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Impact of implementing the WHO labour care guide on caesarean section rate, labour progress monitoring, and neonatal outcomes in a tertiary care setting

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Abstract
Background: Unnecessary caesarean section (CS) and suboptimal labour monitoring remain important challenges in maternity care. The World Health Organization (WHO) Labour Care Guide (LCG) was introduced as a next-generation tool to support individualized, woman-centred intrapartum care and to improve clinical decision-making beyond rigid partograph thresholds.
Objective: To evaluate the impact of implementing the WHO LCG on caesarean section rate, labour progress monitoring, and neonatal outcomes in a tertiary care setting.
Materials and Methods: A tertiary-care observational cohort study was conducted among term, low-risk women admitted in active labour (≥5 cm cervical dilatation) and monitored using the WHO LCG. Data were recorded using structured labour monitoring documentation and analysed using descriptive statistics (n, %), with 95% confidence intervals for key proportions.
Results: A total of 105 women were included. The majority were primigravida (76.2%). Labour onset was spontaneous in 52.4% and induced in 47.6%. Normal vaginal delivery occurred in 90.5% (95% CI: 83.4-94.7), instrumental delivery in 1.9% (95% CI: 0.5-6.6), and caesarean section in 7.6% (95% CI: 3.9-14.3). The most common indication for CS was fetal distress (62.5%), followed by cephalopelvic disproportion (25.0%) and deep transverse arrest (12.5%). Neonatal outcomes showed respiratory distress in 6.7% (95% CI: 3.3-13.1) and low Apgar score in 10.5% (95% CI: 6.0-17.7). Overall findings suggest that LCG-based monitoring was feasible in a tertiary setting and was associated with a high vaginal birth rate and acceptable neonatal outcomes within this low-risk cohort.
Conclusion: Implementation of the WHO Labour Care Guide in a tertiary care labour ward supported structured monitoring and decision-making, with low CS rate and reassuring neonatal outcome profile in low-risk term pregnancies. Further controlled implementation studies are recommended to confirm causal impact and to evaluate documentation quality and woman-centred care indicators.

Keywords: WHO labour care guide, labour monitoring, partograph, caesarean section rate, intrapartum care, labour progress, fetal distress, Apgar score, neonatal outcomes, tertiary care hospital, observational cohort

Introduction

This study is grounded in the global concern that caesarean section (CS) rates are rising beyond levels likely to confer population-level benefit, while potentially exposing women and newborns to avoidable short- and long-term risks and increasing health-system costs [1]. At the same time, improving outcomes is not only about reducing CS, but about ensuring safe, respectful, evidence-based intrapartum care that optimizes both clinical results and women's childbirth experience [2, 3]. Historically, labour progress monitoring has relied heavily on the partograph and the "one centimetre per hour" rule derived from earlier labour curve concepts, with alert/action lines introduced to trigger escalation of care [4-6]. However, contemporary labour data demonstrate substantial variation in normal labour progression, challenging rigid thresholds for diagnosing delay [7], and systematic evidence has questioned whether traditional alert/action lines accurately predict adverse outcomes or reliably guide better decision-making [8, 9]. In response, the World Health Organization (WHO) issued updated intrapartum care recommendations and promoted a shift toward individualized, woman-centred labour care [2, 3], alongside guidance on non-clinical strategies that can reduce unnecessary CS (e.g., supportive companionship, audit/feedback, and respectful communication) [10]. The WHO Labour Care Guide (LCG) was developed as a next-generation tool aligned with these recommendations,

expanding the focus beyond cervical dilatation to include maternal and fetal well-being, supportive care, and shared decision-making, while using evidence-informed reference limits rather than a universal 1 cm/hour benchmark [11, 12]. Implementation in tertiary care settings is particularly important because these facilities often manage high patient volumes, more interventions, and a greater likelihood of escalating to CS when labour progress is perceived as abnormal. Early clinical evaluations suggest that LCG-based monitoring may reduce intrapartum CS and certain interventions without worsening neonatal outcomes, but effects can vary by context and implementation strength [13, 14]. Therefore, the objective of this study is to evaluate whether implementing the WHO LCG in a tertiary care hospital reduces the caesarean section rate, improves the quality and completeness of labour progress monitoring/documentation, and maintains or improves key neonatal outcomes (e.g., Apgar scores, NICU admission) compared with existing monitoring practices, while also supporting respectful, evidence-based intrapartum care consistent with WHO quality standards and classification/audit approaches for CS trends [9, 10, 14-18]. We hypothesize that implementation of the WHO LCG will

(i) lower the rate of primary and intrapartum caesarean sections by reducing unnecessary diagnosis of labour delay and promoting timely, appropriate supportive measures;

(ii) improve adherence to comprehensive monitoring of maternal and fetal well-being and supportive care; and

(iii) achieve these improvements without increasing adverse neonatal outcomes [2, 3, 9, 11, 13, 14].

