Interdisciplinary Academic and Research Journal, 6 (6), November-December 2026
Old ISSN 2774-0374: New ISSN 2985-2749
Website: https://so03.tci-thaijo.org/index.php/IARJ/index
Article ID: e298683

Effect of Case-Based Learning Combined with the Five-Dimensional Perspective Technique (CBL-5DP) on Clinical Decision-Making Ability of Nursing Students

Dai Yu[1], Tanwarat Pinthong[2] and Suchawadee Somsamran[3]
Valaya Alongkron Rajabhat University under the Royal Patronage, Pathum Thani Province, Thailand
[1]E-mail: 415954799@qq.com, ORCID ID: https://orcid.org/0009-0003-0562-6176
[2]E-mail: tanwarat@vru.ac.th, ORCID ID: https://orcid.org/0009-0002-6083-2063
[3]E-mail: suchawadee.som@vru.ac.th, ORCID ID: https://orcid.org/0009-0000-8516-4175
Received 23/02/2026 Revised 13/03/2026 Accepted 20/04/2026

Abstract

Background and Aims: Teacher-centered approaches inadequately develop clinical decision-making (CDM) ability in emergency nursing practice. This study aims to 1) compare nursing students' CDM ability before and after case-based learning combined with the five-dimensional perspective technique (CBL-5DP) instruction; 2) compare post-instruction scores with the 70 percent criterion; and 3) assess student satisfaction with the CBL-5DP teaching method.

Methodology: A quasi-experimental one-group pretest–posttest design was used with 45 second-year nursing students, selected through cluster random sampling in the academic year 2025 from Qujing University of Medicine. The research instruments were six lesson plans in the emergency nursing course, CDM ability evaluation (Ye & Jiang, 2005; 30 items; total score = 100), and a student satisfaction questionnaire (CVI = 0.92; α = 0.91). Data were analyzed using descriptive statistics, paired-samples t-test, and one-sample t-test.

Results: CDM ability improved significantly from pretest (M = 56.60, SD = 9.12) to posttest (M = 82.42, SD = 5.10), with a mean difference of 25.82 points, $t_{(44)}$ = 20.24, p < .001. All participants (100%) exceeded the 70-point competency criterion ($t_{(44)}$ = 16.34, p < .001). Overall student satisfaction reached the highest level (M = 4.79, SD = 0.47), with a range of 4.75–4.84 across all four evaluated aspects.

Conclusion: The CBL-5DP teaching method produced large, statistically significant improvements in nursing students' CDM ability. The integrated 5DP enhances conventional CBL, providing explicit, measurable structure that guides systematic clinical reasoning across all decision-making dimensions. These findings offer practical implications for nursing educators seeking to bridge the theory-practice gap systematically and develop graduates' CDM ability.

Keywords: Case-Based Learning; Five-Dimensional Perspective Technique; Clinical Decision-Making Ability; Nursing Students; Emergency Nursing

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Introduction

Emergency nursing practice demands rapid integration of complex clinical information, prioritization of interventions under severe time pressure, and execution of high-stakes decisions with incomplete data—competencies that fundamentally distinguish the emergency setting from other clinical environments (Alfaro-LeFevre, 2020; Tanner, 2006). The ability to make sound clinical decisions is therefore not merely a supplementary professional skill but a patient-safety imperative: deficiencies in this capacity are directly associated with adverse events, medication errors, and delayed treatment (Benner et al., 2010).

In China, the rapid expansion of healthcare infrastructure has intensified demand for nurses capable of independent clinical judgment, particularly in under-resourced regional facilities serving large, geographically dispersed populations (Li et al., 2020). Yet the prevailing structure of pre-registration nursing education remains predominantly teacher-centered and lecture-based, prioritizing theoretical knowledge transmission over the development of situation-specific reasoning skills (Zhu, 2019). Consequently, nursing graduates typically require six to twelve months of supervised orientation before demonstrating independent clinical decision-making (CDM) capacity, imposing substantial institutional costs and delaying the realization of care-quality improvements (Li et al., 2020). The problem is especially acute in Southwest China's regional medical universities, where constrained clinical exposure, limited simulation infrastructure, and high student-to-faculty ratios further impede the transfer of declarative knowledge to authentic clinical performance.

