

Case Report

Closing Gaps in Antenatal Care Service Delivery: A PDCA Based Intervention from Rural Haryana

Running Title: Closing Gaps in Antenatal Care Service Delivery

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Abstract

The RMNCAH programme outlines standards for quality antenatal care, but effective implementation remains key. This assessment evaluated antenatal services in Kheri and Badona Kalan, Haryana, using a structured checklist based on RMNCAH guidelines through community visits, interviews, and record reviews. Routine services were well covered (BP, haemoglobin, weight, gestational age, Td, IFA, calcium, RBS/OGTT, registrations), but gaps existed in clinical history, examinations, advanced scans, TSH, urine tests, and documentation. PMSMA performance was satisfactory; counselling was adequate except for family planning. A training session with ASHAs and ANMs addressed gaps. A phased approach with supervision, strengthened referrals, and PDCA-based monitoring is recommended.

Keywords: Antenatal care, Health system strengthening, Maternal health, Rural, Service quality.

Introduction

Strengthening antenatal care (ANC) is essential for improving maternal and neonatal outcomes and progressing towards universal health coverage. World

Health Organisation (WHO) ANC and Reproductive, Maternal, Neonatal, Child and Adolescent Health (RMNCAH) guidelines focus on early pregnancy registration, adequate ANC contacts,

timely screening of high-risk pregnancies, nutrition and immunization services, counselling, and family involvement. Effective implementation depends on well-trained frontline health workers, availability of essential investigations, functional referral linkages, and routine monitoring to guide local action [1,2].

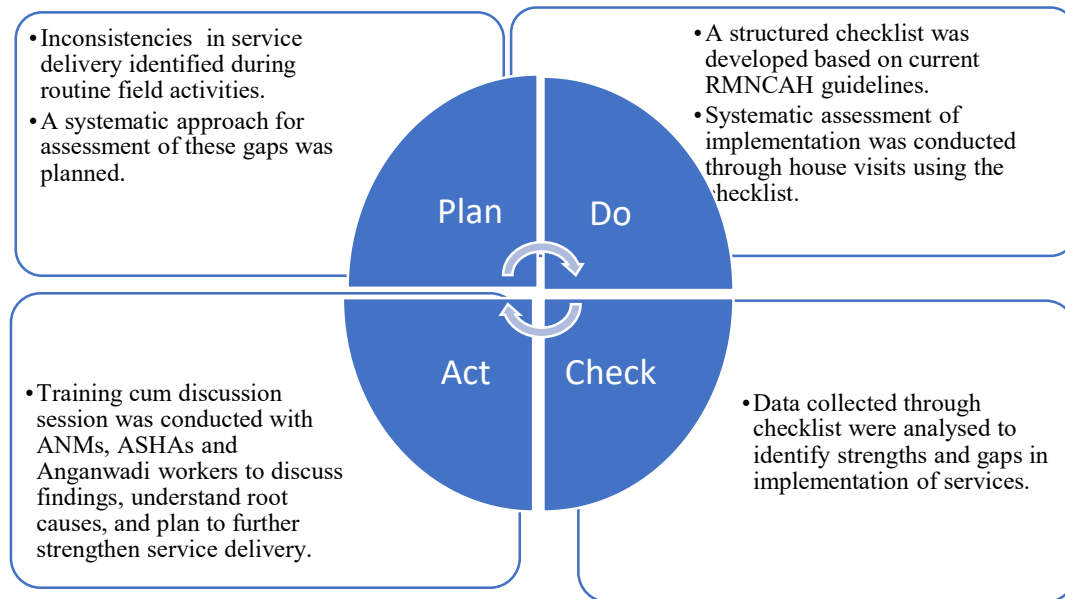
National Family Health Survey (NFHS) data from round 3 to round 5 representing the pre-RMNCAH and post-RMNCAH periods show a substantial increase in the proportion of women receiving antenatal care in India from 77 percent to 94 percent indicating the positive impact and overall success of the programme[3,4]. Despite the implementation of RMNCAH programme in Kheri and Badona Kalan, routine services observations indicated gaps in the delivery of essential ANC components.

