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Original Research Article

Impact of simulation-based-teaching in obstetrics and gynecology in under-graduate medical education

Satwant Kaur, Beena Mahaur*, Tanya Kumar, Ankit Aneja

Department of Obstetrics and Gynaecology, Adesh Medical College and Hospital, KKR, Mohri, Shahbad, Haryana, India

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***Correspondence:**
Dr. Beena Mahaur,
E-mail: beenamahaur@yahoo.com

ABSTRACT

Background: Simulation based teaching (SBT) is an evolving teaching-learning method (TLM) that can enhance skill acquisition among students while providing multiple practice sessions, before on-patient implementation helping to improve confidence and competency among medical students.
Methods: The study was conducted among 150 students of Phase II MBBS students of Adesh medical college and hospital, KKR, Haryana, from April 2022 to October 2022 on batches of 30 students each during their clinical postings of 4 weeks in the OBG department. They were further divided into batches of 10, and given didactic lecture on the selected topic. Following which, the facilitators demonstrated the skill. The students were allowed to practice individually. There doubts were cleared. An OSCE evaluation of the skill was made, followed by a debriefing session. A feedback form was then filled by both students and facilitators to assess impact of SBT.
Results: Among the 150 students of phase II MBBS students, 146 responses were received. Both the medical students and the facilitators showed high levels of satisfaction with SBT. About 60.27% (88) students had a good overall experience with this new TLM.
Conclusions: SBT improves retention as well as understanding of the concept. The teachers witnessed improved confidence and enhanced overall performance. The current study concludes that SBT is a highly effective tool and should be firmly inculcated in medical education.

Keywords: SBT, TLM, Medical education

INTRODUCTION

Simulation is a generic term that refers to an artificial representation of a real-world process to achieve educational goals through experimental learning. Once Gaba defined simulation as "a technique-not a technology-to replace or amplify real experiences that evoke or replicate substantial aspects of the real world in fully interactive manner".[1] Maran and Galvin defined simulation as "an educational technique that allows interactive, ant at times immersive, activity by recreating a part of clinical experience without exposing patient to associated risks. Simulation training provides students skills and repetition prior to clinical practice. Skill assessment with simulation is a viable way for students to learn. If this will be developed as standardized learning, patient safety will improve.[2] As technology continues to improve, simulation-based teaching in medical education will become more and more popular and accessible. That is why it is also integrated in obstetrics and gynecology for teaching recently to reduce consequential errors. The role of obstetric and gynecologic simulation also plays a key role in both outcomes-based as well as competency-based medical education.

Despite its recent rise in popularity, however, simulation teaching is not new to medical education. Simulators were initially created for flight training for pilots in the 1920s, and the ability to reproduce clinical situations has been utilized in obstetric and gynecologic education. Simulations used in medical training were used in the 1960s with standardized patients and mannequins.[3]

Debriefing is necessary for the learning experience for students. Successful debriefing tends to follow a similar set of rules that creates a safe learning environment with a clear set of rules.

Debriefing can focus on cognitive process involved in the recognition of the problem and implementation of the management guidelines and at technical level at which the ability of learner to apply rules and appropriate responses in stressful situation is evaluated.[4] Debriefing also allows the facilitator to talk through clinical reasoning. Errors made during the simulation, provide the opportunity for the facilitator to correct and provide an explanation and through evaluation.

This is an educational research project with the aim to evaluate the effectiveness of SBT as a TLM for undergraduate medical students and to implement it routinely as a clinical teaching, if found effective in country like India, where to establish simulation lab is big challenge.

Aim and objectives

SBT in IUCD insertion and removal and antenatal abdominal examination on simulators, to evaluate the satisfaction of students and faculty on this simulation-based teaching technique.

METHODS

Study design

This was the prospective observational study, conducted for six months at tertiary care center in the department of obstetrics and gynaecology at Adesh medical college and hospital, KKR Mohri, Haryana after obtaining ethical clearance.

Study participants

All 150 students of phase II MBBS, batch 2019 posted in department of were included in this study. The students were posted in obstretrics and gynaecology department on rotational basis in batches of thirty students for four weeks. Five faculty members who consented as facilitators were available for the study were included.

