



ASSESSMENT AND IMPLEMENTATION OF QUALITY ASSURANCE IN LABOUR ROOMS IN DIFFERENT TIERS OF HEALTH FACILITIES OF WEST BENGAL, INDIA

Swati Pramanick^{1*}, Soumya Mondal², Samir Dasgupta³, Tapan K. Naskar⁴, Debjit Chakraborty⁵

¹Bidhannagar, North 24 Parganas, West Bengal,

²Bureau of Applied Economics & Statistics, South 24 Parganas, West Bengal,

³Community Medicine, North Bengal Medical College & Hospital, West Bengal

⁴Gynae & Obs., Kolkata Medical College & Hospital, West Bengal,

⁵Epidemiology, ICMR NICED, Kolkata.

ARTICLE INFO

Article History:

Received 10th July, 2021

Received in revised form 2nd

August, 2021

Accepted 26th September, 2021

Published online 28th October, 2021

Key words:

Labour Room, Quality Assurance, West Bengal, Care at Birth, Health Facility

ABSTRACT

Background: Quality of care at the health facilities during childbirth remains a key concern. Enhanced quality could have the utmost dividend in saving maternal and newborn lives.

Objective: The objective of this study was to assess quality assurance measures in the labor rooms of different tiers of public health facilities West Bengal.

Methods: Labor room quality assurance intervention was implemented in selected Basic Emergency Obstetric and Neonatal Care (BEmONC) and Comprehensive Emergency Obstetric and Neonatal Care (CEmONC) facilities. The facilities were assessed using labor room quality assurance checklist developed by the Ministry of Health and Family Welfare. The critical gaps affecting service delivery were identified, and a list of priority actions for quality improvement was developed. An intervention model was rolled out in consultation with the Maternal Health Division and the State Quality Assurance Division, West Bengal and UNICEF focusing on each area of concern of quality assurance. Initial assessment was done from January 2018 to April 2018. The interventions were implemented from August 2018 to July 2019 in the selected facilities after which a final assessment was conducted.

Results: Assessment of labor room (BEmOC and CEmOC) was conducted in 105 facilities. The activities toward implementation of the Quality assurance model continued for almost 12 months after which a repeat assessment was done to evaluate the improvements. The results demonstrated a definite improvement in quality assurance scores in most of the facilities with Presidency division little better than Jalpaiguri division. During the intervention period, the scores for Outcome were increased by 20 points in Jalpaiguri division (from 38.0 to 58.1), 19 points in Presidency division (from 45.4 to 64.4) and 18 points in Bardhaman division (from 36.9 to 54.5). The highest gain in scores was observed in quality management component in Presidency division (from 15.4 to 43.0). **Conclusion:** It is possible to further strengthening of quality assurance output within public health system with sustained efforts and commitment.

Copyright©2021 Swati Pramanick et al. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

INTRODUCTION

One of the key objectives of National Health Mission (NHM) is to reduce Maternal and Infant Mortality so that India achieves the SDG target of MMR of less than 70 per lakh live birth (1). To achieve this target, it is imperative that continuous efforts are made to improve the health of the mother and child. With the implementation of several pregnant women centric

initiatives like Janani Suraksha Yojana (JSY) and Janani Shishu Suraksha Karyakram (JSSK), under the aegis of NHM, there has been a sharp increase in Institutional Deliveries (> 98%) across the State (2,3). This increase in the numbers did equate in desired and proportionate improvements in Maternal and Newborn indicators. It is estimated that approximately 46% maternal deaths, over 40% stillbirths and 40% newborn deaths take place on the day of the delivery (4).

Our past experience reveals that lack of standardization of design in terms of infrastructure, equipment, human resource; infection prevention and control along with referrals have been major bottlenecks in ensuring quality maternal and neonatal

*Corresponding author: Swati Pramanick
Bidhannagar, North 24 Parganas, West Bengal

health services. Timely provision of emergency obstetric care and availability of routine essential obstetric and newborn care are the key strategies for reduction of maternal and neonatal morbidity and mortality (4).

