

Impact of Simulation-Based Teaching for Undergraduate Medical Education in Community Medicine

Gajendra Kumar Gupta¹, Geeta Gupta², Deepika Agrawal¹, Anupama Singh³, Neha Jetli⁴, Syed Hasan Nawaz Zaidi⁵

¹Professor, Department of Community Medicine, Santosh Medical College, Santosh Deemed to Be University, Ghaziabad, Uttar Pradesh, India.

²Professor, Department of Microbiology, Santosh Medical College, Santosh Deemed to Be University, Ghaziabad, Uttar Pradesh, India. ³Associate Professor, Department of Community Medicine, Santosh Medical College, Santosh Deemed to Be University, Ghaziabad, Uttar Pradesh, India. ⁴Assistant Professor, Department of Community Medicine, Santosh Medical College, Santosh Deemed to Be University, Ghaziabad, Uttar Pradesh, India. ⁵Professor and Head, Department of Community Medicine, Santosh Medical College, Santosh Deemed to Be University, Ghaziabad, Uttar Pradesh, India

Abstract

Background: Simulation, including role-play and video-assisted teaching and learning technology, has become a prominent innovation in medical education. The objective is to assess the effectiveness and perceptions of students and faculty about the role-play as a teaching-learning method in community medicine. **Material and Methods:** An interventional mixed type, both quantitative and qualitative study was conducted. 105 MBBS phase I students and 9 faculty members of community medicine participated. Students were assessed by using predesigned, validated, structured MCQs, and feedback from students and faculty was taken. **Results:** 29.5% students secured 71%-80% marks, 27.6% secured 81%-90%, 23.8% secured >90% marks. 51 students agree, and 43 strongly agree, that role-play is more beneficial. 66.6% of faculty strongly agree, and 33.3% agree that role-play teaching helps grasp complex concepts more effectively. **Conclusion:** Role play use as a teaching and learning tool in competency-based medical education has a positive impact on communication, knowledge, and IEC in medical students' teaching.

Keywords: Simulation Based Teaching (SBT), Role Play, Teaching-learning-methods, Undergraduate Medical teaching, CBME.

Received: 20 December 2025

Revised: 01 January 2026

Accepted: 16 January 2026

Published: 26 February 2026

INTRODUCTION

Simulation has become a prominent innovation in medical education in recent years. It is creating a paradigm shift towards experimental "hands-on learning rather than didactic lecture-based teaching". It allows learners to practice clinical skills in a safe, controlled environment, providing realistic scenarios that mimic real-life situations. Simulation-Based Teaching (SBT) encompasses a range of modalities, including virtual reality, high-fidelity models, and standardised patients. This part explores the advantages, challenges, and evidence supporting SBT's efficacy in enhancing experimental skills, teamwork, and decision-making among medical students.^[1] SBT also allows learners to practice repeatedly, receive immediate feedback, and develop confidence in their abilities.^[2]

Simulation-based training is a powerful educational tool that supports patient safety. Learners acquire knowledge in a safe, controlled environment, refine their skills, and develop communication and leadership skills, becoming more confident, competent, and successful professionals.^[3] This has led the General Medical Council to recommend that medical schools should use simulation technology in the education of undergraduate medical students.^[4]

Role-play activity is a teaching method in SBME, although it is underused, and yet it is an efficient teaching strategy in family and community medicine. A negative aspect of lecture-based learning is that students learn passively. The

student generally does not feel much interested in lectures owing to their monotonous character and one-way communication.^[5] Role-play was valued by students for acquiring communication skills, even though some had prior unhelpful experiences. Guidelines for effective role-play include adequate preparation, alignment of roles and tasks with the level of practice, structured feedback guidelines, and acknowledgement of the importance of social interactions for learning.^[6]

This study planned to see the impact of Simulation-Based Teaching for undergraduate medical education in Community Medicine, with the following objectives: 1. To assess the effectiveness of role-play as teaching learning method in community medicine, 2. To determine students' perceptions of role-play as a teaching-learning method in community medicine, and 3. To assess the perception of faculty about the role-play as teaching learning method in community medicine.

