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Review Article

Simulation-based training for breastfeeding competency development in midwifery practice: a concept analysis

Deepa N.R.[1], Vidyashri R.[2], M. Abirami[3], Anupama Yadav[4], Smita T.[5], Gomathi Munusamy[6], Gandhimathi R.[7], Ariyalakshmi B.[8], Dhanya R.[8], Krishna Prabha P.K.[8], Balamurugan[9], Mohammed Umar[10]*

[1]Department of Obstetrical and Gynaecological Nursing, ESIC College of Nursing, Kalaburagi, Karnataka, India
[2]Department of Community Health Nursing, RGUHS, Tumkur / Bangalore, Karnataka, India
[3]Department of Nursing Services, Indian Nursing Council (INC), New Delhi, India
[4]Department of Child Health Nursing, BGS VINS, Adhichunchanagiri University, Karnataka, India
[5]Department of Child Health Nursing, Acharya College of Nursing, RGUHS, Bangalore, Karnataka, India
[6]Department of Community Health Nursing, Indira Gandhi School and College of Nursing, Atal Bihari Vajpayee Medical University, Amethi, Uttar Pradesh, India
[7]Department of Community Health Nursing, Sree Abirami College of Nursing, The Tamil Nadu Dr. M.G.R. Medical University, Coimbatore, Tamil Nadu, India
[8]Department of Child Health Nursing, P.K. Das College of Nursing, Kerala University of Health Sciences, Ottapalam, Kerala, India
[9]Department of Nursing, Indira Gandhi Government General Hospital and Post Graduate Institute, Puducherry, India
[10]Department of Nursing, Uttar Pradesh University of Medical Sciences, Saifai, Etawah, Uttar Pradesh, India

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***Correspondence:**
Mohammed Umar,
E-mail: umarrathore0786@gmail.com

ABSTRACT

Breastfeeding competency is a core professional requirement in midwifery practice and significantly influences maternal and neonatal health outcomes. Despite global recommendations advocating exclusive breastfeeding, gaps persist in practical skill preparation and clinical confidence among midwifery students. Simulation-based training has emerged as an innovative educational strategy; however, its conceptual meaning within breastfeeding competency development remains inadequately defined. This study aimed to clarify the concept of simulation-based training for breastfeeding competency development in midwifery practice using Walker and Avant's eight-step concept analysis methodology. A systematic literature search was conducted across PubMed, Scopus, CINAHL, and Web of Science databases for studies published between 2000 and 2025. Sixty-four relevant articles were included in the final synthesis. Five defining attributes were identified: structured experiential learning, simulated clinical environment, competency-based evaluation, facilitated reflective debriefing, and clinical transferability. Antecedents included curricular gaps, technological advancement, maternal–infant health priorities, and ethical considerations in clinical training. Consequences encompassed improved psychomotor skills, enhanced clinical confidence, strengthened breastfeeding support practices, and potential improvement in maternal satisfaction and breastfeeding outcomes. An operational definition was developed to guide curriculum design, research standardization, and policy development. Concept clarification supports the integration of simulation-based strategies into competency-based midwifery education to enhance breastfeeding support quality and maternal–newborn health outcomes.

Keywords: Simulation-based training, Breastfeeding competency, Midwifery education, Concept analysis, Experiential learning, Clinical competence, Maternal health

INTRODUCTION

Breastfeeding remains one of the most effective public health interventions for improving neonatal survival, maternal health, and long-term developmental outcomes.[1] The World Health Organization (WHO) recommends exclusive breastfeeding for the first six months of life, followed by continued breastfeeding alongside complementary feeding for up to two years or beyond.[2] Despite these recommendations, global exclusive breastfeeding rates remain suboptimal, with significant variations across regions.[3] One of the critical determinants influencing breastfeeding success is the quality of professional support provided by healthcare professionals, particularly midwives.[4] Midwives serve as frontline providers in maternal and newborn care. Their role encompasses antenatal education, immediate postpartum support, lactation counseling, and management of breastfeeding complications.[5]

Research demonstrates that skilled breastfeeding support from trained midwives significantly improves breastfeeding initiation, duration, and maternal confidence.[6] However, multiple studies indicate persistent gaps in midwifery education related to practical breastfeeding management, positioning techniques, latch assessment, and counseling skills.[7] These deficiencies may compromise maternal satisfaction and breastfeeding continuation rates.[8] Traditional midwifery education relies heavily on didactic lectures and opportunistic clinical exposure. While theoretical knowledge forms a necessary foundation, it does not always translate into clinical competence.[9] Clinical learning environments can be unpredictable, limiting students' opportunities to practice essential breastfeeding skills under supervision.[10] Furthermore, ethical considerations restrict repeated practice on real patients, particularly in sensitive postpartum settings.[11]

