

RESEARCH ARTICLE

Assessment of labor room facilities in Community Health Centers, Taluk hospitals, and the Gadag district hospital

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*School of Environmental Science, Public Health and Sanitation Management, Karnataka State Rural Development and Panchayat Raj University, Gadag, Karnataka, India***Received on: 14 Aug 2022; Revised on: 21 Sep 2022; Accepted on: 16 Oct 2022****ABSTRACT**

Background: Maternal and infant mortality are sensitive indicators that provide evidence for describing a country's health-care system and indicating the current socioeconomic situation. Recognizing the need to prioritize safe and respectful childbirth practices, the Government of India launched the LaQshya-Labour Room Quality Improvement Initiative in March 2018, with the goal of reducing maternal and new-born mortality and morbidity and increasing women's satisfaction with healthcare. All Government-run medical colleges, district hospitals (DH), community health centers (CHC), sub-district hospitals, and referral units must follow LaQshya guidelines. LaQshya intends to follow guidelines in organizing the infrastructure and protocol of labor rooms and maternity operation theaters. The guidelines provide standards for space, layout, equipment, consumables, and human resources. **Objectives:** The objectives of the study are as follows: (1) To assess the delivery room's infrastructure, equipment, and human resources in the CHC, Taluk hospital, and DH. (2) To analyze the maternal and new-born health-care facility and assess the availability of services and essential drugs in the labor room. **Materials and Methods:** A cross-sectional study was conducted to determine the labor room facilities in Gadag District's CHC, Taluk hospital, and DH. By obtaining permission from the District Health Officer (DHO) and the relevant officer at the Health Force for conducting the study. The CHCs, Taluk Hospitals (TH), and DHs were chosen using the Universal Sampling Technique. Data for the study were collected using an observational check-list during the course of studying the labor room facility such as infrastructure, equipment, manpower, and delivery room services with essential medicine. **Results:** The findings revealed that with the exception of the DH, the majority of infrastructure and equipment are available and capable of providing labor room services, but no hospitals have human resources in accordance with Laqshya guidelines. Apart from Nargundtaluk and DHs, no other health facility has a blood bank or a storage unit. In terms of services, all TH and DHs can provide labor room services, whereas CHCs cannot. Almost all essential medications are available in hospitals. **Conclusion:** Most of the health institutes had the required infrastructure, equipments, drugs, and service provision except human resource and blood storage facilities in taluk hospital and CHCs of Gadag district.

Keywords: CHC, DH, Human resource, Infrastructure, LaQshya guidelines, TH**INTRODUCTION**

Maternal health refers to the health of women during pregnancy, childbirth, and the postnatal period. Each stage should be a positive experience,

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ensuring women and their babies reach their full potential for health and well-being.

Maternal health is a good indicator that health system works. Improving maternal health is one of the WHO's key priorities, grounded in a human rights approach and linked to efforts on universal health coverage. It is the WHO's responsibility to monitor progress toward the global goal for

reducing maternal death (SDG target 3.1). The WHO supports Member States as they implement plans to promote access to quality health services for all. Strong partnerships are crucial, such as The Network for Improving Quality of Care (QoC) for Maternal, Newborn, and Child Health, launched by the WHO and UNICEF.^[1]

Increasing universal coverage of delivery in health facilities is necessary but insufficient to meet the targets; if QoC provided is poor, improved maternal and neonatal health outcomes are unlikely.^[2,3]

Global maternal mortality is currently estimated to be 210 per lakh live births. Each year in India, roughly 28 million women experience pregnancy and 26 million have a live birth. Of these, an estimated 67,000 maternal deaths and one million newborn deaths occur each year. Thus, pregnancy-related mortality and morbidity continues to have a huge impact on the lives of Indian women. One of the important reasons for the same is non-acceptance or non-utilization/underutilization of maternal health-care services, especially among the rural population.^[4]

Recognizing the need to prioritize safe and respectful childbirth practices, the Government of India in March 2018 launched LaQshya-Labor Room Quality Improvement Initiative, to be implemented nation-wide with the objective of reducing maternal and newborn mortality and morbidity and enhancing the satisfaction of women availing healthcare. LaQshya guidelines are applicable to all Government-run medical colleges, district hospitals (DH), community health centers (CHC), sub-district hospitals, and referral units. LaQshya aims to organize the infrastructure and protocol of labor rooms and maternity operation theater according to guidelines. The standards provided in guidelines revolve around the space, layout, equipment, consumables, and human resources.^[5,6]

Table 1: The following are the list of Government Hospitals

Type of hospital	Facility name
Community Health Centre	1. Laxmeshwar CHC 2. Gagendragad CHC
Taluk Hospitals	1. Shirahatti TH 2. Mundergi TH 3. Nargund TH 4. Ron TH
District Hospital	1. DH Gadag

Achieving high coverage of delivery services is a necessary but insufficient component of this strategy; increased access to poor quality care will not improve maternal and child health, delivery services must also provide good-quality care. However, measurement of quality is difficult for several reasons. Quality is a multi-faceted concept without a universally accepted definition or common operationalization. Evaluating quality in maternity care is further complicated by several features: There are at least two recipients of the services (mother and baby), childbirth is a culturally sensitive issue, and most users of maternal health services are well, but serious complications can develop unpredictably.^[6] Under Sustainable Development Goal, India has fixed the target to bring down the maternal mortality ratio from 113 per one lakh live births to <70 by 2030.^[7]

MATERIALS AND METHODS

Study design

A cross-sectional study was done to assess the labor room facilities in CHC, Taluk hospital, and DH of Gadag District. By obtaining permission from the District Health Officer (DHO) and the relevant officer at the Health Force for conducting the study. Universal Sampling Technique was used to choose the CHCs, Taluk Hospitals (TH), and DH. Data regarding the study were collected by check-list in the course of study the labor room facility such as infrastructure, equipment, manpower, and services of delivery room with essential medicine.

Study setting

The observational and cross-sectional study was done to assess the labor room facilities in CHC, Taluk hospital, and DH of Gadag District. Data were obtained from October to November 2021 using pre-tested observational check-list.

Participants

Staff nurse/facility staff those who serve for labor room in FRUs and DH.

