

Original Article



Whole task simulation in surgical training: A hybrid method of teaching undergraduate medical students

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Abstract

Background: The current Competency-Based Medical Education (CBME) curriculum practiced in India accentuates that medical graduates must demonstrate competency in safely diagnosing, investigating, and managing clinical presentations across both community and secondary care settings. Therefore, there is a need for more hybrid teaching methods that simulate real situations. This approach will help newly qualified doctors gain confidence and prepare them for the future. We used the whole task simulation method to teach them one of the most common surgical problems i.e., breast cancer along with communication skills, professionalism, Interprofessional teamwork, asepsis, and safe surgery practices.

Methods: The study enrolled 20 final-year MBBS students through purposeful sampling. Following classroom-based teaching on a Breast case, a simulated scenario was given, based on SECO (The Safe and Effective Clinical Outcome) design, and was modified with the addition of a simulated operating room setup. History taking, examination, ordering investigations and interpreting them, pre-operative counseling and consent and operation theatre scenario was done using standardized patient and mannequins. Pre- and post-simulation survey was conducted. Quantitative data were collected through Google Forms to assess their conceptual knowledge and qualitative data by Focused group discussions.

Results: Students preferred a shift to this hybrid method of learning in a simulated environment over classical classroom-based teaching. They all felt that getting involved in a real-life situation helps in understanding surgical management better. They also understood the concept of teamwork and effective communication. *"I feel it's the best way to learn clinical medicine. No amount of literature could ever replace the knowledge we get from being in the scenario"*, was one of the responses given by the participants.

Conclusion: Integration of surgical simulated clinics along with the operation room (OR) set up into the undergraduate curriculum could facilitate the acquisition of clinical skills actively and interactively. Such a hybrid method of teaching is an effective tool for teaching communication skills, professionalism, interprofessional teamwork along clinical skills.

Introduction

The undergraduate medical curriculum has undergone many changes over time. In spite of these changes, the majority of the newly qualified doctors feel unprepared to confront the patients in their clinical practice.¹ This is due to a lack of clinical experience, mainly due to the limited opportunities to develop skills in clinical diagnosis or the management of patient problems in undergraduate learning. The present Competency-Based Medical Education (CBME) curriculum in India states that medical graduates must show competency in safely diagnosing, investigating, and managing clinical presentations across both community and secondary care settings. Hence

there is a need for more hybrid method of teaching them in an almost real situation to make them more confident newly qualified doctors of the future. We used the Whole Task Simulation method to teach them the competencies related to breast cancer along with communication skills, professionalism, Interprofessional teamwork, asepsis, and safe surgery practices. In this study, we aimed to assess the role of Whole task simulation in teaching breast clinical cases for undergraduate students.

Materials and Methods

The study enrolled 20 final-year MBBS students in the surgical unit through purposeful sampling. Following a

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large group teaching on breast cancer, the students were briefed on how to take informed consent, and how to break bad news using SPIKES protocol.² They were taken to the operation room (OR) and asked to observe a surgery being conducted (intubation of a patient, the scrubbing techniques, draping techniques, and announcement of WHO Safe Surgery checklist) along with a description of the various important surgical steps.

After a week, following a pre-test, students were taken to the skill lab and a simulated scenario of a breast cancer patient was created, based on SECO (The Safe and Effective Clinical Outcome) design³ and simulated OR setup in addition to it. Students were divided into teams of 4-5 and they played the roles of the inter-professional (IP) team (Surgeons, anaesthetist, physician, nurses, and technicians), while Observer 1 acted the role of the simulated patient and Observer 2 helped in a debriefing session. Observers were surgeons involved in this study. This whole task session was conducted in 2 sessions, where each session had 10 students.

Students were asked to take a history from a simulated patient with a breast lump. The examination of the lump took place on task trainers. Once they arrived at a diagnosis, they were asked to order investigations and interpret the reports provided by the Facilitator. The students were then asked to break the news of breast cancer to the patient using the SPIKES protocol. The Simulated patient was then prepared for surgery by taking an informed consent. The students were then asked to form the OR team where they took roles of surgeon, anesthetist, nurse, and technicians. They did the preoperative workup, shifted the patient, scrubbed in for the case, painted and draped the patient, and also read the WHO Safe Surgery Checklist (Figure 1). They were allowed to ask the Facilitator in case of any difficulties

throughout the task. Communication skills like history taking, informed consent, and breaking bad news were assessed by the observers. The learning objectives were based on the competencies addressed as per the CBME curriculum (Box 1).

Following a debrief session, a post-test was given. Quantitative data, pre-and post-test, was collected through Google form questionnaires using a 5-point Likert scale (ranging from strongly agree to strongly disagree) (Box 2), which assessed the students' conceptual knowledge and was analyzed by paired *t* test. Qualitative data (Box 3) was collected by focused group discussion. The interview was then transcribed and repetitive units were removed. The transcript was read by both the authors and meaning units (codes) were identified. These were then grouped to get the major themes like teamwork (interprofessional teamwork in diagnosing, in OR), teaching methods (didactic versus active learning, best part), and communication (breaking bad news, informed consent, learning points).

