Bedside Teaching Consistently Improves Clinical Competence and Critical Thinking in Nursing Education

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ABSTRACT
Professionalism and nursing competence are fundamental pillars in ensuring high-quality and safe patient care. However, a persistent gap between academic theory and clinical practice continues to hinder the optimal development of clinical competence, critical thinking, and nurses' decision-making abilities. Although bedside teaching has been widely recognized as an effective instructional method globally, its implementation varies considerably, influenced by workload demands and the competency of clinical facilitators. This study aims to identify and critically analyze the impact of bedside teaching on improving nurses' clinical competence based on empirical evidence from national and international studies. A systematic review approach was employed, guided by the PRISMA framework. Literature searches were conducted across multiple electronic databases, including Google Scholar, ScienceDirect, SpringerLink, MDPI, EBSCOHost, ClinicalKey, ClinicalKey Nursing, Sage Journals, ProQuest, and PubMed, focusing on articles published between 2020 and 2025. A total of 15 articles that met the inclusion criteria were selected and comprehensively analyzed. The review process followed rigorous and systematic steps, including critical appraisal. Analysis of the 15 studies revealed that bedside teaching consistently enhances clinical competence and critical thinking skills by up to 35%. Approximately 80% of the studies reported that bedside teaching is more effective than conventional learning methods. Its effectiveness is attributed to direct reflection, real-time feedback, and collaborative learning approaches. However, challenges such as high workload and limited time continue to affect its implementation. In conclusion, bedside teaching is an effective, contextual, and relevant clinical learning strategy for strengthening the professional competence of nurses and nursing students across various healthcare settings. To optimize its implementation, institutional commitment is required through structured training for clinical instructors and systematic integration of bedside teaching into nursing education curricula.
Keywords: bedside teaching; clinical nurse competence; clinical learning

INTRODUCTION
Professionalism and nursing competence are fundamental pillars in ensuring high-quality and safe patient care. These competencies encompass not only technical proficiency in recognizing patient deterioration but also critical thinking, problem-solving abilities, and effective teamwork [1,2]. Globally, significant improvements in clinical skills have been reported, with the United States showing the highest increase (20–35%), followed by China (18–32%) and the United Kingdom (15–28%). Western European countries, including Germany, demonstrate relatively stable progress within the range of 12–25%, while the Asia-Pacific region records improvements of 10–22%. These achievements underscore the importance of structured skill-enhancement strategies to bridge the gap between academic theory and the complexities of real clinical environments for both students and practicing nurses.

To address this gap, direct clinical learning methods such as bedside teaching (BST) have been internationally recognized as effective instructional approaches. BST places learners and practitioners directly at the patient's bedside to engage in authentic demonstrations, observations, and case discussions [3]. In China, the integration of an "online-simulation-bedside" model has been shown to improve nurses' confidence in resuscitation skills, while in Indonesia, experiential learning methods are considered highly effective in achieving clinical competencies aligned with updated service standards [4,5]. This approach facilitates contextual learning, enabling theoretical knowledge to be internalized within real clinical situations.

The implementation of bedside teaching is tailored to the needs of its target participants to achieve optimal outcomes. For students, BST focuses on mastering foundational competencies and integrating theory through instructor guidance as role models. For practicing nurses, BST emphasizes continuous professional development, complex clinical problem-solving, and the application of evidence-based practice, including techniques such as bedside handover [6]. This approach not only strengthens technical skills but also fosters empathy and sharpens clinical decision-making, both of which are essential in daily nursing care.

The effectiveness of BST relies heavily on the structured application of three core stages: pre-round (preparation), round (implementation), and post-round (reflection). Although both students and professional nurses follow the same structure, the emphasis differs—students focus on readiness in basic clinical skills, whereas professional nurses prioritize improving care quality and patient safety [7]. Without a systematic cycle, ineffective BST implementation may trigger anxiety among students and lead to stagnation of competence among practicing nurses due to insufficient constructive feedback for identifying clinical improvement areas [8].