Traditional case-based learning (CBL) approaches, which position authentic cases as the stimulus for learning, have demonstrated efficacy in developing clinical reasoning in health professional education (Burgess et al., 2021; Gholami et al., 2021; Thistlethwaite et al., 2012). However, the literature reveals a critical limitation: most CBL implementations treat clinical decision-making as a unitary outcome, without systematically scaffolding the multiple cognitive sub-processes involved, and without providing learners with an explicit, shared analytical framework to guide case analysis across different emergency presentations (Hong & Yu, 2017; Sümen & Adibelli, 2024).

The five-dimensional perspective technique (5DP), originally developed by Ye and Jiang (2005) through Delphi methodology with Chinese nursing experts, directly addresses this limitation by decomposing the CDM process into five measurable, teachable components: problem identification (30%), goal setting (10%), solution decision-making (30%), implementation (20%), and evaluation/feedback (10%). Critically, this dimensional architecture is not an arbitrary pedagogical construct: Peng et al. (2024), through large-scale analysis of over 30,000 clinical nursing cases, confirmed that nurses' natural cognitive approach to patient assessment closely

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mirrors these five dimensions, lending strong empirical support to the framework's ecological validity. Furthermore, Gloudemans et al. (2013) demonstrated that structured clinical reasoning frameworks significantly enhance nursing students' ability to transfer knowledge to novel clinical presentations—a finding directly relevant to the emergency nursing context, where case variety is high. When combined with CBL, the 5DP framework provides the explicit scaffolding that conventional CBL lacks: each learning activity is mapped onto a specific decision-making dimension, making the cognitive process visible, measurable, and amenable to targeted formative feedback.

Despite these theoretical advantages, no published study has systematically investigated the differential effects of CBL-5DP across all five CDM dimensions in an emergency nursing course. Existing CBL research has examined aggregate CDM scores (Gholami et al., 2021; Hong & Yu, 2017) or individual sub-competencies such as critical thinking (Sümen & Adibelli, 2024), but has not mapped learning gains to the specific dimensions most challenged by emergency practice. This study, therefore, addresses a clear gap in the literature by examining, in a regional Chinese medical university context, both the overall and sub-dimensional effects of CBL-5DP on nursing students' CDM ability, alongside students' satisfaction with the integrated pedagogical approach.

Objectives

1. To compare the clinical decision-making (CDM) ability of nursing students before and after learning through case-based learning combined with the five-dimensional perspective technique (CBL-5DP).

2. To compare the CDM ability of nursing students after learning through CBL-5DP with the determined criterion of 70 percent of the total score.

3. To assess the students' satisfaction after learning through CBL-5DP.

Literature Review

Clinical decision-making (CDM) ability in nursing is conceptualized as a systematic, experience-informed, evidence-based cognitive-behavioral process enabling nurses to identify problems, set goals, implement interventions, and evaluate outcomes (Alfaro-LeFevre, 2020; Benner et al., 2010). Tanner's (2006) research-based model of clinical judgment identifies four interrelated processes—noticing, interpreting, responding, and reflecting—that closely parallel the five dimensions of the 5DP framework, providing a complementary theoretical rationale for the integrated approach.

The five-dimensional framework developed by Ye and Jiang (2005) through Delphi methodology with Chinese nursing experts operationalizes this construct across five weighted

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dimensions: problem identification (30%), goal setting (10%), solution decision-making (30%), implementation (20%), and evaluation/feedback (10%). This framework has demonstrated validity and reliability across Chinese nursing student populations and provides measurable indicators for educational assessment (Ye & Jiang, 2005). The integration of CBL with the five-dimensional framework, therefore, provides both theoretical coherence and practical scaffolding for developing clinical decision-making competencies essential for professional nursing practice.