Results

This whole task activity tested all their domains i.e., knowledge, attitude, and communication along with an emphasis on teamwork and professionalism. There was a significant improvement in their confidence across all domains. Initially, students seemed to be confident concerning history taking and examination of a patient with a breast lump, however, their confidence level dropped in ordering and interpreting investigations, Counselling the patient, obtaining informed consent, asepsis in the OR, and teamwork in the OR. Significant improvement was noted among all the domains (*P* value < 0.0001) (Figure 2).



Figure 1. Steps involved in the Whole task Simulation

Box 1. Competencies addressed in the study

1. Clinical features, Investigations, and principles of treatment of benign and malignant tumors of the breast.
2. The correct technique to palpate the breast for breast swelling in a mannequin or equivalent.
3. Communicate the results of surgical investigations
4. Counsel the patient with malignant conditions of the breast.
5. The techniques of asepsis and suturing in a simulated environment.
6. To obtain informed consent in a simulated environment
7. Professionalism and empathy to the patient undergoing General Surgery
8. Principles of Preoperative Assessment.
9. Principles of Safe General Surgery

Box 2. Pre- and Post-test questionnaire –5-point Likert scale

1. I am confident in taking the history of a patient with a breast lump.
2. I am confident in examining a patient with a breast lump.
3. I am confident in ordering appropriate investigations for a patient with carcinoma breast.
4. I am confident in interpreting investigations of a patient with carcinoma breast.
5. I am aware of and understand the basis of asepsis in the OR.
6. I know the Safe Surgery checklist.
7. I know the SPIKES protocol of communication.
8. I am confident in breaking the news of breast cancer to the patient.
9. I am aware of the teamwork in the OR.

Box 3. Questions in debriefing and feedback

1. Do you prefer to learn in a simulated clinic environment or a classroom-based tutorial on the same subject matter?
2. What do you think is lacking in our regular teaching methods?
3. How did it feel to learn in a simulated clinic environment?
4. "The top priority in my education is to prepare me to pass my final exams or to become a competent junior doctor". What is your opinion?
5. Does getting involved in a real-life situation help you understand the surgical management of the patient better?
6. Describe your experience in a few words or sentences

Preference of learning methods

Students preferred a shift to this hybrid method of learning in a simulated environment over classical classroom-based teaching.

Responses

"I feel it's the best way to learn clinical medicine."

"I would prefer learning clinical subjects in this hybrid method i.e., lecture followed by simulated scenario, which teaches us to use our theoretical knowledge in real life situations."

"A more hands-on experience surely helps understand the procedure and steps more than a normal lecture session."

Real-life scenarios in learning

Students felt that getting involved in a real-life situation helps in understanding surgical management better and it would be safe too.

Responses

"It was almost like a real-life scenario wherein we have to have a clear idea as to how to proceed with the patient."

"Involvement is the best way to learn patient management. No amount of textbook literature can

replace the knowledge garnered from being at the scene."
"I feel it's the best way to learn clinical medicine. No amount of literature could ever replace the knowledge we get from being in the scenario."

Communication skills

Communication skills cannot be learned through books, which newly qualified junior doctors usually lack. Hence counselling and informed consent sessions were very helpful for them. SPIKES protocol in breaking bad news was taught to them and they used it in breaking the news of breast cancer to the simulated patient.

Response

"I never thought it would be difficult to break the news of malignancy to a patient. The patient's mindset in accepting it would be difficult. Knowing SPIKES protocol and using it in this was very helpful and I would use this in the future to counsel the patient."

Priority of learning

When students were asked about their priority in medical education, whether passing an exam or becoming a competent doctor, most of them chose to become competent doctors.

Responses

"Passing the exam is important, but at the end of the day, being a competent doctor is what is of utmost importance. Such simulated sessions help in making us confident in handling things."

"Definitely to become a competent doctor, if we understand the subject better, we'll pass the exams too."

"Whole task helps us become competent doctors, rather than focus on helping us pass exams."

Overall experience

Students enjoyed these sessions while learning the subject. Clinical skills, communication skills, Asepsis in the OR, and interprofessional teamwork were emphasized throughout the session. Students liked the communication skills and OR scenario the most. The concept of teamwork in the pre-anesthetic workup and also in the OR was well appreciated.

Responses

"I was surprised by the number of small things that had to be given attention to. I had to be aware of every part of my body from head to toe when I was in the surgical field. Your entire body and mind...super concentrated on the area you are operating, that's what I felt like."

