

Review Article

Nursing interventions in the prevention of postpartum hemorrhage: A systematic review

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Keyword:

Postpartum Hemorrhage; Nursing
Intervention; Wiedenbach Theory

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DOI:

<https://doi.org/10.52235/lp.v7i3.805>

Article Info:

Received : April 26, 2026

Revised : July 16, 2026

Accepted : July 19, 2026

Lentera Perawat

e-ISSN : 2830-1846

p-ISSN : 2722-2837



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Abstract

Background: Postpartum hemorrhage (PPH) remains a major cause of preventable maternal morbidity and mortality. Nursing and midwifery interventions may contribute to risk recognition, early response, clinical monitoring, and professional preparedness; however, the available evidence is methodologically diverse.

Objective: To synthesize eight eligible publications on nursing and midwifery contributions to postpartum hemorrhage (PPH) prevention and early management, including primary intervention evidence and contextual or conceptual evidence, and to examine their relevance to Wiedenbach's Need for Help theory.

Methods: This systematic review was reported in accordance with PRISMA 2020. PubMed, ProQuest, SAGE Journals, and ClinicalKey for Nursing were searched for English-language publications from January 2015 to December 2025. The search identified 5,397 records, 56 full-text reports were assessed, and eight publications were included: four primary intervention studies and four contextual or conceptual publications. Design-appropriate Joanna Briggs Institute appraisal criteria were used, and findings were synthesized narratively in separate evidence strata.

Results: The eight included publications comprised one randomized clinical trial, one non-randomized controlled study, two one-group pretest-posttest studies, one qualitative evidence synthesis, one integrative review, one narrative review, and one conceptual paper. Primary clinical studies reported reductions in blood-loss scores or nursing risk events, while educational studies reported improved knowledge or competency. Contextual sources highlighted physiological care strategies, objective monitoring, communication, resource readiness, and barriers to timely recognition. None of the publications directly tested Wiedenbach's theory.

Conclusion: Nursing and midwifery interventions show potential to strengthen PPH prevention and early management.

Background

Postpartum hemorrhage (PPH) remains a major maternal health concern, particularly in settings where delays in recognition, escalation, referral, and access to essential resources increase the likelihood of severe complications. Evidence from Ethiopia illustrates the continuing burden of PPH and the contribution of obstetric and service-related risk factors, including multiparity and inadequate antenatal care (Nigussie et al., 2022). PPH prevention therefore requires more than the availability of uterotonic medication; it also depends on timely risk assessment, objective monitoring, coordinated action, and a health system capable of responding before maternal instability progresses.

Clinical recognition is frequently complicated by differences in how women, families, and health professionals interpret postpartum blood loss. A qualitative evidence synthesis found that perceptions of normal and abnormal bleeding influence help-seeking, detection, and escalation of care (Akter et al., 2023). Similar concerns have been reported in facility-based and community

settings, where limited resources, workload, cultural beliefs, and inconsistent readiness may delay preventive or corrective action (Bazirete et al., 2020; Flanagan et al., 2021; Than et al., 2017). These findings support a central role for nurses and midwives in continuous observation, communication, documentation, and rapid coordination.

Standardized hemorrhage protocols and benchmarks can improve consistency, although their effectiveness depends on implementation fidelity and professional preparedness (Federspiel et al., 2023). Reviews of nursing and midwifery education have also emphasized the need for realistic training, early recognition skills, and structured responses to deterioration (Lavoie et al., 2022). Midwives continue to report challenges in PPH management related to clinical autonomy, teamwork, resources, and emergency readiness (Yao et al., 2024). Primary intervention studies are therefore needed to determine whether clinical and educational strategies improve maternal outcomes or the competencies required to achieve them.

Wiedenbach's Need for Help theory describes professional nursing as a process of identifying a patient's need for help, providing appropriate assistance, and validating whether the assistance achieved its intended purpose (Wiedenbach, 1964). The theory is conceptually compatible with PPH prevention because maternal status can change rapidly and requires sensitive observation and timely action. Saxton et al. (2016) proposed a psychobiological strategy for reducing PPH risk, but their paper was conceptual rather than a primary effectiveness study. Conceptual compatibility must therefore be distinguished from direct empirical testing of Wiedenbach-based care.

Previous versions of this review combined primary studies, conceptual papers, and secondary reviews within the same evidence table, which prevented a valid assessment of intervention effectiveness. The present revision restricts the synthesis to primary intervention studies and uses secondary literature only to contextualize the findings. The review question was: Among postpartum women, nurses, midwives, or nursing students, what effects do nursing or midwifery-led clinical and educational interventions have on PPH-related maternal outcomes or professional preparedness? The objective was to synthesize the available primary evidence and then interpret its conceptual relationship to Wiedenbach's Need for Help theory without presenting theory alignment as proof of clinical effectiveness.