Case-based learning (CBL) is a powerful pedagogical approach for cultivating clinical decision-making (CDM) ability in nursing education (Li et al., 2020). However, Sümen and Adibelli (2024) demonstrated that structured CBL outperformed conventional lecture-based instruction in developing nursing students' CDM ability but had a moderate effect due to students' unwillingness to dedicate time to cases, their fear of making mistakes or saying the wrong thing in group discussions, concerns about the risk of forgetting despite the method being more educational than theoretical information, and the varying opinions on a case from different individuals (Sümen and Adibelli, 2024). Several current studies tend to measure students' decision-making levels by using different techniques with the CBL (Davoodi et al., 2022; Li et al., 2020; Liu, 2024). For example, Xiang et al. (2025) conducted a meta-analysis aimed at assessing the impact of CBL alone or in combination with other methods on improving critical thinking within Chinese nursing education contexts and confirmed that combinations of CBL with problem-based learning (PBL) significantly enhance critical thinking among nursing students in China. While Davoodi et al. (2022) found that the integrated teaching-learning method significantly impacts the oncology CDM ability and cognitive learning of internship nursing students. Likewise, Liu (2024) reported that using the CBL combined unfolding technique significantly increased nursing students' perceived proficiency in information-seeking and unbiased assimilation of new information, clinical reasoning, and clinical decision-making ability. However, in the current study, there are a few instances of the CBL-5DP teaching method, which systematically guides students through multiple analytical dimensions of clinical cases. However, in the current study, there are a few instances of the CBL-5DP teaching method, which systematically guides students through multiple analytical dimensions of clinical cases. Existing research has examined aggregate CDM scores (Gholami et al., 2021; Hong & Yu, 2017). This study, therefore, addresses a clear gap in the literature.

Conceptual Framework

The independent variable comprises the CBL-5DP teaching method, which integrates six sequential instructional steps with the five weighted CDM dimensions of the Ye and Jiang (2005) framework. Each teaching step is explicitly mapped onto one or more CDM dimensions so that the pedagogical scaffold aligns structurally with the construct being developed. This teaching

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method is grounded in Kolb's (1984) experiential learning theory and aims to enhance the dependent variables, namely CDM ability and student satisfaction.

According to Kolb, learning occurs optimally when students move through a cycle of concrete experience, reflective observation, abstract conceptualization, and active experimentation. This study frames peer-collaborative case analysis as the mechanism for conceptual development to construct a 'cognitive scaffold' through the six sequential steps of CBL-5DP: Step 1: Case Presentation and Goal Setting, Step 2: Group Analysis and Problem Identification, Step 3: Evidence Gathering and Integration: students engage with authentic clinical cases (concrete experience) and analyze the cases through five structured analytical dimensions (reflective observation and abstract conceptualization), Step 4: Solution Development and Evaluation, Step 5: Facilitator-Led Debrief, and Step 6: Reflection: apply their conclusions to clinical decision-making tasks (active experimentation).

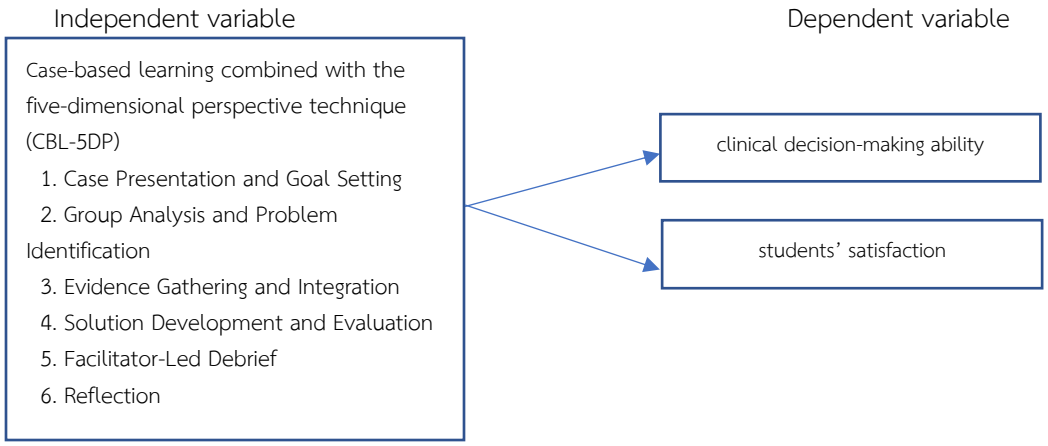


Figure 1 Conceptual framework

Methodology

This study employed a one-group pretest-posttest design (Campbell & Stanley, 1963). The pretest (O1) measured clinical decision-making ability before the intervention; the treatment (X) was the implementation of CBL combined with the five-dimensional perspective technique; and the posttest (O2) measured clinical decision-making ability and student satisfaction after the intervention. The study was conducted from November 2025 to March 2026.

