settings, and adherence to LCG protocols, but the overall direction of benefit remains consistent.

The strength of this study lies in its comparative design, adequate sample size, and standardized intrapartum monitoring using the Labor Care Guide, ensuring reliable assessment of cesarean section outcomes. However, limitations include a single-center setting and relatively small subgroup numbers, which may affect generalizability and statistical power in stratified analysis. Future studies should include multicenter randomized trials with larger populations and longer follow-up to validate these findings. Additionally, further research is needed to explore maternal satisfaction, neonatal outcomes, and cost-effectiveness of LCG implementation in diverse clinical settings.

CONCLUSION

The Labor Care Guide demonstrated a significant reduction in cesarean section rates compared with standard intrapartum care, while maintaining consistent outcomes across maternal subgroups. It proved to be an effective, structured tool for labor monitoring and decision-making, supporting safer obstetric practice and promoting evidence-based reduction of unnecessary operative deliveries.

PATIENT'S CONSENT

Informed written consent was obtained from each study subject

CONFLICT OF INTEREST

The authors declared no conflict of interest.

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