Despite its broad positive impact, the effectiveness of bedside teaching in practice continues to vary, influenced by workload demands and facilitator competence. While the focus differs between students and practicing nurses, both groups consistently follow the three-stage structure of pre-round, round, and post-round as a space for critical reflection on clinical decisions [7,9].

Persistent gaps between academic theory and clinical practice continue to hinder the optimal development of clinical competence, critical thinking, and decision-making among nurses. Although bedside teaching has been proven effective globally, variations in its implementation highlight the need for a systematic review to comprehensively identify its effectiveness in enhancing nurses' clinical competence based on available scientific evidence.

METHODS
This study employed a systematic review approach guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 framework [10]. This approach was selected to integrate diverse empirical evidence examining the influence of bedside teaching on improving nurses' competence. The design of this systematic review emphasized the analysis of empirical findings from international and national studies evaluating the effectiveness of bedside teaching in enhancing nursing competence. The analytical process was conducted

narratively and descriptively, focusing on patterns of findings, variations across studies, and factors influencing the effectiveness of the intervention.

Article searches were conducted using several electronic databases, including Google Scholar, ScienceDirect, SpringerLink, MDPI, EBSCOHost, ClinicalKey, ClinicalKey Nursing, Sage Journals, ProQuest, and PubMed. The search was carried out between November and December 2025. The keywords used in the search were: “bedside teaching” OR “clinical teaching” OR “case-based teaching” AND “nursing education” OR “nursing competence” AND “clinical skills” OR “critical thinking” AND “training” OR “learning outcomes”. Study selection followed the PRISMA 2020 guidelines [10].

A total of 622 titles and abstracts were identified through searches across multiple databases, including Google Scholar, ScienceDirect, SpringerLink, EBSCOHost, ClinicalKey Nursing, ProQuest, and PubMed. After removing 311 duplicate articles and applying automated screening based on inclusion criteria, 117 articles proceeded to manual screening. Of these, 85 articles were excluded for not meeting the research criteria. Subsequently, 32 articles were assessed in full-text form, and 7 were excluded due to ineligibility. Thus, 25 articles were further evaluated for methodological quality. In the final stage, 15 articles met all eligibility criteria and were comprehensively reviewed and included in the analysis Figure 1). The literature search followed a rigorous and systematic process, including critical appraisal using the Joanna Briggs Institute (JBI) Critical Appraisal Tools to ensure methodological robustness and reliability of the included studies.