Population and Sample

The population consisted of 270 second-year nursing students (6 intact classrooms) enrolled at Qujing University of Medicine for the 2025 academic year. All participants had completed

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foundational nursing courses and were undertaking the Emergency Nursing course as part of their core curriculum. Using cluster random sampling, one classroom (n = 45) was randomly selected. The sample size met the minimum requirements for planned statistical analyses and fell within the typical range (30-60 participants) reported in similar educational intervention studies.

Intervention and instruments

The intervention consisted of six two-hour lesson plans (12 hours total) in emergency nursing using case-based learning integrated with the five-dimensional (CBL-5DP) (Table 1). Each lesson plan followed a systematic six-step teaching process synthesized from Kolb (1984), Taha et al. (2024), and Burgess et al. (2021):

Step 1: Case Presentation and Goal Setting (15 min) – introduction of an authentic clinical case with clear learning objectives.

Step 2: Group Analysis and Problem Identification (25 min) – students worked collaboratively within small, stable groups to analyze case details, identify the most pressing clinical issues, and systematically prioritize problems.

Step 3: Evidence Gathering and Integration (15 min) – generating and critically appraising evidence from clinical guidelines, nursing textbooks, and peer-reviewed literature, synthesizing evidence-derived information with their case-specific patient data to form justified clinical hypotheses

Step 4: Solution Development and Evaluation (25 min) – clinical application within realistic constraints of patient condition, resource availability, and procedural appropriateness.

Step 5: Facilitator-Led Debrief (25 min) – instructor-structured debriefing and feedback, which constituted a critical mechanism for consolidating accurate clinical reasoning.

Step 6: Reflection (15 min) – students in individual written reflection, during which they recorded personal learning takeaways and considered applications of their new knowledge to future clinical encounters.

To ensure treatment fidelity, a standardized facilitator protocol specifying time allocation, guiding questions, and expected student outputs for each step was developed and used consistently across all six sessions. A single instructor delivered all sessions, eliminating inter-instructor variability as a confound. An independent observer (a nursing education faculty member) rated fidelity adherence using a structured checklist for two randomly selected sessions, yielding a fidelity rate of 94.2%. The six emergency nursing cases are summarized in Table 1.

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Table 1 Lesson Plans and Learning Activities Using CBL-5DP.

Lesson Plan	Case Description	Key Learning Activities
1. Emergency Nursing in Acute Myocardial Infarction	58-year-old male farmer with sudden retrosternal chest pain (8/10), dyspnea, diaphoresis; BP 160/95 mmHg, HR 105 bpm, SpO_2 92%; ECG shows ST-elevation in II, III, aVF	Groups identified critical problems (chest pain, oxygen deficit), set SMART goals (restore tissue perfusion within 90 min), evaluated interventions (oxygen, aspirin, morphine, ECG monitoring), planned implementation priorities, and reflected on time-sensitive decision-making
2. Emergency Nursing Care for Patients with Acute Stroke	A 63-year-old male patient presented with sudden right-sided limb weakness and aphasia lasting 90 minutes. His NIHSS score was 12, with BP 190/110 mmHg. He had a history of atrial fibrillation but was not on anticoagulation therapy.	Groups analyzed stroke severity, established thrombolysis eligibility goals, compared intervention options (thrombolysis vs. conservative), role-played rapid neurological assessment, and evaluated treatment timing decisions.
3. Emergency Nursing Care for Patients with Penicillin Anaphylaxis	A 28-year-old woman developed laryngeal tightness, facial flushing, blood pressure (BP) 70/40 mmHg, and SpO_2 88% with a rash after receiving intravenous penicillin for 2 minutes.	Groups prioritized life-threatening problems (airway, circulation), set immediate stabilization goals, selected epinephrine administration protocol, simulated emergency response, and reflected on anaphylaxis management.
4. Emergency Nursing Care for Patients with Food Poisoning	Eight students from a middle school developed nausea, vomiting, and diarrhea two hours after lunch. Two showed signs of dehydration, and one had a blood pressure of 85/50 mmHg.	Groups identified multi-patient triage priorities, established hydration goals, planned IV fluid therapy and monitoring, practiced resource allocation, and evaluated outbreak management strategies.
5. Emergency Nursing Care for Patients with Scalds	4-year-old boy with 15% TBSA burns (chest, upper limbs) from hot soup; ruptured blisters, intense crying	Groups assessed burn severity and pediatric pain, set burn care and comfort goals, developed cooling and dressing protocols, role-played child communication techniques, and reflected on pediatric emergency care
6. Emergency Nursing Care for Foreign Body Airway Obstruction in Infants and Young Children	An 18-month-old infant developed sudden choking, wheezing, and loss of speech after consuming peanuts, with SpO_2 at 90% and HR at 170 bpm.	Groups recognized airway obstruction urgency, established oxygenation goals, evaluated Heimlich vs. back blows, simulated infant resuscitation techniques, and debriefed on pediatric airway management.

