Learning Climate As A Predictor of Nurse Clinical Competence: A Cross-Sectional Regression Analysis

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ABSTRACT

Background: Clinical competence is essential for safe, high-quality nursing care. Workplace learning conditions (learning climate) may be a key organizational lever to strengthen competence among practicing nurses.

Aim: To examine whether learning climate predicts nurses' clinical competence in an Indonesian tertiary referral hospital.

Methods: This associative cross-sectional study was conducted at Prof. Dr. Margono Soekarjo Hospital, Central Java, Indonesia (August-December 2025). A total of 125 registered nurses from IRNA 1 and the Emergency Department participated via total sampling. Learning climate was measured using the Clinical Learning Environment and Supervision (CLES) scale, while clinical competence was assessed using a 28-item questionnaire based on Indonesia's Regulation No. 40/2017. Linear regression tested the predictive effect of learning climate on clinical competence (p < .05).

Results: Participants' mean age was 36.90 years (SD = 8.24) with mean work experience of 12.24 years (SD = 8.75). Mean learning climate and clinical competence scores were 113.52 (SD = 12.53) and 121.02 (SD = 10.05), respectively. Learning climate significantly predicted clinical competence (B = 0.615, p < .001), explaining substantial variance (R^2 = 596). Age and work experience were not significant predictors.

Conclusion: A more supportive learning climate is associated with higher nurse clinical competence. Strengthening supervision, feedback, and learning opportunities may accelerate competence development and improve care quality.

INTRODUCTION

Clinical competence is a core professional requirement for nurses, underpinning safe practice, clinical decision-making, and high-quality patient outcomes. In modern healthcare systems, competence is increasingly shaped by both individual factors and the workplace context in which learning and performance occur (Park et al., 2024; Salifu et al., 2022). Evidence suggests that clinical learning environments—characterized by supervision quality, feedback, leadership support, and learning opportunities—are central to competence development among nursing students and practicing nurses (Abuadas, 2022; Visiers-Jiménez et al., 2021).

The **learning climate** refers to nurses' perceptions of educational, interpersonal, and organizational conditions that support learning during routine clinical work. A positive climate is associated with higher engagement, better communication, stronger reflective practice, and improved performance (Hoffman & Willemse, 2024; Putra et al., 2025). Conversely, heavy workloads, limited supervision, and insufficient feedback can undermine workplace learning and contribute to stagnation or decline in competence (Hastuti, 2023).

Theoretical framing

The relationship between learning climate and competence can be explained through complementary learning theories.

First, **Benner's *From Novice to Expert*** theory posits that competence develops through progressive stages (novice to expert) via meaningful clinical experiences that are interpreted and refined over time (Benner, 1984). A supportive learning climate provides structured opportunities for guided practice, coaching, feedback, and reflection—conditions required for nurses to translate experience into expertise.

Second, **Kolb's Experiential Learning Theory** explains competence development as a cycle of (1) concrete experience, (2) reflective observation, (3) abstract conceptualization, and (4) active experimentation (Kolb, 1984). A conducive learning climate strengthens each step of this cycle by enabling reflection, dialogue with supervisors and peers, and safe trial of improved practice.

Third, **Organizational Learning Theory** emphasizes that organizations can facilitate learning by creating systems for knowledge sharing, feedback, and continuous improvement (Argyris & Schön, 1978; Senge, 1990). In hospitals, learning climate can be understood as a practical manifestation of how well an organization functions as a learning organization—supporting individual learning while transforming it into collective competence and standardized practice.

Objective

Despite growing international evidence, quantitative research examining the predictive role of learning climate on nurse competence in Indonesian tertiary-care settings remains limited. Therefore, this study aimed to assess whether learning climate predicts nurses' clinical competence using regression analysis.

METHODS

Study Design And Setting

This study used an associative cross-sectional design. Data were collected from August to December 2025 at Prof. Dr. Margono Soekarjo Hospital, a type-A referral hospital in Central Java, Indonesia.

Participants And Sampling

The study population included all registered nurses working in inpatient 1 ward and the Emergency Department. A total sampling approach was applied. Nurses were eligible if they (a) were actively providing direct clinical care and (b) had at least one year of work experience. A total of 125 nurses met inclusion criteria and participated.

Measures

Demographic and professional variables Demographic data included age, sex, employment status, education level, and work experience.

