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Declarations
No funding was received for this study. The authors
declare no conflict of interest. The study received
ethical approval. All participants provided informed
consent.

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Knowledge, Attitudes, and Practices of Nurses Regarding Uterine Massage for Preventing Postpartum Hemorrhage in a Tertiary Care Hospital

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ABSTRACT

Background: Postpartum hemorrhage (PPH) remains the leading cause of maternal mortality worldwide, with uterine atony as the most common etiology. Uterine massage, a core component of the Active Management of the Third Stage of Labor, is a low-cost and non-pharmacological intervention that can prevent PPH, particularly in low-resource settings. Despite its proven effectiveness, gaps persist between theoretical knowledge and routine clinical application among frontline healthcare providers. Objective: This study aimed to assess the knowledge, attitudes, and practices of nurses regarding uterine massage for the prevention of PPH in a tertiary care hospital in Peshawar, Pakistan. -Methods: A descriptive cross-sectional study was conducted among 60 registered nurses with at least one year of experience. Data were collected using a structured questionnaire adapted from a validated tool and analyzed using SPSS version 27. Associations between knowledge, attitudes, practices, and training status were evaluated using chi-square tests, with odds ratios and 95% confidence intervals reported. Results: Overall, 75% of participants demonstrated good knowledge and 78.3% expressed positive attitudes toward uterine massage, but only 60% reported consistent practice. Formal training was significantly associated with higher knowledge (OR = 3.2, 95% CI: 1.1–9.1, p = 0.028), and good knowledge predicted consistent practice (OR = 2.9, 95% CI: 1.0–8.2, p = 0.041). Documentation was poor, with only 38.3% routinely recording uterine massage. Conclusion: Although nurses showed adequate knowledge and favorable attitudes, practice was inconsistent due to limited training and weak documentation. Implementing mandatory simulation-based training and standardized documentation systems may bridge this knowledge–practice gap and strengthen PPH prevention strategies.
Keywords
Postpartum Hemorrhage, Uterine Massage, Knowledge, Attitudes, Practices, Nurses, Pakistan

INTRODUCTION

Postpartum hemorrhage (PPH) is one of the most serious complications of childbirth and remains the leading cause of maternal mortality worldwide, accounting for almost one-third of all maternal deaths (1). It is commonly defined as blood loss exceeding 500 mL after vaginal delivery or 1000 mL following cesarean section, with uterine atony being the most frequent underlying cause (2). The burden of PPH is particularly pronounced in low- and middle-income countries, including Pakistan, where limited resources, weak health infrastructure, and high maternal mortality ratios amplify its public health significance (3). Reducing maternal deaths requires consistent implementation of evidence-based strategies for PPH prevention and management. The Active Management of the Third Stage of Labor (AMTSL) is globally recognized as the gold-standard preventive approach, comprising uterotonic administration, controlled cord traction, and uterine massage to stimulate contraction and maintain uterine tone (4). Uterine massage, in particular, is a simple, low-cost, and non-pharmacological technique that can be delivered even in settings where uterotonics may not be readily available, making it especially important for resource-limited environments (5). Despite this, evidence suggests a persistent gap between awareness of uterine massage and its consistent clinical application.

Studies from diverse contexts indicate that while health workers frequently recognize uterine atony as the principal cause of PPH, their competency in applying evidence-based interventions such as uterine massage remains inadequate. In Ethiopia, fewer than 35% of midwives demonstrated satisfactory knowledge of PPH management, including uterine massage (6). A similar discrepancy was observed in Nigeria, where nurses overwhelmingly identified uterine atony as the primary etiology but performed poorly when tested on evidence-based PPH management protocols (7). In India, auxiliary nurse-midwives were aware of the importance of uterotonics but lacked practical training in uterine massage techniques, leading to inconsistent implementation (8). Evidence from Tanzania further underscores this concern, as over 75% of student nurse-midwives demonstrated poor competency in PPH management during clinical assessments, reflecting deficiencies in pre-service education (9).

The importance of structured and simulation-based training emerges consistently across studies. In Saudi Arabia, simulation training markedly improved maternity nurses' knowledge, confidence, and technical competency in uterine massage, with skills retained at one-month follow-up (10). Conversely, the absence of such interventions perpetuates knowledge-practice gaps. Attitudinal research also shows that nurses and midwives often recognize the necessity of PPH prevention practices but encounter barriers such as high workload, inadequate staffing, lack of standardized

protocols, and limited documentation practices, all of which undermine consistent application (11,12). Moreover, trials like E-MOTIVE highlight that bundled interventions, including uterine massage, significantly reduce severe PPH, yet adherence in real-world low-resource settings remains challenging (13).