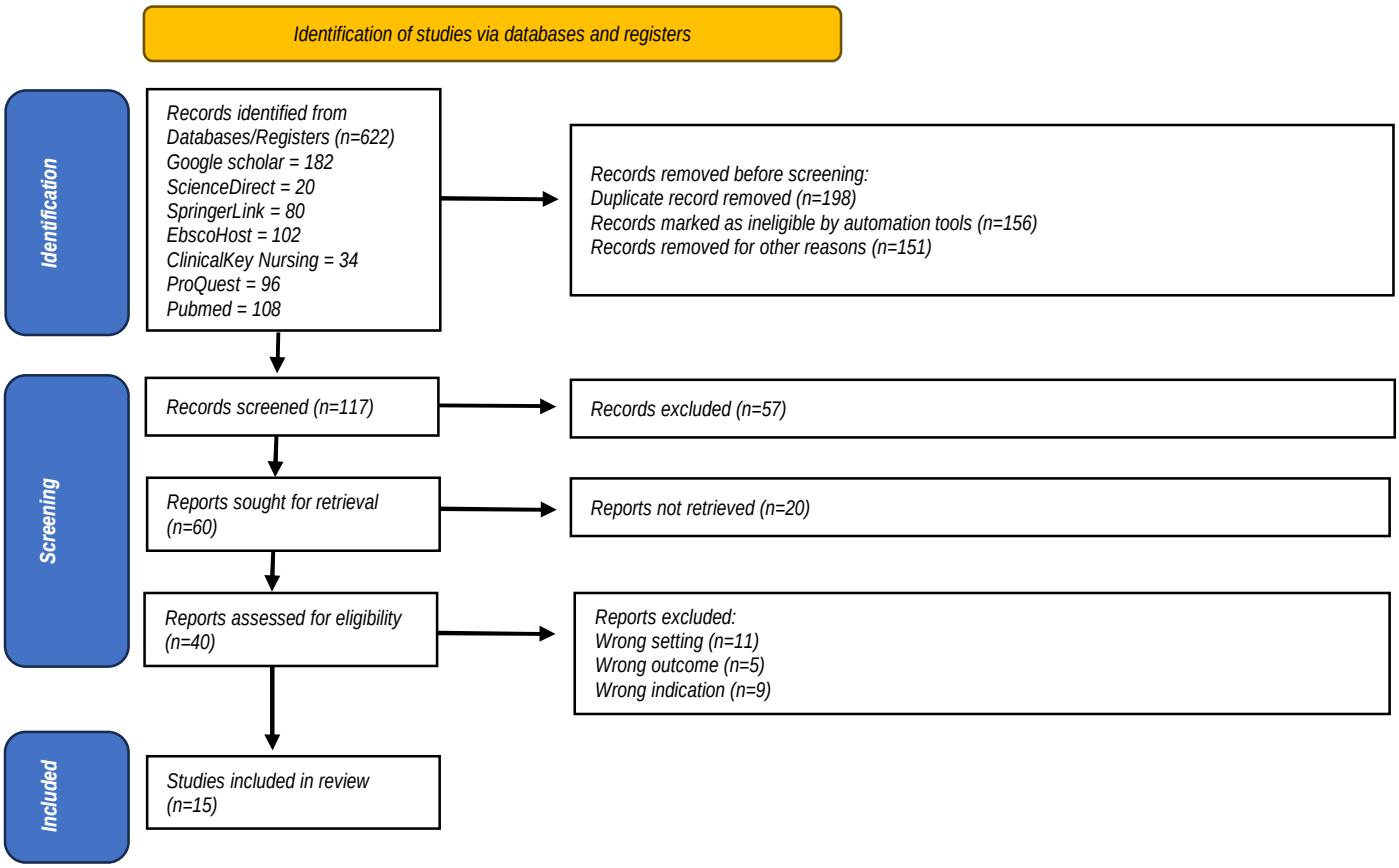

Figure 1. PRISMA flow diagram in articles selection

RESULTS

A total of 15 articles that met the inclusion criteria were analyzed in this review. All studies were published between 2020 and 2025, with most originating from Asian countries (China, Iran, Indonesia) and several from Europe. The majority employed quasi-experimental designs and randomized controlled trials (RCTs) to evaluate the impact of bedside teaching on improving clinical competence among nursing students and novice nurses. Most studies involved 40–120 participants, with intervention durations ranging from 2 weeks to 3 months. Although the bedside teaching methods varied, they commonly incorporated clinical demonstrations, case discussions, post-action reflection, and direct feedback from clinical instructors.

Studies demonstrate that bedside teaching consistently enhances clinical competence and critical-thinking abilities among students by up to 35%, with 80% of the included research reporting superior outcomes compared to conventional teaching methods [16,17]. The effectiveness of this strategy is strongly supported by direct reflection, real-time feedback, and collaborative approaches that strengthen communication and clinical decision-making. Nevertheless, its successful implementation remains influenced by institutional commitment and the pedagogical competence of facilitators, particularly in addressing major barriers such as high clinical workload and limited time availability in practice settings [2,11].

