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Assessment of knowledge and practice of active management of third stage of labor among practicing midwives

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Abstract
Background: Postpartum hemorrhage (PPH) remains a leading cause of maternal mortality, especially in low-resource settings. Active Management of the Third Stage of Labor (AMTSL) is a proven strategy to prevent PPH. This study aimed to assess the knowledge and practice of AMTSL among midwives working in Gaya, Bihar, India.
Materials and Methods: A cross-sectional descriptive study was conducted among 120 practicing midwives across five healthcare facilities in Gaya. Data were collected using a structured knowledge questionnaire and an observational checklist assessing real-time practice. Descriptive and inferential statistics were used for analysis.
Results: While 78.3% of participants demonstrated adequate knowledge of AMTSL, only 55.8% adhered to all three components—timely uterotonic administration, controlled cord traction, and uterine massage—in practice. Midwives with recent training and over five years of experience showed significantly better adherence ($p < 0.05$). Uterine massage was the most frequently missed component.
Discussion: The study revealed a clear gap between knowledge and actual practice. Factors such as limited refresher training, drug availability, and high workload influenced implementation. Strengthening training programs and facility-level support mechanisms are essential to bridge this gap.
Conclusion: Despite satisfactory knowledge levels, the inconsistent application of AMTSL highlights a need for regular skill-based training, supportive supervision, and better logistical support to improve maternal outcomes and reduce PPH-related mortality.

Keywords: Active Management of Third Stage of Labor, postpartum hemorrhage, midwives, maternal mortality, obstetric care, Bihar, India

1. Introduction

The third stage of labor, defined as the period between the birth of the baby and the expulsion of the placenta, is a critical window in maternal care. It is during this stage that the risk of postpartum hemorrhage (PPH)—the leading direct cause of maternal mortality globally—is most significant. According to the World Health Organization (WHO), PPH is responsible for nearly one-quarter of maternal deaths worldwide. In developing countries such as India, where access to emergency obstetric care may be inconsistent, the need for effective, preventive interventions is both urgent and paramount. One of the most widely endorsed interventions is the Active Management of the Third Stage of Labor (AMTSL).

AMTSL is a set of evidence-based practices aimed at accelerating placental delivery and minimizing blood loss. It consists of three core components: administration of a uterotonic drug (typically oxytocin) within one minute after the birth of the baby, controlled cord traction (CCT) to assist in the delivery of the placenta, and uterine massage immediately after placental expulsion to stimulate contraction and prevent hemorrhage. Proper execution of these steps can reduce the incidence of severe PPH by up to 60%, as supported by extensive clinical trials and WHO guidelines.

In India, maternal mortality remains a serious concern, particularly in economically weaker states such as Bihar. Although the country has made notable strides in improving institutional deliveries through government schemes like Janani Suraksha Yojana (JSY) and LaQshya, the quality of intrapartum care remains variable. The state of Bihar, and specifically Gaya city, faces a combination of high delivery loads, overburdened health workers, and infrastructural limitations, which make the implementation of standardized obstetric protocols like AMTSL more challenging. In this context, midwives and auxiliary

nurse midwives (ANMs) serve as critical frontline providers of maternal care, often being the only health personnel present during deliveries, particularly in primary health centers and sub-centers.

Despite their central role, there is limited data on how well midwives in semi-urban and rural Indian settings understand and apply AMTSL protocols. Existing literature has consistently pointed to a gap between theoretical knowledge and actual practice among healthcare workers. For example, studies from South Asia, including India, Nepal, and Bangladesh, suggest that while most birth attendants are familiar with the components of AMTSL, correct and consistent practice during labor is lacking. Factors contributing to this gap include lack of refresher training, insufficient drug supply, lack of supervision, and workload pressures. A study conducted in South India found that although 85% of midwives had adequate knowledge of AMTSL, only 52% performed all the steps correctly during observed deliveries.

Midwives working in facilities in Gaya, Bihar, face similar constraints. Health centers often struggle with high patient-to-staff ratios, irregular supply of oxytocin, and outdated skills, especially among staff with many years of service but limited continuing education. Moreover, formal monitoring and evaluation of AMTSL practice is seldom integrated into routine supervision. These challenges raise critical questions: Are midwives in Gaya adequately equipped—both in knowledge and practice—to implement AMTSL effectively? Are there system-level gaps that hinder the proper application of a procedure that can save lives?

Given the WHO's recommendation for AMTSL as a standard practice in all deliveries and the Indian Ministry of Health's adoption of these guidelines, evaluating the preparedness of the healthcare workforce is essential. Understanding the current level of knowledge among midwives, as well as their actual practices, offers valuable insight into both the effectiveness of training programs and the functionality of health systems. Such assessments also help inform future policy directions, identify training needs, and develop supportive interventions that bridge the knowledge-practice gap.