“A child’s risk of dying is highest during the first 28 days of life when about 40% of under-five deaths take place, translating into three million deaths. Up to one half of all newborn deaths occur within the first 24 hours of life and 75% occur in the first week”(5). Maternal, Neonatal deaths can be prevented by adherence to simple evidence-based practices during or just after childbirth. It is important to provide quality of care during intra-partum and post-partum period during 48 hours mandatory stay of the mother in the facility, for each and every delivery (6).

Birth is the time of highest risk, when more than 40% of maternal deaths (total about 290,000) and stillbirths or neonatal deaths (5.5 million) occur every year. The 2.9 million annual neonatal deaths worldwide are attributable to three main causes: infections (0.6 million), intrapartum conditions (0.7 million), and preterm birth complications (1.0 million) (7).

It has been observed that increased coverage and quality of preconception, antenatal, intrapartum, and postnatal interventions by 2025 could avert 71% of neonatal deaths (1.9 million [range 1.6-2.1 million]), 33% of stillbirths (0.82 million [0.60-0.93 million]), and 54% of maternal deaths (0.16 million [0.14-0.17 million]) per year (8).

The present study intends to assess the quality issues in labour rooms at different tiers of health facilities in West Bengal. Critical steps of this study are measuring Quality standards with the help of measurable elements and check list; Quality Assessment; identification of gaps and areas of improvement; evolve an action plan, implementation of improvement initiatives and follow up assessment.

MATERIALS AND METHODS

The study was conducted in three phases: initial assessment, implementation of intervention, and post intervention assessment. Nine districts were selected by Probability Proportional to Size (PPS) method, from three administrative divisions of West Bengal. By proportionate sampling procedure 105 health facilities (9 Medical College & Hospitals, 20 Sub Divisional Hospitals / State General Hospitals and 76 Rural Hospitals and Block Primary Health Centres) were selected. Initially the selected health facilities were assessed during the period of January 2018 to April 2018. Assessment was done using National Quality Assurance Standards (NQAS) checklist for Labor Room that was developed, validated and shared by the Ministry of Health and Family Welfare, Government of India (9). Eight concerned areas of Quality Assurance parameters which include Service Provision, Patient Rights, Inputs, Support Services, Clinical Services, Infection Control, Quality Management, and Outcome were assessed using the check list by means of observation, staff interview, record review and patient interview. After gathering information and evidence for measurable elements, assessment was concluded for extent of compliance - full, partial or non-compliance for each of the checkpoints. In the score sheet the variable was assigned a score of 2 for full compliance, 1 for partial compliance, and 0 for non-compliance.

Identification of gaps and areas of improvement was an important and integral part of assessment. ‘Root-cause analysis’ of the observed gaps were conducted after initial quality assessment, so that real & sustainable solutions are found. Gaps were categorized in terms of: High, Moderate, and Low (10). The critical gaps affecting service delivery were identified, and a list of priority actions for infection control, biomedical waste management, infrastructure and equipment availability and maintenance was developed and interventions were planned to address and overcome them. Implementation was carried out with the support of and in consultation with the Maternal Health Division of West Bengal. Efforts were put in to equip the facilities and health-care staff with required logistics and skills to facilitate the improvement of the quality of services. The implementation phase lasted for 12 months (from August 2018 to July 2019). A follow up assessment was conducted in August 2019 to December 2019 to gain an understanding of the outcome of the interventions.

Intervention model for Quality Assurance in labor rooms

Quality circles were formed at the Labour Rooms of selected facilities comprising doctors, nurses, program managers, support staffs and were trained. Each member of Quality Circles were oriented on Quality Improvement and Clinical Protocols, assessment of the Labour Rooms against National Quality Standards, preparation of time bound action plan, based on the identified gaps, collation of requirements and resource allocation through the PIP process under the NHM, recording of data elements for monitoring of the indicators and implementation of Quality Management System, ensuring availability of drugs & supplies, initiation of Patients’ satisfaction survey among all patients reporting in the labour room.