Table 2: Availability of labor room infrastructure at two CHC's

Variables	Availability of infrastructure			
	Gagendragad		Laxmeshwar	
	Yes	No	Yes	No
Number of delivery tables in LR	02		03	
LR Signage	Yes	-	Yes	-
LR on ground floor	Yes	-	Yes	-
Restricted area signage	-	No	-	No
Contact details of referral transport displayed	-	No	-	No
Name and contact number of doctor and nurse on duty	-	No	-	No
Frosted/White colored glass for windows	Yes	-	Yes	-
Labor tables as per load	Yes	-	Yes	-
Privacy screen available	-	No	Yes	
Duty roster display inside	-	No	-	No
24*7 availability of SBA trained SN/ANM	Yes		Yes	
Consent taken before delivery	Yes		Yes	
Standard bed head ticket being used	-	No	-	No
Correct use of Partograph	Yes		Yes	
LR in proximity of NBSU (only if NBSU available)	Yes		Yes	
Power back up for LR	Yes		Yes	
Labor room clean look for any blood stains, dust, used cotton, Gauze, etc.	Yes		Yes	
Attached toilet with western commode	Yes		Yes	
Running water in toilet	Yes		Yes	
Functional flush	Yes		-	No
Adequate light at Labor room	Yes		Yes	
Labor table corroded	-	No	-	No
Stand for slippers and slippers at entrance	Yes		Yes	
Temperature controlled	Yes		Yes	
Attendant crowding	-	No	-	No
BMW segregation done	Yes		Yes	
Display of protocols at correct places	Yes		Yes	

Variables

- Independent variables: Name and Place of the public health institute.
- Dependent variables: Labor room assessment was done using observational checklist.

Data source

Primary data were collected using observational checklist. Visited the hospitals to observe the labor room infrastructure, equipment, services, drugs facility, and entered data in checklist. Collected human resource information from staff nurse of labor room.

Study size

Universal sampling –The study was conducted in all CHC's, TH and DH comes under the Gadag district. Two CHCs, four THs, and one DH were present in the district and all those are included in the study.

Data collection tool

Data regarding facility assessment were collected using checklist prepared by the LAQSHY guidelines. Check list: The data collection tools developed after doing the rigorous review literature and some questions were obtained from Govt. of India LAQSHY guidelines.

Table 3: Availability of labor room equipment at two CHC's

Variables	Gagendragad		Lakshmeshwar	
	Yes	No	Yes	No
Antiseptic solution	Yes		Yes	
Liquid soap with dispenser	Yes		Yes	
Kelly's pad	Yes		Yes	
Macintosh	Yes		Yes	
HIV Kits	Yes		Yes	
Uristix	Yes		Yes	
Hub Cutter	Yes		Yes	
Functional BP apparatus	Yes		Yes	
Refrigerator	-	No	-	No
Room thermometer	Yes		Yes	
IV Stand	Yes		Yes	
Vaccine carrier	Yes		Yes	
Separate mops for LR	Yes		Yes	
Glutaraldehyde solution	Yes		-	No
Washing powder	Yes		Yes	
Baby weighing scale	Yes		Yes	
Glucometer	Yes		Yes	
Weighing scale for adult	Yes		Yes	
Autoclave	Yes		Yes	
Steel top labor table	Yes		Yes	
Foot step for labor table	Yes		Yes	
Mattress on labor table	Yes		Yes	
Stethoscope	Yes		Yes	
Doppler	Yes		Yes	
Trolley	Yes		Yes	
Boiler	Yes		Yes	
Wall clock (with second hand)	Yes		Yes	
Bleaching powder	Yes		Yes	
Three bucket system for Cleaning	Yes		Yes	

Table 4: Availability of Trays In Labor Room At Two CHC's

Variables	Gagendragad responses		Lakshmeshwar responses	
	Yes	No	Yes	No
Delivery tray	Yes		Yes	
Episiotomy tray	Yes		Yes	
Baby tray	Yes		Yes	
Medicine tray	Yes		Yes	
Emergency drug tray	Yes		Yes	
PPIUCD tray	Yes		Yes	
Resuscitation for mothers	Yes		Yes	

Statistical methods

The quantitative data obtained were analyzed using Microsoft Excel to generate frequencies and percentages.

Table 5: Availability of basic human resource at labor room in two CHCs

Variables	Gagendragad		Lakshmeshwar	
	Yes	No	Yes	No
Pediatrician availability (minimum 1)	-	No	-	No
Anesthetist availability (minimum 1)	-	No	Yes	
OBG Specialist (minimum 1)	-	No	Yes	
Grade A nurses given for LR during day shift minimum 2 per shift?	Yes		Yes	-
Grade A nurses given for LR during night shift minimum 2 per shift?	-	No	-	No
Sweeper for LR at day shift (minimum 1 per shift)?	Yes		Yes	
Sweeper for LR at night shift (minimum 1 per shift)?	Yes		Yes	

Table 6: Available facility for maternal and new born care at two CHCs

Variables	Gagendragad		Lakshmeshwar	
	Yes	No	Yes	No
ANC OPD	Yes		Yes	
Labor room	Yes		Yes	
Functional OT	Yes		Yes	
PNC Ward	Yes		Yes	
NBCC	Yes		Yes	
NBSU	Yes		-	No
KMC	-	No	-	No
Blood bank/storage unit	-	No	-	No
Pharmacy	Yes		Yes	
Laboratory	Yes		Yes	
Radiology	Yes		Yes	

Ethical clearance

Ethical clearance was obtained from the Ethics Committee of Karnataka State Rural Development and Panchayat Raj University, Gadag. Before data collection, necessary permission from the concerned officials was obtained.