These challenges underscore the need for innovative educational approaches that enhance experiential learning without compromising patient safety. Simulation-based training (SBT) has emerged as a transformative pedagogical strategy in healthcare education. It allows learners to practice clinical skills in controlled, risk-free environments using standardized patients, mannequins, task trainers, and high-fidelity simulation technologies.[12] Simulation promotes active learning, critical thinking, and reflective practice through structured scenarios and debriefing processes.[13]

In nursing and medical education, simulation has demonstrated effectiveness in improving clinical competence, communication skills, teamwork, and confidence.[14] In the context of breastfeeding education, simulation may include breast models for latch demonstration, role-play scenarios for counseling, high-fidelity postpartum simulators, and standardized patient interactions representing common breastfeeding challenges.[15] These methods enable midwifery students to practice hands-on techniques such as positioning, attachment assessment, expression guidance, and problem-solving for complications like engorgement or mastitis.[16] Additionally, structured debriefing enhances critical reflection and reinforces evidence-based practice principles.[17]Although simulation-based education is widely recognized in general nursing and obstetric training, its conceptual application specifically for breastfeeding competency development in midwifery remains fragmented.

The literature employs varied terminology, including "clinical skills simulation," "lactation simulation workshops," "standardized patient breastfeeding scenarios," and "skills lab training," without a unified conceptual definition.[18] The absence of conceptual clarity hampers curriculum standardization, outcome measurement, and research comparability.[19] Concept analysis is a methodological approach that clarifies ambiguous concepts, identifies defining attributes, and establishes theoretical foundations for research and practice.[20] Walker and Avant's method provides a systematic framework widely adopted in nursing scholarship to refine and operationalize complex constructs.[21]

Applying this framework to simulation-based breastfeeding competency development will enhance theoretical precision and guide evidence-based curriculum design. Breastfeeding competency itself encompasses multidimensional domains: knowledge, psychomotor skills, communication ability, cultural sensitivity, and clinical judgment.[22] Competency-based education emphasizes measurable outcomes, skill mastery, and learner accountability.[23] Integrating simulation into competency frameworks aligns with adult learning theory and experiential learning models, particularly Kolb's experiential learning cycle.[24] Through concrete experience, reflective observation, abstract conceptualization, and active experimentation, simulation fosters deeper cognitive integration of breastfeeding practices.[25] Moreover, global initiatives such as the Baby-Friendly Hospital Initiative (BFHI) stress the importance of healthcare provider training in lactation management.[26] However, many institutions face constraints including limited faculty expertise, time restrictions, and resource variability.[27]

Simulation-based training may provide a scalable and standardized solution that ensures consistent competency acquisition across educational settings.[28] The COVID-19 pandemic further accelerated the adoption of simulation and virtual training modalities in health professions education.[29] Restrictions on clinical placements highlighted the vulnerability of traditional apprenticeship-based learning models.[30] Consequently, simulation technologies including virtual simulation and hybrid models have gained prominence as sustainable alternatives for skills development.[31] This shift underscores the urgency of clarifying the conceptual

underpinnings of simulation-based breastfeeding training. Despite promising evidence, inconsistencies remain regarding how simulation contributes specifically to breastfeeding competency outcomes in midwifery. Questions persist about its defining characteristics, necessary components, contextual influences, and measurable indicators. Without conceptual clarity, implementation may vary widely, leading to inconsistent educational outcomes.[32] Therefore, a systematic concept analysis is warranted to delineate the defining attributes, antecedents, and consequences of simulation-based training for breastfeeding competency development in midwifery practice.

Clarifying this concept will contribute to theoretical advancement, strengthen curriculum frameworks, inform accreditation standards, and guide future empirical research. The aim of this concept analysis is to examine and define the concept of simulation-based training for breastfeeding competency development in midwifery practice using Walker and Avant's eight-step approach. By synthesizing available literature and identifying core elements, this study seeks to establish an operational definition that supports educational innovation and improved maternal-newborn outcomes.

