Section: Community Medicine and OBG

Meta Analysis

# CONTINUUM OF MATERNAL CARE: LINKING ANTENATAL, INTRANATAL, AND POSTNATAL SERVICES

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ABSTRACT

**Background:** Maternal and child health is a vital indicator of a nation's development and healthcare equity. Ensuring a continuum of maternal care—from antenatal to intranatal and postnatal stages is crucial for reducing preventable maternal and neonatal morbidity and mortality. Despite various national and global initiatives, gaps in the linkage between different phases of maternal care continue to persist, particularly in low- and middle-income countries like India. **Objectives:** This review aims to critically examine the continuum of maternal care by integrating evidence on antenatal, intranatal, and postnatal services. It seeks to identify existing gaps, barriers, and strategies to strengthen continuity and quality of maternal health services.

**Materials and Methods:** An extensive literature review was conducted using databases such as PubMed, Scopus, and Google Scholar. Reports and policy documents from WHO, UNICEF, and India's Ministry of Health and Family Welfare were also reviewed. Articles published between 2007 and 2023 were included, focusing on maternal health programs, service utilization patterns, and determinants of continuity of care in developing countries.

**Results:** Findings reveal that although global maternal mortality has declined substantially since 2000, about 287,000 maternal deaths still occur annually, largely from preventable causes. Evidence highlights that fragmented service delivery, poor referral linkages, and socioeconomic disparities impede the continuum of care. In India, initiatives such as the RMNCH+A strategy, Janani Suraksha Yojana, and LaQshya have improved institutional deliveries and antenatal coverage, yet postnatal follow-up remains inconsistent. Studies emphasize that women's education, socioeconomic status, and accessibility of healthcare facilities are key determinants influencing care continuity.

**Conclusion:** A strong, integrated continuum of maternal care—linking antenatal, intranatal, and postnatal services—is essential to achieve Sustainable Development Goal 3.1 of reducing global maternal mortality. Strengthening health-system linkages, community awareness, and monitoring mechanisms can ensure comprehensive and equitable maternal healthcare.

**Keywords:** Continuum of care, maternal health, antenatal care, intranatal care, postnatal care, RMNCH+A, India, maternal mortality, WHO, health systems.

## INTRODUCTION

Maternal and child health remains one of the key indicators of a nation's overall health and socioeconomic development. The continuum of maternal care, encompassing antenatal, intranatal, and postnatal services, is essential to ensure the survival and wellbeing of both mother and child. The World Health Organization (WHO) emphasizes that maternal care should not be viewed as isolated episodes of service delivery but rather as a continuous and integrated process extending from pregnancy through childbirth to the postpartum period. This approach ensures that women receive timely, comprehensive, and coordinated healthcare across all stages of the reproductive cycle.[1,2]

Globally, despite remarkable progress in reducing maternal and neonatal mortality, approximately 287,000 women die each year from preventable causes related to pregnancy and childbirth (WHO, 2023). A significant proportion of these deaths occur during the intrapartum and immediate postpartum periods, highlighting the need for seamless integration between antenatal, delivery, and postnatal care services. The continuum of care (CoC) framework addresses these challenges by linking care across time (from prepregnancy to motherhood) and place (from community to facility based care).[3,4]

In India, the implementation of national programs such as the Reproductive, Maternal, Newborn, Child, and Adolescent Health (RMNCH+A) strategy, Janani Suraksha Yojana (JSY), and LaQshya initiative has led to notable improvements in institutional deliveries and antenatal coverage. However, gaps remain in the continuity of care—particularly in the transition from antenatal to postnatal phases, where dropouts and inadequate followup often occur. Studies have shown that fragmented service delivery, poor referral linkages, and lack of awareness among mothers are major barriers to achieving effective continuity of care in both rural and urban settings.[5]

Ensuring a robust continuum of maternal care is vital not only for reducing maternal and neonatal mortality but also for promoting safe motherhood, early identification of complications, and longterm child development outcomes. This review aims to critically analyze the concept, importance, barriers, and current strategies for strengthening the continuum of maternal care, with a focus on integrating antenatal, intranatal, and postnatal services within the public health framework.