Address for correspondence: Dr. Gajendra Kumar Gupta, Professor, Department of Community Medicine, Santosh Medical College, Santosh Deemed to Be University, Ghaziabad, Uttar Pradesh, India. E-mail: gajendrakgupta1@santosh.ac.in

DOI:
10.21276/amit.2026.v13.i1.382

How to cite this article: Gupta GK, Gupta G, Agrawal D, Singh A, Jetli N, Zaidi SHN. Impact of Simulation-Based Teaching for Undergraduate Medical Education in Community Medicine. Acta Med Int. 2026;13(1):518-522.

MATERIALS AND METHODS

Study Design: An interventional study of mixed type, both qualitative and quantitative, was conducted in the Department of Community Medicine at a tertiary-level healthcare teaching institute at Ghaziabad between January and August 2024.

Study procedure: All MBBS Phase-I students who were willing to participate were included in the study, and informed consent was obtained from the participants. Students who were absent from any part of the session on the topic were excluded from the study. Role-play was used as a teaching tool for SBT of the competencies CM1.9 and CM1.10, covering Effective Communication skills in health and important aspects of the doctor-patient relationship, respectively. A module designed following the sensitisation of all the department faculty members for SBT using role-play as teaching learning tool for community medicine. A pre-designed, validated role-play module was used. All faculty of the community medicine department were sensitised to the module and involved in conducting the sessions. A two-hour session was conducted. After the session, students provided feedback on simulation-based medical education as a teaching and learning method. Quantitative data were collected to assess efficacy using a pre-designed, validated MCQ-based questionnaire via Google Forms. Qualitative data were collected regarding perceptions using a validated five-point Likert scale via Google Forms. Perceptions of faculty regarding simulation-based medical education as a teaching and learning method were collected using a validated five-point Likert scale via Google Forms.

Data Analysis: Data analysis was performed using STATA MP-17. Quantitative and Qualitative data are presented as frequencies and percentages for the questionnaire and Likert-scale responses to closed-ended questions. Five-point Likert scale, where 1 indicates “strongly disagree,” and 5 indicates “strongly agree”.

Ethics: Ethical clearance was obtained from the Institutional Ethical Committee.

RESULTS

A total of 105 MBBS phase I students participated in the study, which used role-play as a teaching-learning method.

Assessment of knowledge of the covered competencies was conducted using a Google Form questionnaire, and all 105 students submitted their responses. Feedback on perceptions of role-play was also collected via a Google Form questionnaire. Faculty and senior residents also completed feedback questionnaires regarding their perceptions. The results of the study were as follows:

[Table 1] shows the results of students' knowledge assessment after the session, which indicate that 29.5% of students secured marks between 71%-80%, 27.6% between 81%-90%, and 23.8% secured >90% marks through role-play as the teaching-learning methodology. 7.6% students secured marks between 51%-60%, 5.6% students secured between 61%-70% and <50% each.

[Table 2] indicates students' perceptions of role-play as a teaching and learning method. About 48.6% of students agree, and 41.0% strongly agree, that role-play helps retain information compared to the traditional method of teaching by lecture, etc. Whereas 8.6% of students remained neutral, only 1.9% strongly disagreed.

56.2% of students agree, and 43.8% strongly agree, that role-play enhances their understanding of complex topics. 7.6% of students remained neutral, and 1.9% showed a strongly disagree response.

45.7% of students agree, and 35.2% strongly agree, that they prefer courses that incorporate educational role-play as part of the curriculum. 17.1% of students remained neutral, and 1.9% showed a strongly disagree response. 46.7% of students agree, and 38.1% strongly agree that more educational role-play should be incorporated into teachers' modern teaching toolkit. Whereas 13.3% of students remained neutral, only 1.9% strongly disagreed.

32.3% of students agree, and 22.9% strongly agree, that they actively seek out role-play videos on the internet themselves to supplement their learning. Whereas 39.1% of students remained neutral, 3.8% disagreed, and only 1.9% strongly disagreed.

49.5% of students agree, and 33.3% strongly agree, that educational role-play helps them learn more effectively. Whereas 12.4% of students remained neutral, only 3.8% strongly disagreed, and 0.95% of students remained neutral.

51.4% students agree, and 37.1% students strongly agree that the use of educational role-play contributes to maintaining their interest and attention during the course. Whereas 8.6% of students remained neutral, 3.8% strongly disagreed, and only 0.95% disagreed.