This study was conducted in selected government and private healthcare facilities in Gaya, Bihar, with the primary objective of assessing the knowledge and practice of AMTSL among midwives. By examining both theoretical understanding and observed delivery room practices, this research aims to identify discrepancies, if any, and to explore the systemic and personal factors that influence the quality of care during the third stage of labor.

The study specifically seeks to answer the following research questions:

1. What is the level of knowledge among practicing midwives in Gaya regarding the components and purpose of AMTSL?
2. To what extent do midwives apply all three components of AMTSL correctly and consistently during labor?
3. What are the barriers to and facilitators of proper implementation of AMTSL in local health settings?

The findings from this study are expected to contribute to local maternal health strategies, reinforce the need for ongoing professional development for midwives, and ultimately support the goal of reducing maternal mortality in Bihar and other resource-constrained regions. In an era where India is striving to meet the Sustainable Development Goal of reducing the maternal mortality ratio to fewer than 70 per 100,000 live births by 2030, strengthening routine practices like AMTSL at the provider level is a crucial step forward.

2. Materials and Methods

Study Design and Setting

A cross-sectional, descriptive study was conducted from January to March 2025 in government and private hospitals in southern India. The selected institutions offer delivery services and employ certified midwives in labor wards.

Study Population

The target population consisted of 120 midwives with at least one year of clinical experience in conducting deliveries. Participants were selected through purposive sampling.

Data Collection Tools

Two instruments were used:

Structured Questionnaire: Assessed sociodemographic data and knowledge of AMTSL, including timing, drug choice, and steps.

Observational Checklist: Evaluated practice during actual deliveries based on WHO protocol.

Validity and Reliability

Tools were validated by experts in obstetrics and nursing education. A pilot study involving 10 midwives ensured clarity and consistency. Cronbach's alpha was 0.82, indicating high reliability.

Data Analysis

Data were entered in SPSS v25.0 and analyzed using descriptive and inferential statistics. Chi-square test was applied to examine associations between knowledge, practice, and sociodemographic variables.

3. Results

3.1 Demographic Characteristics of Participants

A total of 120 midwives participated in the study. The majority were female (98.3%), and the mean age of participants was 34.7 ± 5.9 years. Most midwives (68.3%) had completed a General Nursing and Midwifery (GNM) diploma, while the remainder held BSc Nursing or Auxiliary Nurse Midwife (ANM) qualifications. Over half (56.7%) had more than 5 years of experience in labor and delivery care. Only 38.3% had received in-service training on AMTSL within the past two years.

Table 1: Demographic Characteristics of Midwives (N = 120)

Variable	Frequency (n)	Percentage (%)
Age (years)		
20-30	36	30.0
31-40	58	48.3
41 and above	26	21.7
Educational Qualification		
GNM	82	68.3
BSc Nursing	24	20.0
ANM	14	11.7
Years of Experience in Labor Ward		
1-5 years	52	43.3
>5 years	68	56.7
Recent AMTSL Training (<2 years)	46	38.3

3.2 Knowledge of AMTSL

Out of the total participants, 78.3% (n = 94) had adequate knowledge based on their questionnaire scores (≥70% correct responses). Almost all participants (96.7%) correctly identified oxytocin as the preferred uterotonic drug, while 88.3% knew it should be administered within 1 minute after birth. However, only 61.7% were aware of the proper technique and timing for controlled cord traction, and 58.3% recognized the importance of uterine massage post placental expulsion.

Table 2: Knowledge on Components of AMTSL (N = 120)

Knowledge Item	Correct Response (n)	Percentage (%)
Identified oxytocin as preferred uterotonic	116	96.7
Correct timing for uterotonic administration	106	88.3
Knowledge of controlled cord traction	74	61.7
Knowledge of uterine massage post placenta delivery	70	58.3
Awareness of all three core components	65	54.2
Overall adequate knowledge (score ≥70%)	94	78.3

3.3 Observed Practice of AMTSL

Among the 120 midwives observed for 2-3 deliveries each, full adherence to all three components of AMTSL was recorded in 67 midwives (55.8%). The most commonly missed step was uterine massage (performed in only 49.2% of cases). Delayed administration of oxytocin (>1 minute) was observed in 18.3% of cases, often due to high workload or unavailability of the drug at bedside.

3.4 Factors Influencing Practice

Statistical analysis revealed that midwives who had received AMTSL training in the past two years were significantly more likely to demonstrate correct practice ($p = 0.012$). Similarly, midwives with >5 years of experience performed better in controlled cord traction and uterine massage ($p = 0.045$). No significant association was found between educational qualification and practice adherence ($p > 0.05$).