RESULTS

Results are divided into three sections which follows:

- Part: A – CHC Result
- Part: B – TH Result
- Part: C – DH Result.
- Part: A – CHC Results

Table 7: Availability of services at two CHCs

Variables	Gagendragad responses		Laxmeshwar responses	
	Yes	No	Yes	No
Is there 24*7 delivery services available? (check through the past 3 month records for night delivery)	Yes		Yes	
Complication/high-risk pregnancy detection	Yes		Yes	
Management of PIH/PID/Pre-eclampsia/Eclampsia	Yes		Yes	
Normal delivery	Yes		Yes	
Manual removal of placenta	Yes		-	No
Management of PPH	Yes		Yes	
Administration of parenteral oxytocin/antibiotics/MgSO4	Yes		Yes	
Delivery of septic & HIV+ve PW	Yes		Yes	
Assisted deliveries (forceps/vacuum)	Yes		Yes	
Caesarian Section		No		No
PPIUCD insertion	Yes		Yes	
MTP	-	No	Yes	
Post-abortion sterilization	-	No	-	No
Counseling services (ANC, NBC, PNC, etc.)	Yes		Yes	
IEC for ANC services (4ANC, Family planning, Per abdomen examination)	Yes		Yes	

Table 8: Delivery performance indicators at two CHC’s from August–October 2021

Service Indicators	Gagendragad CHC	Laxmeshwar CHC
Number of normal deliveries conducted from the past 3 months	70	187
Number of C-Section conducted from the past 3 months	0	0
Number of maternal deaths in hospital from the past 3 months	0	0
Number of maternal death review from the past 3 months	0	0
Number of still births from the past 3 months	0	0
Number of live births from the past 3 months	71	187

Table 9: Availability of labor room registers at two CHC’s

Registers	Gagendragad responses		Laxmeshwar responses	
	Yes	No	Yes	No
Delivery register	Yes		Yes	
PPIUCD column register	Yes		Yes	
Referral register (in and out at L2 &L3)	Yes		Yes	

List of Government Community Health Centres(CHCs), Taluk Hospitals (THs) and District Hospital (DH) at Gadag District [Table 1]. The assessment reveals that overall infrastructure of the labor room at both CHCs is adequate to manage the labor cases except that no CHC displayed the contact details of referral transport, neither the name and contact details of duty doctor/nurse nor the duty roster, there was no restricted area signage at both CHCs. Privacy screen was not available in Gagendragad CHC and functional flush was not available in Laxmeshwar CHC [Table 2].

The study reveals that overall availability of equipments is adequate in both CHCs though refrigerator availability was there in both CHCs [Table 3].

The study shows that 100% of availability of trays was there in both CHCs [Table 4].

In this study, basic human resource for labor room was not available in both CHCs. Gagendragad CHC has no O&G specialist, pediatrician, and anesthetist at all, only one Grade A nurse was available during night shift. Lakshmeshwar CHC has no pediatrician, and only one Grade A nurse

Table 10: Availability of essential drugs for labor room at two CHCs

Variables	Gagendragad responses		Lakshmeshwar responses	
	Yes	No	Yes	No
Oxytocin (injection)	Yes		Yes	
Normal saline	Yes		Yes	
Dextrose 5%	Yes		Yes	
Dextrose Normal saline	Yes		Yes	
Ringer's lactate	Yes		Yes	
Dextran/Hemocoel (plasma expander)	-	No	-	No
Distilled water	Yes		Yes	
Ampicillin (injection)	-	No	Yes	
Metronidazole (injection)	Yes		Yes	
Gentamicin (injection)	Yes		-	No
Lig2caine 2%(injection)	Yes		Yes	
Lig2caine 2% with adrenaline (injection)	Yes		Yes	
Oxygen	Yes		Yes	
Diclofenc sodium (injection/tab)	Yes		Yes	
Paracetamol (tab)	Yes		Yes	
Adrenaline (epinephrine)(injection)	Yes		Yes	
Aminophylline (injection)	-	No	Yes	
Atropine (injection)	Yes		Yes	
Calcium gluconate (injection)	-	No	Yes	
Dexamethasone (injection)	Yes		Yes	
Diazepam (injection)	Yes		Yes	
Digoxin (tab)	-	No	-	No
Frusemide (injection)	Yes		Yes	
Glucose 25% (injection)	Yes		Yes	
Hydrocortisone (injection)	Yes		Yes	
Nitroglycerine (injection)	-	No	-	No
Promethazine (injection)	-	No	-	No
Magnesium sulfate (Injection)	Yes		Yes	
Pheniramine maleate (injection)	Yes		Yes	
Labetalol (injection)	Yes		Yes	

Table 11: Newborn vaccine availability at two CHCs

Variables	Gagendragad responses		Lakshmeshwar responses	
	Yes	No	Yes	No
Vit. K-1	Yes		Yes	
BCG	Yes		Yes	
Hep B "0" dose	Yes		Yes	
OPV "0" dose	Yes		Yes	

was available during night shift. There was a critical gap in human resource for labor room in Gagendragad CHC [Table 5].

The present study shows that both CHCs have availability of facilities, there was no separate infrastructure facility for KMC and blood storage

unit, but they are providing the services at both CHCs [Table 6].

The table shows both CHCs have majority of Service availability except post-abortion sterilization. MTP service was not available at Gagendragad CHC and Manual removal of placenta service was not available at Laxmeshwar CHC both CHCs [Table 7].

The study shows that both CHCs are not providing C-section services. Laxmeshwar CHC had highest performance in conducting deliveries which was more than twice the Gagendragad CHC performance in conducting deliveries. From the past 3 months, there are no maternal deaths and still births occurred in both CHCs [Table 8].