Six Rapid Improvement cycles were introduced and implemented. Each cycle was of two months duration. The quality improvement themes were on Real-time Partograph generation & usage of Safe Birth check-list and strengthening documentation practices, respectful maternity care and enhancement of patients’ satisfaction, clinical assessment, triage and timely management of complications, management of Labour as per protocols including AMTSL & rational use of Oxytocin, essential and emergency care of Newborn & Pre-term babies including management of birth asphyxia and timely initiation of breast feeding as well as Kangaroo Mother Care (KMC) for preterm newborn, Infection Prevention including Biomedical Waste Management. Onsite training and demonstrations were provided by the field team during visits on upkeep of equipment, biomedical waste management, infection control practices.

Observations

Initial assessment of labor room was conducted in 105 facilities (48, 18 and 39 from Bardhaman, Jalpaiguri and Presidency Division respectively). The average composite score of facilities in Jalpaiguri Division was recorded 441.3, while in Presidency and Bardhaman Division, it was 435.3 and 430.9 respectively out of a total of 800. The average score of facilities on quality management (25.5, 23.9 and 15.4 in Bardhaman, Jalpaiguri and Presidency Division respectively) and outcome (45.4, 38.0 and 36.9 in Presidency, Jalpaiguri and Bardhaman Division respectively) were lowest among all parameters in all the divisions.

Table 1 Key gaps identified and the interventions undertaken or planned.

| Area of concern | Common gaps identified | Interventions undertaken / planned |
|----------------------|--|--|
| A. Service Provision | <ul style="list-style-type: none"> • Patients were referred to higher centres unnecessarily; during referral higher centers were not intimated. • There was gap in knowledge and practice of – Preterm delivery conduction, Medical / Surgical management of PPH, management of retained placenta, management of PIH / Eclampsia. • Functional Newborn resuscitation services were not available at many facilities. • 24*7 point of care diagnostic tests was not available. | <ul style="list-style-type: none"> • Monthly referral audit by facility in-charge. • Training of MOs of primary tier HF on BEmONC focusing on detection of high risk pregnant pregnancies, basic obstetric management (with complication), newborn care and referral management. • Availability of Ambu bags with “0” and “1” size masks. • Tie up with PPP labs under JSSK Diagnostics. |
| B. Patient Rights | <ul style="list-style-type: none"> • The facilities did not have uniform and user-friendly signage system. • The facilities do not display the services and entitlements available in its departments • Adequate visual privacy was not provided at every point of care. • There was no established procedure for taking informed consent before treatment and procedures. • Consent forms were not bilingual. | <ul style="list-style-type: none"> • Standard signage templates shared with funds for printing as per PIP approvals. • District RCH team sensitized along with facility in-charges to ensure display • Ensured availability of at least side screens and mothers’ gown in maternity wards. • Notified State specific consent form in local language and standard format in Obs. Case sheets |
| C. Inputs | <ul style="list-style-type: none"> • Labour Room and associated services were not arranged according to Labour-Delivery-Recovery Concepts. • Functional telephone and intercom connections were not available. • There was no scope of unidirectional flow of care at facilities. • All types of functional Equipment & Instruments for examination & Monitoring were not available. • All types of functional equipment & instruments for diagnostic procedures were not available. • Frequent changing of sweepers in Labor Room. • Spill management protocols, 10 don'ts of LR were not available. • Many facilities did not have plan for prevention of fire. • Many facilities did not have a defined and established procedure for effective utilization, evaluation and augmentation of competence and performance of staff. • Labour room staffs were not trained on Quality Management, Respectful Maternal Care. | <ul style="list-style-type: none"> • Space constraint in establishing LDRs; would be planned in new construction sites. • Dedicated helpline numbers recommended. • Reorganization of Labour Rooms & Maternity wards carried out with unidirectional outlay. • Gap analysis done and funds allocated for procurement of basic equipments like foetal Doppler, BP etc. • Gap analysis done and funds allocated for procurement of basic instruments. • Orders for non rotational deployment of sweepers issued by State. • ICNs notified and trained in spill management. ‘Do’s & Dont’s displayed in LR. • Fire extinguishers put up at strategic sites and mock drills being carried out. • Being taken care of through OSCE trainings under LaQshya; Review of data fed in LaQshya portal by HF. • Orientation on Quality Management and Respectful Maternal Care ongoing. IEC materials on RMC being provided to HF. • CAMC in place through central tender process. Biomedical Engineers in place in districts for tracking maintenance. • No established SOP yet. |
| D. Support Services | <ul style="list-style-type: none"> • Many facilities did not have established system for maintenance of critical Equipment • The facility does not have established procedure for internal and external calibration of measuring Equipment • There was lack of practice of calculating and maintaining buffer stock. • Toilets were not clean with functional flush and running water. | <ul style="list-style-type: none"> • Sister in-charges trained on maintain buffer stock. Online stock inventory in place up to PHC level with trained Pharmacists. • Dedicated Asst Suptd. to supervise RCH services and house-keeping. • Advisory issued to attend within 15 minutes of admission. |
| E. Clinical Services | <ul style="list-style-type: none"> • There was delay between the time admission with & clinical intervention. • There was lack in recording and reporting of Clinical History, recording of current labour details, recording of Vitals, shape & Size of abdomen, presence of scars, foetal lie and presentation & vaginal examination etc. • There was no fix schedule of reassessment as per protocols. | <ul style="list-style-type: none"> • Orientation of MOs and Staff Nurses on use of Obstetric Case sheets with all vital monitoring parameters • Reassessment compromised at higher tier facilities due to high load of delivery admissions. |

