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Improvement of the first-hour breastfeeding rate following vaginal delivery: A point-of-care quality improvement study from the North Bastar Region of India.

Dr Anju Rani Ekka MBBS, MS[1], Dr Gayatri Mourya MBBS, MS[2], Dr Kiran Lata Thakur MBBS, MS[2]*

[1]*Associate Professor, Department of Obstetrics and Gynaecology, Late Smt. Indira Gandhi Memorial Government Medical College, North Bastar, Kanker, Chhattisgarh, India*

[2]*Assistant Professor, Department of Obstetrics and Gynaecology, Late Smt. Indira Gandhi Memorial Government Medical College, North Bastar, Kanker, Chhattisgarh, India*

Abstract

Background

Early initiation of breastfeeding (EIBF) within one hour of birth reduces neonatal morbidity and mortality, promotes bonding and supports exclusive breastfeeding, yet coverage after normal vaginal delivery remains suboptimal in many Indian public hospitals.

Objectives: To increase the EIBF rate after uncomplicated vaginal births in the labour room from 20% to 80% over six months using standard quality-improvement methods.

Methods

A point-of-care quality-improvement (POCQI) study from October 2022 to April 2023 in a tertiary-care teaching hospital. Root-cause analysis using fish-bone diagrams and process mapping identified gaps in staff awareness, role clarity, and documentation. A one-month baseline phase (October 2022) was followed by four Plan–Do–Study–Act (PDSA) cycles from November 2022 to February 2023 and a two-month sustenance phase (March–April 2023). Key change ideas were structured counselling of mothers during antenatal and intrapartum periods, initiation of EIBF in the labour room itself, clear assignment of responsibilities to staff on each shift, and creation of a monitoring, feedback, and reporting system.

Results

Overall, 483 eligible term mother–baby dyads with uncomplicated vaginal deliveries from a tertiary-care teaching hospital in the tribal North Bastar region were included. Baseline EIBF prevalence was 20%. After successive PDSA cycles, EIBF increased to 35%, 78%, 84% and 89%. During the sustenance phase, EIBF exceeded 90%, reaching 96% and 98% in the two subsequent months, indicating the effectiveness and stability of the intervention package.

Conclusion

Implementation of a structured QI approach, with active participation of nurses, obstetricians, paediatricians, and hospital managers, substantially improved EIBF rates and maintained high performance in a tertiary-care setting.

Recommendations

Similar low-cost POCQI interventions should be integrated into routine labour-room practice, supported by institutional policies, staff training, real-time data review, and periodic audits to ensure sustained high EIBF coverage and adaptation to other delivery settings.

Keywords: *Early initiation of breastfeeding, Infant feeding, Quality improvement, Vaginal birth, Point of Care Quality Improvement.*

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Correspondent author: Dr. Anju Rani Ekka, MBBS, MS*

E-mail: dranju.ekka@gmail.com ORCID iD: https://orcid.org/0009-0007-3491-7457

Associate Professor, Department of Obstetrics and Gynaecology, Late Smt. Indira Gandhi Memorial Government Medical College, North Bastar, Kanker, Chhattisgarh, India

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Introduction

Infant and Young Child Feeding (IYCF) encompasses standard recommendations on how best to feed newborns and children under two years of age, with early initiation of breastfeeding (EIBF) recognised as one of the most critical practices in this package.[1–3] EIBF is defined as putting the baby to the mother's breast within the first hour after birth so that the infant receives colostrum, the first, antibody-rich milk.[2] Early and exclusive breastfeeding is a powerful intervention for child survival, particularly in reducing morbidity and mortality from neonatal infections, diarrhoea, and pneumonia.[3,4] In addition, EIBF helps maintain newborn temperature, promotes uterine involution, and lowers the risk of postpartum haemorrhage, while early suckling strongly predicts continued exclusive breastfeeding in the subsequent months.[1–3]

A growing body of evidence shows that the timing of the first breastfeed has a direct impact on neonatal survival. A large systematic review and meta-analysis demonstrated that delayed initiation of breastfeeding is associated with a significantly higher risk of neonatal death.[4] Starting breastfeeding between 2 and 23 hours after birth carries a markedly greater mortality risk than initiating within the first hour.[4,5] Although India has made progress in reducing neonatal mortality, which remains around 20 per 1,000 live births, delayed breastfeeding continues to be an important, avoidable contributor to newborn deaths.[2,4] Supporting mothers to initiate breastfeeding in the first hour after birth is therefore a simple, high-impact, and low-cost strategy to improve newborn survival at scale.[2–4]