Table 1: Students' performance showing Impact of Role-Play as TLM.

| Sl. No. | Percentage of Marks Obtained | No. of Students | Percentage of Students |
|---------|------------------------------|-----------------|------------------------|
| 1 | < 50 | 6 | 5.7 |
| 2 | 51 – 60 | 8 | 7.6 |
| 3 | 61 – 70 | 6 | 5.7 |
| 4 | 71 – 80 | 31 | 29.6 |
| 5 | 81 – 90 | 29 | 27.6 |
| 6 | > 90 | 25 | 23.8 |
| Total | | 105 | 100 |

Table 2: Students Perception on Role-Play as TLM

| Sl. No. | Question | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|---------|---|-------------------|----------|------------|------------|----------------|
| 1 | Educational role play help you retain information compared to traditional teaching method | 2 (1.9%) | - | 9 (8.6%) | 51 (48.6%) | 43 (41.0%) |
| 2 | Role play enhances understanding of complex topics | 2 (1.9%) | - | 8 (7.6%) | 59 (56.2%) | 46 (43.8%) |
| 3 | I prefer courses that incorporate educational role play as part of | 2 (1.9%) | - | 18 (17.1%) | 48 (45.7%) | 37 (35.2%) |

| | the curriculum | | | | | |
|---|--|----------|-----------|------------|------------|------------|
| 4 | More educational role play should be incorporated in modern teaching toolkit by the teachers | 2 (1.9%) | - | 14 (13.3%) | 49 (46.7%) | 40 (38.1%) |
| 5 | You actively seek out role play videos on the internet yourself to supplement your learning | 2 (1.9%) | 4 (3.8%) | 41 (39.1%) | 34 (32.3%) | 24 (22.9%) |
| 6 | I believe that educational role play helps me learn more effectively | 4 (3.8%) | 1 (0.95%) | 13 (12.4%) | 52 (49.5%) | 35 (33.3%) |
| 7 | Use of educational role play contribute to maintaining your interest and attention during the course | 2 (1.9%) | 1 (0.95%) | 9 (8.6%) | 54 (51.4%) | 39 (37.1%) |

Table 3: Faculty Perception on Role-Play as TLM

| Sl. No. | Question | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|---------|--|-------------------|----------|-----------|-----------|----------------|
| 1 | Educational role play help students grasp complex concepts more effectively than traditional lectures | - | - | - | 3 (33.3%) | 6 (66.7%) |
| 2 | Level of student engagement is more when educational role play is used as a teaching tool compared to traditional lectures | - | - | - | 5 (55.5%) | 4 (44.4%) |
| 3 | It is important to incorporate educational role play into modern teaching toolkit | - | - | - | 5 (55.5%) | 4 (44.4%) |
| 4 | Educational role plays support students' long-term retention of course material | - | - | - | 5 (55.5%) | 4 (44.4%) |
| 5 | Will you prefer to incorporate educational role play into your future courses | - | - | 1 (11.1%) | 4 (44.4%) | 4 (44.4%) |
| 6 | Are you confident in your ability to integrate educational role plays effectively into your teaching | - | - | 1 (11.1%) | 6 (66.7%) | 2 (22.2%) |
| 7 | Are educational role plays a valuable resource for faculty development | - | - | - | 4 (44.4%) | 5 (55.5%) |

[Table 3] depicts faculty perceptions of role-play as a teaching and learning method. A total of 9 faculty members, including one senior resident, participated in the study on role-play as teaching learning method. 66.7% of the faculty strongly agreed that educational role-play helps students grasp complex concepts more effectively than traditional lectures, whereas 33.3% agreed.

55.5% of faculty agree that student engagement is higher when educational role-play is used as a teaching tool compared to traditional lectures, and 44.4% strongly agree.

55.5% of faculty agree that it is important to incorporate educational role-play into the modern teaching toolkit, and 44.4% strongly agree.

55.5% of faculty agree that educational role-play supports students' long-term retention of course material, and 44.4% strongly agree.

44.4% agree, and 44.4% strongly agree that they will prefer to incorporate educational role-play into their future courses, and 11.1% faculty members remained neutral.

66.7% of the faculty agree, and 22.2% strongly agree that they are confident in their ability to integrate educational role-plays effectively into their teaching, whereas 11.1% of the faculty remain. 5% of faculty agree, and 44.4% strongly agree that student engagement is higher when educational role-play is used as a teaching tool compared to traditional lectures.