Materials and Methods

Material (Study design, setting, participants, and tools): This study will be conducted as an observational cohort study in a tertiary care labour ward setting, aligned with the thesis framework (Institute of Obstetrics and Gynaecology). The study period will mirror the thesis timeframe (December 2021-July 2022). The study population will include term, low-risk women without a previous uterine scar, admitted in the active first stage of labour defined at ≥5 cm cervical dilatation, consistent with WHO recommendations emphasizing revised labour definitions and supportive intrapartum care [2, 3]. A minimum sample of 105 women will be enrolled (as per thesis sample). Inclusion criteria: low-risk women with spontaneous or induced labour, gestational age >37 weeks. Exclusion criteria: gestational age <37 weeks, high-risk pregnancies (e.g., heart disease, pre-eclampsia), and cephalopelvic disproportion. The primary tool will be the WHO Labour Care Guide (LCG) and its user manual, which structures documentation into seven sections (identification, supportive care, baby care, woman's care, labour progress, medication, shared decision-making) to prompt timely reflection and action [11, 12]. Standard labour ward equipment (BP apparatus, thermometer, fetoscope/Doppler/CTG where indicated, sterile vaginal examination set, neonatal resuscitation setup) and a structured proforma (as used in the thesis) will be utilized for consistent data capture.

Methods (Implementation, monitoring, outcomes, analysis, ethics): Before study initiation, skilled birth attendants will receive orientation on WHO intrapartum care principles and standardized LCG completion using the "assess-record-check-plan" approach to strengthen monitoring quality and respectful maternity care [2, 3, 11, 15]. For each enrolled woman, baseline assessment will be recorded at active labour diagnosis (≥5 cm), and subsequent observations will be documented at WHO-recommended intervals for fetal heart rate, contractions, cervical dilatation/descent, maternal vitals, membranes/liquor, and medications, with deviations from reference thresholds triggering documented actions (e.g., reassessment, amniotomy/oxytocin only when clinically indicated, referral/escalation) [2, 11, 12]. The primary outcome will be caesarean section (CS) rate (overall and, where feasible, stratified using the Robson 10-group classification) [1, 16]. Secondary outcomes will include: completeness and timeliness of labour progress monitoring (documentation performance), intrapartum interventions (augmentation, amniotomy, operative vaginal delivery), and neonatal outcomes—Apgar score <7 at 5 minutes, respiratory distress, and NICU admission (respiratory distress and low Apgar were specifically tracked in the thesis cohort). Outcomes will be interpreted within evidence showing limitations of traditional alert/action line concepts and the diagnostic accuracy concerns around partograph thresholds, supporting the shift toward individualized, evidence-based monitoring in the LCG [4, 5, 8, 9, 12]. Data will be entered into Excel/SPSS; categorical variables will be summarized as proportions and compared using χ^2/Fisher's exact test, continuous variables using t-test/Mann-Whitney U as appropriate, with multivariable logistic regression (if sample size permits) to adjust for parity and labour onset (spontaneous vs induced) [7, 11, 14]. Statistical significance will be set at $p<0.05$. Ethical approval will be obtained from the Institutional Ethics Committee, written informed consent will be secured, and confidentiality will be maintained in line with WHO quality-of-care standards [15].

Results

A total of 105 term, low-risk women in active labour (≥5 cm) were monitored using the WHO Labour Care Guide (LCG) during Dec 2021-Jul 2022. The cohort was predominantly primigravida (80/105; 76.2%), followed by second parity (20/105; 19.0%) and third parity (5/105; 4.8%). Gestational age distribution showed most women were between 38-39 weeks (37/105; 35.2%) and 39-40 weeks (31/105; 29.5%). Labour onset was almost evenly split between spontaneous (55/105; 52.4%) and induced (50/105; 47.6%).

Statistical summary approach

Categorical outcomes are presented as n (%); key outcome proportions also include 95% confidence intervals (Wilson method).

Table 1: Baseline obstetric profile of the study cohort (LCG monitored)

Variable	n (%)
Sample size	105 (100.0)
Primigravida	80 (76.2)
Second parity	20 (19.0)
Third parity	5 (4.8)
Gestational age 37-38 weeks	24 (22.9)
Gestational age 38-39 weeks	37 (35.2)
Gestational age 39-40 weeks	31 (29.5)
Gestational age >40 weeks	13 (12.4)
Spontaneous onset of labour	55 (52.4)
Induced labour	50 (47.6)

(Extracted from the thesis summary and frequency tables.)