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Note. AMI = acute myocardial infarction; NIHSS = National Institutes of Health Stroke Scale; TBSA = total body surface area; SMART = Specific, Measurable, Achievable, Relevant, Time-bound.

The research instruments consisted of two pieces of equipment: a clinical decision-making ability assessment scale and a students' satisfaction questionnaire. Details are as follows:

1. Clinical decision-making ability was measured using an instrument adapted from the Clinical Decision-Making Ability Scale for Nursing Undergraduates developed by Ye and Jiang (2005). Each item presents a clinical scenario requiring students to demonstrate decision-making competency within the respective dimension. Items are scored on criterion-referenced rubrics with clearly defined performance levels, yielding a total possible score of 100 points. Higher scores indicate greater clinical decision-making ability. Consistent with widely adopted educational evaluation criteria in China, a cutoff score of 70% of the total score was used to indicate competent clinical decision-making ability.

2. Students' satisfaction was assessed through a 15-item questionnaire using a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree). The questionnaire covered four aspects: learning (4 items), teaching strategy (4 items), teaching media (3 items), and assessment (4 items). Satisfaction levels were interpreted as: 1.00-1.80 = lowest, 1.81-2.60 = low, 2.61-3.40 = moderate, 3.41-4.20 = high, 4.21-5.00 = highest. The questionnaire was validated through expert review (three nursing education specialists, two curriculum experts) and pilot testing (n = 15), yielding a content validity index of 0.92 and Cronbach's α of 0.91, indicating strong validity and reliability.

Data Collection and Analysis

The pretest was administered one week before the intervention to assess students' baseline clinical decision-making ability using the Clinical Decision-Making Ability Scale for Nursing Undergraduates. The intervention was then implemented in the Emergency Nursing course using six lesson plans delivered over 12 hours. Case-based learning combined with the five-dimensional perspective technique was applied consistently throughout the intervention period.

The posttest was administered immediately after the completion of the intervention using the same instrument. Data were analyzed using a statistical software package. Descriptive statistics (means, standard deviations) were calculated for all variables. A dependent samples t-test was used to compare pretest and posttest scores. A one-sample t-test was used to compare posttest scores with the criterion of 70%. Cohen's d was calculated to determine effect size (small = 0.2, medium = 0.5, large = 0.8). The significance level was set at $p < .05$.

Ethical Considerations

This study was approved by the Institutional Review Board of Qujing University of Medicine. All participants provided informed consent. Participation was voluntary, and students could

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withdraw at any time without penalty. Data were kept confidential and used only for research purposes.

Results

1. Comparison of Clinical Decision-Making Ability Before and After the Intervention

Table 2 presents the comparison of clinical decision-making ability before and after the intervention. The mean score increased from 56.60 (*SD* = 9.12) at pretest to 82.42 (*SD* = 5.10) at posttest, representing a mean difference of 25.82 points. The dependent samples t-test revealed a statistically significant improvement, t(44) = 20.24, $p < .001$, with a large effect size (Cohen's d = 3.35). These results support Hypothesis 1.