Table 12: Infrastructure availability at four taluk hospitals

Variables	Mundargi	Shirahatti	Nargund	Ron	F(%)
Number of delivery tables in LR	03	03	04	02	-
LR Signage	Yes	Yes	Yes	Yes	4 (100)
LR on ground floor	Yes	Yes	No	Yes	3 (75)
Restricted area signage	Yes	No	No	No	1 (25)
Contact details of referral transport displayed	No	No	No	No	0 (0)
Name and contact no of Doctor and Nurse on duty	Yes	No	Yes	Yes	3 (75)
Frosted/White colored glass for windows	Yes	Yes	Yes	Yes	4 (100)
Labor tables as per load	Yes	No	Yes	Yes	3 (75)
Privacy screen available	Yes	Yes	Yes	Yes	4 (100)
Duty roster display inside	No	No	No	No	0 (0)
24*7 availability of SBA trained SN/ANM	Yes	Yes	Yes	Yes	4 (100)
Consent taken before delivery	Yes	Yes	Yes	Yes	4 (100)
Standard bed head ticket being used	Yes	No	No	No	1 (25)
Correct use of Partograph	Yes	Yes	Yes	Yes	4 (100)
LR in proximity of NBSU (only if NBSU available)	No	Yes	No	Yes	2 (50)
LR in proximity of OT (L3)	Yes	Yes	Yes	Yes	4 (100)
Power back up for LR	Yes	Yes	Yes	Yes	4 (100)
Labor room clean look for any blood stains, dust, used cotton, Gauze, etc.	Yes	Yes	Yes	Yes	4 (100)
Attached toilet with western commode	No	No	Yes	No	1 (25)
Running water in toilet	Yes	Yes	Yes	No	3 (75)
Functional flush	Yes	No	Yes	No	2 (50)
Adequate light at Labor room	Yes	Yes	Yes	Yes	4 (100)
Labor table corroded	No	No	No	No	0 (0)
Stand for slippers and slippers at entrance	Yes	Yes	Yes	Yes	4 (100)
Temperature controlled	Yes	Yes	Yes	Yes	4 (100)
Attendant crowding	No	No	No	No	0 (0)
BMW segregation done	Yes	No	Yes	Yes	3 (75)
Display of protocols at correct places	Yes	Yes	Yes	Yes	4 (100)

The present study shows that all registers above mentioned in the table are available in two CHCs [Table 9].

The present study shows that majority of essential medicines and vaccines are available in both CHCs. Drugs such as digoxin, nitro-glycerine, and promethazine were not available in both CHCs [Table 10].

The study shows 100% of availability of vaccines for newborn baby at both CHCs [Table 11].

Part: B –TH

The study shows that majority of infrastructure availability was seen in all TH, duty roster and contact details of the referral transport were not displayed. Only nargundtaluk hospital has attached toilet with western commode [Table 12].

The study shows that majority of the infrastructure was available at all the TH. There is a least availability that is 50% of hub cutter, refrigerator, mattress on labor table, and boiler in THs, other 50% of refrigerators were available within the THs [Table 13].

The present study shows 100% of availability of trays in all four THs [Table 14].

The study reveals that there was no pediatrician and anesthetist at Nargund and Ron THs. OBG specialist at all four THs was available [Table 15].

The study shows that all facilities mentioned in the table were available in Ron taluk hospital except blood storage unit and all other three THs are commonly lack in SNCU, KMC and NRC facility, though KMC facility was not there, they are providing the services. Only one taluk hospital (nargund) had the blood storage unit rest of the

Table 13: Availability of equipment's at four Taluk hospitals

Variables	Mundargi	Shirhatti	Nargund	Ron	F(%)
Antiseptic solution	Yes	Yes	Yes	Yes	4 (100)
Liquid soap with dispenser	No	Yes	Yes	Yes	3 (75)
Kelly's pad	Yes	Yes	Yes	Yes	4 (100)
Macintosh	Yes	Yes	No	Yes	3 (75)
HIV Kits	Yes	Yes	Yes	Yes	4 (100)
Uristix	Yes	Yes	Yes	Yes	4 (100)
Hub Cutter	No	Yes	Yes	No	2 (50)
Functional BP apparatus	Yes	Yes	Yes	Yes	4 (100)
Refrigerator	No	Yes	Yes	No	2 (50)
Room Thermometer	Yes	Yes	Yes	Yes	4 (100)
IV Stand	Yes	Yes	Yes	Yes	4 (100)
Vaccine Carrier	Yes	No	Yes	Yes	3 (75)
Separate mops for LR	Yes	Yes	Yes	Yes	4 (100)
Glutaraldehyde Solution	Yes	Yes	Yes	Yes	4 (100)
Washing powder	Yes	Yes	Yes	Yes	4 (100)
Baby Weighing scale	Yes	Yes	Yes	Yes	4 (100)
Glucometer	Yes	Yes	Yes	No	3 (75)
Weighing scale for adult	Yes	Yes	No	Yes	3 (75)
Autoclave	Yes	Yes	Yes	Yes	4 (100)
Steel top Labor table	Yes	Yes	Yes	Yes	4 (100)
Foot step for Labor table	Yes	Yes	Yes	Yes	4 (100)
Mattress on Labor table	No	No	Yes	Yes	2 (50)
Stethoscope	Yes	Yes	Yes	Yes	4 (100)
Doppler	Yes	Yes	Yes	Yes	4 (100)
Trolley	Yes	No	Yes	Yes	3 (75)
Boiler	Yes	No	No	Yes	2 (50)
Wall clock (with second hand)	Yes	Yes	Yes	Yes	4 (100)
Bleaching powder	Yes	Yes	Yes	Yes	4 (100)
Three bucket system for Cleaning	Yes	No	Yes	Yes	3 (75)

Table 14: Availability of trays in four THs

Variables	Mundargi	Shirhatti	Nargund	Ron	F (%)
Delivery tray	Yes	Yes	Yes	Yes	4 (100)
Episiotomy tray	Yes	Yes	Yes	Yes	4 (100)
Baby tray	Yes	Yes	Yes	Yes	4 (100)
Medicine tray	Yes	Yes	Yes	Yes	4 (100)
Emergency drug tray	Yes	Yes	Yes	Yes	4 (100)
PPIUCD tray	Yes	Yes	Yes	Yes	4 (100)
Resuscitation for mothers	Yes	Yes	Yes	Yes	4 (100)

three THs did not had blood storage unit facility. All THs had ANC OPD, labor room, functional OT, PNC ward, NBCC, pharmacy, and laboratory facilities [Table 16].

