

Fostering proficiency in essential skills among emergency medicine residents through simulation-based education

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Introduction:

Simulation-based education has become a crucial element within emergency medicine (EM) residency programs. Medical education places great emphasis on competency-based assessments, and high-fidelity simulation has emerged as an effective methodology to support these assessments.

Objective:

The Accreditation Council for Graduate Medical Education (ACGME) defines a set of core competencies that healthcare professionals must acquire to ensure the delivery of safe and effective patient care. In our study, we sought to investigate the impact of simulation-based education on the enhancement of ACGME core competencies among emergency medicine residents.

Method:

We conducted a prospective observational study at our institute, involving all current EM residents. Each month, we conducted a high-fidelity immersive simulation session, featuring three separate scenarios for both first year (R1) and second year (R2) residents. From August 2020 to April 2023, a total of 36 simulation sessions were conducted, encompassing 108 scenarios.

To assess performance in clinical and non-technical skills, the expert faculty used our custom-designed objective structured assessment tool, the Emergency Medicine Simulation Assessment Tool (EMSAT). This tool evaluated performance across 15 sub-tasks (9 (60%) clinical and 6 (40%) non-technical skills). Each sub-task was mapped to the ACGME core competency; Patient Care (PC), Medical Knowledge (MK), Practice Based Learning (PBL), Systems Based Practice (SBP), Interpersonal and Communication Skills (ICS), and Professionalism (P).

The achieved scores for each competency were converted into percentages for analysis. The data was divided into two groups. The first 18 sessions (54 scenarios) formed phase-I, while the last 18 sessions (54 scenarios) constituted phase-II. A two-tailed paired T-test was utilized to compare the two phases. Our primary outcome measure focused on the improvement observed across all six ACGME core competencies.

Results:

The paired T-test results revealed a significant and substantial difference in all six core competencies between phase-I and phase-II. The mean scores demonstrated a significant improvement between two phases i.e., PC (M=55.1, M=84.4), MK (M=57.2, M=83.6), PBL (M=60.5, M=88.4), SBP (M=62.2, M=89.7), ICS (M=61.8, M=89.7), and P (M=64, M=89.9).

Conclusion:

The implementation of high-fidelity immersive simulations in the training of emergency medicine residents yielded remarkable advancements across all six ACGME core competencies.