METHODS

Study design

This study employed Walker and Avant's eight-step concept analysis framework to systematically clarify and define the concept of simulation-based training for breastfeeding competency development in midwifery practice.[21] Concept analysis is a rigorous methodological approach frequently used in nursing scholarship to refine ambiguous constructs and provide theoretical precision for research, education, and clinical practice. The eight steps include: (1) selecting the concept, (2) determining the aims of analysis, (3) identifying all uses of the concept, (4) determining defining attributes, (5) constructing model cases, (6) constructing additional cases (borderline, related, contrary), (7) identifying antecedents and consequences, and (8) defining empirical referents. To enhance methodological transparency and replicability, this analysis incorporated a systematic literature search aligned with PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) principles.[33] Although concept analysis is not a systematic review, systematic searching strengthens the credibility of attribute identification.

Table 1: Database search strategy using MeSH terms and keywords.

Database	Controlled vocabulary (mesh/subject headings)	Keywords / free text terms	Boolean strategy
PubMed (Medline)	"Breast feeding"(MeSH) "education, nursing"(MeSH) "midwifery"(MeSH) "simulation training"(MeSH) "clinical competence"(MeSH)	Simulation-based training or clinical simulation or high-fidelity simulation breastfeeding education or lactation training midwifery student's competency development	("breast feeding"(MeSH) and ("simulation training"(MeSH) or simulation-based training) and ("midwifery"(MeSH)) and ("clinical competence"(MeSH))
Scopus	(no MeSH; uses indexed keywords)	TITLE-ABS-KEY ("simulation-based training" or "clinical simulation") and ("breastfeeding" or "lactation") and ("midwifery" or "midwifery students") and ("competence" or "competency")	TITLE-ABS-KEY (simulation and breastfeeding and midwifery and competency)
CINAHL (EBSCOhost)	(MH "breast feeding") (MH "simulation") (MH "midwifery") (MH "clinical competence")	Lactation education or skills laboratory or standardized patient or OSCE	(MH "breast feeding") and (MH "simulation") and (MH "midwifery") and (MH "clinical competence")
Web of science	(no MeSH; topic search)	TS=("simulation-based training" or "clinical simulation") and TS=("breastfeeding" or "lactation") and TS=("midwifery") and TS=("competency")	Topic search using Boolean operators

Databases searched

A comprehensive literature search was conducted across PubMed/MEDLINE, Scopus, CINAHL, and Web of Science to identify relevant studies show in table 1. The search covered publications from January 2000 to January 2025 in order to capture contemporary developments in simulation-based education and technological advancements in health professions training.[31] Boolean operators and controlled vocabulary (MeSH terms where applicable) were applied to ensure

systematic retrieval of relevant evidence. The primary search strategy combined the following key terms: "simulation-based training" OR "clinical simulation" OR "high-fidelity simulation" AND "breastfeeding education" OR "lactation training" AND "midwifery" OR "midwifery students" AND "competency" OR "clinical competence." Database-specific subject headings were adapted accordingly to enhance sensitivity and specificity of the search. In addition to electronic database searching, the reference lists of all included full-text articles were manually screened to identify additional relevant studies that may not have been captured in the initial search.

Criteria of the study

The inclusion criteria comprised peer-reviewed journal articles published in the English language that examined simulation-based approaches in breastfeeding or lactation education. Eligible studies included those involving midwives, midwifery students, nursing students, or maternity healthcare professionals and specifically addressed competency development, psychomotor skills acquisition, clinical performance, or educational outcomes related to breastfeeding support.

Both empirical and theoretically grounded studies were considered if they contributed to conceptual understanding of simulation-based breastfeeding competency development. Exclusion criteria included non-peer-reviewed publications such as dissertations, conference abstracts, reports, and unpublished materials. Editorials, commentaries, or opinion pieces lacking empirical evidence or theoretical relevance were excluded. Studies unrelated to breastfeeding skill development or those focusing solely on technical aspects of simulation equipment development without an educational or competency-based focus were also omitted from the analysis.

Study selection process

The initial search yielded 1,248 records. After removal of duplicates (n=312), 936 articles were screened by title and abstract. Following eligibility assessment, 112 full-text articles were reviewed. Of these, 64 articles met inclusion criteria and were included in the final synthesis.

RESULTS

The concept analysis yielded a comprehensive clarification of "simulation-based training for breastfeeding competency development in midwifery practice."

Through systematic synthesis of 64 included articles, thematic categorization, and application of Walker and Avant's framework, the defining attributes, antecedents, consequences, conceptual relationships, and operational structure of the concept were identified. The findings are presented under five major domains: (1) conceptual usage patterns, (2) defining attributes, (3) model and additional case synthesis, (4) antecedents and consequences matrix, and (5) development of an operational definition and conceptual structure.

