Simulation in Medical Education: Past, Present and the Future

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Simulation Based Medical Education can be defined as any educational activity that uses simulative aids to replicate a clinical scenario. Simulation is founded on the idea of doing and practicing. Simulation is “a technique to replace or amplify real-life experiences with artificially contrived guided experiences.”

Health care is becoming increasingly complex, making teaching requirements more challenging and sophisticated. The airline industry has often been cited as the example for healthcare to follow in learning to improve safety. Can a paradigm shift in healthcare culture be achieved so that simulation is routinely integrated into education and practice?

SBME enhances patient safety by removing the patient from the student’s learning curve. It recreates scenarios that are challenging, but not frequently experienced in routine clinical setup. The increased number of students, need for regular and frequent training, legal and accountability issues argues for the need of SBME. Other advantages of SBME include potential to assess performance in challenging situations, better retention of knowledge and skills and availability for frequent and regular practice. Simulation also provides a safe and educationally orientated environment for both teaching and assessment.

A range of competencies including clinical skills, procedure-based skills, communication skills, leadership, team work, decision-making, interpersonal skills and professionalism could be trained through simulation. Options available for simulation include simulated patients, virtual patients, static and interactive manikins, hybrid patients, task trainers and computer-based simulations.

Simulated patients are trained to act as a real patient in order to simulate a set of symptoms or problems. This can provide cases that are needed at the time they are needed and simulated patients may tolerate more students than real patients. This also allows students to learn about situations they may not be able to manage in a real clinical setting. Virtual patients aim to capture the essence of clinical practice in a virtual environment by placing the student in the position of a doctor taking care of the patients. It simulates the continuity of seeing the same patient over long period of time and learning from the patient. Task trainers train a specific task-e.g. Suturing, lumbar puncture, injection techniques, which can range from low-cost to high cost and low fidelity to high fidelity. Hybrid patients are a combination of a simulated patient and a task trainer. This adds human element to the training with a task-trainer and makes simulation more realistic for the students. Computer-based simulation with realistic clinical scenarios can facilitate teaching of problem-solving and clinical decision making. 3-D Virtual simulation is now available with high-tech
simulators that are of high-fidelity and are more exciting. However many advances in simulation have been made through low-fidelity, low-cost approaches. Training on much cheaper low-fidelity simulators can be just as effective. Low-fidelity simulation has huge potential to be used widely with a significant impact on training and patient safety.

Simulation is not a panacea to solve all the challenges within the health system. There are several limitations of SBME. High-fidelity simulation is very expensive and negative learning and false confidences are also concerns.

It is unlikely that simulation will replace the importance of key clinical experiences, and learning from them, but an understanding of the cost-effectiveness of simulation shall certainly enable more informed choices regarding SBME.