The Dual Outcomes of Integrating AI in Nursing Education: Investigating the Impact of AI-Supported Case-Based Learning on the clinical decision-making of Students

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Background and Aim: Effective clinical decision-making is the core of nursing practice and a guarantor of patient safety. As clinical environments become more complex, the need for innovative teaching methods to strengthen this vital skill is increasingly felt. Although technologies such as Artificial Intelligence (AI) promise to transform education, their actual impact on the development of independent clinical judgment is not fully understood This study aimed to investigate the effect of Case-Based Learning (CBL) supported by AI on the clinical decision-making ability of nursing students.

Methods: In this single-group quasi-experimental study, 36 nursing students of Lorestan University of Medical Sciences were studied. The intervention was designed in two 6-week phases, including the analysis of 12 clinical scenarios. In the first phase, cases were solved using the traditional method and group discussion. In the second phase, in addition to the above, artificial intelligence-based chatbots were used to help analyze, reason, and extract decision-making options. Clinical decision-making skills were measured using the validated Lowry questionnaire at three points (before the intervention, after the first phase, and after the second phase). Data were analyzed using repeated-measures analysis of variance and Bonferroni pairwise comparisons in SPSS software.

Results: The results indicated a significant decreasing trend in clinical decision-making scores. The mean score decreased from 99.31 in the pretest to 92.42 at the end of phase one and then to 91.86 at the end of phase two ($p < 0.001$). This decrease was primarily significant between the pretest and the end of phase two ($p = 0.021$). Interestingly, no significant difference was observed between the scores of the two post-intervention phases, indicating that the decline occurred mainly after the introduction of AI and then stabilized.

Conclusion: The findings of this study suggest a paradoxical effect. While integrating AI may enhance certain aspects of learning, it can, in the short term, lead to a weakening of students' perception of their independent clinical decision-making ability. This may be due to the initial dependency on the tool, confusion from information overload, or reduced confidence in personal judgment. These cautionary results emphasize the need for more careful design of AI-driven educational interventions. It is suggested that such training be accompanied by strategies to strengthen intellectual independence, critical thinking regarding AI outputs, and guided reflection to prevent the potential threat of "skill degradation.

Keywords: Case-based learning, clinical decision making, nursing students, generative artificial intelligence, nursing education