Despite these benefits, many babies worldwide are still not put to the breast soon after birth. Global and regional reports highlight that, even where institutional deliveries and skilled birth attendance are increasing, early initiation of breastfeeding often lags, with substantial missed opportunities in the immediate postnatal period.[2,5] Facility-based studies from India and other settings have consistently documented low baseline EIBF rates and have shown that targeted quality improvement (QI) interventions can significantly improve first-hour breastfeeding initiation in both vaginal and caesarean births.[1–3]

In India, health-system level efforts to improve intrapartum and immediate postpartum care include the LaQshya – Labour Room Quality Improvement Initiative, which aims to standardise and upgrade the quality of care in labour rooms and maternity operation theatres across public facilities.[6] Complementing this, the World Health Organization has promoted the Point of Care Quality Improvement (POCQI) model, a simple four-step approach that helps frontline teams identify problems, test change ideas, and monitor improvements using PDSA (Plan–Do–Study–Act) cycles.[7] Promotion of EIBF is a key element within LaQshya implementation.[1,6]

Against this background, and following the LaQshya roll-out in our hospital, we undertook a structured QI project using the POCQI approach. The project employed a series of PDSA cycles to reorganise care in the labour room and increase the proportion of babies born by uncomplicated vaginal delivery who were put to the breast within the first hour after birth. The specific aim was to raise the EIBF rate among eligible term vaginal births from a baseline of 20% to at least 80% over a six-month period, thereby aligning our facility's performance with national quality-of-care benchmarks for intrapartum and immediate postpartum services.

Materials and methods

Study design and setting

This hospital-based before-and-after point-of-care quality improvement study was conducted in the labour room of the Mother and Child Hospital attached to Late Smt. Indira Gandhi Memorial Government Medical College, Kanker, is located in the North Bastar region of Chhattisgarh, India. The maternity unit comprises 55 beds, a single labour room, and one maternity operation theatre, and handles approximately 1,500 deliveries annually. The project was implemented under the national LaQshya programme using a point-of-care quality improvement approach over seven months from October 2022 to April 2023. Since the initiative aimed to strengthen routine service delivery without introducing any experimental intervention, it was treated as exempt from formal ethics review under programme implementation.

Study population

The study population included consecutive mother–newborn dyads delivered in the labour room during the study period who were screened for eligibility from labour-room delivery records and immediate postnatal registers. All eligible term vaginal deliveries occurring during the baseline, intervention, and sustenance phases were included in measurement and analysis.

Inclusion and exclusion criteria

Eligible participants were healthy mother–newborn dyads with singleton term vaginal deliveries at 37–42 weeks of gestation. Excluded were neonates delivered by lower

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segment caesarean section, preterm births, low-birth-weight babies weighing less than 2500 g, newborns with major congenital malformations, multifetal births, sick newborns requiring additional care, and babies born to mothers who were clinically unwell or unable to initiate breastfeeding within the first hour. Only dyads meeting all eligibility criteria were included in the quality-improvement measurements.

Study size

A formal sample size calculation was not performed because this was a facility-based quality improvement initiative rather than an analytical comparative study. The figure of 483 represents the total number of consecutive eligible mother–baby dyads encountered during the entire study period and included in the ongoing monthly measurement of the early initiation of breastfeeding indicator.

Quality improvement approach and model

The POCQI model was implemented in a stepwise manner, following a planned sequence of activities.

Step 1: Identifying the problem, forming the team, and defining the aim

Breastfeeding is a core component of essential newborn care. The LaQshya programme recommends that at least 80% of newborns should be breastfed within one hour of birth, or that facilities achieve a minimum 30% improvement from their baseline rate [6]. A baseline assessment of early initiation of breastfeeding (EIBF) carried out during October–November 2022 showed that only 20% of eligible babies were breastfed within one hour.

This low EIBF rate was chosen as a priority problem because it was important to mothers and babies, feasible to improve within existing resources, easy to measure, and largely within the control of the labour-room team. A facility QI team was formed, consisting of two obstetricians, the nursing sister in charge, and two staff nurses.