- Assessment findings were not recorded in partograph.
- Due to lack of periodic monitoring early diagnosis of danger signs of severe PE and convulsions often not done.
- There was no established Antibiotic policy.
- Indication of Caesarean Section often not justified.
- In many facilities handover was not given during the shift change beside the pregnant women.
- Women were not encouraged and counseled for allowing birth companion of their choice.
- allowing birth companion of their choice.
- Facility staff is not adhered to standard protocol for resuscitating the newborn within 30 seconds.
- BP and Proteinuria is not checked in every case.
- All the drugs in case sheet and discharge slip were not written in generic name.
- Maximum dose of high alert drugs were defined and communicated.
- Adverse drug reaction form was not available in labour room and reporting is in practice.
- Nursing station was not provided with the critical value of different test.
- Initiation breast-feeding was not practiced soon after birth.
- Initial steps of resuscitation were not started within 30 seconds.
- Frequent refresher trainings of SN on use of Partograph and on-site mentoring by Sills Lab mentors.
- Frequent reorientation of MOs and Staff Nurses on basic obstetric care.
- Pharmacovigilance to be implemented soon; however, tier wise EDL notified.
- Caesarean Section audit being implemented.
- Sister's (Nursing Staff) handover "khata" in place and supervision by Nursing Supervisors being strengthened.
- Birth companion implemented at few HF; would be scaled up gradually.
- Newborn resuscitation incorporated in SBA and Skills Lab trainings.
- Attending Staff Nurses sensitized.
- Prescription audit initiated.
- Maximum dose suggested to be displayed at duty station.
- ADR forms to be implemented.
- Display of critical value of different test at duty station suggested.
- Initiated at most facilities even after C-Section delivery.
- MOs and SNs repeatedly oriented on initiation within 30 seconds which is life saving.
- Surface and environment samples are not taken regularly for microbiological surveillance.
- In many facilities hand washing facilities were not provided at point of use as per requirement.
- Lack of adherence of 2 minutes Hand washing
- No supply of Elbow length obstetric gloves
- There was lack of standard practices and materials for decontamination and cleaning of instruments and procedures areas.
- Standard practice of mopping and scrubbing were not followed & three bucket system was not followed.
- The facilities did not ensure segregation of Bio Medical Waste as per guidelines and 'on-site' management of waste was not carried out as per guidelines.
- Samples sent for Microbiological surveillance from most facilities to the nearest MCH.
- Reorganization of hand washing facilities stressed upon and BME of districts to monitor and facilitate.
- Frequent orientation and supervision of hand washing; Hand washing audit initiated.
- Superintendents instructed to procure elbow length obstetric gloves.
- ICNs identified and training at each health facility and responsible to implement and supervise.
- Fund provided for procuring three bucket system and repeated trainings of Karmabandhus suggested.
- Frequent trainings on BMW by agencies.