The study shows that there was most of the service availability in all the TH. C-section service which is one of the most important service for pregnant women in taluk hospital was not available in

Table 15: Availability of basic human resource for labor room in four THs

Variables	Mundargi	Shirahatti	Nargund	Ron	F (%)
Pediatrician (min 1)	Yes	Yes	No	No	2 (50)
Anesthetist (min 1)	Yes	Yes	No	No	2 (50)
OBG specialist (min 1)	Yes	Yes	Yes	Yes	4 (100)
Grade A nurses given for LR during day shift minimum 2 per shift?	Yes	Yes	Yes	Yes	4 (100)
Grade A nurses given for LR during night shift minimum 2 per shift?	Yes	Yes	Yes	Yes	4 (100)
Sweepers for LR at day shift (minimum 1 per shift)?	Yes	Yes	Yes	Yes	4 (100)
Sweepers for LR at night shift (minimum 1 per shift)?	Yes	Yes	Yes	Yes	4 (100)

Table 16: Availability of facility at four Taluk hospitals

Availability of facility	Mundargi	Shirahatti	Nargund	Ron	F (%)
ANC OPD	Yes	Yes	Yes	Yes	4 (100)
Labor room	Yes	Yes	Yes	Yes	4 (100)
Functional OT	Yes	Yes	Yes	Yes	4 (100)
PNC Ward	Yes	Yes	Yes	Yes	4 (100)
NBCC	Yes	Yes	Yes	Yes	4 (100)
NBSU	No	Yes	Yes	Yes	3 (75)
SNCU (DH)	No	No	No	Yes	1 (25)
KMC (DH)	No	No	No	Yes	1 (25)
NRC (DH)	No	No	No	Yes	1 (25)
Blood bank/storage unit	No	No	Yes	No	1 (25)
Pharmacy	Yes	Yes	Yes	Yes	4 (100)
Laboratory	Yes	Yes	Yes	Yes	4 (100)
Radiology	Yes	No	Yes	Yes	3 (75)

Table 17: Availability of services at four Taluk hospitals

Variables	Mundargi	Shirahatti	Nargund	Ron	F (%)
Is there 24*7 delivery services available? (check through the past 3 month records for night delivery)	Yes	Yes	Yes	Yes	4 (100)
Complication/high-risk pregnancy detection	Yes	Yes	Yes	Yes	4 (100)
Management of PIH/PID/Pre-eclampsia/Eclampsia	Yes	No	Yes	Yes	3 (75)
Normal delivery	Yes	Yes	Yes	Yes	4 (100)
Manual removal of placenta	Yes	Yes	Yes	Yes	4 (100)
Management of PPH	Yes	Yes	Yes	Yes	4 (100)
Administration of parenteral oxytocin/antibiotics/MgSO4	Yes	Yes	Yes	Yes	4 (100)
Delivery of septic and HIV+ve PW	Yes	Yes	Yes	Yes	4 (100)
Assisted deliveries	Yes	Yes	Yes	Yes	4 (100)
Cesarean Section (for L3)	Yes	Yes	No	No	2 (50)
PPIUCD insertion	Yes	Yes	Yes	Yes	4 (100)
MTP	Yes	Yes	Yes	Yes	4 (100)
Post-abortion sterilization	Yes	Yes	Yes	Yes	4 (100)
Counseling services (ANC, NBC, PNC, etc.)	Yes	Yes	Yes	Yes	4 (100)
IEC for ANC services (4ANC, Family planning, Per abdomen examination)	Yes	Yes	Yes	Yes	4 (100)

Nargund and Ron THs because there no pediatrician and anesthetist in Nargund and Ron THs [Table 17].

The study shows that there were no C-sections conducted for the past 3 months in any of the THs.

Table 18: Delivery performance indicators at four THs from August–October 2021

Variables	Mundergi	Shirahatti	Nargund	Ron
Number of normal deliveries conducted from the past 3 months	93	114	114	105
Number of C-sections conducted from the past 3 months	0	0	0	0
Number of maternal deaths in hospital from the past 3 months	1	0	0	0
Number of maternal death review from the past 3 months	1	0	0	0
Number of still births from the past 3 months	0	4	0	0
Number of live births from the past 3 months	92	110	114	105

Table 19: Availability of labor room registers at four THs

Variables	Mundergi	Shirahatti	Nargund	Ron	F (%)
Delivery register	Yes	Yes	Yes	Yes	4 (100)
PPIUCD column register	Yes	Yes	Yes	Yes	4 (100)
Referral register (in and out at L2 and L3)	Yes	Yes	Yes	Yes	4 (100)

Table 20: Availability of essential medicines at four Taluk hospitals

Variables	Mundergi	Shirahatti	Nargund	Ron	F (%)
Oxytocin (injection)	Yes	Yes	Yes	Yes	4 (100)
Normal saline	Yes	Yes	Yes	Yes	4 (100)
Dextrose 5%	Yes	Yes	Yes	Yes	4 (100)
Dextrose Normal saline	Yes	Yes	Yes	Yes	4 (100)
Ringer's lactate	Yes	Yes	Yes	Yes	4 (100)
Dextran/Hemocoel (plasma expander)	Yes	Yes	No	No	2 (50)
Distilled water	Yes	Yes	Yes	Yes	4 (100)
Ampicillin (injection)	No	Yes	No	Yes	2 (50)
Metronidazole (injection)	Yes	Yes	Yes	Yes	4 (100)
Gentamicin (injection)	Yes	Yes	Yes	Yes	4 (100)
Lignocaine 2%(injection)	Yes	Yes	Yes	Yes	4 (100)
Lignocaine 2% with adrenaline (injection)	No	Yes	Yes	Yes	3 (75)
Oxygen	Yes	Yes	Yes	Yes	4 (100)
Diclofenac sodium (injection/tab)	Yes	Yes	Yes	Yes	4 (100)
Paracetamol (tab)	Yes	Yes	Yes	Yes	4 (100)
Adrenaline (epinephrine)(injection)	Yes	Yes	Yes	Yes	4 (100)
Aminophylline (injection)	No	No	Yes	Yes	2 (50)
Atropine (injection)	Yes	Yes	Yes	Yes	4 (100)
Calcium gluconate (injection)	Yes	Yes	Yes	Yes	4 (100)
Dexamethasone (injection)	Yes	Yes	Yes	Yes	4 (100)
Diazepam (injection)	Yes	Yes	Yes	Yes	4 (100)
Digoxin (tab)	No	No	No	No	0 (0)
Furosemide (injection)	Yes	Yes	Yes	Yes	4 (100)
Glucose 25%(injection)	Yes	Yes	Yes	Yes	4 (100)
Hydrocortisone (injection)	Yes	Yes	Yes	Yes	4 (100)
Nitroglycerine (injection)	No	No	No	Yes	1 (25)
Promethazine (injection)	No	Yes	No	Yes	2 (50)
Magnesium sulfate (Injection)	Yes	Yes	Yes	Yes	4 (100)
Pheniramine maleate (injection)	Yes	Yes	Yes	Yes	4 (100)
Labetalol (injection)	Yes	Yes	Yes	Yes	4 (100)