In Pakistan, where maternal mortality remains a pressing concern, nurses are frequently the frontline providers in obstetric care. Their knowledge, attitudes, and practices regarding uterine massage are therefore critical to bridging the gap between preventive guidelines and clinical outcomes. While global and regional data reveal knowledge-practice discrepancies, there is a paucity of context-specific evidence examining how Pakistani nurses perceive and apply uterine massage in routine care. This knowledge gap limits the design of targeted interventions, including training programs, documentation protocols, and policy strategies, that could strengthen maternal health outcomes nationally. This study was therefore designed to assess the knowledge, attitudes, and practices of nurses regarding uterine massage for preventing postpartum hemorrhage in a tertiary care hospital in Peshawar. The objective was to determine whether nurses possess adequate theoretical knowledge, maintain positive attitudes, and translate these into consistent practice, and to identify barriers such as lack of training or weak documentation that may hinder implementation. By addressing these questions, the study aims to generate evidence to inform training programs, strengthen institutional policies, and ultimately contribute to reducing preventable maternal deaths in Pakistan.

MATERIAL AND METHODS

This study was designed as a descriptive, cross-sectional observational investigation to assess the knowledge, attitudes, and practices of nurses regarding the use of uterine massage for preventing postpartum hemorrhage. The design was selected to provide a point-in-time evaluation of the target population in order to identify existing gaps between theoretical knowledge and clinical application within a routine care setting. The study was conducted at a tertiary care hospital in Peshawar, Pakistan, over a six-month period, reflecting a representative period of clinical activity that allowed inclusion of nurses across different shifts and units.

Participants were recruited using convenience sampling from the pool of registered nurses currently employed at the hospital. Eligibility criteria included registration with the Pakistan Nursing and Midwifery Council, graduation from a recognized nursing institution, and a minimum of one year of professional work experience to ensure adequate clinical exposure. Nurses in training and those with less than one year of experience were excluded. Eligible participants were approached directly by the research team, informed about the study objectives, and invited to participate. Written informed consent was obtained from all respondents prior to data collection, and participation was voluntary.

Data were collected using a structured questionnaire adapted from a previously validated tool developed by Wedad M. Almutairi and Salma M. Almutairi (14). The instrument was refined for contextual relevance through expert review and consisted of four sections: demographic and professional characteristics; a 21-item multiple-choice knowledge scale covering PPH definitions, risk factors, causes, and preventive interventions; a series of Likert-type items assessing attitudes toward uterine massage; and a set of items evaluating self-reported practices, training exposure, and documentation behaviors. The operational definition of "good knowledge" was based on achieving a score above the median value on the knowledge scale, while "positive attitude" was defined as agreement with the majority of positive attitudinal statements. "Consistent practice" was defined as reporting the use of uterine massage in routine care after every vaginal delivery.

To minimize potential bias, anonymity was maintained and no identifiers were collected. Self-report bias was addressed by clarifying to participants that responses would not affect their employment status and by ensuring a confidential environment during questionnaire administration. Confounding factors such as years of professional experience and prior training in PPH management were recorded for potential adjustment during analysis.

The target sample size was calculated as 60 participants using the RaoSoft sample size calculator with a 95% confidence level, 5% margin of error, and an assumed response distribution of 50%, providing sufficient precision to detect differences in knowledge, attitudes, and practices among the sample population. Data were entered and analyzed using the Statistical Package for the Social Sciences (SPSS) version 27. Descriptive statistics, including means, standard deviations, frequencies, and percentages, were generated for all variables. Associations between knowledge, attitudes, and practices were explored using chi-square tests for categorical variables. Subgroup analyses were performed for training status and years of experience to assess potential effect modification. Missing data were minimal and handled using listwise deletion. Statistical significance was set at $p < 0.05$ for all tests, and confidence intervals at the 95% level were reported.

Ethical approval was obtained from the institutional review board of the tertiary hospital. The study adhered to international ethical principles, including voluntary participation, informed consent, confidentiality of data, and protection of participants' rights. Data were securely stored in password-protected files accessible only to the research team, ensuring data integrity and reproducibility. The methodological transparency, including detailed definitions, validated instruments, and explicit statistical procedures, provides a clear framework for replication by other researchers in similar contexts.

RESULTS

The study included 60 nurses who completed the structured questionnaire. The mean age of participants was 28.4 years (SD = 4.2), and the majority were female. The results are presented across four domains: knowledge, attitudes, practices, training, and documentation related to uterine massage for the prevention of postpartum hemorrhage. Knowledge of uterine massage was generally high, with 75% of participants scoring above the threshold for "good knowledge." However, one-quarter demonstrated poor knowledge, indicating a notable minority requiring further educational support.