F. Infection Control

- H. Outcome
- Facility does not measure productivity Indicators on monthly basis
 - Facility does not measure Clinical Care & Safety Indicators on monthly basis
 - Facility does not measure Service Quality Indicators on monthly basis .
 - Training on record keeping and measuring indicators were done.
 - Quarterly monitoring of Hospital performances based on quality outcome indicators had been initiated.

Table 2 Comparison of average scores of Quality Assurance components of facilities between Initial Assessment (2018) and Final Assessment (2019).

| Quality assurance components | Bardhaman division average score (n=48) (out of 100) | | Jalpaiguri division average score (n=18) (out of 100) | | Presidency division average score (n=39) (out of 100) | |
|-------------------------------------|--|--------------|---|--------------|---|--------------|
| | 2018 | 2019 | 2018 | 2019 | 2018 | 2019 |
| Service Provision | 60.6 | 79.9 | 61.3 | 77.4 | 58.7 | 75.2 |
| Patient Rights | 70.5 | 83.0 | 69.4 | 83.9 | 69.2 | 81.7 |
| Inputs | 58.1 | 69.0 | 59.3 | 74.9 | 59.9 | 75.4 |
| Support Services | 60.4 | 74.0 | 62.7 | 79.0 | 62.2 | 79.1 |
| Clinical Services | 60.3 | 75.2 | 63.4 | 78.2 | 61.7 | 81.9 |
| Infection Control | 58.5 | 80.8 | 63.3 | 84.8 | 62.9 | 86.7 |
| Quality Management | 25.5 | 43.5 | 23.9 | 45.5 | 15.4 | 43.0 |
| Outcome | 36.9 | 54.5 | 38.0 | 58.2 | 45.4 | 64.4 |
| Composite score (out of 800) | 430.9 | 559.9 | 441.3 | 582.0 | 435.3 | 587.3 |

The activities toward implementation of the model continued for almost 12 months after which an assessment was done. The results [Table2] demonstrated a definite improvement in quality assurance scores in most of the facilities with Presidency division little better than Jalpaiguri division [Figures 1, 2 and 3]. During the intervention period, the scores for Outcome were increased by 20 points in Jalpaiguri division (from 38.0 to 58.1), 19 points in Presidency division (from 45.4 to 64.4) and 18 points in Bardhaman division (from 36.9 to 54.5). The highest gain in scores was observed in quality management component in Presidency division (from 15.4 to 43.0).



Figure 2 Compliance of health-care facilities to labor room checklist indicators in Jalpaiguri Division [data comparison between Initial Assessment (2018) and Final Assessment (2019)].

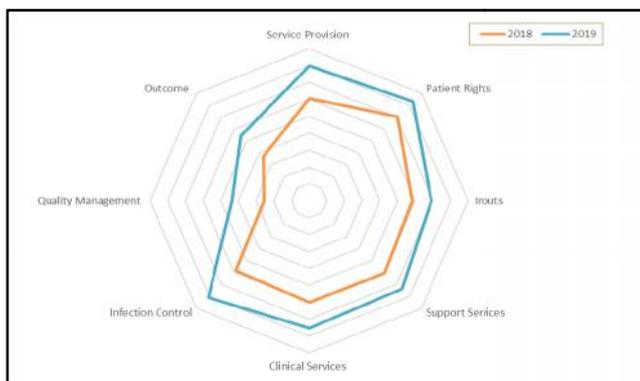


Figure 1 Compliance of health-care facilities to labor room checklist indicators in Bardhaman Division [data comparison between Initial Assessment (2018) and Final Assessment (2019)].

