
بسم الله الرحمن الرحيم

TEHRAN UNIVERSITY OF MEDICAL SCIENCES

Co-funded by the Erasmus+ Programme of the European Union

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Workshop On MediTec Project

September 2020
Tehran, Iran

Introduction to Simulation based Medical Education

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Definition

“The technique of imitating the behaviour of some situation or process by means of a suitably analogous situation or apparatus, especially for the purpose of study or personnel training.”

Oxford English Dictionary

Definition

Simulation based **medical education** (SBME)

is **defined** as any **educational** activity that

utilizes **simulation** aides to replicate clinical scenarios.

Abdulmohsen H. Al-Elq, 2010

Overview

- Becoming more and more popular.
- Becoming equal to effective learning and safer care for patients.
- Becoming a solution for all the perceived ills of teaching and training.

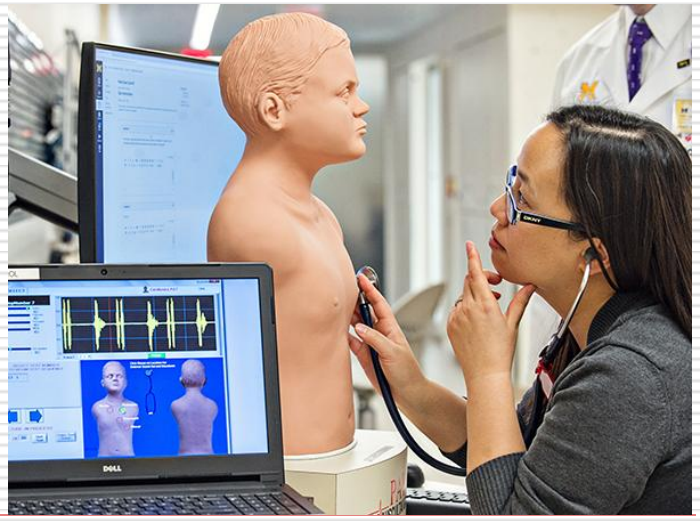
Overview

- **Is not a substitute with and from real patients in real clinical contexts.**
- **Must not become an end in itself, disconnected from professional practice.**
- **Simulation is a technique, not a technology!**

Gaba D. M. (2004). The future vision of simulation in health care. *Quality & safety in health care*, *13 Suppl 1*(Suppl 1), i2–i10. doi:10.1136/qhc.13.suppl_1.i2

Widespread

- **The use of simulation-based training:**
  - **Undergraduate and postgraduate contexts,**
  - **General and specialty curricula,**
  - **Clinical and non-clinical settings**



Skills in Simulation based MD

Technical (procedural) skills

Non-technical skills

Workplace-based simulation

Technical Skills

Technical skills: SPs

- **Simulated patient** is an actor who is trained to represent a patient during a clinical encounter with a health care provider.
- If Simulated patient act similarly in all situations is named **standardized patient.**

Technical skills: SPs

- **Providing timely and accurate feedback from the 'patient's perspective'.**
- **Can work unsupervised (teaching and assessment).**
- **Trained and supported SPs are needed for involving in high-stakes assessments.**
- **Can play role of covert patients to evaluate health services.**

Technical skills: SPs

- Although planning and managing an SP service is time-consuming and can be costly in the initial stages, experienced SPs can replace clinicians in both teaching and assessments.
- Recent developments: accreditation, standards and certification of SPs.

Technical skills: VR

- **The computer-generated simulation of a three-dimensional image or environment that can be interacted with in a seemingly real or physical way by a person using special electronic equipment,**

Virtual Reality

https://www.oculus.com

Augmented Reality

Microsoft Hololens

Technical skills: VR

- Virtual reality simulators facilitate and measure tactile feedback in real time.
- Enable doctors to improve operating techniques.
- virtual reality has its own challenges and opportunities.

Technical skills: VR

Non-technical Skills

Non-technical skills

- Training and development of non-technical (social and cognitive) skills and the way in which human factors impact on patient safety.