Table 2: Labour outcomes with 95% CI

Outcome	n (%)	95% CI (proportion)
Normal vaginal delivery	95 (90.5)	83.4-94.7
Instrumental vaginal delivery	2 (1.9)	0.5-6.6
Caesarean section (CS)	8 (7.6)	3.9-14.3

Mode of delivery frequencies from the thesis indicate that vaginal birth was the dominant outcome (90.5%), with low instrumental birth (1.9%) and CS rate (7.6%).

Table 3: Indications for caesarean section (n = 8)

Indication	n (%)
Fetal distress (FD)	5 (62.5)
Cephalopelvic disproportion (CPD)	2 (25.0)
Deep transverse arrest	1 (12.5)

(As reported in the thesis frequency table/figure set.)

Interpretation: Within this low-risk cohort, fetal distress was the most common indication, suggesting that operative delivery was largely driven by fetal compromise rather than routine escalation of interventions.

Outcome	n (%)	95% CI (proportion)
Respiratory distress	7 (6.7)	3.3-13.1
Low Apgar score	11 (10.5)	6.0-17.7

The thesis explicitly reports 7 (6.7%) neonates with respiratory distress and 11 (10.5%) with low Apgar score.

Interpretation: Overall neonatal compromise remained infrequent, and the confidence intervals suggest the true event rates are likely in the single-digit to mid-teens range for this setting and case-mix (noting this is an observational cohort).

Table 5: Apgar score categories (n = 105) and labour duration (vaginal births; n = 97)

Apgar score categories (as coded in the thesis):

Category	n (%)
1	1 (0.9)
2	3 (2.9)
3	7 (6.7)
4	64 (60.9)
5	30 (28.6)

Duration of labour (n = 97):

Category	n (%)
1	30 (30.9)
2	44 (45.4)
3	11 (11.3)
4	8 (8.2)
5	4 (4.1)

Interpretation: Most newborns clustered in the higher Apgar categories (categories 4-5 = 89.5%), consistent with generally reassuring immediate neonatal status.
For labour duration (available for 97 cases), the largest group fell into categories 1-2 (76.3%), indicating that most vaginal labours were completed within the most common time bands captured by the thesis tool.

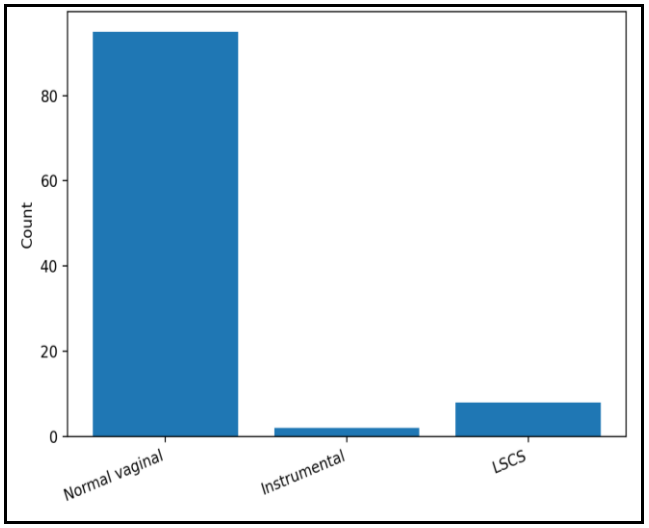

Fig 1: Mode of delivery distribution (n = 105)

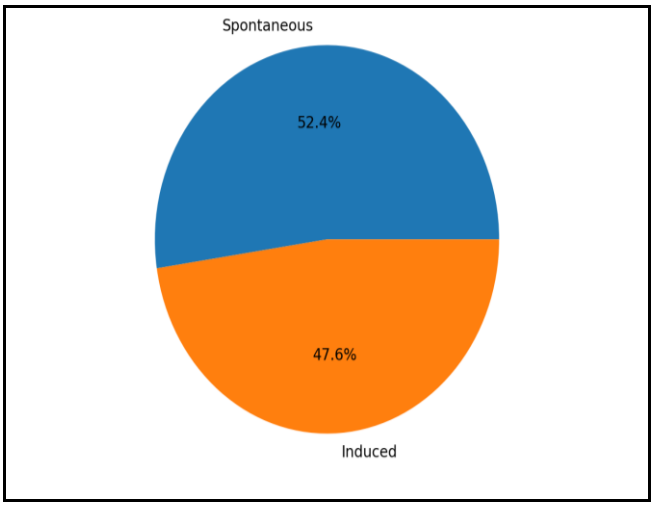

Fig 2: Onset of labour (n = 105)