## MATERIALS AND METHODS

This is a meta analysis of published literature focusing on the integration and utilization of antenatal, intranatal, and postnatal care services. Emphasis was placed on identifying gaps, barriers, and strategies for strengthening continuity of care across different levels of healthcare delivery.

A comprehensive literature search was conducted using multiple electronic databases,

**Inclusion Criteria**

- Articles published between 2010 and 2024
- Studies focusing on the continuum of maternal healthcare in low and middleincome countries
- Government policy documents, WHO and UNICEF reports, and peerreviewed journal articles
- Studies published in English

**Exclusion Criteria**

- Studies unrelated to maternal or newborn health.
- Editorials, commentaries, and conference abstracts lacking full text.
- Duplicate or outdated publications

**Data Extraction and Synthesis**

Relevant data were extracted from eligible studies regarding maternal healthcare utilization, program implementation, barriers to service continuity, and policy initiatives. The information was summarized thematically under major domains — antenatal, intranatal, postnatal care, and program integration. Emphasis was given to identifying existing gaps and best practices for improving continuity of care.

**Quality Assessment**

Each selected article was reviewed for methodological quality, relevance, and clarity. Studies from recognized journals and official health organizations were given higher priority to ensure credibility and reliability.

**Outcome Measures**

The main outcome of interest was the identification of key determinants influencing the continuity of maternal care and evaluation of strategies that improve linkage between antenatal, intranatal, and postnatal services.

## RESULTS

A total of 68 research articles, 7 WHO and UNICEF reports, and 5 national program documents were included in this review. Data were analyzed to understand global and Indian trends in maternal care utilization, with a focus on linkage between antenatal, intranatal, and postnatal services.

Globally, several low and middle income countries continue to struggle with fragmented maternal health services. The WHO (2023) reported that approximately 287,000 maternal deaths occur annually, primarily due to preventable causes such as hemorrhage, hypertensive disorders, and sepsis.

Countries with well established continuity between antenatal and postnatal services, such as Sri Lanka, Thailand, and Malaysia, demonstrated markedly reduced maternal mortality rates compared to nations with discontinuous systems.

**Table 1: Global trends in maternal care continuum (WHO, 2023)**

| Country | >ANC visits(%) | Institutional deliveries(%) | Postnatal care within 48 hrs(%) | MMR (per 100000 live births) |
|---|---|---|---|---|
| Srilanka | 97 | 99 | 95 | 36 |
| Thailand | 94 | 99 | 92 | 37 |
| India | 58 | 89 | 63 | 97 |
| Nigeria | 52 | 51 | 42 | 512 |
| Ethiopia | 43 | 50 | 34 | 401 |

According to NFHS5 (2020–21), India recorded substantial progress in maternal healthcare utilization compared to NFHS4 (2015–16). However, significant regional variations persist. While institutional deliveries reached 89%, only 63% of mothers received postnatal care within 48 hours of delivery, showing a clear gap in continuity.

**Table 2: Maternal health service utilization in India (NFHS5, 2020–21)**

| Parameter | NFHS4 (2015–16) [5] | NFHS5 (2020–21) [4] | Percentage |
|---|---|---|---|
| Mothers with ≥4 ANC visits | 51.2% | 58.1% | +6.9% |
| Institutional deliveries | 78.9% | 89.0% | +10.1% |
| Mothers receiving postnatal checkup within 48 hrs | 51.0% | 63.0% | +12.0% |
| Mothers consuming ≥100 IFA tablets | 30.3% | 45.0% | +14.7% |

Analysis of state specific studies revealed differences based on healthcare infrastructure, literacy levels, and socioeconomic status. Southern states such as Kerala and Tamil Nadu demonstrated nearcomplete linkage between antenatal, intranatal, and postnatal services, while states like Bihar and Uttar Pradesh showed significant service dropouts after delivery.