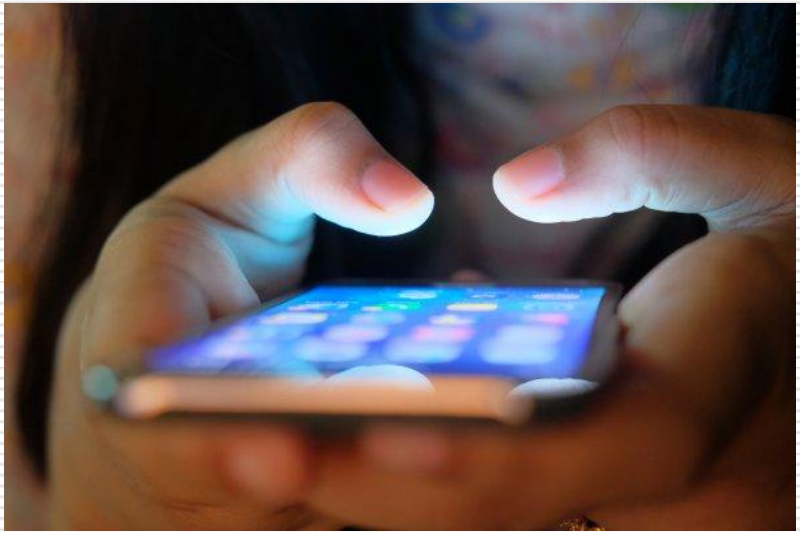
Non-technical skills

- Human factors have been shown to cause the majority of errors and often these are not due to lack of knowledge or inability to perform a technical skill, but due to lack of so-called ‘softer’ skills like team working, communication, leadership and decision-making.

Healthcare team

- **Teamwork failures: a major cause of errors.**
- **Simulation-based team training can help address some of the common issues concerning poor or ineffective communication and differing perceptions about the goals of healthcare, team roles and leadership.**

Other types



- Social media
- Use of smart phones
- Blogs
- Podcasts
- Interactive questions before and after training

A simple Classification of simulators

	Appearance	Interaction with the learner	Educational context
Part task trainer	Realistic, but of a single body part	Feels realistic but limited or no response	Repetitive practice of isolated skill
Full body simulator	Realistic body, often with associated physiological modelling	Allows examination (for example, pulses) and realistic interactions	Realistic practice of whole scenarios
Screen simulator	2D image of patient, equipment or staff	Realistic response to input via keyboard or mouse	Cognitive exploration of a variety of situations
Virtual reality	3D image of patient, equipment or staff	Realistic response to input via a variety of methods	Realistic practice, often of a defined task
Real people as simulators	Real people	Verbal and non-verbal communication	Practice of a variety of clinical skills
Hybrid simulation	Any combination of the above	Verbal and non-verbal communication and interaction	Realistic practice
Simulated environments	An entire clinical environment	Full interaction with patient and team	Realistic practice and team training

Instructional consideration

- There is no difference between simulation and many other forms of education and training.
- Requires skillful and knowledgeable Instructors or facilitators
- Requires the skill of "providing feedback" (in the moment and structured debriefings)

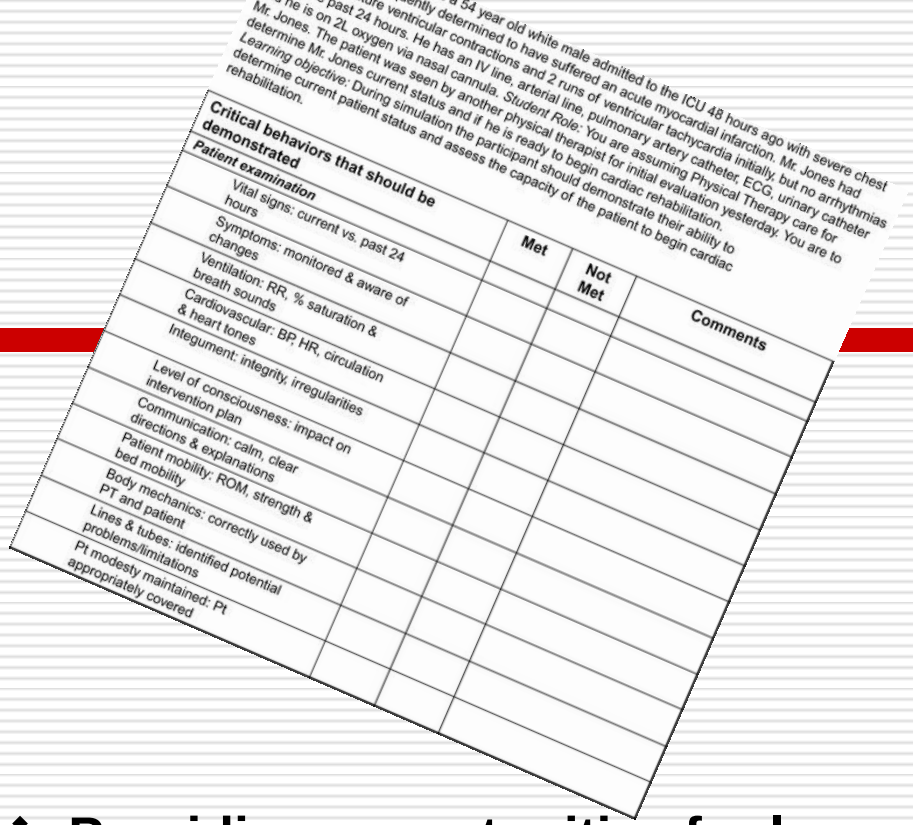
Instructional consideration

- **Assessment drives learning**
- **Attributes of assessment should be considered:**