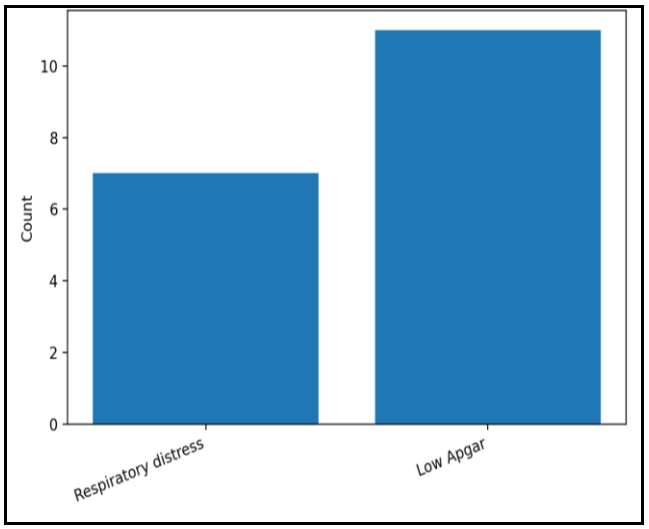

Fig 3: Key neonatal outcomes (n = 105)

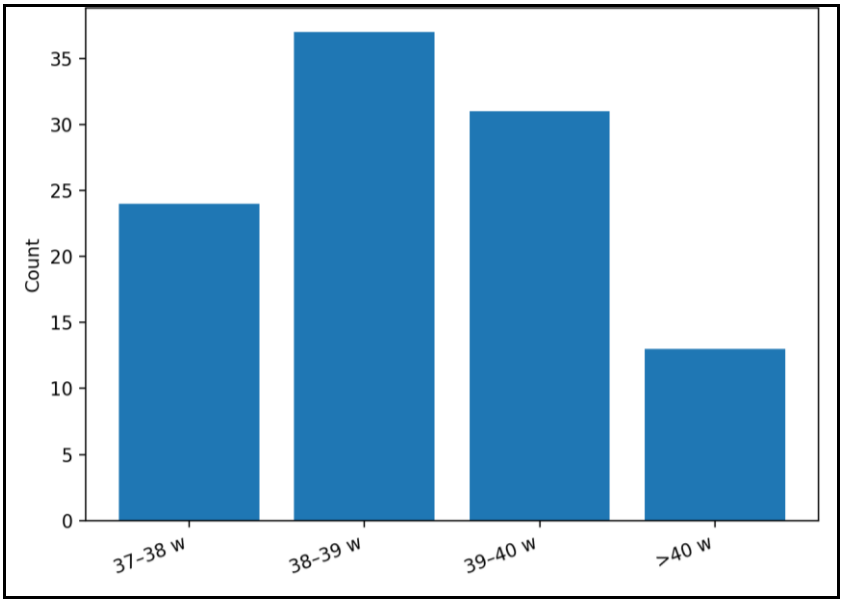

Fig 4: Gestational age distribution (n = 105)

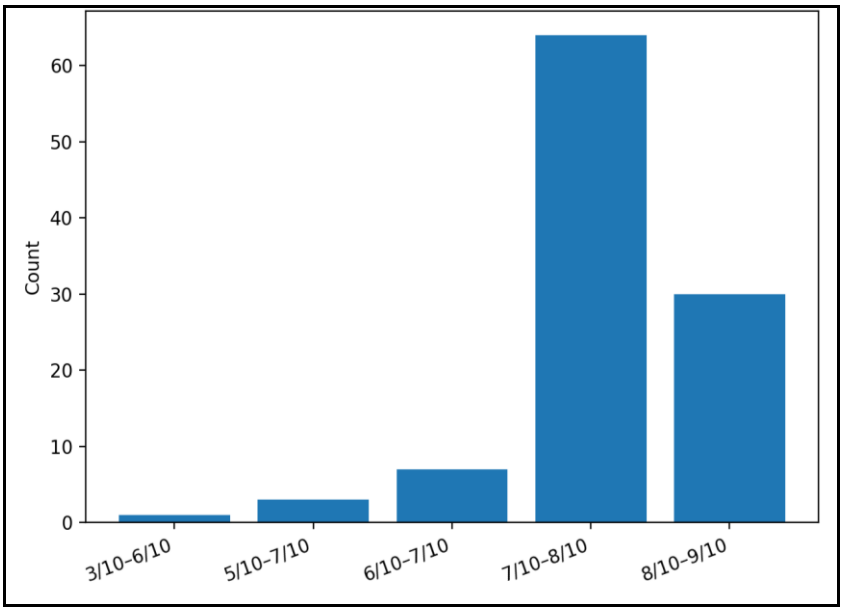

Fig 5: Apgar score categories (n = 105)

