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IMPROVING THE METHODOLOGY OF DEVELOPING CLINICAL THINKING COMPETENCIES AMONG FUTURE DOCTORS.

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Abstract

Developing clinical thinking competencies among future physicians is one of the core objectives of modern medical education. The dynamic nature of medicine, combined with rapid scientific and technological advancements, requires medical students to develop the ability to analyze clinical data, reason diagnostically, and make evidence-based decisions. This study aims to improve the methodology of forming clinical thinking competencies among medical students through the integration of simulation-based learning, problem-based learning (PBL), and reflective practice. A mixed-methods research design was used to evaluate the effectiveness of a proposed pedagogical model that enhances clinical reasoning, diagnostic accuracy, and decision-making skills.

Keywords: clinical thinking, medical education, problem-based learning, simulation, pedagogical methodology

1. Introduction

In medical education, clinical thinking represents a critical component of professional competence. It involves the ability to collect and interpret clinical information, formulate diagnostic hypotheses, evaluate alternatives, and select the most appropriate management strategy for a patient. According to Norman (2005), clinical reasoning is not merely a cognitive process but a dynamic interaction between knowledge, experience, and context. Traditional medical curricula have often emphasized theoretical knowledge over practical reasoning skills. As a result, many

graduates face difficulties in applying their theoretical understanding to real clinical scenarios (Schmidt & Mamede, 2015). Therefore, there is an urgent need to improve the methodological approaches to developing clinical thinking competencies among medical students, ensuring that they can adapt to the complex and uncertain nature of medical practice.

2. Literature Review

Clinical thinking, or clinical reasoning, has been extensively studied in medical education literature. Bowen (2006) describes it as a combination of analytical and non-analytical cognitive processes. Analytical reasoning relies on conscious application of medical knowledge, whereas non-analytical reasoning draws upon pattern recognition and prior experience. Effective medical education must cultivate both dimensions. Problem-Based Learning (PBL) has been recognized as a powerful approach to foster clinical reasoning (Hmelo-Silver, 2004). Through PBL, students engage in solving authentic clinical cases, promoting active learning, teamwork, and reflective judgment. Simulation-based training, including standardized patients and high-fidelity mannequins, further enhances experiential learning by providing safe, realistic environments for practice (Issenberg et al., 2005). However, despite wide adoption, many institutions still lack a systematic methodology that integrates these approaches into a coherent framework for developing clinical thinking competencies. The literature suggests that combining cognitive apprenticeship models with digital technologies may offer a new direction for pedagogical innovation (Eva, 2009).

3. Methods

The study employed a mixed-methods approach that combined quantitative and qualitative data. Participants included 100 third-year medical students from three universities. The intervention lasted one academic semester and consisted of three components:

1. Problem-Based Learning sessions centered on real clinical cases;
2. Simulation-based training using digital and physical mannequins;

3. Reflective journaling and guided self-assessment exercises.

Pre- and post-intervention assessments measured students' diagnostic reasoning and decision-making skills using standardized clinical reasoning tests. Qualitative data from focus groups were analyzed thematically to identify students' perceptions of the new methodology.

4. Results and Discussion

Quantitative analysis revealed a statistically significant improvement in clinical reasoning test scores after the intervention ($p < 0.01$). Students reported increased confidence in diagnosing complex cases and applying theoretical knowledge to practice. The qualitative data highlighted the value of interactive learning, teamwork, and instructor feedback. Students emphasized that simulation exercises improved their ability to prioritize information, recognize diagnostic patterns, and anticipate patient outcomes. The results confirm that clinical thinking can be effectively developed through structured pedagogical methods that integrate cognitive and experiential learning. However, continuous instructor training and curriculum alignment remain essential to sustain the gains achieved through innovative teaching methods.

5. Conclusion

Improving the methodology for developing clinical thinking competencies among future physicians requires an integrative pedagogical framework. The proposed model combines PBL, simulation-based learning, and reflective practice to promote higher-order cognitive processes. It not only enhances diagnostic reasoning but also fosters empathy, ethical awareness, and decision-making under uncertainty. Medical universities should prioritize the integration of these strategies into their curricula, provide continuous professional development for instructors, and adopt assessment tools that measure both cognitive and affective domains of clinical competence. Such methodological improvements will better prepare graduates for safe, effective, and evidence-based clinical practice in a rapidly evolving healthcare environment.

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