Methods

Study Design

A systematic review of intervention studies was conducted and reported according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 statement (Page et al., 2021). A protocol specifying the review question, eligibility criteria, information sources, study selection, data extraction, appraisal, and synthesis approach was prepared before screening.

Eligibility Criteria

Studies were eligible when they: (1) reported primary research using a randomized controlled, non-randomized controlled, quasi-experimental, cohort, or analytical observational design that evaluated an intervention; (2) involved women during labor or the postpartum period, practicing

nurses or midwives, or nursing/midwifery students; (3) evaluated a nursing or midwifery clinical, organizational, monitoring, risk-management, or educational intervention directly related to PPH prevention, early detection, or early severity reduction; (4) reported measurable maternal outcomes or professional preparedness outcomes; (5) were published in English between January 2015 and December 2025; and (6) were available in full text. Conceptual papers, editorials, single case reports, protocols, qualitative evidence syntheses, integrative reviews, narrative reviews, scoping reviews, systematic reviews, and meta-analyses were excluded as units of analysis. Purely pharmacological studies without a nursing or midwifery care component were also excluded.

Information Sources and Search Strategy

PubMed, ProQuest, SAGE Journals, and ClinicalKey for Nursing were searched. Controlled vocabulary, where available, and free-text terms were combined around the concepts of "postpartum hemorrhage," "nursing care," "midwifery care," "prevention," "early detection," "risk management," "education," "simulation," and "Need for Help theory." Search syntax was adapted to each database. Records were exported to Mendeley Reference Manager for duplicate identification and reference management. The search covered publications from January 2015 to December 2025.

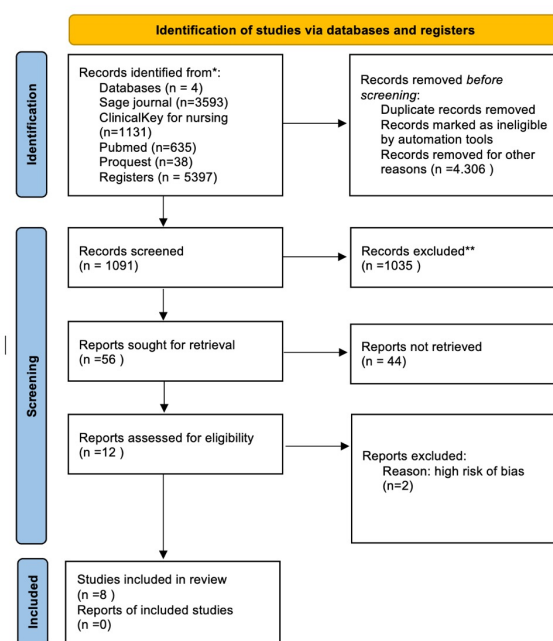


Figure 1. PRISMA flow diagram

Study Selection and Data Extraction

Two reviewers independently screened titles and abstracts and then assessed potentially eligible full-text reports. Disagreements were resolved through discussion and consensus. Two reviewers independently extracted author, year, country, design, setting, participant characteristics, intervention, comparator, outcomes, measurement timing, and principal findings using a standardized form. Extraction discrepancies were resolved by consensus, with referral to a third reviewer when necessary.

Critical Appraisal

Methodological quality was assessed with design-specific Joanna Briggs Institute (JBI) critical appraisal tools for randomized controlled trials and quasi-experimental studies (Aromataris et al., 2024). Appraisal focused on allocation, comparability, confounding, completeness of follow-up, reliability of outcome measurement, and appropriateness of analysis. No numerical total score, arbitrary cut-off, or "level of evidence" label was used because such labels do not replace domain-level appraisal. Appraisal findings were used to qualify the narrative interpretation rather than to exclude studies solely on the basis of a summary score.

Data Synthesis

Meta-analysis was not undertaken because the included studies differed substantially in population, intervention content, comparator, **Table 1.** Characteristics and principal findings

study design, and outcome measurement. A structured narrative synthesis grouped interventions into: (1) clinical and organizational interventions affecting postpartum blood loss or early risk; and (2) educational interventions affecting PPH-related knowledge or competency. Empirical findings from included primary studies were presented separately from contextual secondary literature and from conceptual interpretation using Wiedenbach's theory.