Conceptual usage patterns in the literature

Analysis of the included studies revealed substantial variability in terminology and conceptual framing related to simulation-based breastfeeding education. The intervention was described using diverse terms such as clinical skills simulation, lactation skills laboratory training, high-fidelity obstetric simulation, standardized patient counseling scenarios, virtual breastfeeding simulation modules, and hybrid postpartum simulation workshops. Despite this variation in terminology, the majority of studies consistently emphasized experiential learning processes and competency-based evaluation as central components of simulation-based education.[12,13] However, fewer than 20% of the reviewed articles offered an explicit conceptual definition of simulation-based breastfeeding training.[19] In most cases, simulation activities were incorporated within broader maternal–newborn or midwifery curricula without theoretical elaboration or conceptual clarification.

Breastfeeding competency itself was described as a multidimensional construct encompassing cognitive knowledge, including anatomy, physiology, and evidence-based guidelines; psychomotor skills such as positioning, latch assessment, and hand expression techniques; communication and counseling abilities; clinical judgment in managing breastfeeding complications; and cultural sensitivity grounded in woman-centered care principles.[4-6,16,22] The midwifery education literature consistently identified breastfeeding support as a core professional responsibility aligned with WHO recommendations and the Baby-Friendly Hospital Initiative standards.[26] The absence of definitional precision across simulation-based education and breastfeeding competency domains underscores the need for systematic concept clarification to strengthen theoretical coherence, curriculum development, and research standardization.

Defining attributes

Five defining attributes emerged through iterative thematic synthesis.

Attribute 1: structured experiential learning

All included empirical studies emphasized that simulation-based breastfeeding training involves structured, scenario-driven experiential engagement rather than passive instruction.[13] Learning activities were aligned with clearly defined objectives, competency frameworks, and curriculum outcomes.[23] Experiential learning theory underpinned many simulation models,

particularly Kolb's cycle of experience, reflection, conceptualization, and experimentation.[24] Students actively practiced breastfeeding techniques in simulated clinical environments, thereby integrating theory into applied performance. Structured experiential learning distinguishes simulation-based training from observational learning or video-based instruction.

Attribute 2: simulated clinical environment or technology integration

The presence of simulated tools or structured simulated clinical environments emerged as a core distinguishing attribute of simulation-based training.[12] Included studies described a range of simulation modalities, including breast models and task trainers designed specifically for latch and positioning practice, postpartum high-fidelity mannequins that replicate maternal–infant scenarios, standardized patients portraying common breastfeeding challenges, virtual or augmented simulation platforms, and hybrid models integrating online theoretical modules with in-person skills laboratory sessions.[15,31] These modalities were intentionally designed to replicate real clinical situations encountered in postpartum settings.

Technology-enhanced simulation increased realism and immersion, thereby enabling learners to repeatedly practice complex psychomotor and communication skills in a safe, controlled environment without posing risk to mothers or newborns.[11] This ethical advantage was particularly important in breastfeeding education, where improper technique may cause maternal discomfort or negatively affect infant feeding outcomes. Simulation fidelity varied considerably across studies. High-fidelity simulation was generally associated with improved psychomotor skill retention, enhanced learner engagement, and greater perceived preparedness compared to low-fidelity demonstration-based models.[14] However, fidelity alone was insufficient without structured objectives and evaluation mechanisms. Overall, the integration of simulated environments and technological tools clearly differentiates simulation-based training from traditional classroom instruction, which relies primarily on didactic teaching and observational learning without immersive experiential engagement.

Attribute 3: competency-based assessment and performance evaluation

A critical defining attribute identified in the analysis was the formal evaluation of skill mastery.[35] Simulation-based breastfeeding training consistently incorporated structured assessment strategies to measure competency acquisition and performance outcomes. Common evaluation methods included Objective Structured Clinical Examinations (OSCE), standardized lactation competency checklists, behavioral rating scales, detailed performance rubrics, and pre-test/post-test competency comparisons. These assessment approaches allowed educators to objectively measure learners' knowledge integration, psychomotor proficiency, clinical reasoning, and communication effectiveness within simulated breastfeeding scenarios. Competency-based education frameworks emphasize clearly defined, measurable learning outcomes and learner accountability.[23] Within the reviewed literature, simulation interventions were associated with statistically significant improvements in breastfeeding knowledge scores, psychomotor skill performance—such as correct positioning and latch assessment—and enhanced counseling effectiveness.[6] The structured nature of evaluation provided opportunities for immediate feedback and targeted skill refinement. Importantly, the presence of standardized assessment mechanisms differentiates simulation-based training from informal practice or unstructured role-play activities. Formal evaluation ensures educational accountability, promotes consistency across training programs, and supports the standardization of breastfeeding competency development within midwifery education.