The aim statement was: to improve the EIBF rate among newborns delivered by vaginal delivery from 20% to 80% over six months using standard continuous QI methods, including root-cause analysis and Plan–Do–Study–Act (PDSA) cycles. EIBF was defined as the initiation of breastfeeding within one hour after birth. The main outcome indicator was the EIBF rate, expressed as the percentage of eligible babies who received breastfeeding within one hour.

Step 2: Analysing the problem and measuring the quality of care

Because the team could not initially identify all reasons for delay in breastfeeding, a process flowchart was developed (Figure 1) to map each step of care for mother and baby in the labour room. This helped to visualise the pathway from birth to first feed and to locate points where delays occurred.

A Fishbone (cause-and-effect) diagram was then used to perform root-cause analysis (Figure 2). The team grouped the contributing factors under five domains: policy, people, place, practice, and procedures. This exercise highlighted multiple gaps, including inconsistent counselling, lack of clear role allocation, physical separation of mother and baby at critical times, and poor documentation. Based on these findings, the QI team planned a series of PDSA cycles to introduce and test specific change ideas.

Step 3: Developing and testing change ideas (PDSA cycles)

Change ideas were developed from the process flowchart and Fishbone analysis and tested using sequential PDSA cycles. In each cycle, the facility team agreed on a small set of interventions, implemented them over one month, reviewed the results and then modified the strategy for the next cycle.

The broad package of interventions included:

structured counselling of mothers on EIBF during antenatal visits and in early labour,

practising EIBF in the labour room itself immediately after birth,

assigning clear responsibilities for EIBF to specific staff on each shift, and

introducing a simple system for routine monitoring and feedback of EIBF rates.

After each PDSA cycle, the team decided whether to adopt, adapt, or abandon individual change ideas based on observed effects and practicality. Four consecutive PDSA cycles were conducted from November 2022 to February 2023, and the details of the change ideas and their implementation are summarised in Table 1.

Step 4: Sustaining improvement

Once effective change ideas were identified, and EIBF rates consistently exceeded the target of 80%, these practices were embedded into routine care. A two-month post-intervention follow-up phase (March–April 2023)

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focused on sustaining the gains without introducing any new change ideas.

To prevent regression to previous practices, the hospital adopted a written policy on EIBF and restricted the use of formula feeds to clearly defined complicated cases. Job descriptions and newborn-care protocols were updated to include EIBF responsibilities, and documentation of EIBF timing was made mandatory in both the delivery case sheet and labour register. The QI team continued to monitor EIBF as a key indicator and held weekly meetings to review progress, address challenges, and recognise staff efforts, thereby maintaining motivation and ownership.

Bias

Several steps were taken to reduce bias. First, the outcome was defined a priori as breastfeeding initiation within one hour after birth using uniform eligibility criteria throughout the study period. Second, all consecutive eligible vaginal births were included to minimize selection bias. Third, the team used process mapping, fishbone analysis, and routine labour-room documentation to standardize identification of delays and monitoring of performance. Fourth, data were reviewed repeatedly across baseline, PDSA, and sustenance phases to limit random fluctuation and improve the reliability of observations. However, as a single-centre before-and-after quality improvement project, the findings remained susceptible to temporal changes in staffing, documentation quality, and observer-related measurement bias.

Data collection and analysis

Monthly data on eligible deliveries and EIBF status were extracted from delivery case sheets and the labour register and entered into a Microsoft Excel spreadsheet. Descriptive statistics were used to summarise baseline characteristics and monthly EIBF rates.

Ethical considerations

This quality improvement initiative was conducted at Late Smt. Indira Gandhi Memorial Government Medical College–associated Mother and Child Hospital, Kanker, Chhattisgarh, India, as part of routine service improvement under the national LaQshya programme. As the project was designed to improve existing clinical processes without introducing any experimental intervention, alteration in standard patient care, or collection of identifiable personal data for research purposes, it was considered exempt from formal institutional ethics committee review under programme implementation. Confidentiality of participant information was maintained throughout, and only anonymized aggregated data were used for analysis and reporting.

Results

Over the seven months, 483 eligible mother–baby dyads with uncomplicated term vaginal deliveries were included across the baseline, intervention, and sustenance phases. The EIBF rate during the one-month pre-intervention baseline phase was only 20%, reflecting very low coverage of this essential newborn care practice [Table 1].