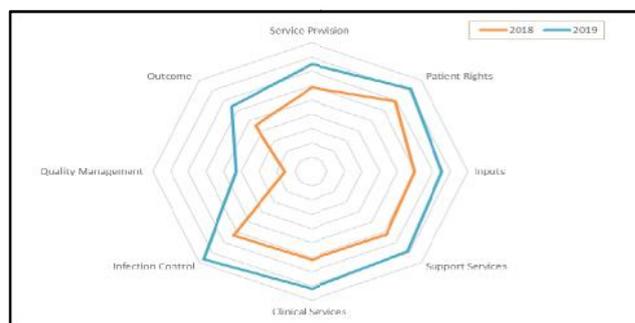


Figure 3 Compliance of health-care facilities to labor room checklist indicators in Presidency Division [data comparison between Initial Assessment (2018) and Final Assessment (2019)].

DISCUSSION

After exercising one year of the Quality Assurance interventions for labor rooms in West Bengal, we observed improvements at different areas of concern such as service provision, inputs, infection control, support services, clinical services and patient rights components. Continuous monitoring and supportive supervision based on a cycle of Plan, Do,

Check and Act was able to bring about Quality Improvement at the public health facilities. Quality Assurance interventions were intended for achieving improvements in the intra-partum and immediate post-partum care, which took place in the labour room and maternity operation theatre. Quality Improvement cycles were the most significant process that could strengthen systems within the facility for sustenance. A structured post-training follow-up and handholding through the focused Quality Improvement (QI) cycles definitely could strengthen the maternal and newborn health care services through a comprehensive approach. Regular and repeated Quality Improvement visits helped to promote quality of care focusing on the identification and solution of problems and helping to optimize the allocation of resources, promoting quality standards, teamwork and better two-way communication (11). Quality of care is a result of a well-functioning health services delivery system at the facilities that include properly trained, skilled and motivated teams equipped with necessary medicines, equipments and commodities. An enabling environment for provision of evidence-based practices and client-centered, respectful maternity care services along with robust facility management and administrative systems are also essential components of quality assured services for maternal and child health care (7). From different parts of the country and elsewhere it has been reported that interventions are piloted in labor rooms focused on specific aspects such as improving clinical care through skill-focused training and refresher courses (12-15). JHPIEGO, in partnership with the Children's Investment Fund Foundation and the state governments of Rajasthan, Andhra Pradesh, Telangana and Gujarat is using the Safe Child Birth Checklist (SCC) to improve the Quality of Care at public health facilities in these states (16). SCC is a simple tool, here in West Bengal that is incorporated in L1, L2 and L3 level Obstetric Case sheets prescribed by Govt. of India, which helps the health care providers at four different check points to remember and perform safe care practices and follow protocols during and immediately after child birth. We realized that only training and retraining could not bring the intended result, it was the motivation of the service providers along with their skill and enabling environment that would transform our intervention plan into actions. Prioritization of gaps was crucial for uplifting the facilities in terms of Quality of Care. A holistic approach was taken to improve every aspect of maternal and newborn care. Remarkable improvements were observed in infection control practices, support services and clinical services that do not largely depend on factors such as infrastructural issues and human resources. The scarcity of staff has been incriminated as a gap that affects the quality of services in the long run (17). In our study we also observed that availability of supplies and infrastructural improvements scaled up. Infection control practices also improved through regular monitoring and supportive supervision. Uneven distribution of skilled health-care work force, poor quality of training and post training follow-ups and supervision are identified as major bottlenecks in any quality improvement initiative (18 -22). This was partly addressed by periodic monitoring visits, on-site trainings, and frequent interaction with staff to keep their motivation level high (23). This may have worked as a short-term measure but can in no way overcome the pit falls of having a shortage of staff, especially in labor rooms where skilled workforce is of utmost importance (24 – 26).

In Bihar, there was an acute shortage of qualified and trained nurses and ANMs irrespective of their training status are often seen as a substitute. This may tide over the crisis and manage the load of normal deliveries but cannot be seen as an alternative to skilled nurses, especially for complicated labor. Interventions worked well in facilities where hospital manager, labor room staff, and medical officers worked together as a team in a dynamic and supportive environment (27). The intervention model was owned by the health-care providers. They were involved in the planning, prioritizing, and implementation of activities. The multi-country analysis of health system bottlenecks emphasized financial barrier as a critical bottleneck (19). Major financial budget does not require making changes visible. Despite issues with availability of infrastructure, logistics, and skilled staff, few facilities did show a way for improvement (27).