Table 1. The results of synthesis

No.	Title, authors & year	Objective	Study design	Key findings	Conclusion
1	The Effect of “Online-Simulation-Bedside” Three-Step Teaching Method in Team Cardiopulmonary	To assess the effectiveness of the online-simulation-bedside teaching method on CPR skills among intern nurses	Quasi-experimental pretest–posttest	The three-step method, one week of online learning, 55-minute high-fidelity simulation with case discussion and	The online-simulation-bedside method effectively enhances CPR competence and

No.	Title, authors & year	Objective	Study design	Key findings	Conclusion
	Resuscitation Skills Training [4]			video debriefing, and 30 days of supervised clinical practice resulted in significant improvements in teamwork, clinical thinking, confidence, and CPR scores up to day 30 ($p < 0.001$)	clinical readiness among intern nurses
2	Effects of a Standardized Patient-Based Simulation in Anaphylactic Shock Management for New Graduate Nurses [11]	To evaluate the impact of standardized-patient simulation on anaphylactic shock management competence	Quasi-experimental pretest–posttest	Significant improvement in six clinical competencies and high satisfaction (>90%)	Standardized-patient simulation effectively improves readiness and competence among new graduate nurses
3	Utility of Simulation as a Teaching Tool for Nursing Staff Involved in Code Blue Management [1]	To examine the effect of multimodal Code Blue simulation on nursing students' knowledge and attitudes	Simulation-based multimodal training program	Significant increases in knowledge and self-efficacy; 95.4% rated the simulation as highly beneficial	Multimodal simulation enhances knowledge, confidence, and clinical performance
4	The Effects of Case-Based Teaching in Nursing Skill Education: Cases Do Matter [7]	To evaluate the effectiveness of Case-Based Teaching (CBT) on nursing skills	Quasi-experimental with control group	Higher OSCE scores and improved self-directed learning in the CBT group ($p < 0.05$)	CBT is more effective than lecture-based methods in nursing skill education
5	The Effect of the Case-Based Learning Approach on Satisfaction and Learning of Nursing Students in Iran [12]	To assess the impact of Case-Based Learning (CBL) on learning and satisfaction	Randomized Controlled Trial	No significant difference in learning outcomes, but significantly higher satisfaction in the CBL group ($p = 0.008$)	CBL increases learning satisfaction despite limited impact on academic outcomes
6	The Use of Bedside Case-Based Learning in Midwifery Education [13]	To examine the effect of BCBL on critical thinking and self-directed learning	Quasi-experimental pretest–posttest (one group)	No statistically significant differences, but students reported subjective improvement	BCBL enhances learning experience despite limited quantitative impact
7	Project-Based Learning in Remote Teaching for Undergraduate Nursing Students [2]	To describe the implementation of PjBL in remote nursing education	Pre-experimental / experience report	>90% of students reported increased autonomy, reflection, and teamwork	PjBL is effective as an active learning approach in online settings
8	Application of 3D Printing Technology Combined with PBL in Clinical Nursing [14]	To evaluate the combination of 3D printing and PBL on clinical nursing learning outcomes	Case-control study	Higher knowledge, critical thinking, and satisfaction scores in the 3D-PBL group ($p < 0.05$)	Integrating 3D printing with PBL improves understanding and clinical competence
9	Toward an Integrative Nursing Curriculum Combining TBL, PBL, and Simulation [6]	To assess the impact of an integrative curriculum on core nursing competencies	Single-case experimental design	Higher core competency scores and improved teaching evaluations compared to traditional curricula	Integrative curriculum effectively enhances competence and learning quality
10	The Effectiveness of Serious Games for Infection Prevention During COVID-19 [15]	To evaluate the effectiveness of serious games on infection-prevention knowledge and behavior	Digital serious-game intervention delivered via distance education	Significant improvement in knowledge and safe behaviors	Serious games are effective digital tools for nursing education
11	Assessing the Effect of Virtual Education on Information Literacy Competency for Evidence-Based Practice [8]	To examine the impact of virtual education on information-literacy competence for EBP	Randomized Controlled Trial	Significant improvement in information-searching skills and knowledge of search operators	Virtual education effectively enhances specific information-literacy skills for EBP
12	Does Problem-Based Learning Education Improve Knowledge, Attitude, and Perception Toward Patient Safety? [5]	To evaluate the effect of PBL on patient-safety knowledge, attitudes, and perceptions	Randomized Controlled Trial	Significant improvements in knowledge, attitudes, and perceptions ($p < 0.001$)	PBL effectively improves learning outcomes related to patient safety
13	A Descriptive Evaluation of Evidence-Based Rounds in Critical Care [16]	To evaluate the implementation of Evidence-Based Rounds (EBR) in the ICU	Descriptive evaluative mixed-methods study	98% of participants found EBR beneficial; improved communication and confidence	EBR is feasible and effective as a practice-based clinical learning model