Table 1. Monthly early initiation of breastfeeding (EIBF) rates across study phases (n = 483)

Study phase	Month & year	Description	EIBF rate (%)
Baseline	October 2022	Pre-intervention	20
PDSA cycle 1	November 2022	Initial change ideas tested	35
PDSA cycle 2	December 2022	EIBF started on the labour table	78
PDSA cycle 3	January 2023	Consolidation of effective changes	84
PDSA cycle 4	February 2023	Further streamlining of practices	89
Sustenance month 1	March 2023	Post-intervention follow-up	96
Sustenance month 2	April 2023	Post-intervention follow-up	98

Total number of eligible mother–baby dyads over the seven months = 483.

When summarised by phase, the mean EIBF rate increased from 20% in the baseline period to 71.5% during the four-month intervention phase and 97% in the

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two-month sustenance phase, with phase-wise ranges of 20%, 35–89%, and 96–98%, respectively [Table 2].

Table 2. Phase-wise summary of improvement in early initiation of breastfeeding (EIBF)

Phase	Duration (months)	EIBF rate (%), mean*	EIBF rate (%), range	Key findings
Baseline	1 (Oct 2022)	20	20	Very low coverage; multiple barriers to EIBF identified.
Intervention	4 (Nov 2022–Feb 2023)	71.5	35–89	Steady rise in EIBF; sharp increase after PDSA cycle 2.
Sustenance	2 (Mar–Apr 2023)	97	96–98	High EIBF maintained above 90% without new interventions.

*Mean calculated from monthly EIBF rates in each phase.

Baseline analysis revealed several modifiable barriers to EIBF at multiple levels. Among mothers, poor knowledge and low awareness of the need to start breastfeeding within one hour were prominent. On the provider side, nursing staff demonstrated limited awareness and inconsistent counselling practices. Social customs and family beliefs frequently encouraged delaying the first breastfeed, while routine ward practices led to prolonged mother–baby separation. Lack of privacy in the labour area and the absence of a clear hospital policy on EIBF further contributed to these delays [Table 3].

Table 3. Barriers to early initiation of breastfeeding (EIBF) identified at baseline (Fishbone and process-flow analysis)

Domain	Barrier identified	Brief description
Mothers	Lack of knowledge and awareness	Many postpartum mothers were not aware of the need for EIBF.
Nursing staff	Limited awareness and inconsistent counselling	Staff did not consistently prioritise or promote EIBF.
Social factors	Social customs and family beliefs	Traditional practices delayed the first breastfeeding after delivery.
Practices	Faulty staff practices and prolonged mother–baby separation	Routine workflow led to unnecessary separation and delay.
Environment	Lack of privacy in the labour area	Inadequate privacy discouraged initiation of breastfeeding early.
System/policy	Absence of a clear hospital policy on EIBF	No written guidance or mandate to ensure EIBF as standard practice.

Following these diagnostic exercises, four sequential PDSA cycles were implemented. EIBF coverage rose progressively from 20% at baseline to 35% after PDSA cycle 1, in which staff sensitisation and basic counselling were introduced [Table 1, Table 4]. A marked jump to 78% was observed after PDSA cycle 2, when breastfeeding was initiated on the labour table itself, directly addressing the challenges of separation and inadequate privacy [Table 4]. Subsequent cycles that focused on clarifying staff roles for EIBF and strengthening documentation with regular feedback further increased the rate to 84% and then 89% after PDSA cycles 3 and 4, respectively [Table 1, Table 4].

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Table 4. Key change idea and its observed effect on EIBF rate

PDSA cycle	Key change idea	Related barrier addressed	EIBF rate (%) after cycle
Cycle 1	Staff sensitisation and basic counselling on EIBF	Limited staff awareness and inconsistent practice	35
Cycle 2	Initiation of breastfeeding on the labour table itself	Prolonged separation; lack of privacy	78
Cycle 3	Clear role allocation to staff for EIBF in each shift	Unclear responsibility; variable implementation	84
Cycle 4	Strengthening documentation and regular feedback	Poor tracking and monitoring of EIBF performance	89

During the two-month post-intervention sustenance phase, no new change ideas were introduced. Despite this, EIBF coverage not only remained high but improved slightly, with monthly rates of 96% and 98% [Table 1]. The consistently high mean EIBF rate of 97% in the sustenance phase [Table 2] indicates that the QI interventions were successfully embedded into routine practice and that the gains achieved during the PDSA cycles were effectively consolidated.