This case report describes the application of a systematic Plan–Do–Check–Act (PDCA) approach to identify service delivery gaps and implement context-appropriate improvements to strengthen routine antenatal care services in these villages.

Methods

The Rural Health and Training Centre (RHTC) of PGIMER, Chandigarh, located in Kheri, Haryana, caters to the healthcare needs of two villages - Kheri and Badona Kalan. Although RHTC Kheri does not directly integrated into National Health Mission, Haryana, it plays a vital role in delivering primary healthcare services; through its outreach and facility-based services, RHTC serves as a platform for strengthening national health programs, providing training to healthcare workers, and facilitating community-based interventions. The health and related services under various national programmes are delivered via Sub-center Samlerhi that is under the Hangola Primary Health Center (PHC) in Raipur Rani Block. Three Anganwadis situated in the two villages, provide the various services under Integrated Child Development Services (ICDS) scheme. According to Annual Health Survey FY 2024-25, villages of Kheri and Badona Kalan cover 3050 population and 541 households. In the year the birth rate was 10.4/ 1000 population and death rate 9.1/ 1000 population. Total 32 antenatal mothers were registered in the year 2024-2025, with zero maternal deaths.

The Plan Do Check Act (PDCA) approach[5] (Figure 1)



Source: Authors' Formulation

Figure 1: Implementation of Plan Do Check Act Cycle

Identification of Problem

During regular ANC home visits and outpatient department (OPD) assessments at RHTC Kheri, it was noted that there was variable adherence to standard ANC guidelines.

Antenatal service delivery Assessment tool [6–8] (Supplementary material 1)

A tool was designed using current antenatal care guidelines and protocols under RMNCAH to assess the quality of antenatal care service delivery. The tool has three sections- Section A contains patient identification details and details of the pregnancy; Section B contains the checklist that includes 5 domains in each trimester with 33 items along with means

of verification of the same; Section C contains information regarding the Pradhan Mantri Surakshit Matritva Abhiyan (PMSMA) visit.

Implementation of the tool during ANC Visits

The checklist was implemented during ANC house visits in the villages of Kheri and Badona Kala (n=11 pregnant women) by Community medicine residents and health care workers at RHTC Kheri. The checklist served as a tool to identify gaps and areas of non-compliance in real-time and ensured adherence to ANC guidelines as recommended by the Ministry of Health.

Results

(Please find attached details of results in Supplementary material 2)

Compliance was assessed by calculating the percentages of incomplete, partially complete, and complete observations out of the total observations. Observations were weighted as incomplete = 0, partially complete = 1, and complete = 2. The total compliance percentage was calculated using the formula: $((\text{Incomplete}\% \times 0) + (\text{Partially complete}\% \times 1) + (\text{Complete}\% \times 2))/2$. A total compliance percentage of more than 70% was interpreted as satisfactory performance, while $\leq 70\%$ was considered non-satisfactory performance.

In the first trimester (n=11), domains of urine pregnancy test, assessment of last menstrual period and estimated date of delivery, blood pressure, haemoglobin, blood grouping and glucose testing had satisfactory performance; while documentation of obstetric score, thyroid testing, detailed history, height measurement, and clinical examinations including per vaginal, breast, and abdominal examinations had non-satisfactory performance. During the second trimester (n=10), domains of period of gestation, weight, blood pressure, haemoglobin estimation, tetanus toxoid, Iron Folic Acid (IFA) and calcium supplementation, and glucose testing had

satisfactory performance; however domains of history taking, abdominal, per vaginal and breast examinations, urine albumin/sugar and completion of level two ultrasound had non-satisfactory performance. In the third trimester (n=4), satisfactory performance was observed for gestational age assessment, weight, blood pressure, haemoglobin, tetanus toxoid, IFA and calcium supplementation, whereas urine albumin and sugar testing, level three ultrasound, and clinical examinations were non-satisfactory performance.