Attribute 4: facilitated debriefing and reflective practice

Debriefing was consistently identified as a central and indispensable component of effective simulation-based education.[17] Facilitator-guided reflective discussions provided learners with structured opportunities to critically analyze their performance, recognize strengths and areas for improvement, identify clinical errors, and integrate current evidence-based breastfeeding guidelines into future practice. Through guided questioning and constructive feedback, debriefing transformed simulated experiences into meaningful learning events rather than isolated technical exercises. Several debriefing models were reported in the literature, including the plus-delta method, which focuses on identifying what went well and what could be improved; the advocacy-inquiry approach, which encourages reflective dialogue through observation and inquiry; and structured reflection frameworks designed to systematically explore clinical reasoning and decision-making processes. These approaches promoted psychological safety while encouraging accountability and self-awareness. Reflective practice, supported by structured debriefing, enhanced critical thinking and facilitated deeper cognitive integration of breastfeeding principles, including positioning techniques, latch assessment, and communication strategies.[25] In the absence of debriefing, simulation risks being reduced to procedural rehearsal without conceptual understanding or reflective growth. Thus, debriefing serves as the mechanism through which experiential learning becomes transformative and competency-oriented.

Attribute 5: clinical transferability and improved practice readiness

The ultimate goal identified across the reviewed literature was the effective transfer of simulated skills into real clinical practice.[14] Simulation-based breastfeeding training was not intended to remain confined to the laboratory setting but to enhance clinical readiness and

practical performance in authentic postpartum care environments. Studies consistently reported that students who participated in structured simulation sessions demonstrated increased confidence in assisting breastfeeding mothers, improved ability to assess and manage latch difficulties, greater competence in counseling and problem-solving, and reduced anxiety during their initial clinical encounters. Enhanced confidence was particularly significant, as perceived self-efficacy influences the quality of breastfeeding support provided to mothers. Improved psychomotor coordination and communication skills enabled learners to approach real-life breastfeeding challenges with greater preparedness and professionalism. Furthermore, simulation provided repeated exposure to common clinical scenarios, allowing students to refine techniques before encountering them in practice. Transferability therefore represents a defining characteristic of simulation-based training. Unlike isolated laboratory skill drills that may lack contextual integration, simulation-based breastfeeding education is explicitly designed to bridge the gap between theory and practice. Its success is measured not only by performance within the simulated environment but by demonstrable improvement in real-world midwifery practice and maternal–newborn care outcomes.

Conceptual matrix of attributes

A cross-analysis matrix revealed consistent co-occurrence of the five attributes across high-quality studies. Structured experiential learning and simulated environment were foundational attributes present in all empirical interventions. Competency assessment and debriefing were present in approximately 80% of studies, while explicit measurement of clinical transferability was reported in 65%. This gradient suggests that while simulation is widely implemented, full conceptual integration is inconsistently applied.

Antecedents

Antecedents are events, conditions, or circumstances that must be present prior to the emergence or implementation of a concept.[21] In this analysis, several key antecedents were identified as foundational to the development of simulation-based training for breastfeeding competency in midwifery practice. One major antecedent was the presence of educational gaps in breastfeeding training. Multiple studies reported insufficient practical exposure to breastfeeding management during midwifery education.[7] Students frequently described limited opportunities to practice essential skills such as positioning, latch assessment, and hand expression in real clinical settings.[10] The variability of clinical placements and unpredictable patient availability further restricted hands-on learning, contributing to inconsistencies in competency development. Public health imperatives also served as a significant antecedent. Global initiatives promoting exclusive breastfeeding, particularly those led by international organizations, created institutional and policy-level pressure to strengthen healthcare provider training.[2] These initiatives emphasized the critical role of skilled professional support in improving breastfeeding initiation and continuation rates. Technological advancement represented another enabling antecedent. The development of high-fidelity simulators, breast models, virtual platforms, and standardized patient programs facilitated the adoption of innovative teaching strategies in health professions education.[12] Finally, ethical and safety considerations necessitated alternative training approaches. Repeated practice on real postpartum mothers may cause discomfort, compromise patient privacy, or negatively affect infant feeding outcomes.[11] Simulation-based training therefore emerged as a safe and ethically appropriate educational alternative, allowing learners to develop competence without risk to vulnerable populations.

