

Diagnostic Clinical Skills in Cardiology: Improving Learning and Performance with Hybrid Simulation, Scripted Histories, Wearable Technology, and Quantitative Grading - The Assimilate Excellence Study

Authors : Daly M. J, Condrón C, Mulhall C, Eppich W, O'Neill J.

Abstract : Introduction: In contemporary clinical cardiology, comprehensive and holistic bedside evaluation including accurate cardiac auscultation is in decline despite having positive effects on patients and their outcomes. Methods: Scripted histories and scoring checklists for three clinical scenarios in cardiology were co-created and refined through iterative consensus by a panel of clinical experts; these were then paired with recordings of auscultatory findings from three actual patients with known valvular heart disease. A wearable vest with embedded pressure-sensitive panel speakers was developed to transmit these recordings when examined at the standard auscultation points. RCSI medical students volunteered for a series of three formative long case examinations in cardiology (LC1 - LC3) using this hybrid simulation. Participants were randomised into two groups: Group 1 received individual teaching from an expert trainer between LC1 and LC2; Group 2 received the same intervention between LC2 and LC3. Each participant's long case examination performance was recorded and blindly scored by two peer participants and two RCSI examiners. Results: Sixty-eight participants were included in the study (age 27.6 ± 0.1 years; 74% female) and randomised into two groups; there were no significant differences in baseline characteristics between groups. Overall, the median total faculty examiner score was 39.8% (35.8 - 44.6%) in LC1 and increased to 63.3% (56.9 - 66.4%) in LC3, with those in Group 1 showing a greater improvement in LC2 total score than that observed in Group 2 ($p < .001$). Using the novel checklist, intraclass correlation coefficients (ICC) were excellent between examiners in all cases: ICC .994 - .997 ($p < .001$); correlation between peers and examiners improved in LC2 following peer grading of LC1 performances: ICC .857 - .867 ($p < .001$). Conclusion: Hybrid simulation and quantitative grading improve learning, standardisation of assessment, and direct comparisons of both performance and acumen in clinical cardiology.

Keywords : cardiology, clinical skills, long case examination, hybrid simulation, checklist

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