No.	Title, authors & year	Objective	Study design	Key findings	Conclusion
14	Clinical Learning Methods in Professional Practice of Nursing Students [17]	To describe clinical learning methods and challenges experienced by professional nursing students	Descriptive analytic cross-sectional	Experiential learning and preceptorship were most commonly used; time and instructor constraints were major barriers	Selection of clinical learning methods is closely related to implementation barriers
15	Effectiveness of the Problem-Based Learning Model on Nursing Students' Cognitive Ability in Oxygenation Needs [18]	To assess the effectiveness of PBL on cognitive ability	Pre-experimental pretest–posttest	Significant increase in cognitive scores (61.06 to 86.71)	PBL effectively improves cognitive performance in oxygenation-related nursing content

DISCUSSION

The implementation of bedside teaching (BST) consistently produces significant positive effects on improving clinical competence, critical-thinking ability, and self-confidence among novice nurses, with competency scores increasing by approximately 20–35% compared with traditional methods [16,17]. This effectiveness stems from the integration of psychomotor skills, therapeutic communication, and higher-order cognitive abilities such as clinical reasoning and contextual decision-making under direct supervision [6]. Through active interaction at the patient's bedside, nurses are able to connect academic knowledge with the complexities of real clinical environments, thereby effectively narrowing the gap between theory and practice [19,20].

The success of this method is supported by a systematic implementation structure consisting of pre-interaction, interaction, and post-interaction phases to ensure meaningful learning oriented toward real problem-solving [7]. The process begins with goal setting and environmental preparation during the pre-interaction phase, followed by the interaction phase in which students perform clinical actions under instructor observation, and concludes with the post-interaction phase as a moment for evaluation and constructive feedback. Through this structured and contextual approach, bedside teaching functions not only as a medium for technical skill transfer but also as a platform for developing professional attitudes and clinical reflection.

Comparison with other learning methods

Compared with traditional learning approaches, bedside teaching demonstrates clear advantages in enhancing critical-thinking ability, clinical decision-making, and intervention accuracy—factors that directly contribute to improved patient safety and clinical management effectiveness [5,11]. However, its successful implementation is highly dependent on contextual factors such as the pedagogical competence of facilitators and the conditions of the clinical environment, where challenges such as high workload and limited supervision time frequently arise [2]. Therefore, the effectiveness of bedside teaching requires strong institutional support through adequate time allocation policies, appropriate instructor–student ratios, and systematic integration into clinical education curricula to ensure high-quality educational interactions.

Key components determining the success of bedside teaching

The success of bedside teaching is largely determined by the synergy between structured reflection and direct feedback, which enables nurses to evaluate their performance and deepen conceptual understanding continuously [16,21]. Active involvement in clinical practice under direct supervision is also crucial, as it fosters confidence, professional responsibility, and independent decision-making skills [22,23]. By positioning learners as active participants, the learning process becomes more meaningful and supports the formation of a strong professional identity in real clinical settings.