"Today's class was a very good learning experience; it was interactive and active learning. The role-play session with the simulated patient helped change the mindset of how our thought process should be while

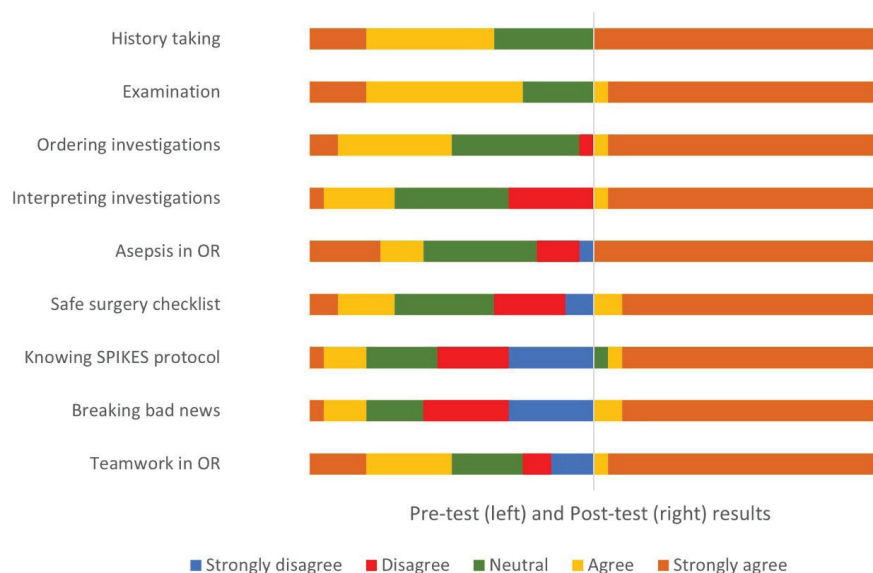


Figure 2. Pre- and Post-test results

learning the topic and how we are going to apply the knowledge in clinical practice. The emphasis on the importance of communication skills was helpful indeed. The simulation class of things to be followed in OT was useful in understanding the importance of how much precautions are to be followed even for the smallest things and the importance.”

“I liked how all of us could be actively involved in the case, starting from taking history to post-operative considerations. Since we were a part of it actively, it was easier to understand and I’ll remember it by heart from now. Furthermore, I liked how we learned how to coordinate and work as a team with colleagues.”

Discussion

CBME curriculum has been introduced in medical education in India, which states that medical graduates must show competency in safely diagnosing, investigating, and managing clinical presentations. This focuses on integrated learning rather than separating clinical knowledge, skills, professionalism, and communication.⁴ However, to have this skill training on the patients would not be safe. Simulated clinics, along with OR set up provides a safe environment for medical undergraduates in learning clinical and communication skills. This makes the medical undergraduate program more interesting and helps in providing more efficient and confident newly qualified doctors to society.

SECO clinics address safe clinical practice in a supervised environment as an objective.³ In this simulation design, students are encouraged to take clinical responsibility for patients by combining their theoretical knowledge and clinical skills in the management of the patient, safely and effectively. Hence, we based our simulation on the SECO design and also improvised it with an additional

simulation in an operating room setup.

Breast cancer is a leading cancer among Indian women with a mortality rate of 10.6%⁵ and it is the most common case presented in the surgical outpatient department. Hence, we chose the Breast case for our Whole task simulation.

Certain studies showed that classroom-based/textbook knowledge followed by Simulated-based clinical learning was more effective in gaining knowledge and clinical skills, rather than only simulation-based learning.⁶ Hence, we followed a hybrid method which included both classroom-based teaching followed by simulation-based teaching on the same topics. We found that students were more active and involved in the latter. Simulation-based clinics and OR setups provide intrinsic motivation for learning by allowing students to recognize the importance of preparing for clinical practice in addition to passing examinations. Many studies have found that such intrinsic motivation has improved learning outcomes, quality of care, and doctor-patient relationships and has reduced physician burnout and job dissatisfaction.^{6,7} Students also felt that learning through realistic clinical scenarios in a ‘safe’ environment is good for improving their clinical and communication skills.^{6,8}

Good communication skills are very important in medical practice, which helps in building good patient-doctor relationships. However, these skills were not taught to the medical graduates in our traditional teaching. CBME curriculum focuses on teaching communication skills to undergraduates. However, this cannot be taught by didactic lectures. This can be achieved using simulated patients or role-play with colleagues.⁹ Communication skills like breaking the news of cancer to the patient using SPIKES protocol, counseling, and obtaining informed consent were practiced on a simulated patient, which

made the students more confident in talking to the real patients.

They enjoyed the simulated OR setup the most and tasks like pre-anesthetic workup, scrubbing and gowning, painting, and draping the patient. Meanwhile, they understood the importance of Interprofessional teamwork in the management of a patient.

The students in our study preferred such active learning in a small group simulated environment which has helped them to improve their skills compared to the traditional clinical education, seen in other studies too.^{6,10} It is seen that such sessions improve students' clinical knowledge, and communication skills and also boost their confidence in dealing with surgical emergencies.

The limitation of our study is that the number of study group students is less and it is a single institution study.

Conclusion

Integration of surgical simulated clinics along with OR setup into the undergraduate curriculum could facilitate the acquisition of clinical skills actively and interactively. Such a hybrid method of teaching is an effective tool for teaching communication skills, professionalism, interprofessional teamwork, and safe surgical practice and emphasizes the point of a collaborative approach to a patient. This would help the undergraduates be more confident in their clinical practice.

Authors' Contribution

Conceptualization: Caren D'Souza, Supriya Pinto.

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Competing Interests

The authors declare no conflict of interests.

Ethical Approval

This study was approved by the Institutional Ethical Committee, KS Hegde Medical Academy, Mangalore, Karnataka ((INST/EC/

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