  reliability, validity, feasibility, cost-effectiveness, acceptability and educational impact.

Instructional consideration

- Assessments need to be integrated within the curriculum.
- Both formative and summative assessments should be considered.
- Appropriate levels of fidelity and realism should be selected.



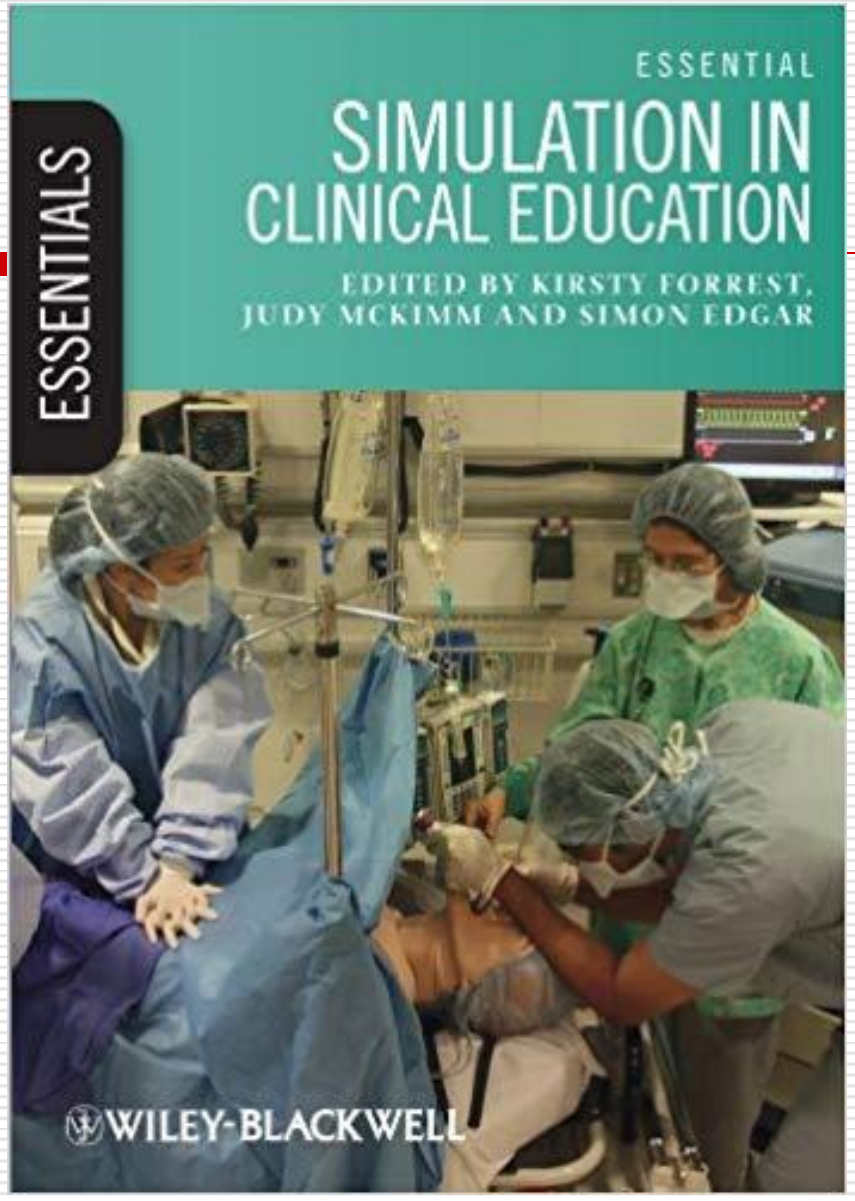
Instructional consideration

- Providing opportunities for learners to receive **timely and specific feedback.**
- A large number of **checklists and global rating scales** have been developed, tested and validated in various settings.

Instructional consideration

- **SBME enables educators to measure performance more consistent and reliable.**

Reference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