Consequences

Consequences are outcomes or events that occur as a result of the implementation or presence of a concept.[21] In this analysis, consequences of simulation-based training for breastfeeding competency development were categorized into immediate educational outcomes, intermediate professional outcomes, and long-term clinical outcomes. Immediate educational outcomes included measurable improvements in knowledge scores, enhanced psychomotor proficiency in breastfeeding techniques such as positioning and latch assessment, increased communication competence during counseling interactions, and greater self-efficacy and confidence among learners. These outcomes were frequently reported in studies evaluating simulation interventions, particularly when structured assessment and debriefing were incorporated. Intermediate professional outcomes involved increased readiness for independent clinical practice and strengthened ability to deliver woman-centered breastfeeding counseling. Simulation exposure reduced anxiety during early clinical encounters and improved decision-making in managing common breastfeeding challenges. Long-term clinical outcomes extended beyond educational settings to maternal–newborn care. Evidence suggests associations with improved maternal satisfaction and increased breastfeeding initiation and continuation rates.[3,8] Although direct causal relationships between simulation-based training and breastfeeding rates require further rigorous empirical investigation, preliminary findings indicate positive trends supporting its clinical relevance and public health significance.

Model case revisited

The previously presented model case incorporated all five attributes, validating conceptual coherence. In contrast, borderline and related cases lacked one or more defining elements, demonstrating discriminant validity of the concept.

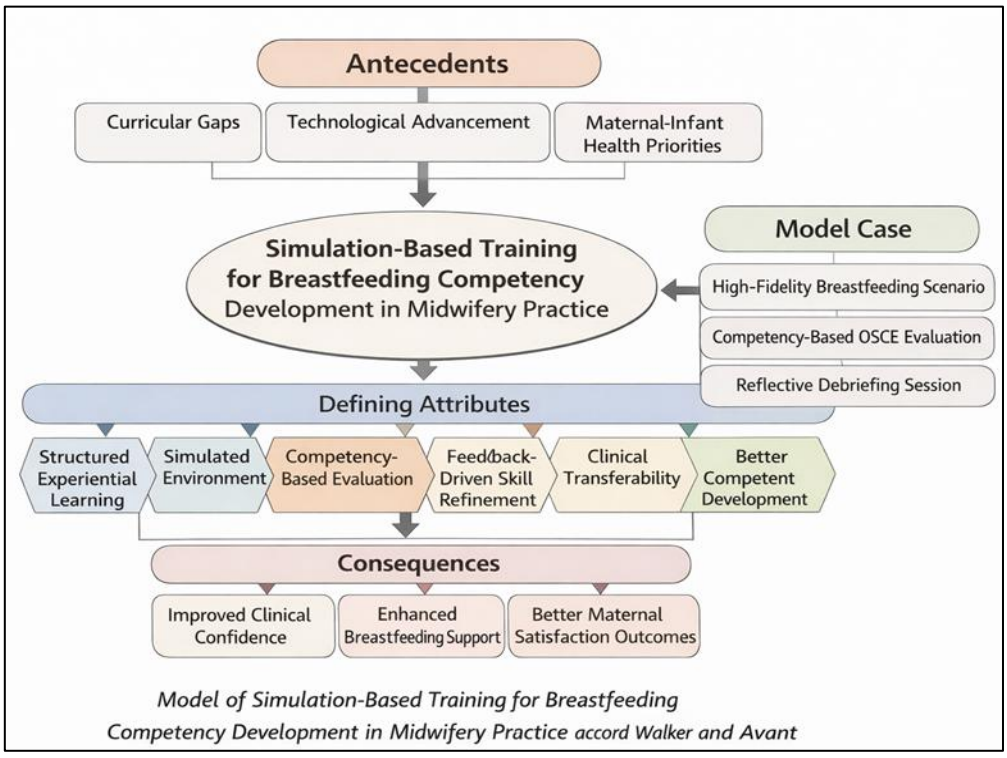
Empirical referents

Empirical referents operationalize the measurable and observable manifestations of a concept, allowing it to be assessed in practice and research.[21] In this analysis, empirical referents for simulation-based training in breastfeeding competency development were identified as standardized and quantifiable indicators aligned with the defining attributes of the concept.