Results

The four database searches identified 5,397 records: PubMed (n = 635), ProQuest (n = 38), SAGE Journals (n = 3,593), and ClinicalKey for Nursing (n = 1,131). After 356 duplicate records were removed, 5,041 titles and abstracts were screened and 4,985 records were excluded. Fifty-six full-text reports were assessed for eligibility. Forty-eight reports were excluded because they were outside the review scope, lacked a relevant nursing or midwifery component, did not provide a usable empirical or contextual contribution, or otherwise failed to meet the eligibility criteria. Eight publications were included in the final narrative synthesis: four primary intervention studies and four contextual or conceptual publications (See Figure 1).

Eight publications were included: four primary intervention studies and four contextual or conceptual sources. Their designs and principal findings are summarized in Table 1

Study and design	Participants and intervention	Outcomes and main findings	Methodological interpretation
Xia et al. (2022), China Non-randomized controlled study	Two hundred patients with PPH (100 intervention; 100 control). The intervention combined doctor-nurse collaborative and hierarchical management with nursing risk management; the comparator received nursing risk management.	Bleeding volume, nursing-record quality, nursing risk events, treatment response, and satisfaction. The intervention group had lower blood loss and fewer risk events and higher documentation, treatment, and satisfaction outcomes (reported $p < .05$ or $p < .01$).	Concurrent comparison was a strength, but allocation by admission order was non-random. Control of confounding and baseline equivalence were insufficiently reported; confidence in causal attribution is limited.
Longkumer et al. (2021), India One-group pretest-posttest study	Sixty final-year BSc nursing students received a planned teaching program on PPH detection and prevention.	Knowledge measured before and seven days after the program. Posttest knowledge was significantly higher than pretest knowledge ($t = 25.2$, $p < .05$). The article reports inconsistent pretest means across sections.	The intervention and timing were described, but the absence of a control group, use of a self-developed questionnaire, short follow-up, and inconsistent reporting substantially limit inference.
Zou et al. (2023), China Pilot one-group	Eighty-two practicing midwives completed a two-	Core competency and learning experience or satisfaction improved after training. The	The educational intervention was structured, but the study lacked a control group and

Study and design	Participants and intervention	Outcomes and main findings	Methodological interpretation
pretest-posttest quasi-experimental study	day obstetric critical-care simulation program.	study did not report direct maternal PPH outcomes.	long-term follow-up. Outcomes were primarily professional and self-reported; translation into clinical outcomes remains uncertain.
Niknami et al. (2023), Iran Randomized clinical trial	Ninety-eight women after vaginal birth were randomized to receive 100 g of date fruit two hours postpartum or routine care.	Twenty-four-hour blood loss was assessed with the Pictorial Blood Loss Assessment Chart. Median scores were 35.0 versus 39.0; the estimated median difference favored the intervention by 9.0 units (95% CI 2.0-18.0; p = .009).	Randomization and a concurrent control strengthened the study. Allocation concealment and blinding were not clearly reported, and PBLAC is an indirect blood-loss measure; confidence is moderate rather than definitive.
Saxton et al. (2016), Australia Conceptual or theoretical paper	No empirical sample. Pronuturance Plus integrated physiological and psychobiological concepts to propose skin-to-skin contact, early breastfeeding, and a calm, supportive birth environment.	The paper proposed support for endogenous oxytocin, uterine contraction, and reduced atony or PPH risk, but it reported no primary outcome data or comparative effect estimate.	The mechanism is relevant and clearly articulated, but conceptual evidence cannot establish intervention effectiveness.
Almutairi (2021), Saudi Arabia Narrative literature review	Reviewed literature on skin-to-skin contact and early breastfeeding as physiological approaches to PPH prevention.	The review suggested that these low-cost practices may support endogenous oxytocin release, uterine contraction, and reduced atony risk; no pooled effect estimate was reported.	Directly relevant to physiological nursing and midwifery care, but narrative selection and the absence of formal risk-of-bias synthesis limit certainty.
Akter et al. (2023), multinational Cochrane qualitative evidence synthesis	Sixty-seven qualitative studies from 26 countries involving women, community members, lay health workers, and skilled health professionals.	Perceptions of normal and abnormal bleeding, availability of drugs and supplies, communication, referral pathways, and service readiness influenced recognition, help-seeking, and timely management.	Systematic and transparent qualitative synthesis; it provides strong contextual evidence but does not estimate comparative intervention effectiveness.
Castiblanco Montañez et al. (2022), Colombia Integrative review	Synthesized 41 publications on nursing interventions intended to prevent progression of PPH to hypovolemic shock.	Highlighted objective blood-loss and vital-sign monitoring, early recognition of shock, intravenous access, fluids, transfusion preparation, documentation, and interprofessional coordination.	Useful nursing-practice synthesis, but the evidence was heterogeneous and secondary, with no direct pooled effect estimate.