CONCLUSION

Under the initiative of implementation of quality assurance in Labour rooms, multiple interventions were planned and implemented to close the identified gaps, within the stipulated time frame and impact of interventions was simultaneously measured through verifiable indicators in real time. Therefore, efficient reporting of status of activities and achievement of targets were required to measure the success of the initiatives. All indicators were reported by the facilities on monthly basis that helped in continuous monitoring. Quality improvement was evident in many areas i.e real-time partograph generation & usage of Safe Birth check-list and strengthening documentation practices, respectful maternity care and enhancement of patients' satisfaction, clinical assessment, triage and timely management of complications, management of Labour as per protocols including AMTSL & rational use of Oxytocin, essential and emergency care of Newborn & Pre-term babies including management of birth asphyxia and timely initiation of breast feeding as well as Kangaroo Mother Care (KMC) for preterm newborn, Infection Prevention including Biomedical Waste Management. Sustainability is the key to any quality improvement measure. Continuous supportive supervision and monitoring along with continued efforts and commitment definitely will bring about sustained improvement.

Conflict of interest None declared.

Acknowledgement

The authors acknowledge the West Bengal University of Health Sciences for allowing to conduct the study.

The authors also are thankful to Director of Health Sciences, Director of Medical Education Services, Maternal Health Division of Department of Health & FW, Government of West Bengal.

The authors are also indebted to Institutional Ethics Committee, Kolkata Medical College and Hospital, Kolkata, West Bengal for approving the study.

References

1. National Rural Health Mission: About NHRM. Available from: <http://www.nrhm.gov.in/nhm.html>.
2. Janani Suraksha Yojna. Available from: <http://www.nrhm.gov.in/nrhmcomponents/rmncha/maternalhealth/jananisurakshayojana/background.html>.