4. Discussion

This study was conducted to assess the knowledge and actual clinical practice of Active Management of the Third Stage of Labor (AMTSL) among midwives working in Gaya, Bihar—a region where maternal health challenges remain significant. The findings reveal a noteworthy gap between the midwives' theoretical understanding of AMTSL and their implementation of these practices during labor. While a majority of the participants demonstrated adequate knowledge, fewer than 60% adhered fully to the correct sequence and timing of all three AMTSL components in practice.

The observed knowledge level (78.3% had adequate knowledge) aligns with results from similar studies conducted in comparable low-resource settings. For instance, Yisma *et al*. (2017) [4] in Ethiopia and Chandhiok *et al*. (2018) [5] in India reported that most midwives are well-versed in identifying oxytocin as the drug of choice and understanding its timing. In the present study, 96.7% of participants correctly identified oxytocin, and 88.3% knew it should be administered within one-minute post-delivery—highlighting a strong theoretical grasp of AMTSL.

Despite these encouraging levels of knowledge, only 55.8% of the observed midwives applied all three components of AMTSL correctly during actual deliveries. This knowledge-practice discrepancy echoes the concerns raised by other scholars (Begley *et al*., 2019; Maged *et al*., 2020) [2, 3], who emphasized that possession of knowledge does not automatically ensure skillful application. In our study, uterine massage was the most frequently omitted step, even among those with formal training. This could be attributed to the perception that it is less critical than oxytocin administration, or due to time constraints and patient overload, especially in high-volume government hospitals.

Controlled cord traction, another vital step in AMTSL, was also inconsistently practiced. Only 61.7% of the midwives reported knowing the correct technique and timing, and fewer applied it appropriately during observation. This inconsistency is concerning as improper handling can lead to retained placenta or uterine inversion, which in turn can cause secondary hemorrhage. The findings underscore the necessity of reinforcing practical training and simulation in midwifery education.

A significant association was found between recent AMTSL training and adherence to correct practice. Midwives who had undergone training in the last two years were significantly more likely to administer AMTSL appropriately ($p< 0.05$), which aligns with findings from Koblinsky *et al*. (2016) [7], who highlighted the importance of periodic refresher courses in maintaining clinical

competence. In-service training programs that include both theoretical reinforcement and hands-on skill development should thus be institutionalized across healthcare settings, especially in districts like Gaya where delivery loads are high.

Experience also played a role in influencing practice adherence. Midwives with more than five years of experience were better at applying controlled cord traction and post-delivery uterine massage, possibly due to experiential learning and confidence gained over time. However, even among experienced providers, gaps persisted, reinforcing the notion that routine training and audit-feedback loops are necessary regardless of years of service.

The lack of association between educational qualification and practice performance suggests that both diploma and degree holders require equal attention in post-qualification clinical skill enhancement. Simply possessing a higher academic degree does not guarantee better application of labor management protocols, which are heavily dependent on hands-on practice and institutional environment.

Systemic issues such as staff shortages, non-availability of uterotonics at bedside, and heavy workload were commonly reported by participants as barriers to practice. These logistical challenges must be addressed through administrative reforms, better drug procurement systems, and supportive supervision at the facility level.

Overall, the study highlights the importance of bridging the gap between knowledge and real-world application of AMTSL. Improving the quality of maternal health care in regions like Bihar demands more than just training; it requires systemic support, regular monitoring, and institutional accountability to ensure that life-saving protocols are practiced consistently.

5. Conclusion

This study underscores a critical insight into the current state of maternal care in Gaya, Bihar, by evaluating the knowledge and clinical practice of Active Management of the Third Stage of Labor (AMTSL) among midwives. While the majority of midwives demonstrated a sound understanding of the key principles of AMTSL—particularly regarding uterotonic administration—there was a marked discrepancy between their theoretical knowledge and actual implementation during deliveries. Only slightly more than half of the participants adhered to all three components of AMTSL consistently, highlighting a significant gap between training and practice.

The findings further indicate that factors such as recent in-service training, greater clinical experience, and institutional support significantly influence the effective application of AMTSL. However, systemic barriers—including high patient load, unavailability of essential drugs, and time constraints—continue to impede optimal practice.

To bridge this knowledge-practice gap, it is essential to institutionalize regular hands-on skill-based training, ensure uninterrupted availability of uterotonics like oxytocin, and establish supportive supervisory mechanisms. Midwives are the cornerstone of maternal care, especially in resource-limited settings, and empowering them with practical skills, timely resources, and consistent mentorship is key to reducing preventable maternal deaths from postpartum hemorrhage.

Strengthening the routine implementation of AMTSL at all delivery points must become a strategic priority within India's maternal health framework. Doing so will not only improve clinical outcomes but will also help achieve national and global targets for maternal mortality reduction, as envisioned under the Sustainable Development Goals (SDGs).

Conflict of Interest
Not available

Financial Support
Not available

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