Clinical and Organizational Interventions

Two primary studies evaluated interventions with maternal or service outcomes. Xia et al. (2022) reported that a combined doctor-nurse collaborative, hierarchical, and risk-management model was associated with lower bleeding volume and fewer nursing risk events among patients already experiencing PPH. This intervention is better interpreted as early management and prevention of further deterioration rather than primary prevention of PPH onset. Niknami et al. (2023) reported a modest reduction in postpartum blood-loss scores after a midwifery-supported dietary intervention. The finding was

statistically significant, but it came from a single trial using an indirect blood-loss measure and should not be interpreted as a replacement for established PPH prevention protocols.

Educational Interventions

Longkumer et al. (2021) found that a planned teaching program improved nursing students' knowledge of PPH detection and prevention. Zou et al. (2023) similarly reported improved competency and learning experience after obstetric critical-care simulation among midwives. Both studies support the educational value of structured PPH training; however, neither used a concurrent comparator, and neither

demonstrated that improved knowledge or perceived competency reduced PPH incidence, blood loss, transfusion, severe morbidity, or mortality.

Contextual and Conceptual Evidence

The four contextual or conceptual publications broadened interpretation without providing additional causal estimates. Saxton et al. (2016) and Almutairi (2021) described physiological rationales for skin-to-skin contact, early breastfeeding, and supportive environments that may promote endogenous oxytocin and uterine contraction. Akter et al. (2023) identified perceptual, cultural, communication, resource, and referral barriers that influence recognition and timely response. Castiblanco Montañez et al. (2022) synthesized nursing actions centered on objective assessment, hemodynamic monitoring, rapid stabilization, documentation, and team coordination. These publications inform

mechanism and implementation but should not be interpreted as direct evidence of intervention effectiveness.

Critical Appraisal Findings

Methodological limitations were common across the eight publications. Among the primary studies, the randomized trial provided the strongest comparative evidence but did not clearly report allocation concealment or blinding. The non-randomized clinical study was vulnerable to selection bias and residual confounding, while the two educational studies used single-group pretest-posttest designs. Among the contextual publications, the Cochrane qualitative synthesis used the most transparent systematic methods; the integrative, narrative, and conceptual sources were limited by their secondary nature and variable search or appraisal transparency. Table 2 presents the domain-level appraisal summary.

Table 2. Domain-level critical appraisal summary for the eight included publications

Study	Relevant JBI tool	Appraisal strengths	Main concerns affecting interpretation
Niknami et al. (2023)	JBI RCT checklist	Random allocation reported; concurrent comparator; predefined outcome and analysis.	Concealment and blinding unclear; indirect blood-loss measurement; single-center study.
Xia et al. (2022)	JBI quasi-experimental checklist	Concurrent comparison; clinically relevant maternal and service outcomes.	Non-random allocation; potential baseline imbalance and confounding; limited reporting of analytic adjustment.
Longkumer et al. (2021)	JBI quasi-experimental checklist	Intervention and assessment interval described; complete pre/post reporting.	No control group; self-developed measure; very short follow-up; inconsistent reporting of the pretest mean.
Zou et al. (2023)	JBI quasi-experimental checklist	Structured simulation intervention; clearly identified professional outcomes.	No control group; short-term assessment; predominantly self-reported outcomes; no maternal outcomes.
Saxton et al. (2016)	JBI text and opinion criteria	Coherent conceptual sequence and source-supported physiological rationale.	No empirical sample, comparator, or outcome testing; clinical effectiveness remains untested.
Almutairi (2021)	JBI text and opinion or narrative evidence criteria	Clear focus on physiological nursing and midwifery practices; clinically relevant rationale.	Narrative source selection; no formal risk-of-bias assessment or pooled effect estimate.
Akter et al. (2023)	JBI systematic review criteria	Clear review question; systematic qualitative synthesis; transparent confidence assessment.	Contextual qualitative evidence only; no comparative intervention effect and variable transferability across settings.
Castiblanco Montañez et al. (2022)	JBI systematic review or integrative review criteria	Nursing-specific scope and structured synthesis of assessment and stabilization actions.	Heterogeneous secondary evidence; limited ability to determine causality or a pooled effect.

Discussion

This review synthesized eight eligible publications: four primary intervention studies and four contextual or conceptual sources. The primary studies suggest that nursing and midwifery interventions may influence postpartum blood loss, nursing risk-management processes, knowledge, and professional competency. The contextual publications explain physiological mechanisms, nursing responsibilities, and implementation conditions that may shape whether interventions are delivered in time. Separating the two evidence strata prevents secondary or conceptual publications from being treated as direct proof of effectiveness.