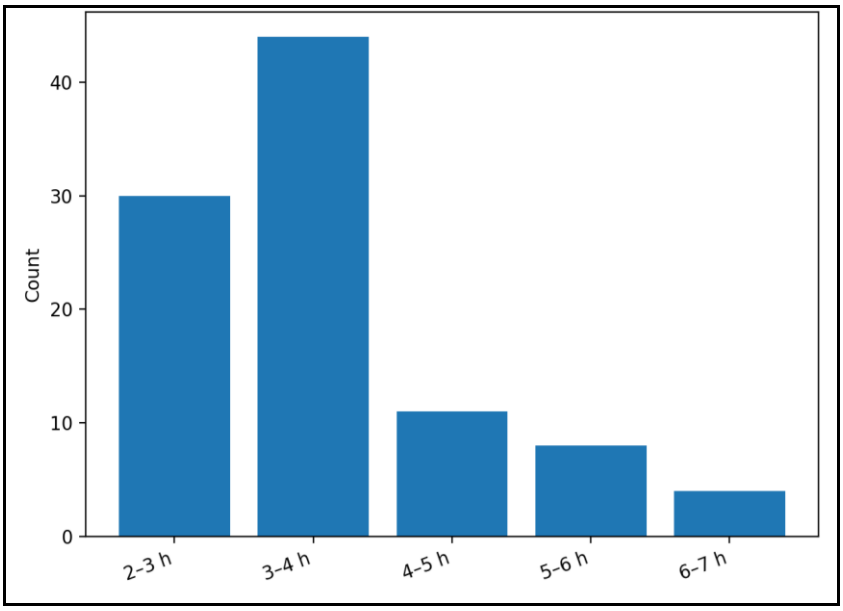

Fig 6: Duration of labou (vaginal births; n = 97)

