

Background

Assessment of clinical competence in medical education requires students to integrate communication, clinical reasoning, and decision-making skills under standardized conditions. AI-simulated virtual patient consultations designed to reflect OSCE/C3DO-style encounters may offer a scalable approach to assessment preparation; however, evidence describing performance improvement across repeated encounters during routine curricular implementation remains limited.

Objectives

The study aims to evaluate changes in medical student performance across repeated AI-simulated, OSCE/C3DO-style virtual consultation encounters implemented as part of a pilot program.

Methods

A pilot study was conducted involving 120 fourth-year medical students who completed 16 faculty-assigned AI-simulated virtual patient consultations over four weeks. Each consultation represented a standardized clinical encounter and was scored using predefined performance criteria. Two linear mixed-effects models were fitted: one compared first versus last consultation scores, and the second examined the association between consultation attempt number and performance score. Student identifier was included as a random intercept in both models.

Results

Mean performance scores increased from the first consultation (mean = 56.8) to the final consultation (mean = 79.3) representing a mean improvement of 22.5 points ($p < 0.001$). Mixed-effects modeling demonstrated significant improvement between first and last consultations (estimate = 16.9, $p < 0.001$) and a positive association between consultation attempt number and performance score (estimate = 1.14 points per attempt, $p < 0.001$).

Conclusions

Medical students demonstrated significant performance improvement across repeated AI-simulated, OSCE/C3DO-style virtual patient consultations. These findings support the use of structured AI-simulated consultation programs for assessment preparation and integration into undergraduate medical education curricula.