Counselling services had satisfactory performance for IFA and calcium supplementation, birth preparedness, danger signs, diet and breastfeeding domains, with the exception of family planning counselling, which showed non-satisfactory performance. Satisfactory performance was observed in utilisation of ICDS, PMMVY, JSY. However non-satisfactory performance was observed in utilisation of PMSMA services.

Key patterns:

- Strengths: Routine tests (BP, Hemoglobin, weight, gestational age, Td, IFA, calcium, RBS/OGTT) and scheme registrations well covered.
- Gaps: Clinical history, physical examinations (abdomen, breast, per vagina), advanced ultrasounds (Level 2

& 3), thyroid testing, urine albumin/sugar, and documentation. *Lessons learnt* [9] (Table 1)

- Counselling: Adequate overall, but family planning counselling weak. Additional information can be made available by the authors upon request.

Table 1: Gaps identified in Antenatal care

Category	Gaps	Implications
Documentation	• Incompletely or incorrectly filled components in MCP card (investigations, anthropometry, history).	• Inadequate clinical decision-making
Knowledge	• Standard GPAL system for obstetric score not followed	• Misclassification of obstetric risk • Missed data regarding abortions, perinatal deaths.
Service delivery	• Incomplete obtaining and documenting of past obstetric history and present history. • Lack of counselling services regarding family planning. • Breast examination/History not performed for all mothers in the latter half of pregnancy. • Abdomen examination not performed for all mothers.	• Missed identification of high-risk cases • Missed opportunities for prevention and early detection • Inaccurate maternal health monitoring affecting quality of care.
	• Thyroid profile not done for all mothers. • Level 2 ultrasound not done for all mothers due to cost barriers.	• Potential undetected complications • Incomplete antenatal screening compromising quality of care •

**GPAL: Gravida Para Abortion Live. It is an obstetric score system commonly used [9]*

Source: Authors' Formulation

Actions Taken

A training and discussion session was held for ASHAs and ANMs in Kheri and Badona Kalan to address service delivery gaps identified during assessments. The session focused on identifying root causes and developing actionable strategies, while also refreshing knowledge on antenatal care and reinforcing the importance of guideline compliance to improve care quality and outcomes.

The session was conducted using sections of the Mother and Child Protection card, leveraging its familiarity among health workers. All content was based on standard RMNCAH guidelines. The module was based on antenatal care content from ASHA and ANM training under the National Health Mission. [6–8,10,11]