The simulation scenario took place in the skill lab in obstetrics and gynaecology department on phase II MBBS (Batch 2019) students posted in OBG from April 2022 to October 2022.

The students first received didactic lectures regarding the topics selected for simulation-based learning CuT insertion and removal and antenatal abdominal examination. The batch of 30 students further divided into three batches, comprising 10 students in each batch.

On the day of the session, the facilitators did pre-briefing related to the topics where they demonstrated the students the procedural skill on a simulator. Thereafter, the students allowed to practice the procedural skill on their own, individually in the presence of a facilitator. The student's queries resolved and they allowed to practice till they master the skill. Each student assessed individually by facilitators.

This session followed by debriefing where the students and facilitators sat together to reflect on the actions taken during the session. Then a take home message given by facilitators to the students.

Students then asked to fill a feedback form to assess simulation as a TLM and also to evaluate the satisfaction of the students and faculty towards simulation-based teaching in OBG.

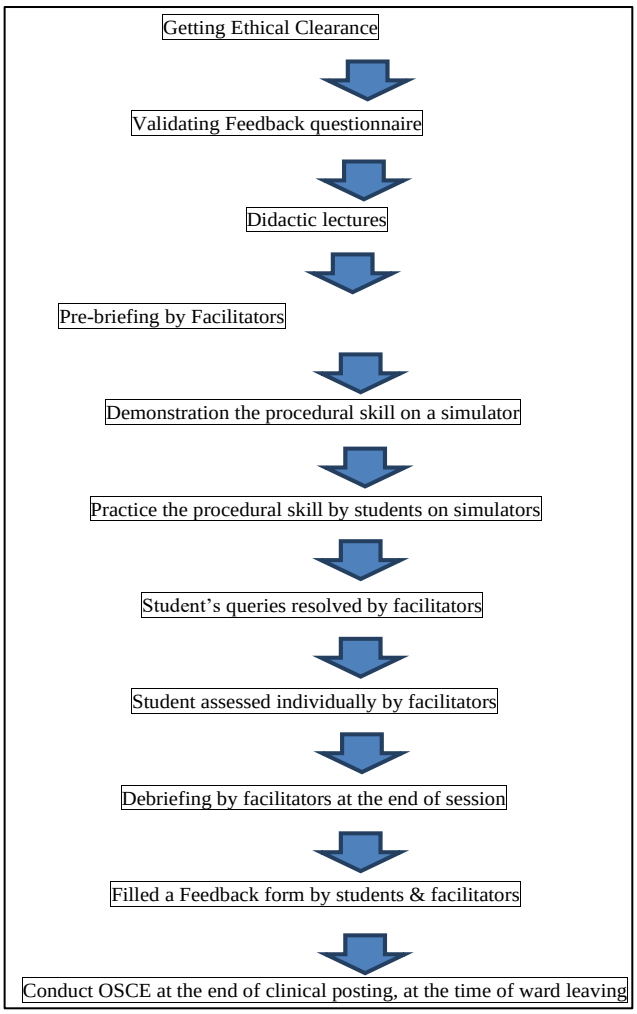

Figure 1: Study design.

Assessment done at the end of clinical posting by OSCE method at the time of ward leaving test.

Simple Statistical methods like mean, percentage were utilized to analyze results.

Implications

Short term: 1. Improve learner's skill on simulator, 2. Increase the confidence, 3. Satisfaction level of learner, 4. Increase the satisfaction level of faculty and 5. Faculty trained in SBT.

Intermediate: 1. Increase in confidence of learner will improve his practice in real interactions with patients so he will be effective practitioner and 2. Patient safety will improve.

Long term: 1. Improved patient safety and outcome; so overall better health care system and 2. Reduction in maternal mortality rate.

RESULTS

The study was conducted among one hundred and fifty medical students of MBBS phase II of Adesh medical college during their clinical posting in the obstetrics and gynaecology department from the April 2022 to October 2022.

The feedback forms were handed over to all students and facilitators at the end of completion of the posting of all 5 batches. Of these 146 responses were received, implying a response rate of 97.33%. The feedback forms registered great satisfaction with SBT as a TLM.