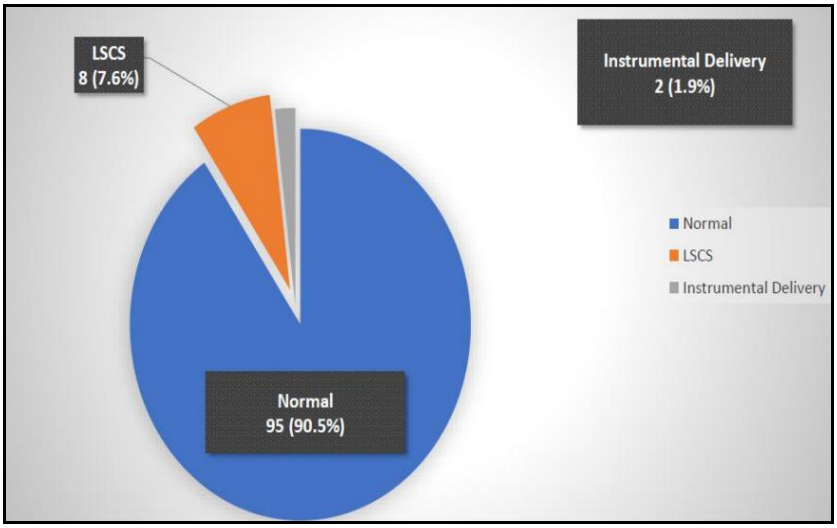

Fig 7: Distribution of mode of delivery

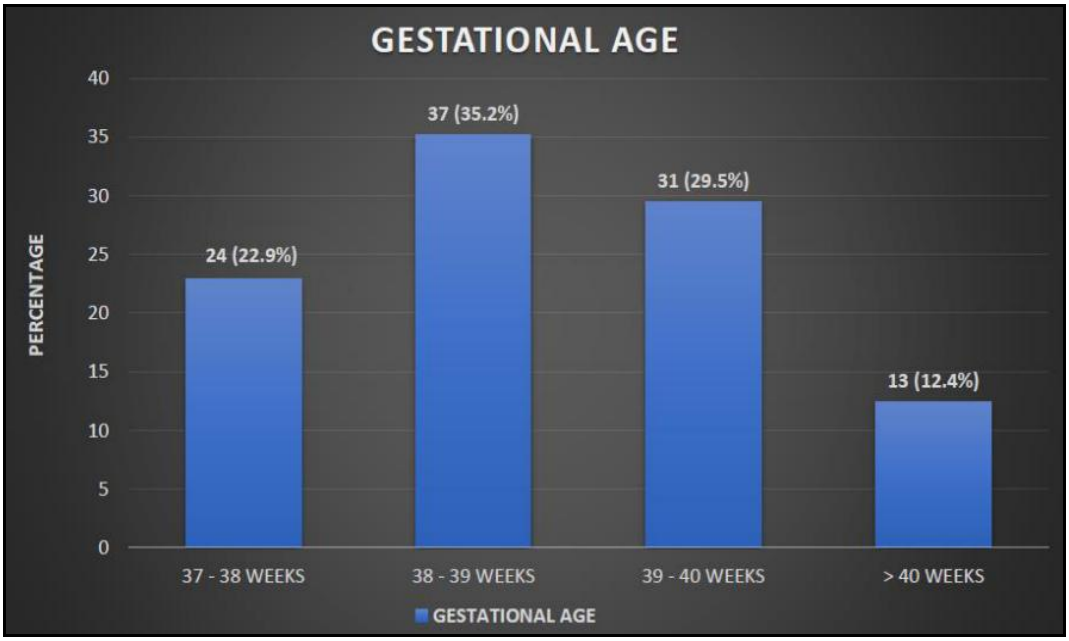

Fig 8: Gestational age distribution

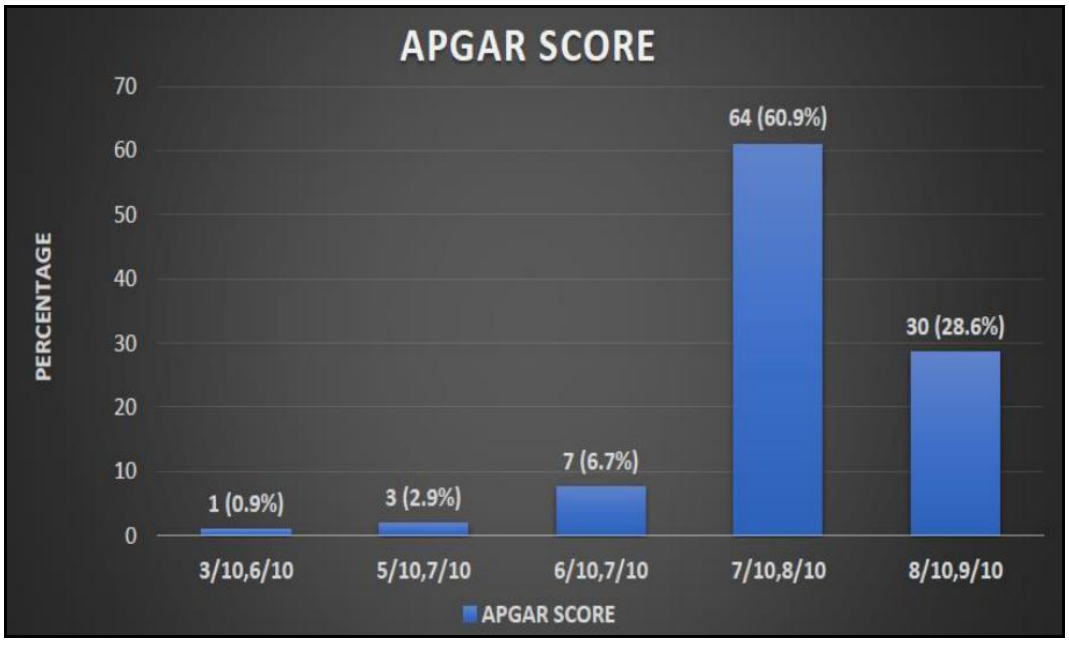

Fig 9: Apgar score distribution

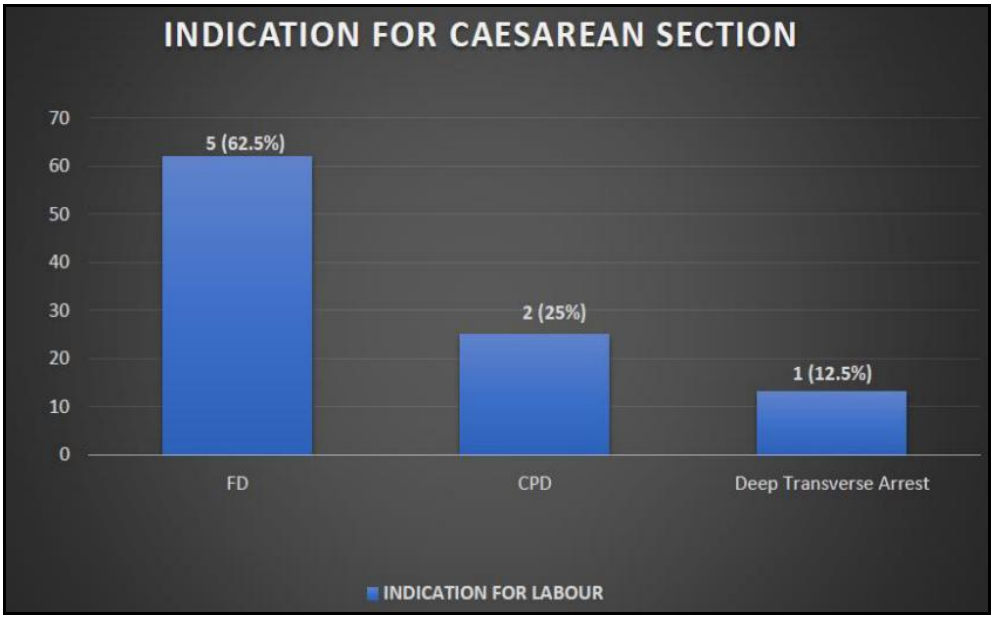

Fig 10: Indications for caesarean section

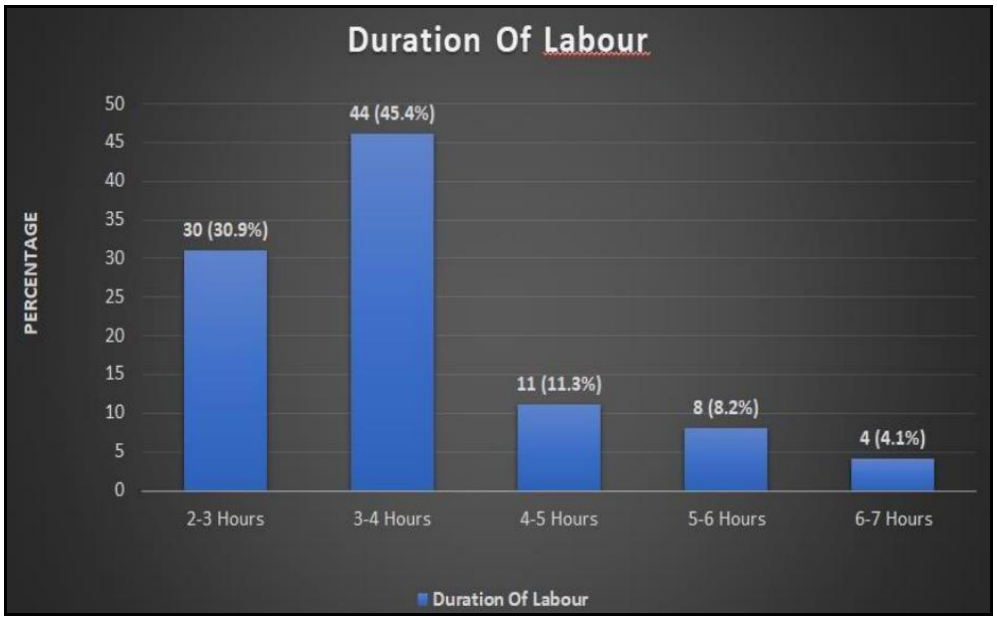

Fig 11: Duration of labour distribution

Discussion

This tertiary-care observational cohort of 105 term, low-risk women monitored with the WHO Labour Care Guide (LCG) demonstrated a low caesarean section (CS) rate of 7.6% with a high proportion of normal vaginal births (90.5%) and minimal instrumental deliveries (1.9%).

These findings are noteworthy in the context of global concerns about rising CS rates and the need to reduce unnecessary caesarean births while maintaining maternal-newborn safety [1]. The LCG is designed to support individualized, woman-centred intrapartum decision-making and to move away from rigid interpretations of labour progress that originated from historical labour curves and alert/action line concepts [4-6, 12]. In this cohort, the use of an active phase threshold at ≥5 cm (aligned with modern WHO intrapartum guidance) may have reduced premature "failure-to-progress" labelling and potentially avoided avoidable escalation to operative delivery [2, 3, 11]. This interpretation is consistent with the broader evidence that "one-size-fits-all" partograph thresholds have limited diagnostic accuracy for predicting adverse outcomes [8], and that partograph use alone does not uniformly improve clinical outcomes across settings [9].

The pattern of CS indications in the study also provides clinically meaningful insight. Among the eight caesarean births, fetal distress accounted for 62.5%, while CPD and deep transverse arrest were less frequent.

This suggests that operative delivery was primarily driven by perceived fetal compromise rather than routine intervention triggered solely by slower cervical dilatation. Such a distribution is compatible with the LCG's broader emphasis on fetal and maternal well-being, supportive care, and structured reassessment—rather than using cervical dilatation rate as the single dominant trigger for action [11, 12]. Importantly, the cohort's neonatal outcomes remained generally reassuring, with respiratory distress in 6.7% and low Apgar in 10.5%.

While these proportions must be interpreted cautiously (given the absence of a parallel control group), they align with the principle that reducing unnecessary CS should not come at the

expense of newborn safety [1-3]. It is also important to ensure internal consistency in reporting: the thesis results support 11/105 (10.5%) low Apgar rather than lower values occasionally stated elsewhere, and future manuscript versions should standardize this outcome definition and denominator.