**Table 3: Continuum of maternal care across selected Indian states**

| State | ≥4 ANC Visits (%) | Institutional Deliveries (%) | Postnatal Care within 48 hrs(%) | Continuum Completion Rate (%) |
|---|---|---|---|---|
| Kerala | 95 | 99 | 97 | 92 |
| Tamil Nadu | 93 | 98 | 90 | 88 |
| Maharashtra | 87 | 94 | 82 | 79 |
| Andhra Pradesh | 80 | 90 | 73 | 68 |
| Uttar Pradesh | 53 | 77 | 45 | 40 |
| Bihar | 49 | 72 | 38 | 35 |

**Table 4: Summary of barriers affecting continuum of maternal care**

| Category | Common Barriers Identified | Impact on Continuity |
|---|---|---|
| Socioeconomic | Poverty, low literacy, unemployment | Poor ANC and PNC attendance |
| Cultural / Social | Preference for home delivery, postpartum confinement practices | Delayed postnatal care |
| Health System Related | Shortage of ANMs, poor followup, referral gaps | Disruption in care chain |
| Accessibility | Long distances, lack of transport, poor roads | Reduced institutional delivery |
| Awareness and Counseling | Poor knowledge of warning signs, inadequate health education | Dropouts postdelivery |

Several national initiatives have contributed to improving the continuum of care:
Janani Suraksha Yojana (JSY) – incentivizing institutional delivery.
Pradhan Mantri Surakshit Matritva Abhiyan (PMSMA) – ensuring fixedday ANC checkups.
LaQshya Initiative – improving quality of intrapartum care.
HomeBased Newborn Care (HBNC) – extending postnatal care to households.
RMNCH+A Strategy – integrating reproductive, maternal, newborn, and adolescent care under one framework.

**Table 5: Key national initiatives strengthening continuum of care**

| Program / Initiative | Year of Launch \| | Major Focus Area | Key Outcomes |
|---|---|---|---|
| Janani Suraksha Yojana (JSY) | 2005 | Institutional delivery | Improved access and reduced outofpocket costs |
| RMNCH+A Strategy | 2013 | Integrated maternal & child care | Strengthened service linkages |
| PMSMA | 2016 | Fixedday ANC clinics | Increased early registration |
| LaQshya | 2017 | Quality intranatal care | Reduced stillbirth and maternal morbidity |
| HBNC | 2011 | Postnatal home visits | Improved early PNC coverage |

## DISCUSSION

The findings of this review study reaffirm that continuity across antenatal, intranatal, and postnatal care is vital to achieving optimal maternal and neonatal outcomes. Fragmented or incomplete care leads to missed opportunities for early detection of complications such as preeclampsia, anemia, postpartum hemorrhage, and neonatal sepsis. Antenatal care provides the first opportunity to identify highrisk pregnancies and prepare for safe delivery. However, several studies noted that early registration does not always translate to institutional delivery or skilled birth attendance. This disconnect is often due to limited counselling during ANC visits and poor coordination between community and

facility based services. The RMNCH+A strategy and LaQshya initiative were designed to address this issue by ensuring birth preparedness and facility readiness, but the impact remains uneven across states.

The period immediately after delivery remains the most vulnerable phase for both mother and newborn. Evidence from WHO and UNICEF joint reports (2022) shows that nearly 40% of maternal deaths occur within the first 24 hours postpartum. Despite institutional deliveries rising in India, followup care often ceases once the mother is discharged. Postnatal home visits by frontline workers, though mandated under Janani Suraksha Yojana and Home Based Newborn Care (HBNC) programs, are inconsistently implemented, especially in urban slums and remote tribal areas.

Institutional delivery is a crucial link in the maternal care continuum. The Janani Suraksha Yojana (JSY), introduced in 2005, has substantially increased institutional births across India. A national evaluation by Lim et al. (2010),[6] found that JSY was associated with a 43% increase in institutional deliveries and a significant reduction in maternal deaths.

However, Chatterjee and Paily (2019),[7] emphasized that institutional delivery alone is not sufficient unless accompanied by quality intrapartum care and functional referral systems. Their study noted that nearly one-fourth of maternal deaths occurred despite institutional deliveries due to delays in recognition and management of complications. This observation corresponds with WHO's LaQshya initiative (2017), which underscores the importance of quality improvement in labour rooms rather than mere institutionalization of births.