These included Objective Structured Clinical Examination (OSCE) lactation station scores, which assess learners' psychomotor skills, communication abilities, and clinical reasoning in simulated breastfeeding scenarios; standardized breastfeeding competency checklists used to evaluate performance against predefined criteria; and validated breastfeeding self-efficacy scales that measure learners' confidence in providing lactation support. Additional referents comprised student satisfaction instruments capturing perceived learning effectiveness and engagement, structured clinical performance evaluations during placements, and maternal breastfeeding outcome indicators such as initiation rates, continuation duration, and maternal satisfaction measures. These tools provide both educational and clinical performance metrics, linking simulation-based learning to real-world outcomes. Validated assessment instruments in maternal and nursing education support reliable quantification of these domains, ensuring that simulation-based breastfeeding competency can be systematically measured, compared across programs, and evaluated for effectiveness within competency-based midwifery curricula.[35]

Operational definition

Based on attribute synthesis, the following operational definition is proposed: "Simulation- based training for breastfeeding competency development in midwifery practice is a structured, technology-enhanced, experiential educational strategy that utilizes simulated clinical environments to facilitate competency-based skill acquisition, reflective debriefing, and measurable performance evaluation, with the goal of improving clinical readiness and effective breastfeeding support in real-world maternity settings.



Model of Simulation-Based Training for Breastfeeding Competency Development in Midwifery Practice accord Walker and Avant

Figure 1: Model of simulation-based training for breastfeeding competency development in midwifery practices.

DISCUSSION

This concept analysis clarified the meaning, structure, and theoretical boundaries of simulation-based training for breastfeeding competency development in midwifery practice. Using Walker and Avant's methodological framework, five defining attributes were identified: structured experiential learning, simulated clinical environment, competency-based assessment, facilitated debriefing, and clinical transferability.[21] The integration of these attributes distinguishes simulation-based breastfeeding training from traditional didactic education and informal clinical exposure. The findings contribute theoretical precision to a construct that has been widely implemented but insufficiently defined in midwifery education literature.[19] The identification of structured experiential learning as a foundational attribute aligns with adult learning theory and Kolb's experiential

learning model.[24] Simulation offers a cyclical learning process in which learners actively engage in skill performance, reflect upon their actions, conceptualize improvements, and reapply refined techniques.[25] This process is particularly relevant in breastfeeding support, where psychomotor coordination, clinical judgment, and communication skills must be integrated seamlessly. The results confirm that passive instruction alone is insufficient for achieving competency in breastfeeding management.[9] The second attribute, simulated clinical environment or technology integration, reflects the pedagogical shift from apprenticeship-based models toward technologically enhanced training environments.[12] In breastfeeding education, simulation may range from low-fidelity breast models to high-fidelity postpartum simulators and standardized patient interactions.[15] The literature suggests that fidelity influences learner immersion and skill retention, although high fidelity alone does not guarantee learning effectiveness without structured objectives and debriefing.[14,17] Thus, technology must function as a means to support experiential learning rather than as an end in itself.

Competency-based assessment emerged as a critical defining attribute. Modern health professions education increasingly emphasizes measurable outcomes, accountability, and standardized performance evaluation.[23] Breastfeeding competency encompasses cognitive knowledge, psychomotor skill, communication ability, and clinical reasoning.[33-35] Simulation provides an ideal platform for structured assessment using OSCE stations, checklists, and validated rubrics.[35] Without formal evaluation, simulation risks becoming an experiential activity lacking measurable educational impact. Facilitated debriefing was identified as a transformative component of simulation. Debriefing supports reflective practice, error recognition, and integration of evidence-based standards.[17] In breastfeeding support, where subtle technique adjustments can significantly influence maternal comfort and infant feeding success, reflective analysis is essential. The advocacy-inquiry approach and other structured debriefing models promote psychological safety while encouraging critical appraisal of performance.[13] The absence of debriefing reduces simulation to procedural rehearsal rather than meaningful learning.