Table 1. Distribution of Nurses by Knowledge Score and Associated Factors (n = 60)

Knowledge Score	Frequency	Percent	OR (95% CI) for Good Knowledge by Training	p-value
Poor Knowledge	15	25.0%	Reference	
Good Knowledge	45	75.0%	3.2 (1.1–9.1)	0.028

Nurses who had received formal training were more likely to demonstrate good knowledge compared with those without training (OR = 3.2, 95% CI: 1.1–9.1, p = 0.028). Attitudes towards uterine massage were positive in most cases, with over three-quarters of nurses recognizing it as an important intervention for PPH prevention.

Table 2. Distribution of Nurses by Attitude Score and Association with Training (n = 60)

Attitude Score	Frequency	Percent	OR (95% CI) for Positive Attitude by Training	p-value
Poor Attitude	13	21.7%	Reference	
Good Attitude	47	78.3%	2.4 (0.8–7.1)	0.114

Although trained nurses were more likely to report positive attitudes, the association did not reach statistical significance.

Practice of uterine massage was inconsistent. While 60% of nurses reported routinely performing uterine massage after delivery, 40% admitted to either rare or occasional practice.

Table 3. Reported Practice of Uterine Massage and Association with Knowledge (n = 60)

Practice Level	Frequency	Percent	OR (95% CI) for Consistent Practice by Good Knowledge	p-value
Inconsistent	24	40.0%	Reference	
Consistent	36	60.0%	2.9 (1.0–8.2)	0.041

Nurses with good knowledge were significantly more likely to report consistent practice (OR = 2.9, 95% CI: 1.0–8.2, p = 0.041).

Formal training in uterine massage was reported by less than one-third of the sample, highlighting a major gap.

Table 4. Nurses Who Received Formal Training in Uterine Massage (n = 60)

Training Status	Frequency	Percent
Yes	18	30.0%
No	42	70.0%

Documentation practices were also suboptimal, with fewer than 40% of participants routinely recording uterine massage in patient charts.

Table 5. Documentation of Uterine Massage in Clinical Records (n = 60)

Documentation Status	Frequency	Percent
Yes	23	38.3%
No	37	61.7%

These findings demonstrate a strong knowledge base and generally positive attitudes among nurses, yet highlight serious gaps in consistent practice, training exposure, and clinical documentation. Inferential analysis revealed that both training and knowledge were significantly associated with better practice, underscoring the importance of structured education and reinforcement strategies.
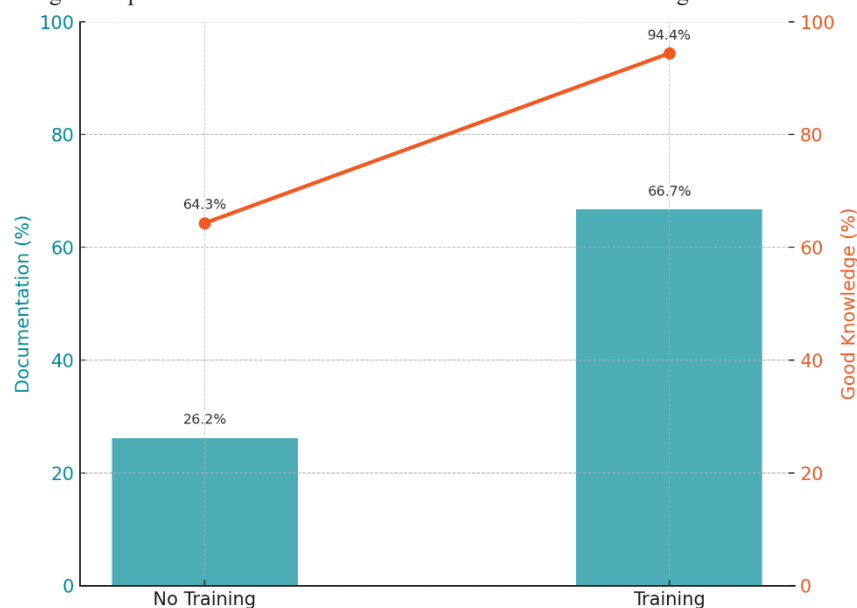
Figure 1 Impact of Training on Nurses' Knowledge and Documentation of Uterine Massage

Training coverage showed a strong influence on both knowledge and documentation of uterine massage. Among nurses without formal training, only 64.3% demonstrated good knowledge and 26.2% documented the procedure, whereas training increased these rates to 94.4% and 66.7% respectively. The integrated line–bar visualization highlights this dual effect, with documentation represented by bars and knowledge by a smoothed scatter line, illustrating a parallel upward shift. Clinically, this pattern underscores that structured training not only enhances theoretical competence but also improves record-keeping, a critical component for patient safety and continuity of care.