Learning climate. Learning climate was measured using the **Clinical Learning Environment and Supervision (CLES)** scale (Hasan, 2012). The instrument includes 27 items across five dimensions: ward atmosphere, leadership style of the head nurse, nursing values in the ward, learning values in the ward, and supervisory relationship. Items use a 5-point Likert response (1 = strongly disagree to 5 = strongly agree). Prior work reported strong psychometric properties (Hasan, 2012).

Clinical competence Clinical competence was measured using a 28-item questionnaire developed based on the **Indonesian Ministry of Health Regulation No. 40/2017** on professional clinical nurse career development and previous empirical work (Abd et al., 2023; Kementerian Kesehatan Republik

Indonesia, 2017). The instrument assesses professional practice, ethical and legal aspects, accountability, nursing care delivery, and personal/professional development using a 5-point Likert response.

Data Collection

After ethical clearance, eligible nurses were approached in their units. Participants received an explanation of the study purpose and provided informed consent before completing the self-administered questionnaire.

Data Analysis

Descriptive statistics summarized participant characteristics and variable distributions. Linear regression was used to test the predictive effect of learning climate on clinical competence. Model fit was assessed using the coefficient of determination (R^2).

Statistical significance was set at $p < .05$.

Ethical Considerations

Ethical approval was obtained from the institutional ethics committee at Margono Hospital (No. 420/09098; October 20, 2025). Participation was voluntary. Confidentiality and anonymity were maintained.

RESULTS AND DISCUSSION

Result

Participant characteristics

Participants had a mean age of 36.90 years (SD = 8.24) and a mean work experience of 12.24 years (SD = 8.75). The sample included 73 women (58.4%) and 52 men (41.6%). Most nurses held a three-year diploma (53.6%), followed by BSN + professional nurse certification (44.0%).

Table 1. Respondents Characteristics (n=125)

Characteristic	Freq	(%)
Age	Mean= 36.90 (SD: 8.240	
Work Experience	Mean =12.24 (SD: 8.7540	
Sex		
Male	52	41.6
Female	73	58.4
Employment Status		
Rural Govt Employee	73	58.4
Govt. Civil Servant	52	41.6
Educational Background		
Diploma 3 yrs	67	53.6
BSN+Dipl 3 yrs	2	1.6
BSN+Nurs Certified	55	44.0
Master/Nurse Specialis Certfd,	1	0.8

Learning Climate And Clinical Competence Scores

The mean learning climate score was 113.52 (SD = 12.53). The mean clinical competence score was 121.02 (SD = 10.05).

Table 2. Score Average of Nurses' Learning Climate and Clinical Competence (n=125)

| Variable	Mean	SD
Learning Climate	113.52	12.53
Clinical Competence	121.02	10.05

Regression Analysis

In the regression analysis (Table 3), learning climate emerged as a significant predictor of clinical competence (coefficient = 0.615, $p < 0.001$). Other significant predictors included educational background; particularly, higher qualifications correlated with decreased competence scores (BSN + RN: coefficient = -13.75, $p = 0.038$) Interestingly, age and work experience did not show significant impacts on clinical competence (ps 0.63 and 0.608 respectively), indicating a potential need for more nuanced exploration of these demographic factors.

Table 3. Regression Analysis

Predictor	Coefficient	p
Intercept	68.15	0.001
Learning Climate	0.615	0.001
Age	-0.102	0.630
Work Experience	0.102	0.608
BSN+RN	-13.75	0.038
BSN-RN	-10.99	0.174
Diploma	-14.99	0.023
Specialist	-20.47	0.028
Govt.Civil Employer	-0.267	0.859

Model diagnostic plots (figure 1) indicated an acceptable fit of the regression model. The predicted-versus-actual scatter showed most observations clustering near the 45° reference line, suggesting that predicted competency aligned reasonably well with observed values. Residuals were centered around zero and displayed an approximately normal, unimodal distribution with no major departures. However, a mild pattern of regression-to-the-mean was observed, with a tendency to overestimate lower competency scores and underestimate higher scores, indicating slight bias at the extremes.
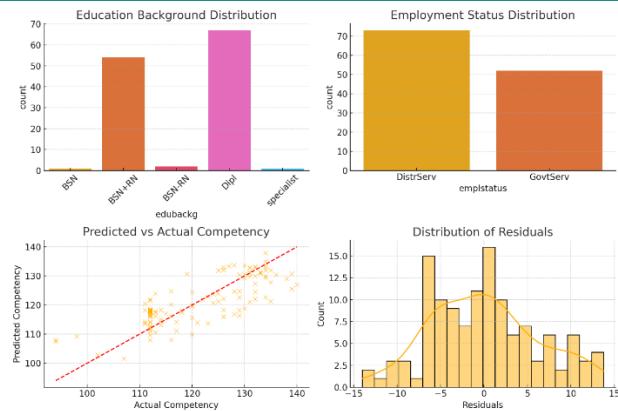
Figure 1 Distribution of Residuals