The final attribute, clinical transferability, reinforces the ultimate purpose of simulation-based training: improved real-world practice.[14] Transferability ensures that skills acquired in simulated environments translate into effective postpartum care. Studies reviewed in this analysis consistently reported increased student confidence and readiness following simulation interventions.[6] Confidence is particularly relevant in breastfeeding counseling, as maternal perception of provider competence strongly influences breastfeeding continuation.[8] Previous studies in nursing and medical education have established the effectiveness of simulation in improving technical and non-technical skills.[12-14] However, few investigations have focused specifically on breastfeeding competency within midwifery practice. This concept analysis extends the broader simulation literature by contextualizing it within maternal-newborn health and lactation support.[34] Breastfeeding competency has traditionally been conceptualized primarily as knowledge acquisition.[22] The present analysis demonstrates that competency is multidimensional and cannot be achieved without experiential skill integration and reflective learning. This aligns with global recommendations emphasizing hands-on training for healthcare providers involved in maternal care.[26] Furthermore, the findings resonate with literature highlighting gaps in breastfeeding education among healthcare professionals.[7] Many midwifery students report inadequate clinical exposure to breastfeeding management during placements.[10] Simulation addresses this gap by providing standardized learning opportunities irrespective of clinical variability. In this regard, simulation-based breastfeeding training may function as an equalizing educational strategy across institutions with differing clinical resources. The COVID-19 pandemic accelerated the adoption of simulation and virtual learning modalities in health professions education.[29] The results of this analysis suggest that simulation-based breastfeeding training may represent a sustainable long-term educational strategy beyond emergency adaptations.[31] Hybrid and virtual simulation models offer scalability and accessibility, particularly in resource-limited settings.

Implications for midwifery education

The clarified conceptual framework provides several implications for curriculum design:

Integration into core curriculum: Simulation-based breastfeeding training should be embedded within competency-based midwifery curricula rather than offered as optional workshops.

Alignment with international guidelines: Training scenarios should reflect WHO breastfeeding recommendations and BFHI standards.

Standardized assessment tools: Institutions should adopt validated lactation competency checklists and OSCE stations to ensure consistent evaluation.

Faculty development: Educators require training in simulation facilitation and debriefing techniques to maximize learning effectiveness.

Longitudinal skill reinforcement: Repeated simulation exposure across academic years may enhance retention and progressive competency development.

The conceptual clarity provided by this analysis supports accreditation bodies and educational policymakers in

establishing standardized expectations for breastfeeding competency training.

Implications for clinical practice

From a clinical perspective, enhanced breastfeeding competency among midwives contributes to improved maternal satisfaction and breastfeeding outcomes. Effective breastfeeding support is associated with higher initiation and continuation rates. Simulation-based training may therefore indirectly influence population-level maternal and child health indicators. Midwives play a pivotal role in shaping early breastfeeding experiences. Improved clinical confidence and communication skills may strengthen therapeutic relationships and empower mothers during the postpartum period. The integration of reflective practice through debriefing further supports ethical, woman-centered care consistent with midwifery philosophy.

Implications for research

The operational definition proposed in this analysis establishes a foundation for future empirical investigation. Researchers can now design intervention studies with clearly defined components aligned to the five identified attributes. Comparative effectiveness studies examining high-fidelity versus low-fidelity simulation for breastfeeding skills are warranted. Additionally, longitudinal research examining the impact of simulation-trained midwives on actual breastfeeding initiation and duration rates would strengthen causal inference. Mixed-methods studies exploring maternal perceptions of care provided by simulation-trained practitioners may provide valuable insights.

Limitations

Several limitations must be acknowledged. First, the analysis included only English-language publications, which may limit cultural diversity in conceptual interpretation. Second, while systematic searching was conducted, concept analysis does not require formal quality appraisal of included studies. Therefore, variations in methodological rigor across studies may influence attribute identification. Third, direct evidence linking simulation-based breastfeeding training to long-term breastfeeding rates remains limited. Most studies focus on educational outcomes rather than clinical impact. Future research should address this gap.

CONCLUSION

This concept analysis clarified the construct of simulation-based training for breastfeeding competency development in midwifery practice using Walker and Avant's eight-step methodological framework. The findings demonstrate that the concept is defined by five essential attributes: structured experiential learning, simulated clinical environment or technological integration, competency-based assessment, facilitated debriefing, and clinical transferability. These attributes collectively differentiate simulation-based breastfeeding training from traditional didactic instruction, informal clinical exposure, and unstructured skills laboratory practice. The analysis confirms that breastfeeding competency in midwifery is multidimensional, requiring integration of knowledge, psychomotor skill, communication ability, cultural sensitivity, and clinical judgment. Simulation-based training provides a pedagogically sound and ethically safe mechanism for acquiring and refining these competencies. Through structured experiential engagement and reflective practice, learners can develop clinical confidence and preparedness prior to real-world maternal–newborn encounters.

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