Discussion

This quality improvement project set out to raise the rate of early initiation of breastfeeding among healthy mother–baby pairs with uncomplicated vaginal deliveries in a tertiary-care teaching hospital, using structured root-cause analysis and PDSA cycles within the POCQI framework. Starting from a baseline EIBF rate of 20%, far below the LaQshya benchmark of 80%, the findings suggest that early breastfeeding was initially hindered by remediable gaps in routine intrapartum and immediate postpartum care. The marked rise in EIBF following the intervention demonstrates the effectiveness of the QI approach in improving provider practices and care processes, while the maintenance of rates above 90% for two consecutive months indicates successful institutionalization and sustainability of these improvements. Similar improvements in immediate newborn care and breastfeeding practices following point-of-care QI interventions have been documented from other Indian tertiary and secondary hospitals, supporting the effectiveness of this methodology in resource-constrained settings [8–12].

The very low baseline EIBF rate in our facility reflects an important missed opportunity in immediate newborn care, despite high rates of institutional delivery. This finding suggests that the presence of facility-based childbirth alone does not ensure optimal breastfeeding practices unless supported by timely counselling, staff engagement, and standardized post-delivery care processes. In this context, the baseline result highlights a clear implementation gap between service availability and effective maternal–newborn care. Previous studies have highlighted that, even where most births occur in health facilities, a substantial proportion of newborns are not put to the breast within the first hour of life, contributing to preventable neonatal morbidity and mortality [4,5,8,9]. These findings are consistent with reports that delayed initiation remains a persistent challenge in both public and teaching hospitals, and they underscore the scale of missed opportunities to deliver this simple, high-impact intervention at the point of birth [8,9,12].

The diagnostic phase of the QI process was central to designing effective solutions. The process map exposed prolonged mother–baby separation, fragmented workflows, and the absence of a clear EIBF policy as major bottlenecks, while Fishbone analysis allowed the team to organise the causes of delay under people, procedure, policy, place, and practice. Similar use of process mapping and cause-and-effect analysis has been reported in POCQI-based projects aimed at improving immediate newborn care, delayed cord clamping, and early breastfeeding in Indian facilities [8,10,11]. In this context, this analysis also brought to light a strong local custom of discarding colostrum as "impure", echoing earlier observations that, although breastfeeding is nearly universal, initiation is often late and colostrum is frequently wasted [9].

Sequential PDSA cycles then provided a structured way to test, refine, and scale up change ideas. Initial cycles that focused on sensitising staff and standardising counselling produced modest gains in EIBF, a pattern similar to other QI reports where early cycles mainly addressed knowledge and awareness [8,10,12]. The most dramatic improvement followed the decision to initiate breastfeeding on the labour table, which directly targeted mother–baby separation and privacy concerns. Later cycles strengthened role clarity, documentation, and feedback, embedding EIBF into routine practice. This trajectory aligns with prior QI studies showing that combining workflow redesign, task allocation, and regular feedback can substantially improve early breastfeeding and other newborn-care indicators [8,10–

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12]. The experience also underscored the value of using antenatal and intrapartum contacts for proactive breastfeeding counselling, leading us to institutionalise structured counselling in the ANC outpatient clinic.

Implementing QI for the first time in this centre posed notable challenges. The team initially struggled with unfamiliar QI concepts and the discipline of running PDSA cycles in a busy labour room, while shifting entrenched staff behaviours demanded strong leadership support and continuous engagement. Nonetheless, the POCQI approach proved highly practical: it enabled systematic identification of local barriers to EIBF and generated solutions that were evidence-based, low-cost, acceptable to staff and families, and feasible within existing constraints, much like other reports from Indian teaching and district hospitals [8–12].

Generalizability

The findings from this single-centre QI project can be generalised mainly to tertiary care public hospitals with similar staffing, workload, and resources. Caution is required when extrapolating to private facilities, tertiary referral centres, or settings with different sociocultural norms and breastfeeding-support systems. Further multi-site evaluations would strengthen external validity and applicability.