DISCUSSION

The present study provides valuable insights into the knowledge, attitudes, and practices of nurses regarding uterine massage for the prevention of postpartum hemorrhage, highlighting both encouraging trends and critical gaps. A majority of participants demonstrated good theoretical knowledge and positive attitudes, findings that are consistent with reports from Ethiopia and India where health workers recognized uterine atony as the leading cause of postpartum hemorrhage and acknowledged the importance of preventive measures such as uterine massage (6,8). However, as seen in our sample, adequate knowledge did not reliably translate into consistent practice, a pattern echoed in previous work from Nigeria and

Tanzania where significant knowledge-practice discrepancies were documented (7,9). This suggests that theoretical understanding alone is insufficient and that clinical behaviors are shaped by broader systemic and organizational factors.

Our analysis demonstrated that training was significantly associated with higher knowledge levels, and knowledge in turn predicted consistent practice, reinforcing the argument that educational interventions are pivotal. Similar results were observed in Saudi Arabia, where simulation-based training improved both competency and confidence in applying uterine massage techniques and where skills were retained over time (10). The mechanisms underlying this improvement likely involve experiential learning, skill reinforcement, and reduction of performance anxiety, which together facilitate translation of knowledge into practice. These findings align with skill-acquisition theories that emphasize practice-based reinforcement as critical for sustained competency. The implication for clinical care is that structured and repeated training opportunities may represent the most effective strategy for ensuring uterine massage is consistently implemented in busy obstetric wards.

Despite positive attitudes among more than three-quarters of participants, only 60% reported consistent practice, indicating an attitude–practice gap. This gap is not unique to our setting; studies in South Asia have documented that even when health workers agreed on the importance of PPH prevention, actual implementation was often limited by heavy workload, staffing shortages, and lack of institutional support (11). In our study, poor documentation rates further compounded this challenge. With fewer than 40% of nurses recording uterine massage in patient charts, opportunities for clinical accountability and audit were diminished. Poor documentation has been reported across maternal health programs in low-resource countries and is associated with discontinuity of care and compromised patient safety (12). Integrating standardized documentation tools, such as mandatory electronic fields or simplified checklists, could bridge this gap and strengthen adherence to recommended practices.

From a theoretical perspective, the findings underscore the need to view uterine massage not as an isolated intervention but as part of a broader bundle of PPH prevention strategies. Large-scale trials such as E-MOTIVE have shown that combined measures including uterine massage can reduce severe hemorrhage outcomes, yet real-world adherence remains low in resource-limited settings (13). Our results provide empirical evidence from Pakistan that reinforces the necessity of embedding uterine massage within structured institutional protocols supported by training, monitoring, and accountability mechanisms.

The strengths of this study include its focus on a frontline cadre of healthcare providers in a high-burden region, the use of a validated instrument adapted for local context, and the inclusion of inferential analysis linking knowledge and training to practice behaviors. However, limitations must be acknowledged. The relatively small sample size and use of convenience sampling restrict the generalizability of findings to other institutions or regions. Self-reported practices are subject to recall and social desirability bias, which may have led to overestimation of adherence. Additionally, the cross-sectional design captures associations but not causal relationships, and unmeasured factors such as ward workload or supervisory oversight could also influence practice.

Despite these limitations, the study highlights actionable gaps and offers clear directions for future research. Larger multicenter studies with longitudinal designs would provide stronger evidence on causal pathways between training, knowledge retention, and practice. Qualitative research exploring contextual barriers, including workload, cultural norms, and managerial factors, would complement quantitative findings and guide targeted interventions. Furthermore, experimental studies testing the effectiveness of simulation-based or on-the-job training programs in Pakistan could directly inform national maternal health policy. While nurses in this tertiary hospital in Peshawar possess adequate knowledge and hold favorable attitudes toward uterine massage, practice remains inconsistent, and both training deficits and weak documentation systems are critical barriers. Addressing these challenges through mandatory simulation-based training, standardized protocols, and strengthened documentation processes could narrow the knowledge–practice gap, enhance the reliability of postpartum hemorrhage prevention strategies, and ultimately reduce maternal mortality in low-resource settings.

CONCLUSION

This study demonstrated that while most nurses working in a tertiary care hospital in Peshawar possessed good knowledge and positive attitudes toward uterine massage as a preventive intervention for postpartum hemorrhage, consistent practice remained suboptimal, largely due to insufficient training and poor documentation. These findings highlight the urgent need to integrate mandatory simulation-based education and standardized record-keeping into routine obstetric practice to ensure that evidence-based guidelines translate into reliable bedside care. Clinically, strengthening nurses' competencies in uterine massage can directly contribute to reducing preventable maternal deaths in resource-limited settings where access to pharmacological interventions may be inconsistent. From a research perspective, the demonstrated association between training, knowledge, and practice underscores the importance of further studies exploring scalable educational interventions and systemic barriers to implementation. By addressing these gaps, healthcare systems can more effectively align frontline nursing practices with global standards for postpartum hemorrhage prevention, thereby improving maternal safety and outcomes.

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