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Hybrid Simulations in Nursing Education

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"It's not practice that makes perfect, it's perfect practice that makes perfect"

- Coach Vincent Lombardi

Nursing is a profession which is built up on the integration of theory and practice. Imparting practical skills and attitudes in nursing education is a crucial challenge. Innovative teaching strategies to enhance the psychomotor skills and communication skills in practical learning. One such method is the Hybrid Simulation. Hybrid Simulation is one which utilizes the technical skills, psychomotor and therapeutic communication skills simultaneously. Situations which require both communication and performing skills can be trained using this hybrid simulation. Hybrid simulation is a blend of more than one simulation. It may use a simulated patient, simulated procedure, simulated interactions and simulated situation or environment at the same time.

Simulation is the imitation or representation of one act or system by another.[1] Simulation education is a bridge between classroom learning and real-life clinical experience. Novices can be taught how to give injections by practicing on an orange with a real needle and syringe.

The main purposes of simulation are – education, assessment, research and health system integration in facilitating patient safety.

With the simulators, repetition of skill practices can be given, which reduces the anxiety level of the students and also improves more confidence. The created scenario are objective in nature, gives feedback whenever necessary, utilizes supporting materials for education and helps in review the recorded videos during debriefing sessions.

Hybrid simulation involves a task trainer or partial simulator being realistically affixed to a standardized patient. This allows for the proper teaching and assessment of clinical treatment and communication skills in an integrated fashion. In a labor and delivery room, the team of healthcare providers involved in treating a mother and her baby can lead to a lack of clear leadership, miscommunication, or confusion – all of which are capable of bringing harm to a patient.

These types of human factors, along with systemic factors, can be identified and corrected through the use of in situ simulation (simulation that takes place in the real clinical environment). And, because of its ease of use and portable nature, hybrid simulation lends itself well to an in situ simulation environment.

Some of the components associated with hybrid simulations are

Standardized Patients - Individuals trained to portray specific illness or behavior for the purposes of teaching or assessment. Used to assess Communications and professional competencies and required clinical skills testing for the students

Improvised Technology-Biological or Synthetic models made of easily available items. Closely mimic human tissue , Slab of ribs to teach insertion of chest tubes, Animal feet or head for suturing practice etc.,

Screen Based Simulation-Computer programs and Desktop

Task Trainers - Devices designed to simulate a specific task or procedure. Examples: Pericardiocentesis, Chest tubeAirway, Artificial knee, Central line etc.,

Mannequins- are of three types.

Low Fidelity- Features: Static airway +/- rhythm generation, No/minimal programmed responses.

Mid Fidelity-Relatively new class of mannequins, often used for ACLS training. Features: Active airways –Breathing/pulses, rhythms, Basic procedures like defibrillation using some automated response and programmed scenarios

High Fidelity-Mannequin with electrical, pneumatic functions driven by a computer. Features: Dynamic airways, reactive pupils, Heart sounds, lung sounds, chest movement ,Pulses, rhythms, vital signs, Abdominal sounds, voiceCO_2 exhalation, cardiac output,Bleeding, salivation, lacrimation etc.,

Virtual Reality-Advanced form of human-computer interaction. Allowing human beings to work in the world of computers.

A high fidelity simulator can be used to express the bodily changes by manually operating in the computer to exhibit various symptoms. High-fidelity simulators are life-size mannequins that can simulate multiple human functions such as breathing, generating a pulse, producing a heartbeat as well as being able to communicate with the learner through a remote operator interface (Goolsby, Goodwin, & Vest, 2014).

Advantages

- The simulated scenarios are realistic enough almost close to reality .Hence the students experience an unique satisfied learning experience.
- It gives the students a chance to practice the skills and also apply the knowledge that they have acquired
- Enable better understanding of abstract concepts, those concepts which are difficult to explain can be enacted through high fidelity simulators.
- Acquisition of clinical skills is better when students are trained using simulations
- Students feel a high sense of satisfaction and confidence, to face the reality.
- Simulation is used when the real system cannot be engaged, because it may not be accessible, or it may be dangerous or unacceptable to engage. eg. Teaching cardio pulmonary resuscitation.
- Provides a safe environment for training that does not expose patients to risk
- Standardised training of procedural steps is possible.
- Training and retraining till the mastery and confidence is obtained.
- Assessment of students for clinical skills for the evaluation purpose can be done using simulation.
- Multidisciplinary team training and specific behavioural and communication skills can be taught using simulated environments at the same time
- structured, dynamic hybrid simulation scenarios are effective for deliberate practice with feedback (e.g. video, sound, documents, pictures, vital signs) displayed on the simulated patient monitor to the student learner.

Disadvantages

- It is not real. Even if simulation is done in a realistic setup, it still isn't real.
- It is expensive. All the spare parts or components of the simulation manikins are of high cost.
- Simulations are high maintenance. Technical failure with hardware and software may result in failure of this method.

Learning occurs when the environment is realistic and students are engaged in the simulation experience by performing a specific role. The outcomes of hybrid simulation experiences are of enormous benefit to nursing students and faculty. It allows students to practice skills and communication techniques simultaneously and gives them the multitasking experience that they would get on the real learning environment. It can increase the diversity and complexity of simulation activities which ensures patient safety, respect, and dignity during real-life encounters.

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