All the five facilitators also expressed great satisfaction in their feedback forms that SBT is a new, more easy for teaching and it improves confidence and skill of learners.

The 60.27% (88) students felt that they had good overall experience with SBT as part of OBG clinical postings.

Table 1 Demographic details of students.

Baseline characteristics	N (%)
Male	84 (56)
Female	66 (44)
Age (in years)	22-25
Urban area	93 (62)
Rural	57 (38)

Out of 150 students 84 (56%) were males and 66 (44%) were females of age groups 22-25 years, 93 (62%) students belong to urban and 57 (38%) belong to rural area.

Some suggestions received from students are as follows: smaller teaching groups, a greater number of SBT type of teaching sessions, a greater number of mannequins and more procedures should be taught via SBT.

Things that learners most admired by this experience are: Enhanced understanding, longer retention of concepts, allows applications of practical knowledge and helps improve communication skills

Table 2: Feedback from students.

Parameters	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
SBT method is interesting clinical TLM	61.64% (90)	29.45% (43)	8.21% (12)	0.68% (1)	0
SBT improves learning of clinical skills	59.58% (87)	28.76% (42)	10.27% (15)	0.68% (1)	0.68% (1)
Pre-briefing was relevant to SBT skills	65.75% (96)	20.54% (30)	12.32% (18)	0.68% (1)	0.68% (1)
Adequate time was given to practice on mannequins	49.31% (72)	24.65% (36)	19.17% (28)	6.16% (9)	0.68% (1)
SBT is a better method for developing clinical skills than traditional method	62.32% (91)	21.23% (31)	14.38% (21)	2.05% (3)	0
SBT motivates learner to achieve objectives in better way	63.01% (92)	21.91% (32)	13.69% (20)	0.68% (1)	0.68% (1)
Facilitator helps in performing skills on simulator	57.53% (84)	21.91% (32)	18.49% (27)	2.05% (3)	0
SBT motivates learner to practice many times	58.90% (86)	22.60% (33)	16.43% (24)	1.36% (2)	0.68% (1)
SBT improves team work and communication skills	57.53% (84)	21.91% (32)	18.49% (27)	1.36% (2)	0.68% (1)
SBT helps in understanding technique in a better way	54.79% (80)	26.02% (38)	15.06% (22)	2.73% (3)	1.36% (2)
SBT helps in better retention of knowledge	58.21% (85)	26.71% (39)	13.69% (20)	0.68% (1)	0.68% (1)

Continued.

Parameters	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
More clinical procedures should involve SBT	57.53% (84)	28.08% (41)	13.69% (20)	0.68% (1)	0
SBT helps in better clinical exam of actual patient	58.21% (85)	23.97% (35)	15.75% (23)	1.36% (2)	0.68% (1)
Debriefing helps clearing learner's doubts	63.01% (92)	21.23% (31)	15.06% (22)	0.68% (1)	0
SBT included in regular curriculum	58.90% (86)	26.02% (38)	12.32% (18)	2.73% (3)	0

Table 3: Feedback of 5 faculty members who were involved in teaching the students via SBT.

Parameters	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Pre-briefing is necessary part of SBT	100% (5)	0	0	0	0
Facilitator's role is mainly monitoring the learner	0	40% (2)	40% (2)	20% (1)	0
Facilitator helps in bridging learning gaps	80 % (4)	20% (1)	0	0	0
SBT is time consuming TLM	0	40% (2)	20% (1)	40% (2)	0
More number of facilitators required for SBT	20% (1)	60% (3)	0	20% (1)	0
Designing of assessment method (OSCE) requires more preparation	40% (2)	40% (2)	20% (1)	0	0
Learning improves learner's skill and focus on procedure	100% (5)	0	0	0	0
SBT increased facilitator and learner interaction	60% (3)	20% (1)	20% (1)	0	0
SBT should be included in routine curriculum	60 % (3)	40% (2)	0	0	0
SBT promotes motivation of learners	60% (3)	40% (2)	0	0	0
SBT is more active and problem solving TLM	60% (3)	20% (1)	20% (1)	0	0
SBT helps in understanding of technique in a more effective and easy way	60% (3)	20% (1)	20% (1)	0	0
Debriefing by facilitators was able to clear the doubts of the learners	60% (3)	40% (2)	0	0	0

Some suggestions received by the facilitators are as follows: 1) Small groups should be taught at a time, 2) Each learner's doubt should be properly dealt with at the same time and 3) Number of facilitators should be more.