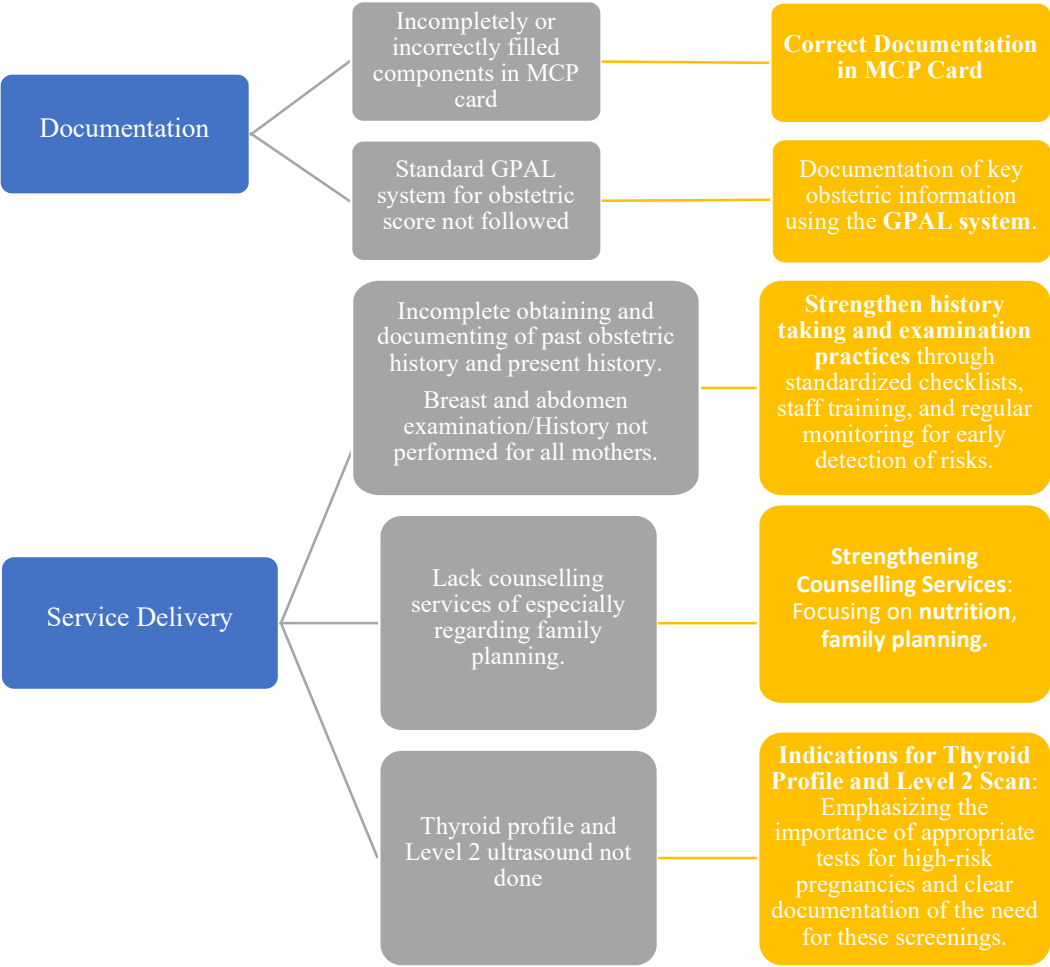


Figure 2: Key focus area of training sessions
Source: Authors' Formulation

Discussion

To sustain improvements in antenatal care delivery, a phased approach is recommended. Immediate efforts should focus on establishing regular supportive supervision at Anganwadi centres to enhance service quality. In the intermediate term, strengthening referral pathways for high-risk pregnancies by facilitating access to Level 2 ultrasound scans and thyroid testing will be critical for improving early detection and management of complications. The first round of the PDCA cycle, guided by a systematic framework, has helped direct solution-oriented and actionable measures. Long-term efforts will emphasize continual monitoring and feedback to assess the effectiveness of implemented actions through regular reviews. This iterative process will enable timely corrections and ongoing improvements to antenatal care delivery.

Evidence from national and international studies suggests that improvements in antenatal care are driven more by strengthening the quality of service delivery rather than coverage alone. An implementation report from Uttar Pradesh[12] highlights the role of strong community platforms, convergence among ASHA, ANM, and AWW, structured tools, and supportive supervision in improving

early registration, identification of high risk pregnancies, and overall ANC quality. These findings are echoed by a BJOG review and an expert consultation published in *BMC Pregnancy and Childbirth*[13,14], which emphasize that gaps in ANC in resource limited settings arise largely from health system weaknesses, limited frontline worker capacity, poor documentation, and inadequate monitoring rather than lack of access.

Evidence from an ANC strengthening intervention in Ethiopia[15] further demonstrates that targeted training, supportive supervision, improved documentation, and availability of investigations can significantly enhance the content and quality of antenatal care, including better risk detection and client satisfaction. Together, these studies reinforce the relevance of systematic quality improvement approaches and provide strong support for the PDCA based, health system strengthening strategy adopted in the present study to improve comprehensive antenatal care at the primary care level.

Ethical considerations

The activity was conducted as part of routine work at RHTC Kheri, PGIMER; hence, institutional ethical committee

approval was not obtained. Informed consent was taken from mothers prior to data collection, anonymity was maintained, and participation was voluntary with the option to withdraw at any time without affecting routine care.

Conflict of interest

The authors declare that there are no conflicts of interest.

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