EDITORIAL

Simulation in Health Care

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Simulation is usually perceived as the advancement in technology to create experiences that are focused towards clinical applications. This is not a holistic view of this sphere. In fact, it is the integration of knowledge and affective domains that are structured carefully to involve different techniques, related equipment's and courses. These are well structured activities that are designed for different levels of participants having diverse levels of expertise. Besides others, one reason for introduction of simulation in medical field is to groom physicians who are safe practitioners.[1] The history of clinical skill lab is traced back to the 17th century in France, where manikins using the foetal model and pelvis were used. These training were given to the paramedical staff namely midwives by Madame Du Coudray.[2] In modern times the basis for standardization of training in simulation medicine dates back to Resusci Anne who managed the training by providing manikins that were simple to use and were low cost. Later on Abrahamson developed the Sim-One simulator that was aimed to train the novice to learn the insertion of endotracheal tubes. This was a high fidelity simulator.[3,4] This development was followed in 1980 by the development of Comprehensive Anesthesia Simulation Environment (CASE) where the simulator was linked to a program.[5] From there on, Barrows introduced the concept of provision of an environment that was safe and helped the participant to practice where skills with simulated patients.[6] To this date more advanced technological equipments that have capabilities of running computer assisted programs, virtual reality and even tactile sensations modalities have been introduced.[7]

Recent advances in simulation

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There are a wide variety of simulators that are available for use; the choice mainly depends on the requirement of the training that it has to be used for. The common types that are extensively used are as follows:

Part-task trainer: This is commonly used for imparting training related to psychomotor and procedural skills. They are used for practice and achieving proficiency. It has both low fidelity such as venipuncture, male and female pelvic models; skin and tissue materials that can be used for practicing injections and suturing with various materials and needles, more over, it can also have high fidelity training equipment.[8]

Computer based systems: These have developed over the period from simple interfaces to advanced programs. They have been usually used for basic sciences with the provision that the participants can practice on them with their own pace. The ability to provide appropriate feedback helps the learner to reinforce what is right and correct what they have not attempted correctly.[9] Such interfaces are usually of low cost, whereas they have a drawback that they require a trained teacher to teach the participants how to use them.[10]

Virtual reality and haptic systems: In virtual reality the technology is used to generate images of objects and environment. These are visualized by the participants using high tech gears and goggles that are connected with various computer systems, the individual has the freedom to interact with those images and objects with the help of various gadgets that are provided with the setup. In haptic systems there is provision of adding the tactile and kinesthetic capability in the equipment. When the virtual reality and haptic systems are integrated they provide a much enriched experience to the learner. The presence of recordings and tracking systems in the devices helps to generate data that can be used for feedback as well as a record of practice sessions carried out by the participant.[11] These are usually applied for advanced training in complex skills like endoscopy and laparoscopy.[12]

Integrated simulator models: In these simulators

there is integration of the manikins with the computers and the outcomes are displayed on monitors. They are used to display common data regarding ECG, pulse oximetry and methodology like insertion of chest tube and passing of urinary catheter, the manikins also respond to the administration of various therapeutic agents. The various available models are both high and low fidelity simulators.[13]

Simulated environment: The simulation facilities are placed at a variety of settings according to the requirement of the learning outcomes for which they are planned to be used. These specific environments can range from simple teaching and learning rooms, where simulated environments are created to create patient wards, operating rooms, emergency rooms, intensive or coronary care units and sometimes domestic settings and road or ambulance environments.[14]

Tailored Training: In the clinical skill labs the training requirements can be designed according to the desires of the team or the individuals of the team. This includes both the beginners and the experts. In clinical skill labs the speed of the various training components of the events can be regulated and modified according to the requirements of trainee. In regular occurrences the physiological events following certain medical situations keep happening and for patient safety they have to be taken over by the treating physicians and the trainees do not get enough time for decision making and implementing their choices, this deficit can be easily managed in clinical skill labs on manikins and high fidelity equipment without compromising patient safety.[13,15]

In recent years medical curriculum has undergone major changes both internationally and nationally.[16] The introduction of outcome competency based curriculum has been adopted to develop required knowledge, skill and attitude. The same can be acquired through well designed activities in the clinical skill labs.[17] Amongst several issues, one of the many factors positively influencing the developments of clinical skill labs in both undergraduate and postgraduate teachings is the fact that, patients remain central to the teaching in medical education, but at the same time there is growing concern among the patients and their relatives that the medical students and practitioners need to be appropriately prepared before they start handling patients, they do not hesitate to voice their distress with the hospital management, for safe handling of the patients by the health care workers at all levels[18]. These growing issues can be attended by formal practice of a wide range of procedures and skills in simulated environments in the clinical skill labs both for the undergraduate and postgraduate trainees aiming at the better patient care and outcomes.

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