Discussion

This study provides evidence that learning climate is a strong predictor of nurses' clinical competence. The findings support the premise that competence development is not solely an individual attribute but is shaped by the clinical and organizational context in which nurses' practice. The results are consistent with prior research linking supportive clinical learning environments to higher competence and improved learning outcomes (Abuadas, 2022; Pu et al., 2025; Visiers-Jiménez et al., 2021).

Interpretation through Benner's framework

Benner's (1984) model suggests that nurses develop competence through staged progression driven by meaningful clinical experiences. The significant role of learning climate in this study implies that workplace conditions—such as coaching, supervision, and feedback—help nurses transform clinical exposure into higher-level practice. Importantly, the non-significant effect of age and work experience aligns with Benner's view that *experience alone is insufficient* if not supported by reflective learning and guided practice. In learning climates with limited feedback or weak supervision, nurses may

accumulate years of service without proportional growth in competence.

Interpretation through Kolb's experiential learning cycle

Kolb (1984) conceptualizes learning as a cycle that requires reflection and experimentation. A supportive learning climate likely strengthens competence by enabling nurses to reflect on clinical events, discuss cases with supervisors or peers, conceptualize improved approaches, and test them in subsequent encounters. Conversely, heavy workloads and limited supervision can interrupt reflection and feedback—weakening the learning cycle and limiting competence gains, even in high-exposure environments. This interpretation is congruent with studies showing that learning opportunities, feedback, and supportive supervision enhance competence development (Hoffman & Willemse, 2024; Salifu et al., 2022).

Interpretation through organizational learning

From an organizational learning perspective, learning climate represents the hospital's capability to function as a learning organization (Argyris & Schön, 1978; Senge, 1990). Hospitals that foster psychological safety, open communication, and continuous improvement allow individual learning to become collective competence through shared standards, knowledge exchange, and quality-improvement routines. The relatively large explained variance (R^2 = .596) suggests that competence is substantially influenced by organizational conditions rather than only by individual characteristics. This finding supports the argument that learning climate should be treated as a strategic organizational lever to improve workforce capability.

Implications of educational background

Educational background was associated with competence in the broader regression approach described in the project materials, highlighting that educational preparation may influence how nurses engage with workplace learning (e.g., reflective practice and self-directed learning). However, the dominance of learning climate as a predictor suggests that organizational support—particularly mentorship and supervision—can reduce disparities by providing structured learning opportunities across educational levels (Ma et al., 2022; Tuomikoski et al., 2019).

Study limitation

This study only examines the confounding factors that feasible to observe. Therefore, this model may be interfered by other factors that cannot be handled by authors in this study.

CONCLUSION AND IMPLICATIONS

Conclusion

Learning climate is a significant and robust predictor of nurses' clinical competence in a primary referral hospital context. Integrating Benner's, Kolb's, and organizational learning perspectives, the findings indicate that competence is deeply embedded in the social and institutional environment where clinical learning occurs. Strengthening learning climate may therefore accelerate nurses' progression toward expertise and improve quality of care.

Practical implications

For nursing leadership and hospital management: Learning climate should be treated as a strategic lever for competence development. Priority actions include strengthening supervisory relationships, improving unit leadership practices, protecting time for feedback and reflection, and building psychologically safe teams that support learning (Senge, 1990; Tuomikoski et al., 2019).

For clinical educators and preceptors: Clinical education should align with experiential learning principles by supporting case reflection, feedback loops, and structured coaching to help nurses convert clinical experience into competence (Kolb, 1984; Ma et al., 2022).

For policy makers and curriculum developers: Competence frameworks and clinical career systems should be accompanied by routine learning climate assessment and improvement plans, consistent with national guidance on clinical nursing professional development (Kementerian Kesehatan Republik Indonesia, 2017).

Recommendations for future research

Future studies should use longitudinal or mixed-method designs to test causal mechanisms and examine mediators (e.g., self-efficacy, mentoring quality). Incorporating objective competence indicators and patient safety outcomes may strengthen the evidence base.

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