

Value of multimodal instruction on improving procedural skill proficiency among medical undergraduates: A study from a Sri Lankan medical faculty

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Acquisition of basic procedural skills is important for the medical students to practice as clinicians. Traditionally, such skills were taught or acquired by medical students at the bedside in the hospital setting during their clinical attachments. Skills laboratory training has been introduced to mitigate the ethical issues arising from practicing invasive procedures with inadequate training. The aim of the present study was to evaluate the effectiveness of simulation-based training and bed-side teaching for skill acquisition in the domain of procedural skills. Volunteer second-year medical students participated in this longitudinal cohort study. All participants rated their self-confidence and competence in performing venipuncture on a real patient (baseline). Afterwards, all the students underwent a simulation-based training (SBT) session followed by four-weeks of bed-side teaching/learning (BST) during clinical attachments in the hospital setting. The students rated their self-confidence and competence in performing venipuncture on real patients following simulation-based training and clinical training. Similarly, an independent assessor who was blinded to the study design scored the student's performance following each method of training using the Integrated Procedural Protocol Instrument (IPPI). Simulated patients and real patients assessed the communication skills of the students using a Communication Assessment Tool (CAT) following the skills-lab training and clinical training respectively. A sample of 55 students included in the study. Majority were females (63.64%, 35/55). The self-assessment ratings of both the confidence and competence of students were significantly higher following the simulation-based training ($p < 0.01$). A further increase in both self-competence and confidence ($p < 0.01$) was observed with the clinical training following simulation-based training. The independent assessment showed a significant increase of means across all categories of IPPI ratings (mean SBT: 2.35; mean BST: 2.78; $p < 0.01$). Student's doctor-patient communication skills were rated significantly higher by real patients in the clinical setting when compared with the ratings given by simulated patients (mean SBT: 2.46; mean BST: 3.76; $p < 0.01$). This study confirmed the effectiveness of simulation-based training in procedural skill acquisition. A significant improvement in technical and communication skills as well as self-confidence and competence were observed following clinical training. This study demonstrated that simulation-based training complements the bed-side learning and that a mix of these teaching/learning modalities substantially augments the clinical performance of medical students. A multimodal instruction for developing procedural skills can be recommended for undergraduate procedural skills training.

Keywords: Procedural skills, Simulation, Bed-side teaching, Skills lab, Medical education

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