Conclusion

This quality improvement project demonstrated that a structured POCQI approach can substantially enhance early initiation of breastfeeding after uncomplicated vaginal deliveries in a busy tertiary care hospital. Starting from a baseline EIBF rate of 20%, sequential root-cause analysis and PDSA cycles increased coverage beyond the LaQshya benchmark and sustained rates above 90% during follow-up. The intervention package—labour-room initiation of breastfeeding, staff sensitisation, role clarity, strengthened documentation and regular feedback—was low-cost, feasible and acceptable to both staff and mothers. Although conducted at a single centre with limited follow-up, these findings support wider adoption of context-specific QI strategies to scale up EIBF and improve newborn survival across similar resource-constrained public health facility settings.

Limitations

This study has several limitations. First, it was conducted in a single government facility in North Bastar, which limits external validity. Second, the short duration and lack of post-discharge follow-up prevented assessment of exclusive breastfeeding, morbidity, or mortality outcomes. Third, reliance on routine labour-room records may have introduced documentation errors in EIBF timing. Fourth, the absence of a concurrent control group means secular trends cannot be fully excluded. Finally, no formal qualitative enquiry was undertaken, so some contextual barriers and facilitators may have been overlooked.

Recommendations

Health facilities should integrate EIBF promotion into routine intrapartum and postnatal care, with clear written policies, role allocation, and mandatory documentation. Regular staff training, bedside coaching, and audit–feedback meetings should be institutionalised to maintain adherence. Antenatal clinics must provide structured counselling to mothers and families on the benefits of EIBF and colostrum. Similar POCQI-based projects should be extended to caesarean births and neonatal intensive care settings. Future multi-centre studies with longer follow-up are recommended to evaluate effects on exclusive breastfeeding, neonatal morbidity and mortality, and to refine scalable, context-specific quality improvement packages for different levels of the health system in India.

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Abbreviations

IYCF – Infant and Young Child Feeding
EIBF – Early Initiation of Breastfeeding
WHO – World Health Organization
POCQI – Point of Care Quality Improvement
PDSA – Plan–Do–Study–Act
QI – Quality Improvement
LaQshya – Labour Room Quality Improvement Initiative
NFHS – National Family Health Survey
SRS – Sample Registration System
NMR – Neonatal Mortality Rate
SDG – Sustainable Development Goal
ANC – Antenatal Care

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OPD – Outpatient Department
LSCS – Lower Segment Caesarean Section

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Conflict of interest

The authors declare no conflict of interest.

Author contributions

ARE- Concept and design of the study, results interpretation, review of literature, and preparation of the first draft of the manuscript. GM- Statistical analysis and interpretation, revision of manuscript. KLT- QI project administration and data collection.

Data availability

Data is available upon request.

Author biography

Dr. Anju Rani Ekka, **MBBS, MS,** is an Associate Professor in the Department of Obstetrics and Gynaecology at Late Smt. Indira Gandhi Memorial Government Medical College, North Bastar, Kanker, Chhattisgarh, India. She is actively involved in clinical care, teaching, and training of medical undergraduates and postgraduates, with a special interest in improving intrapartum and immediate postpartum services for mothers and newborns. She also contributes to quality-improvement activities within the maternity wing of the institution.ORCID iD: https://orcid.org/0009-0007-3491-7457

Dr. Gayatri Mourya, MBBS, MS, is an Assistant Professor in the Department of Obstetrics and Gynaecology at Late Smt. Indira Gandhi Memorial Government Medical College, North Bastar, Kanker, Chhattisgarh, India. She is actively involved in undergraduate and postgraduate teaching, clinical services, and departmental academic activities. Her areas of interest include high-risk pregnancy, labour management, and preventive women's health. She has contributed to institutional research initiatives and participates regularly in skills-enhancement programs aimed at improving maternal and neonatal outcomes in resource-diverse settings.

Dr. Kiran Lata Thakur, MBBS, MS, serves as an Assistant Professor in the Department of Obstetrics and Gynaecology at Late Smt. Indira Gandhi Memorial Government Medical College, North Bastar, Kanker, Chhattisgarh, India. She is actively engaged in clinical care, academic teaching, and departmental training activities. Her professional interests include high-risk obstetrics, gynecologic disorders, and evidence-based intrapartum management. She has contributed to institutional research and quality-improvement initiatives aimed at enhancing maternal and reproductive health outcomes.

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