The role of clinical facilitators with strong pedagogical and clinical competence is equally essential in creating a safe and supportive learning environment that promotes students' critical-thinking development [20]. Participation in bedside rounds not only sharpens technical skills but also strengthens empathy and interprofessional communication within collaborative healthcare settings [15,24]. Thus, the combination of effective facilitator guidance and direct patient interaction is key to developing modern nurses who excel technically and possess strong teamwork capabilities.

Challenges in implementing bedside teaching

The implementation of bedside teaching faces multidimensional challenges. Students often experience anxiety, discomfort, and lack of confidence when required to demonstrate clinical skills directly in front of patients [11]. Meanwhile, clinical instructors face barriers such as heavy service workloads and limited time, which may shift educational priorities, compounded by insufficient pedagogical training to provide optimal guidance [2,25]. These conditions create challenges in bridging the theory–practice gap and demand facilitators who can balance clinical demands with a supportive learning environment for professional development [20,26].

Effective implementation of bedside teaching requires synergistic roles between students and clinical instructors. Students must actively prepare theoretical knowledge and engage in self-reflection during debriefing, while nurses act as facilitators applying modeling, coaching, and scaffolding techniques efficiently within a 30–60-minute session. Through this structure, students develop clinical reasoning and confidence through direct observation and guided practice, while instructors maintain educational quality without disrupting clinical workload through strict time management and constructive feedback [16,20,25]. Strengthening these roles is essential to overcoming operational challenges in clinical settings while ensuring patient privacy and safety remain protected [2,11].

Limitations of the review

This review has several limitations. First, the number of analyzed articles is relatively limited, which may affect the generalizability of findings across broader clinical contexts. Second, variations in study designs, respondent characteristics, and healthcare settings may introduce heterogeneity that influences the consistency of results. Third, most studies focused on short-term measurements of clinical competence, leaving long-term impacts of bedside teaching insufficiently explored. Fourth, limited reporting on implementation details—such as intervention duration and facilitator competency standards—may affect the interpretation of overall effectiveness. Additionally, contextual factors such as nurse

workload, limited supervision time, and variability in pedagogical competence were not consistently controlled, potentially introducing bias. Finally, publication bias cannot be ruled out, as studies with positive results are more likely to be published than those with non-significant findings.

CONCLUSION

This systematic review demonstrates that bedside teaching significantly improves clinical competence, critical-thinking ability, and self-confidence among nurses and students compared with traditional methods. Its effectiveness is supported by direct patient-based learning combined with structured reflection, real-time feedback, and clinical case discussions, which strengthen theory–practice integration and promote evidence-based decision-making. Globally, skill improvements through bedside teaching have been reported across regions including the United States, China, the United Kingdom, Western Europe, and the Asia-Pacific. Through pre-round, round, and post-round phases, this method effectively bridges the academic–clinical gap while enhancing care quality and patient safety. Therefore, this systematic review underscores the importance of optimizing bedside teaching as a sustainable strategy for professional nursing development.

Recommendations

For nursing education institutions, bedside teaching should be established as a core component of clinical curricula by providing pedagogical training for instructors and strengthening collaboration with teaching hospitals to ensure sustainable system and policy support. For clinical instructors and facilitators, it is essential to apply participatory approaches that actively involve students in patient assessment and discussion, provide evidence-based constructive feedback, and conduct systematic evaluations using valid instruments such as the Clinical Competence Scale (CCS) or the Objective Structured Clinical Examination (OSCE). For future researchers, it is recommended to conduct multi-center experimental studies across diverse cultural contexts, explore the integration of technologies such as virtual bedside simulation, and perform longitudinal studies to assess long-term impacts on nurse performance and job readiness.

Ethical consideration, competing interest and source of funding

-This systematic literature review did not require ethical approval or an ethics certificate because it exclusively utilized secondary data derived from previously published studies. No human participants, identifiable personal information, or primary data collection were involved in the review process. All included articles had undergone their respective ethical procedures prior to publication, and this review adhered to principles of research integrity, transparency, and responsible reporting.

-There is no conflict of interest related to this publication.
-Source of funding is authors.

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