The two studies with maternal or service outcomes addressed different stages of care. Niknami et al. (2023) examined an adjunctive intervention after vaginal birth and found a modest reduction in a blood-loss score. Xia et al. (2022) evaluated an organizational nursing model among women who had already developed PPH and reported lower subsequent bleeding and fewer risk events. The latter study informs early management and prevention of clinical worsening, not primary prevention. This distinction is important because a review of PPH prevention should not combine prevention of onset, early detection, and treatment of established hemorrhage without clearly identifying the stage of intervention.

The educational studies provide evidence of learning rather than evidence of maternal benefit. Planned teaching improved nursing students' knowledge (Longkumer et al., 2021), and critical-care simulation improved midwives' competency and learning experience (Zou et al., 2023). These findings are consistent with the broader educational literature emphasizing structured preparation for hemorrhage recognition and response (Lavoie et al., 2022). However, knowledge, satisfaction, and self-perceived competency are surrogate outcomes. Future studies should connect training interventions to observed clinical performance, protocol adherence, quantified blood loss, escalation time, transfusion, severe morbidity, or mortality.

The four contextual publications broaden the interpretation of the primary findings. Saxton et al. (2016) and Almutairi (2021) emphasized

physiological mechanisms associated with skin-to-skin contact, breastfeeding, endogenous oxytocin, and a supportive birth environment. Akter et al. (2023) demonstrated how perceptions of bleeding, resource availability, communication, and referral pathways affect recognition and response. Castiblanco Montañez et al. (2022) described nursing assessment, hemodynamic monitoring, rapid stabilization, documentation, and coordination intended to prevent progression to hypovolemic shock. These publications strengthen mechanistic and implementation understanding but cannot increase certainty in the primary effect estimates.

Wiedenbach's Need for Help theory offers a coherent conceptual sequence for interpreting PPH care: the nurse or midwife identifies a need for help, provides appropriate assistance, and validates the response (Wiedenbach, 1964). Risk assessment, objective blood-loss monitoring, escalation, team coordination, and reassessment can be mapped onto this sequence. Saxton et al. (2016) and Almutairi (2021) provide related physiological reasoning, while Akter et al. (2023) and Castiblanco Montañez et al. (2022) illuminate contextual conditions and nursing actions. None of the eight included publications operationalized Wiedenbach's constructs as a standardized intervention or compared theory-based care with usual care. The review therefore supports conceptual relevance, not direct evidence that the theory improves PPH outcomes.

The findings have practical implications. Clinical services should prioritize objective blood-loss assessment, clear escalation pathways, team communication, and competency-based emergency training within established evidence-based PPH protocols. Adjunctive interventions should remain secondary to standard prevention and treatment. Research should use prospective controlled designs, clearly defined nursing components, validated maternal outcomes, adequate follow-up, and transparent reporting of allocation and confounding. Theory-based research should specify how identification, ministration, and validation are operationalized and should test whether those components add benefit beyond standard care.

This review has several limitations. Eight publications were included, but only four were primary intervention studies; the interventions

and outcomes were highly heterogeneous, and two primary studies used uncontrolled pretest-posttest designs. The four contextual or conceptual publications cannot establish causal effectiveness and varied in methodological transparency. Restriction to English-language publications and four databases may have omitted relevant evidence. The exact date of the final search was not documented in the source records, and protocol registration was not available. These limitations preclude meta-analysis and reduce certainty in the conclusions.

Conclusion and Recommendation

The synthesis of eight publications indicates that nursing and midwifery contributions may strengthen PPH prevention and early management through clinical monitoring, coordinated risk management, physiological supportive care, professional education, and timely communication. However, only four publications provided primary intervention evidence, and that evidence remains small, heterogeneous, and methodologically limited. The four contextual or conceptual publications clarify mechanisms, nursing roles, and implementation barriers but do not provide additional causal proof. Wiedenbach's Need for Help theory is conceptually relevant to assessment, assistance, and evaluation, but its clinical effectiveness in PPH care has not been directly tested. Future controlled studies should evaluate clearly specified theory-informed nursing interventions with objective maternal outcomes and rigorous risk-of-bias reporting.

Acknowledgement

The author would like to express deepest gratitude to all respondents who willingly took the time to participate in this research. Your contributions were invaluable to the success of this study.

Funding Source

None.

Declaration of conflict of interest

The authors declare no competing interests.

Declaration on the Use of AI

No AI tools were used in the preparation of this manuscript.

Data Availability Statement

Data sharing is not applicable to this article.

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