Table 2 Comparison of Clinical Decision-Making Ability Before and After the Intervention (N = 45)

Assessment	*M*	*SD*	Mean Diff.	t	df	d	*p*
Pretest	56.60	9.12	25.82	20.24**	44	3.35	<.001
Posttest	82.42	5.10					

**$p < .001$.

2. Comparison with the 70% Criterion

Table 3 presents the comparison of posttest scores with the predetermined criterion of 70%. The one-sample t-test revealed that the posttest mean score (M = 82.42, SD = 5.10) was significantly higher than the criterion score of 70, t(44) = 16.34, $p < .001$. All participants (100%) achieved scores above the 70% criterion. These results support Hypothesis 2.

Table 3 Comparison of Posttest Mean Score with the 70% Criterion (N = 45)

Group	n	Criterion	M	SD	t	*p*
Intervention	45	70	82.42	5.10	16.34**	<.001

**$p < .001$.

3. Students' Satisfaction

The overall students' satisfaction with case-based learning integrated with the five-dimensional (CBL-5DP) was high (*M* = 4.79, *SD* = 0.47). All four aspects showed high satisfaction levels. The Learning Aspect received the highest mean score alongside the Assessment Aspect (both M = 4.84), followed by the Teaching Strategy Aspect (M = 4.76) and the Teaching Media Aspect (M = 4.75). At the item level, the highest-rated item was Item 14—' This learning approach deepened your understanding of course content' (M = 4.93, SD = 0.25)—while the lowest-rated item was Item 10—' You believe you have effectively mastered the course content' (M = 4.62, SD = 0.72). These findings can be concluded that students were highly satisfied with learning through

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the CBL-5DP teaching method and confirm that the third research objective was successfully addressed.

Discussion

This study demonstrated that case-based learning integrated with the five-dimensional (CBL-5DP) produced significant, large-magnitude improvements in nursing students' clinical decision-making (CDM) ability of nursing students. Three sets of findings warrant in-depth examination: significant improvement in CDM Ability; achievement of CDM ability above the 70 percent criterion; and the high student satisfaction ratings and their implications for pedagogical design.

1. Significant Improvement in Clinical Decision-Making Ability

The statistically significant improvement in CDM ability (mean gain = 25.82 points; Cohen's d = 3.35) provides compelling evidence that the CBL-5DP teaching method is an effective instructional intervention for developing CDM ability in undergraduate nursing students. This large effect size substantially exceeds those reported in comparable CBL studies (Gholami et al., 2021; Hong & Yu, 2017). It suggests that the structured five-dimensional scaffold systematically guides students through problem identification, goal setting, solution decision-making, implementation, and evaluation/feedback (Ye & Jiang, 2005). This finding demonstrated that the CBL-5DP teaching method produces decisively stronger gains than conventional CBL by transforming passive knowledge reception into an active, problem-solving process that mirrors authentic clinical practice. This finding is theoretically consistent with Kolb's (1984) experiential learning cycle, wherein six authentic emergency cases served as concrete experiential anchors while the 5DP framework facilitated disciplined reflective observation and abstract conceptualization; Wijnen-Meijer et al. (2022) similarly demonstrated that linking case-based discussion with Kolb's cycle significantly enhanced clinical reasoning.

The structured dimensional framework further enabled targeted instructor feedback on specific sub-competencies, consistent with Embo et al.'s (2014) evidence that integrating learning and assessment strengthens nursing students' professional abilities. Notably, score variability decreased substantially from pretest (*SD* = 9.12) to posttest (*SD* = 5.10), indicating that CBL-5DP produced convergent, equitable learning outcomes by compensating for initial differences in students' foundational knowledge. Similar to Li et al. (2020), Sümen and Adibelli (2024), who collectively confirm that structured case-based frameworks outperform lecture-based instruction in developing nursing students' clinical decision-making skills. Xiang et al.'s (2025) meta-analysis further confirmed that CBL combined with structured analytical methods significantly enhances clinical reasoning in Chinese nursing education contexts, directly strengthening the generalizability of the present findings to similar regional institutions. Particularly significant were the gains in

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problem identification and solution decision-making—the two highest-weighted dimensions (30% each)—reflecting the critical cognitive demands of emergency nursing practice (Tanner, 2006; Thistlethwaite et al., 2012).