Table 21: Availability of newborn vaccines at four THs

Variables	Mundergi	Shirahatti	Nargund	Ron	F (%)
Vit. K-1	Yes	Yes	Yes	Yes	4 (100)
BCG	Yes	Yes	Yes	Yes	4 (100)
Hep B “0” dose	Yes	Yes	Yes	Yes	4 (100)
OPV “0” dose	Yes	Yes	Yes	Yes	4 (100)

Table 22: Labor room infrastructure availability at DH

Variables	Availability	
	Yes	No
Number of delivery tables in LR	08	
LR signage	Yes	
LR on ground floor	Yes	
Restricted area signage	Yes	
Contact details of referral transport displayed	Yes	
Name and contact 2 of Doctor and Nurse on duty	Yes	
Frosted/White colored glass for windows	Yes	
Labor tables as per load	-	No
Privacy screen available	Yes	
Duty roster display inside	Yes	
24*7 availability of SBA trained SN/ANM	Yes	
Consent taken before delivery	Yes	
Standard bed head ticket being used	Yes	
Correct use of Partograph	Yes	
LR in proximity of NBSU (only if NBSU available)	Yes	
LR in proximity of OT (L3)	Yes	
Power back up for LR	Yes	
Labor room clean look for any blood stains, dust, used cotton, Gauze, etc.	-	No
Attached toilet with western commode	Yes	
Running water in toilet	Yes	
Functional flush	Yes	
Adequate light at Labor room	Yes	
Labor table corroded	Yes	
Stand for slippers and slippers at entrance	Yes	
Temperature controlled	Yes	
Attendant crowding	Yes	
BMW segregation done	Yes	
Display of protocols at correct places	Yes	

Table 23: Availability of labor room equipment at DH

Variables	Availability	
	Yes	No
Antiseptic solution	Yes	
Liquid soap with dispenser	Yes	
Kelly’s pad	Yes	
Macintosh	Yes	
HIV Kits	Yes	
Uristix	Yes	
Hub Cutter	Yes	
Functional BP apparatus	Yes	
Refrigerator	Yes	
Room Thermometer	Yes	
IV Stand	Yes	
Vaccine Carrier	Yes	
Separate mops for LR	Yes	
Glutaraldehyde Solution	Yes	
Washing powder	Yes	
Baby Weighing scale	Yes	
Glucometer	Yes	
Weighing scale for adult	Yes	
Autoclave	Yes	
Steel top Labor table	Yes	
Foot step for Labor table	Yes	
Mattress on Labor table	Yes	
Stethoscope	Yes	
Doppler	Yes	
Trolley	Yes	
Boiler	Yes	
Wall clock (with second hand)	Yes	
Bleaching powder	Yes	
Three bucket system for Cleaning	Yes	

Four still births happened in Shirahatti TH and one maternal death occurred in Mundari TH [Table 18]. The present study shows that there is a 100% of availability of registers in all THs of Gadag [Table 19]. The present study shows that majority of the essential drugs are available in all the TH’s which is appreciable. Few emergency drugs such as Digoxin 0%, Nitroglycerine 25%, and Promethazine 50% are least available [Table 20].

The present study shows 100% of availability of vaccine in all the TH [Table 21].

Part: C-DH Result Tables

The present study shows that majority of the infrastructure is available at the DH, there is a shortage of labor tables as per case load [Table 22]. The present study shows that all the equipment above mentioned in the table are available at DH [Table 23].

The present study shows that all the trays above mentioned in the table are available at DH [Table 24].

Table 24: Availability of trays in labor room at DH

Variables	Availability	
	Yes	No
Delivery tray	Yes	
Episiotomy tray	Yes	
Baby tray	Yes	
Medicine tray	Yes	
Emergency drug tray	Yes	
PPIUCD tray	Yes	
Resuscitation for mothers	Yes	
MVA/EVA Tray	Yes	
Eclampsia tray	Yes	

Table 25: Availability of basic human resource for labor room in DH

Variables	Availability	
	Yes	No
Pediatrician (minimum 1)	Yes	
Anesthetist (minimum 1)	Yes	
OBG Specialist (minimum 1)	Yes	
Grade A nurses given for LR during day shift minimum 2 per shift	Yes	
Grade A nurses given for LR during night shift minimum 2 per shift	Yes	
Sweepers for LR at day shift (minimum 1 per shift)	Yes	
Sweepers for LR at night shift (minimum 1 per shift)	Yes	

Table 26: Availability of maternal and newborn health-care facility at DH

Variables	Availability	
	Yes	No
ANC OPD	Yes	
Labor room	Yes	
Functional OT	Yes	
PNC Ward	Yes	
NBCC	Yes	
NBSU	Yes	
SNCU (DH)	Yes	
KMC (DH)	Yes	
NRC (DH)	Yes	
Blood bank/storage unit	Yes	
Pharmacy	Yes	
Laboratory	Yes	
Radiology	Yes	

The assessment shows that there is basic human resource availability for labor room in DH [Table 25].

Table 27: Service availability at DH

Variables	Availability	
	Yes	No
Is there 24*7 delivery services available? (check through the past 3 month records for night delivery)	Yes	
Complication/high-risk pregnancy detection	Yes	
Management of PIH/PID/Pre-eclampsia/Eclampsia	Yes	
Normal delivery	Yes	
Manual removal of placenta	Yes	
Management of PPH	Yes	
Administration of parenteral oxytocin/antibiotics/MgSO4	Yes	
Delivery of septic and HIV+ve PW	Yes	
Assisted deliveries (forceps/vacuum)	Yes	
Caesarean Section (for L3)	Yes	
PPIUCD insertion	Yes	
MTP	Yes	
Post abortion sterilization	Yes	
Counseling services (ANC, NBC, PNC, etc.)	Yes	
IEC for ANC services (4ANC, Family planning, and Per abdomen examination)	Yes	

Table 28: Maternal service indicators performance at DH from August–October 2021

Service indicators	Frequency
Number of normal deliveries conducted from the past 3 months	774
Number of C-section conducted from the past 3 months	922
Number of maternal deaths in hospital from the past 3 months	2
Number of maternal death review from the past 3 months	2
Number of still births from the past 3 months	25
Number of live births from the past 3 months	1689

Table 29: Availability of registers at DH

Variables	Availability	
	Yes	No
Delivery register	Yes	
PPIUCD column register	Yes	
Referral register (in and out at L2 and L3)	Yes	
Does this facility have drugs in delivery room?	Yes	

The present study shows that all the facilities above mentioned in the table are available at DH [Table 26].