They were also expected to express their summarized views on SBT. While some facilitators felt that it is an easy learning tool that helps improve academic performance. Others appreciated the ability of SBT to permit learners to practice multiple times and gain confidence.

According to the faculty SBT demonstrates innovation and creativity by enhancing overall interest in learning while simultaneously clearing doubts of the students. Also, SBT helps improve communication and behavioral skills of the students as they learn with their peers.

DISCUSSION

The current study tried to establish a relationship between simulation as an educational tool and its reciprocation in overall student performance as well as understanding. Healthcare education is different from its other counterparts as its objective is to produce professionals that have the ability to apply theoretical knowledge in order to provide service. This is where the need for SBT fits in.[5] It allows clinical skill acquisition through practice rather than a novice type of teaching. It permits the learner to make mistakes and rectify them at the same time without the apprehension of causing any harm to its patient.[6]

In a study conducted on SBT by Gorantla et al among 85 medical and mid-wife students, the participants had reported to have achieved great hands-on experience along with no time constraint. Similarly, the findings of the present study have shown greater satisfaction and confidence among the learners; which also reflected in the results of their assessment post their clinical postings.[7]

In another study conducted by Riaz and et al among 150 students in the fifth year of their MD in Bahrain over a period of six months. They were dived in two groups where group 1 included OBG students, group 2 included internal medicine students. The mean percentage of responses of "strongly agree" and "agree" was quite high, about 98% in group 1 and 96% in group 2; which was slightly higher for OBG pertaining to greater hands-on practical skill required in it. The satisfaction scores of groups one was higher than those from group two for all statements.[8] SBT allows practice of skills that otherwise would not be accessible to all students at all times due to nature of individual case or concerns with patient's privacy/discomfort associated with the specialty.

SBT appreciably compliments clinical understanding and is a very effective mode of TLM.[9]

Employing medical simulation techniques can help move medical training from old ‘’see one, do one, teach one” method into a “see one, practice many, do one” model of success.[10] SBT has proved to reduce risks to both patients and learners.[11,12] It has also proved to be effective in both undergraduate and postgraduate medical education as well as faculty development.[13,14] The simulated patients, simulated environment and integrated simulators have been also used effectively to assess and evaluate clinical skills.[15,16]

The use of innovative teaching methods became a necessity for the development of medical education in the last years because of bad performance of most of the medical graduates especially in clinical skills performance and application of knowledge and problem solving in critical situations.[17]

Limitations

Simulation based TLM is an excellent form of TLM that has revolutionized medical education in India. There are many obstacles faced by using simulation in medical education in India, which has prevented widespread use of this TLM. Lack of knowledge and awareness, due to this we mostly see that simulators cannot be utilized to the fullest. Other challenges are mindset of teaching faculty as well as availability of simulation equipment due high cost and maintenance.

CONCLUSION

SBT is an effective teaching-learning tool providing great clinical competence, along with an opportunity to learn skills that were otherwise not accessible to the students due to emergent and privacy-driven nature of obstetrics and gynecology as a specialty. SBT also helps in bridging the gap between theory and practical that increases practical skills and knowledge without causing harm to patients in medical profession. The need and importance of SBT was again highlighted and tested brutally in the backdrop of COVID-19 that had greatly narrowed down interaction between medical students and patients. SBT offers useful opportunities to reduce risk to patients and learners, improve learning, competence and confidence, retention as well as understanding of concepts in learners. It also increases patient safety and reduce health costs in the long run. The facilitators also feel high levels of satisfaction in students’ confidence and overall performance. This will produce better clinicians that shall provide better patient care. Therefore, the present study emphasizes the need to incorporate SBT as a regular part of medical curriculum.

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