Simulation-based Education and Evaluation: Why the Wait?

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The present undergraduate and postgraduate curriculum in India does not foster the development of technical and nontechnical skills (NTS).[1] These skills are interrelated, and a deficiency in one ultimately leads to errors and poor quality of care delivered to the patient. This potentially compromises patient safety. This reflects a lackadaisical system that gives very poor weight to training/skill development in traditional internships. One possible way to rapidly improve this state is to introduce "simulation-based education and evaluation." Simulation is defined as an artificial representation of a real-world process to achieve educational goals *via* experimental learning.[2]

Simulators are classified as low-fidelity, medium-fidelity, and high-fidelity simulators.[3] Low-fidelity simulators are static, lack realism, and are used to teach basics of technical skills, for example, intravenous insertion arm. Moderate-fidelity simulators have features like pulse, heart sounds, and breathing sounds but lack the ability to talk or/and incorporate chest or eye movements, for example, the "Harvey" cardiology simulator. High-fidelity simulators combine part or whole-body manikins to carry the intervention with computers that drive the manikins to produce physical signs and feed physiological signs to monitors. They can talk, breathe, blink, and respond either automatically or manually to physical and pharmacological interventions.

The importance of NTS when it comes to team management cannot be stressed enough. Technical and NTS are interdependent, and poor NTS will consequently affect poor delivery of the technical skills to the patient.[4] A brief framework for NTS would include skills related to (1) Task management (prioritizing, identifying, utilizing resources, etc.); (2) Teamwork and communication; (3) Situational awareness (perception, comprehension, projection, and decision-making); (4) Human factors (knowledge, skill, and emotional competencies). Unfortunately, unless each postgraduate is specifically trained and evaluated on these grounds, we will be sending ill-equipped and unprepared individuals into clinical practice. Objective assessment of these NTS is feasible only in a team-based simulation scenario considering the sheer number of residents in the institute and country. Assessment tools such as behaviorally anchored rating scales, anesthetists' NTS, taxonomy and behavior rating tools, and anesthesiology students' NTS can be used.[5–7]

There is also an evolving concept of Medical Surprise Anticipation and Recognition Capability[7] in medical education adopted from military training. To err is human; however, anticipating potential events ("surprises") while providing patient care may reduce the number of such errors.[7] Teaching the importance of anticipating such events, how and where to anticipate, and how to react in a timely manner can be done through simulation training.

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There are several simulation labs in PGIMER that can be utilized if an updated and upgraded postgraduate curriculum is formulated. Evidence suggests that simulation-based training improves patient outcomes.[8,9] It helps to mitigate the disparity in clinical and NTS of residents entering the institute *via* the Institute of National Importance – Combined Entrance Test.[10] Simulation-based training in the early weeks/months could help identify the baseline knowledge, and based on this, individualized training could be provided to the residents. Simulation-based exit exams conducted at the end of their residency could be used to provide a quantitative analysis of their improvement over the baseline. There is a resounding need to include in the current curriculum minimum standards for skills one is expected to learn during their postgraduate course and evaluate these skills as part of the final exam.

REFERENCES

1. Sardana DK. In India, doctors are now NEET-coached graduates who haven't dealt with actual patients [Internet]. ThePrint. 2022. [cited 2022 Aug 31]. Available from: https://theprint.in/opinion/in-india-doctors-are-now-neet-coached-graduates-who-havent-dealt-with-actual-patients/1094401
2. Flangan B, Nestel D, Joseph M. Making patient safety the focus: crisis resource management in the undergraduate curriculum. Med Educ 2004;38(1):56–66. DOI: 10.1111/j.1365-2923.2004.01701.x
3. Maran NJ, Glavin RJ. Low-to high-fidelity simulation—a continuum of medical education? Med Edu 2003;37(1):22–28. DOI: 10.1046/j.1365-2923.37.s1.9.x
4. Radhakrishnan B, Katikar MD, Myatra SN, et al. Importance of non-technical skills in anaesthesia education. Indian J Anaesth 2022;66(1):64–69. DOI: 10.4103/ija.ija_1097_21
5. Moll-Khosrawi P, Kamphausen A, Hampe W, et al. Anaesthesiology students' non-technical skills: development and evaluation of a behavioural marker system for students (AS-NTS). BMC Med Educ 2019;19(1):205. DOI: 10.1186/s12909-019-1609-8
6. Flin R, Patey R, Glavin R, et al. Anaesthetists' non-technical skills. Br J Anaesth 2010;105(1):38–44. DOI: 10.1093/bja/aeq134

7. Laurencin CT, McClinton A. Medical surprise anticipation and recognition capability: a new concept for better health care. NAM Perspect 2019;6(9):869–873. DOI: 10.31478/201908d

8. Zendejas B, Brydges R, Wang AT, et al. Patient outcomes in simulation-based medical education: a systematic review. J Gen Intern Med 2013;28(8):1078–1089. DOI: 10.1007/s11606-012-2264-5

9. Kim J, Park JH, Shin S. Effectiveness of simulation-based nursing education depending on fidelity: a meta-analysis. BMC Med Educ 2016;16(1):1–8. DOI: 10.1186/s12909-016-0672-7

10. Jabaay MJ, Marotta DA, Aita SL, et al. Medical simulation-based learning outcomes in pre-clinical medical education. Cureus 2020;12(12):e11875. DOI: 10.7759/cureus.11875