The present study shows that all the services above mentioned in the table are available at DH [Table 27].

The table shows approximately 565 deliveries conducted per month that is 19–20 deliveries

Table 30: Availability of essential drugs at DH

Variables	Availability	
	Yes	No
Oxytocin (injection)	Yes	
Normal saline	Yes	
Dextrose 5%	Yes	
Dextrose Normal saline	Yes	
Ringer's lactate	Yes	
Dextran/Hemocoel (plasma expander)	Yes	
Distilled water	Yes	
Ampicillin (injection)	Yes	
Metronidazole (injection)	Yes	
Gentamicin (injection)	Yes	
Lig2caine 2% (injection)	Yes	
Lig2caine 2% with adrenaline (injection)	Yes	
Oxygen	Yes	
Diclofenc sodium (injection/tab)	Yes	
Paracetamol (tab)	Yes	
Adrenaline (epinephrine) (injection)	Yes	
Aminophylline (injection)	Yes	
Atropine (injection)	Yes	
Calcium gluconate (injection)	Yes	
Dexamethasone (injection)	Yes	
Diazepam (injection)	Yes	
Digoxin (tab)	Yes	
ssFrusemide (injection)	Yes	
Glucose 25% (injection)	Yes	
Hydrocortisone (injection)	Yes	
Nitroglycerine (injection)	Yes	
Promethazine (injection)	Yes	
Magnesium sulfate (Injection)	Yes	
Pheniramine maleate (injection)	Yes	
Labetalol (injection)	Yes	

Table 31: Newborn vaccine availability at district hospital

Variables	Availability	
	Yes	No
Vit. K-1	Yes	
BCG	Yes	
Hep B "0" dose	Yes	
OPV "0" dose	Yes	

conducted per day in DH. There were 25 still births and two maternal deaths happened in the past 3 months in DH [Table 28].

The present study shows that all the registers above mentioned in the table are available at DH [Table 29]. The assessment shows that all the essential drugs above mentioned in the table are available at DH [Table 30].

The study reveals that all the vaccines for new born baby are available at DH [Table 31].

DISCUSSION

Maternal infant and child health is one of the leading health indicators worldwide. Essential obstetric care and clean safe delivery are the two major pillars of safe motherhood, providing quality of services to a pregnant woman during labor has a major impact on safe motherhood.

The present study of labor room shows adequate infrastructure in CHC, TH, and DH of Gadag district, it shows that all this assessed health-care facilities can conduct the labor with available infrastructure. Adequate infrastructure positively affects services and outcomes in a facility. Its maintenance and use can also reflect the mindset of service providers and their capability and intent in delivering quality services.

The Labor Room Assessment study in Bihar that less than half the labor rooms in public sector health facilities in Bihar have adequate infrastructure to ensure safe delivery, sanitation, and hygiene maintenance. The findings show the urgency needed to address the gaps in infrastructure and mitigate infection-related causes that adversely affect maternal and newborn child health.^[8] Another study in Tripura for assessment of labor room in public health-care facilities found that seven labor rooms had shortage of attached toilets. Cleanliness and 24 h running water is also an issue for eight toilets. One DH has not the backup power supply in the labor room. One PHC/CHC has the backup power supply but do not have the regular power supply in the labor room in Unakoti district. Moreover, also backup power is not available in the labor room of one SDH in the same district. Hanging of right protocols at right places is an issue of many of the labor rooms.^[9]

Equipments: The present study found that availability of stethoscope (100%), BP apparatus (100%), weighing machine for newborn (100%), and majority of the equipments have 100% availability in all the assessed health-care facilities of Gadag. Similar study on labor rooms of health facilities in the Bihar state, it was found that

equipments except availability of stethoscope (82%), BP apparatus (80%), weighing machine for newborn (88%), and thermometer (73%), the availability of other equipments is very poor.^[8]

Another study in Tripura for assessment of labor room in public health-care facilities found that the labor table was available in all facilities surveyed but labor table with these entire item mattresses, sheet, Macintosh, Foot-rest, and Kelly's pad was missing. Emergency drug tray and mobile lamp with stand were available in 18 and 23 facilities, respectively. Other items such as suction machine, watch, baby tray, delivery tray, electrical sterilizer, BP apparatus, and weighing machine were available in all facilities.^[10]

The present study shows that basic human resource for labor room is not available in both CHCs. Out of 2 CHCs, no CHC has pediatrician (0%), only one CHC has anesthetist and one O&G specialist that is (50%). Out of four TH, only (50%) of anesthetist and pediatricians are available at TH, there is no pediatrician and anesthetist at two TH. O&G specialist at all four Taluk hospitals is available during day shift but only on call during night shift. Other nursing staff and sweepers are available at both day shift and night shift. Only in DH human resource was fully available.

Another study in Gadag district was conducted 2 years ago for manpower assessment in CHCs and TH, it found that there one physician and one general surgeon available in only one CHC and none of the CHCs having an obstetrician and gynecologist. Overall, 70.31% of medical and paramedical staff exist in both CHCs. Obstetricians and gynecologists were available in all four sub district hospitals whereas only two sub-district hospitals having pediatricians, where three having anesthetists, general duty doctors, and general surgeon. Only two sub-district hospitals having general physicians, etc.