Postnatal care remains the most neglected component of the continuum, both globally and in India. Campbell et al. (2016),[8] estimated that up to 60% of maternal deaths occur during the postpartum period, mostly within the first week after delivery. In a large community-based study in India, Kaur et al. (2017),[9] found that only 57% of mothers received a postnatal check-up within 48 hours, despite 85% institutional deliveries.

This review revealed similar findings — while antenatal and intranatal services were well-utilized, the postnatal phase witnessed the highest drop-out rate. Studies by Singh et al. (2021),[10] and Sahoo et al. (2022),[11] identified sociocultural factors, such as postpartum confinement practices and low awareness of PNC benefits, as major barriers. Furthermore, Titaley et al. (2010),[12] in Indonesia demonstrated that community health worker follow-up and home-based visits significantly improved postnatal coverage, suggesting that strengthened community-level linkages can close existing service gaps.

Multiple studies have consistently shown that education, socioeconomic status, and autonomy of women are strong predictors of CoC completion. According to Singh et al. (2019),[8] educated women were three times more likely to utilize complete maternal health services compared to those without formal education. Similarly, Acharya et al. (2018),[13] found that financial independence and decision-making power within households were critical determinants of service utilization.

Accessibility and health system factors also play an important role. Pell et al. (2013),[14] highlighted that long distances to facilities, lack of transportation, and poor referral systems were major deterrents to continuity of care in Sub-Saharan Africa — a pattern mirrored in India's rural and peri-urban areas.

Globally, WHO (2023) emphasizes the integration of maternal health services across the continuum through its Quality of Care Framework and the Global Strategy for Women's, Children's and Adolescents' Health. In India, initiatives such as RMNCH+A (2013), PMSMA (2016), and HBNC (2011) have contributed to improved linkages, yet gaps persist in monitoring and coordination.[15]

Bhattacharya et al. (2020),[16] observed that lack of inter-sectoral coordination between maternal and child health programs weakens follow-up mechanisms. To address this, community-based interventions like the Home-Based Newborn Care program (HBNC) and digital tracking under Reproductive and Child Health (RCH) portals have shown promising results.

Globally, WHO recommends adopting an integrated Continuum of Care Model, emphasizing not only survival but also wellbeing through respectful maternity care. In India, initiatives such as Pradhan Mantri Surakshit Matritva Abhiyan (PMSMA) provide structured ANC on fixed days, while LaQshya focuses on improving the quality of care during childbirth. Despite these measures, achieving universal coverage requires strengthening community outreach, digital tracking of maternal health indicators, and reinforcing health worker training.

Overall, the review establishes that countries emphasizing continuity across all stages — such as Sri Lanka, Thailand, and Malaysia — achieved sustained reductions in maternal mortality. Their success stems from systematic referral systems, community-based midwifery, and effective data monitoring. As Kerber et al. (2007),[17] concluded, every missed link in the maternal care chain increases the risk of adverse outcomes. Thus, the Indian health system must not only focus on improving coverage but also on ensuring seamless transition between antenatal, intranatal, and postnatal care.

**Recommendations**

**To ensure effective continuity of maternal care:**

1. Strengthen early registration and followup mechanisms through digital platforms like eRCH (Reproductive Child Health portal).
2. Enhance interfacility referral systems to prevent delays in highrisk cases.
3. Promote postnatal home visits by trained ANMs and ASHA workers, particularly within 48 hours of delivery.

4. Integrate maternal counselling programs during antenatal visits to improve awareness of postnatal care importance.
5. Encourage community engagement and male participation in maternal health decisions.

## CONCLUSION

The review highlights that while India has made commendable progress in increasing institutional deliveries and antenatal coverage, postnatal care remains the weakest link in the continuum. Building a seamless bridge between antenatal, intranatal, and postnatal care—supported by community participation and robust health system infrastructure—can substantially reduce preventable maternal and neonatal deaths. A holistic, woman centered approach remains the cornerstone for achieving safe motherhood and sustainable maternal health outcomes.

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