2. Achievement Above the 70% Criterion

The finding that all 45 participants (100%) achieved a posttest mean score of 82.42, significantly exceeding the predetermined 70% competency criterion by 12.42 points (t_{44} = 16.34, p ≤ .01), provides compelling evidence that CBL-5DP successfully brought every student to a clinically meaningful level of decision-making ability. The 70% criterion was established as a criterion-referenced mastery standard in health professions education, ensuring each student meets a minimum competency threshold independent of group performance (Downing et al., 2006, 2009), and its universal attainment represents a key measure of instructional effectiveness beyond statistical significance. This outcome reflects the deliberate, theoretically grounded architecture of CBL-5DP, wherein each of the six sequential steps contributed a distinct yet mutually reinforcing function: **Step 1** activated prior knowledge through authentic case contexts (Burgess et al., 2021; Tanner, 2006); **Step 2** developed collaborative problem-framing and goal-setting through socially mediated reasoning (Xiang et al., 2025); **Step 3** cultivated evidence appraisal and hypothesis formation aligned with Tanner's (2006) interpreting phase (Alfaro-LeFevre, 2020); **Step 4** required multi-criteria evaluation of competing intervention strategies, mirroring the complexity of real-world clinical decision-making (Kolb, 1984; Wijnen-Meijer et al., 2022); **Step 5** delivered dimension-specific, expert-calibrated feedback that systematically corrected misconceptions and homogenized understanding across the five CDM dimensions (Tanner, 2006); and **Step 6** engaged individual written reflection to consolidate and encode transferable clinical reasoning schemas. This study suggests that the structured instructional sequence progressively elevated diverse learners to consistent competency regardless of baseline ability. From a clinical safety perspective, the result of this study is particularly significant: deficiencies in nursing graduates' CDM have been linked to adverse patient outcomes (Liu, 2024), and the criterion-exceeding results observed within a feasible 12-hour intervention suggest that CBL-5DP develops functionally transferable clinical reasoning, not merely examination performance, and may meaningfully reduce the intensive orientation period commonly required of newly graduated nurses.

3. A very high level of students' satisfaction after learning through CBL-5DP

The very high satisfaction ratings (*M* = 4.79, *SD* = 0.47) confirm that the intervention not only achieved its cognitive outcomes but also generated a positive, engaging learning experience. These results also indicate that the five-dimensional scaffold provided students with a transparent analytical structure that reduced learner ambiguity, promoted self-efficacy (Bandura, 1997), and

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enhanced engagement through collaborative inquiry (Yoo et al., 2023). The Highest satisfaction with teacher guidance (*M* = 4.82) reflects students' perception of instructional scaffolding as facilitative rather than directive, consistent with Burgess et al.'s (2021) finding that effective CBL depends on progressive, developmentally calibrated support; the five-dimensional framework further enabled students to self-monitor reasoning and interpret feedback with greater precision. The deliberate constructive alignment between case scenarios, the weighted five-dimensional assessment criteria, and dimension-specific feedback was identified as a key driver of satisfaction in the assessment aspect, consistent with Thistlethwaite et al. (2012), who found that students rate CBL most favorably when assessment visibly rewards the reasoning processes emphasized during instruction. Collectively, these findings indicate that CBL-5DP successfully created a psychologically safe, intellectually stimulating, and clinically authentic learning environment, conditions identified as critical for academic performance and professional identity development in pre-service nursing students (Jack et al., 2018).

Recommendations

1. Recommendations for Practice: Based on these findings, nursing educators should actively apply CBL combined with the five-dimensional perspective technique in clinical nursing education. Well-designed clinical cases aligned with course objectives and students' learning needs should be developed. Teachers should encourage active participation, provide timely feedback, and consider individual differences among students. Educational institutions should provide professional development opportunities for faculty to learn how to implement CBL effectively and use the five-dimensional framework as a scaffolding tool

2. Recommendations for Future Research: Several limitations should be acknowledged. First, the one-group pretest-posttest design without a control group limits causal inferences. Future studies should employ randomized controlled designs to compare CBL with traditional teaching methods. Second, the sample was drawn from a single institution (n = 45), limiting generalizability. Studies with larger sample sizes and participants from multiple institutions are recommended. Third, the study measured immediate learning outcomes; future research should explore the long-term effects of this approach on clinical performance in real settings.

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