3. Janani Shishu Suraksha Karyakaram. Available from: <http://www.nrhm.gov.in/jananishishusurakshakaryakram.htm>. [Last cited on 2016 Oct 14].
4. LaQshyaGuideBook:http://nhm.gov.in/New_Updates_2018/NHM_Components/RMNCH_MH_Guidelines/LaQshya-Guidelines.pdf.
5. PMNCH2011:https://www.who.int/pmnch/media/press/2011/2011_pmnch_report/en/index5.html.
6. MNH Toolkit, MoHFW, GoI, November 2013
7. Lawn, JE, Blencowe, H, Oza, S, You, D, Lee, ACC, Waiswa, P, Lalli, M, Bhutta, Z, Barros, AJD, Christian, P, Mathers, C, Cousens, SN. Every Newborn: progress, priorities, and potential beyond survival.; Lancet Every Newborn Study Group, PMID: 24853593.
8. Bhutta, ZA, Das, JK, Bahl, R, Lawn, JE, Salam, RA, Paul, VK, Sankar, MJ, Blencowe, H, Rizvi, A, Chou, VB, Walker, N. Can available interventions end preventable deaths in mothers, newborn babies, and stillbirths, and at what cost? Lancet Newborn Interventions Review Group; Lancet Every Newborn Study Group. PMID: 24853604.
9. Assessor's Guidebook for Quality Assurance in District Hospitals. New Delhi: Ministry of Health and Family Welfare, Government of India; 2013.
10. Operational Guidelines for Quality Assurance in PublicHealthFacilities:<http://qi.nhsrindia.org/sites/default/files/Operational%20Guidelines%20on%20Quality%20Assurance.pdf>
11. RESOURCE PACKAGE FOR QUALITY IMPROVEMENT CYCLES IN LAQSHYA : GOVERNMENT OF INDIA
12. Jayanna K, Bradley J, Mony P, Cunningham T, Washington M, Bhat S, et al. Effectiveness of onsite nurse mentoring in improving quality of institutional births in the primary health centres of high priority districts of Karnataka, South India: A cluster randomized trial. PLoS One 2016;11:e0161957.
13. Das A, Nawal D, Singh MK, Karthick M, Pahwa P, Shah MB, et al. Impact of a nursing skill-improvement intervention on newborn-specific delivery practices: An experience from Bihar, India. Birth 2016;43:328-35.
14. Dettrick Z, Firth S, Jimenez Soto E. Do strategies to improve quality of maternal and child health care in lower and middle income countries lead to improved outcomes? A review of the evidence. PLoS One 2013;8:e83070. 2015;15 Suppl 2:S2.
15. Iyengar K, Jain M, Thomas S, Dashora K, Liu W, Saini P, et al. Adherence to evidence based care practices for childbirth before and after a quality improvement intervention in health facilities of Rajasthan, India. BMC Pregnancy Childbirth 2014;14:270.
16. Improving Quality of Maternal and Newborn Health in India; 2015. Available from: https://www.jhpiego.org/wpcontent/uploads/2016/04/MNH_Factsheet_April_2015.pdf?c8fa14. [Last cited on 2016 Oct 12].
17. hattacharyya S, Srivastava A, Avan BI, Graham WJ. Quality care at childbirth in the context of health sector reform program in India: Contributing factors, challenges and implementation lesson. Health Syst Policy Res 2012;1:2.
18. Dickson KE, Kinney MV, Moxon SG, Ashton J, Zaka N, Simen Kapeu A, et al. Scaling up quality care for mothers and newborns around the time of birth: An overview of methods and analyses of intervention specific bottlenecks and solutions. BMC Pregnancy Childbirth 2015;15 Suppl 2:S1.
19. Sharma G, Mathai M, Dickson KE, Weeks A, Hofmeyr G, Lavender T, et al. Quality care during labour and birth: A multi-country analysis of health system bottlenecks and potential solutions. BMC Pregnancy Childbirth
20. Bhattacharyya S, Srivastava A, Avan BI, Graham WJ. Quality care at childbirth in the context of health sector reform program in India: Contributing factors, challenges and implementation lesson. Health Syst Policy Res 2012;1:2.
21. Sri S, Sarojini N, Khanna R. Maternal Deaths and Denial of Maternal Care in Barwani District, Madhya Pradesh: Issue and Concerns. Bhopal, India. Bhopal: JanaSwasthyaAbhiyan,CommonHealth,Sama-Resource Group for Women and Health; 2011.
22. Harvey SA, Blandón YC, McCaw-Binns A, Sandino I, Urbina L, Rodríguez C, et al. Are skilled birth attendants really skilled? A measurement method, some disturbing results and a potential way forward. Bull World Health Organ 2007;85:783-90.
23. Salam RA, Lassi ZS, Das JK, Bhutta ZA. Evidence from district level inputs to improve quality of care for maternal and newborn health: Interventions and findings. Reprod Health 2014;11 Suppl 2:S3.
24. WHO. Access for all to Skilled, Motivated, and Supported Health Workers: Background Paper for the Global Strategy for Women's and Children's Health; 2010. Available from: http://www.who.int/pmnch/activities/jointactionplan/20101007_4_skilledworkers.pdf. [Last cited on 2016 Oct 12].
25. WHO. Making Pregnancy Safer: The Critical Role of the Skilled Attendant: A Joint Statement by WHO, ICM and FIGO; 2004. Available from: http://www.unscn.org/layout/modules/resources/files/Making_pregnancy_safer_the_critical_role.pdf. [Last cited on 2016 Oct 12].
26. Renfrew MJ, McFadden A, Bastos MH, Campbell J, Channon AA, Cheung NF, et al. Midwifery and quality care: Findings from a new evidence-informed framework for maternal and newborn care. Lancet 2014;384:1129-45.
27. Jyoti Sharma, Sutapa B. Neogi, Preeti Negandhi, Monika Chauhan, Siddharth Reddy, Sathy: Rollout of Quality Assurance Interventions in Labor Room in Two Districts of Bihar, India: <http://www.ijph.in> on Monday, May 31, 2021, IP: 14.139.216.58.