When compared with emerging implementation evidence, the direction of effect observed here is broadly coherent with studies suggesting that LCG introduction can reduce CS and selected interventions without worsening neonatal outcomes, though magnitude varies with context, staffing, training intensity, and baseline practice [13, 14]. The LCG's design intentionally integrates components of respectful, high-quality intrapartum care—supportive measures, documentation prompts, and shared decision-making—reflecting WHO quality standards and the model of care for a positive childbirth experience [2, 3, 15]. In high-volume tertiary units where decision-making is often fast and risk-averse, embedding structured prompts for reassessment and supportive care may help address known drivers of unnecessary CS, particularly when combined with non-clinical strategies such as audit/feedback and teamwork-based quality improvement [10]. For institutions intending to scale implementation, aligning LCG adoption with standardized CS monitoring through the Robson classification can improve interpretability of CS trends and target the groups contributing most to operative delivery [16].

This study also has limitations typical of thesis-based observational work. First, without a concurrent comparison group (e.g., modified WHO partograph), causal attribution to the LCG cannot be made. Second, the cohort is low-risk and may not reflect outcomes in high-risk pregnancies or referral populations. Third, several "LCG value-add" outcomes—such as completeness of supportive care documentation, timeliness of clinical actions, and women's experience measures—were not analysed here but are central to the LCG's purpose [11, 12, 15]. Finally, supportive practices proven to influence labour experience and potentially reduce interventions (e.g., continuous labour support) should be measured and reported explicitly because they can confound interpretation of CS rates and neonatal outcomes [17]. Future research in this setting should therefore adopt stronger designs (e.g., pragmatic stepped-wedge implementation as used in recent trials), include Robson stratification, and evaluate process indicators (documentation completeness, response-to-threshold actions, and respectful care metrics) alongside clinical endpoints [14-16]. Taken together, the present findings support the feasibility of LCG-based monitoring in a tertiary setting and suggest that it may contribute to maintaining low CS rates with acceptable neonatal outcomes, consistent with WHO's contemporary intrapartum care framework [2, 3, 11].

Conclusion

In conclusion, implementation of the WHO Labour Care Guide (LCG) in a tertiary care setting for term, low-risk women appears to support safe, structured, and woman-centred intrapartum monitoring while maintaining favourable delivery and neonatal outcomes. In this cohort, the high proportion of normal vaginal births with a relatively low caesarean section rate suggests that the LCG framework can help teams focus on holistic assessment—maternal condition, fetal well-being, labour progress, and supportive care—rather than relying on a single rigid progress rule, thereby reducing unnecessary escalation to operative delivery in low-risk labour. The distribution of caesarean indications being largely related to fetal compromise indicates that operative decisions were more likely driven by clinical need rather than routine intervention, and the overall neonatal outcome profile remained broadly acceptable for a tertiary environment. Based on these findings, practical recommendations should be integrated directly into service delivery to strengthen impact and sustainability: first, introduce a structured LCG implementation package that includes hands-on staff training, competency checklists, and supervised "transition weeks" where senior clinicians coach labour ward teams during real-time charting and decision-making; second, standardize admission triage and clearly document the active phase diagnosis criteria to avoid premature diagnosis of labour delay; third, operationalize supportive care as a measurable clinical task by ensuring continuous companionship options, hydration and nutrition guidance, pain relief counselling, mobility/positioning support, and respectful communication are recorded and audited alongside clinical parameters; fourth, create simple escalation algorithms linked to LCG thresholds so that abnormal findings trigger a stepwise response (repeat assessment, targeted supportive measures, senior review, and timely intervention when indicated), minimizing both delayed action and unnecessary intervention; fifth, implement routine weekly or monthly audit meetings that review caesarean cases, especially those labelled as fetal distress or progress concerns, and use standardized classification and feedback to identify avoidable drivers; sixth, strengthen fetal surveillance capacity and interpretation skills through periodic drills and case-based learning to improve the accuracy of fetal compromise detection and reduce false-positive triggers for caesarean section; seventh, ensure documentation quality by introducing rapid chart-completeness checks at shift handover and embedding accountability for missing data, since incomplete records weaken clinical decisions and future evaluation; and finally, scale evaluation beyond immediate outcomes by tracking maternal satisfaction, respectful care indicators, postpartum complications, newborn admissions, and readmissions, so that quality improvement remains balanced between safety, experience, and resource use. Overall, the evidence from this work supports the LCG as a feasible and potentially beneficial approach for improving labour monitoring and decision-making in tertiary care, and it underscores that the best results are likely when the tool is implemented as part of a comprehensive quality-improvement system rather than as a standalone form.

Conflict of Interest
Not available

Financial Support
Not available

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