A similar study was done by Sodani and Sharma in the 2011 Bharatpur District of Rajasthan State. It was found that infrastructure was available in almost all the CHCs, but a shortage of manpower especially specialists was observed.^[10] A similar study was conducted by Chauhan *et al.* in seven CHCs of Shimla District and evaluated in terms of health manpower, infrastructure, and services

2012. This study shows as no specialist doctor was posted at any of the CHCs and the findings are as same as my study.^[11]

Facilities: The present study shows that all CHC, TH, and DH have ANC OPD, labor room, functional operation theater, PNC ward, NBCC, pharmacy, laboratory, NBSU was not there in one CHC and one TH, rest of the others have NBSU facility, blood storage unit only DH and one TH have this facility no other have blood storage unit. One of the major drawbacks for not conducting C-section and other complicated case-related pregnancy is lack in blood storage units in TH and CHC.

Regarding services, two CHCs have availability of services like 24*7 delivery services, high risk pregnancy detection, normal delivery, assisted delivery, PPIUCD insertion, family planning, and also counseling services (100%) but lack in providing C-section services and post-abortion sterilization in both CHCs and also only 50% of CHCs provide MTP and manual removal of placenta. Four THs have all service availability but none of the facility conducted C section for the past 3 months may be because of specialist shortage and blood unavailability. About 100% of all service delivery was present in DH.

Another study conducted at Belagavi District of Karnataka by Patil and Shivaswamy, and found that minor surgeries were performed in all the CHCs. Only tubectomy and vasectomy were performed in 50% of CHCs. Obstetric and gynecological operations were performed in 40% of CHCs.^[12] A study was carried out by Kaur *et al.* in 2015. The results show that appreciable work in antenatal care, 80.6% of the mothers had institutional delivery. Three-quarters of the mothers had not any post-natal check-up. About 68.2% of mothers breastfed their babies in more than 1 h after birth.^[13] A similar study conducted by Sharma *et al.*, at all CHC in Udaipur district results shows that emergency services were available at the majority of CHCs (95.2%), family planning only at 7 (33.3%), 24-h delivery services at all CHCs (100%), emergency obstetric care, and blood storage facility only at 1 (4.8%) of CHCs. The majority (95%) only 5(23.8%) of CHCs had the facility of both surgeon and gynecologist.^[14]

Regarding labor room essential drugs, the present study shows that majority of the essential drugs

are available in both CHCs and few drugs are least available at CHCs such as ampicillin 50%, gentamicin 50%, aminophylline 50%, calcium gluconate 50%, few emergency drugs such as digoxin 0%, nitroglycerine 0%, and promethazine 0%, and rest of all essential drugs of labor room are 100% of available in both CHCs. All the four THs have 100% of availability of essential drugs for labor room except few emergency drugs such as digoxin 0%, nitroglycerin 25% availability, and promethazine 50% of availability. All essential drugs are available in DH vaccines that are also available at all served hospital. A study was conducted in Tripura for labor room assessment, it was found that Oxytocin injection, Mizoprostol 200 mg tab, normal saline, vit K inj, Dextrose normal saline, Ringers lactate, and Metronidazole inj etc were available at almost all 29 labor rooms. There were shortage of Ampicillin inj (20), Gentamicin inj (24), Oxygen (20), Adrenaline inj (10), Aminophylline inj (10), etc. at the labor room.^[11]

In Gadag district, most of the FRU institutions had the physical infrastructure. However, considering the availability of blood storage facility, apart from DH only one taluk hospital has blood storage facility; therefore, utilization of physical infrastructure goes down drastically due to lack of blood itself in FRUs.

Human Resource: If somebody has to do round the clock obstetric delivery and operation for that how many O&G specialist needed, how many institutions can run round the clock as expected, for running round the clock ideally need one person for 8 h that means three O&G specialists needed, except DH, no other institutes have this many O&G specialists. Ideally round the clock services can be given in only one institution that is DH. Most of the institutes had the required equipments, drugs, and service provision in FRU's except human resource and blood storage facilities in taluk hospital and CHCs of Gadag district.

Birth rate in Karnataka is 17/1000 population per year, Gadag district, population is approximately 11 lakhs, (11 lakhs*17/1000) according to these 18,700 births occur per year in Gadag district. Nearly 1700 deliveries occur in DH every 3 months and per year 6800 deliveries as mentioned in the result tables. Nearly 2740 deliveries per year

occur in TH's and CHC's. If we assume, 1000 deliveries occur in 24*7 PHC every year. DH+TH and CHC+24*7PHC=6800+2740+1000=total 10,540 deliveries occur in government institutes out of 18,700 deliveries, it shows only 56% of the deliveries occurring in government institutes, rest of the 44% of deliveries might had occurred under the assistance of dais, private hospitals or nearby city hospitals (Hubli) etc. The rest 44% of deliveries not occurred in government institutes may be because of lack of manpower, infrastructure, and quality of service provision in TH, CHC, and 24*7 PHC, overcrowdings in DH of Gadag district.

No government institutes had done C-section in Gadag district for 3 months except DH which is 922 C-Sections in 3 months (August-October 2021), means approximately 3688 C-sections occur per year in DH out of 6800 total number of deliveries, it shows that 56% of total deliveries are C-section in DH which is more. It leads to heavy burden on hospital staff at DH because there is no blood storage units, non-availability of anesthetist, pediatrician, and O&G specialist (during night shift) at CHC and TH causes more case load at DH. Although they have O&G specialist and anesthetist at Laxmeshwar CHC, Munderggi TH, and Shirahatti TH, they have not done any C-section case.

According to the WHO, more than 15% of C-section is considered as high. Three thousand six hundred and eighty-eight C-sections occurring at DH itself out of 18,700 births per year according to Gadag population, which is 19.8% of C-section, occur at DH itself and do not have the other private institution C-section records of Gadag district, this issue should get noticed by local health departments of the district.

CONCLUSION

The infrastructure and equipment's availability in the assessed facilities is quite satisfactory, few gaps are found that need to be covered in THs and CHCs. Basic human resource was not there for labor room in CHCs and two THs but all the four TH have O&G specialists and required staff nurse. Blood storage unit was there only in DH and one TH, rest of the health institutions are lack in blood storage unit.

Most of hospitals have all service availability but none of the facility conducted C-section services except DH. Meanwhile essential drugs are almost available in the hospitals which are appreciable. Health facilities with sufficient infrastructure, equipments, Human resource, and essential drugs in labor room would improve the level of labor room services provided to the community. Health human resource shortage is the key bottleneck problem in service delivery.

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