DISCUSSION

Role-play, as a simulation method of teaching and learning in the CBME curriculum, shifted away from simple didactic lectures, symposia, and seminar-based teaching and learning in community medicine. So, the department introduced role-play as a teaching and learning method for MBBS undergraduate students. Role-play is a method through which

the faculty and students can present a topic related to health promotion or disease prevention in the form of drama to the remaining students. Quantitative analysis of marks obtained post-session showed that 86.7% of students secured marks above 60%, and 13.3% secured marks below 60%. Similar results with performance improvement reported by Dechenla Tshering Bhutia 2018.^[7] [Table 1]

Students' perceptions of Role-play qualitative metrics indicated that it will help students retain information more effectively than the traditional TLM method. Similar results were also found in other studies by Nikendei C. et al. (2007) and H.M. Bosse et al. (2010).^[8,9]

The present study found that role-play enhances understanding of complex topics, as a simulated environment helps students understand clearly, even during difficult brainstorming sessions. J.N. Modi et al. (2016) also found that role-play can provide an opportunity for rehearsal, improvisation, and even the teaching of complex case scenarios.^[10]

According to our study, most students strongly agree and prefer courses that incorporate role-play as part of the curriculum. A similar survey of Jackson VA et al. (2011) also found positive perceptions of role-playing because it simulated life experiences during the training session.^[11]

Most of the students in the study strongly agreed and agreed that more educational role-play should be incorporated into teachers' modern teaching toolkit. Similar results were found by Bindu T Nair (2019).^[12] Stevenson and Sander (2002) found different results, with the majority of students having a negative perception of role play.^[13]

The present study results showed that most students were entrusted with internet searches for more role-play videos related to or that supplement their learning. Some students were not confident in discussing with teachers and other students. Using role-play from the internet also helps them develop confidence in their studies. Fifa Lestari et al. (2020) also reported that role-

playing techniques can improve students' speaking skills and pronunciation.^[14] The role-play method involves students taking on roles and having conversations with everyone who plays their role. In addition, the role-play method feels fun for students because they do not feel they are learning, but rather engage in dialogue as usual, as reported by R. Arham (2016).^[15]

The students' perception of learning through role-play methodology in the present study was found to be positive. Similar results were also reported in their research by Dechenla Tshering Bhutia 2018.^[7] A role-play session in their study showed that communication skills improved as students had the opportunity to participate in repeated role-plays. Such role-play sessions also improve students' performance scores, as the present study's results show, and similar results were also found by Dechenla Tshering Bhutia (2018).^[7]

Most students also found the role-play to be positive, as it helped maintain their interest and attention throughout the course. Sourya Acharya et al.'s 2014 results also showed that role-play increased students' confidence through repeated practice and rehearsals before final plays, and all the players took their roles seriously.^[16]

Perception of faculty [Table 3] also showed that educational role-play helps students in understanding complex concepts and also found that students remain engaged in teaching learning process from beginning to end, so learning becomes quite effective for students, which helps them to handle patients. Most of the faculty also agree that it's important to incorporate role-play into teaching competency to students, as it provides a real-world environment and improves communication skills. Similar results were also reported by Nikendei C. et al. (2007) and H.M. Bosse et al. (2010).^[8,9] Most of the faculty also agree that role-play helps in the long-term retention of course material, so they prefer incorporating educational role-play into their future teaching tools. Joyner B. and Young L. (2006) also reported similar results in their study.^[17]

Most of the faculty are confident in integrating educational role-plays effectively into their teaching tools and consider them a valuable resource for faculty development. Role-play, on its own, contributes to the development of knowledge and skills and is also part of broader communication for information, education, and community medicine teaching. Feedback and debriefing sessions also help further improve in future sessions.

CONCLUSION

This study has provided a practical foundation for the use of role play as an educational method within the broader context of simulation-based teaching and learning for undergraduate students in community medicine. Now is the time to incorporate role-play into the current medical education system as an effective tool for teaching and learning.

Role-play use as a teaching and learning tool in competency-based medical education has a positive impact on communication, knowledge, and IEC among medical students, as indicated by students' perceptions in this study.

In the present study, students suggested that more sessions are needed in the future for teaching other courses also. It also helps to produce a competent doctor with good communication skills and knowledge. Correct feedback and debriefing sessions, along with proper planning and content, with extra effort from teaching faculty and students, can make a significant change in the medical education field by using role-play as a teaching and learning tool. Introducing role-play enhances the realism of technical skill training and improves doctor-patient communication and relationships. Students do not seem overstrained when practicing clinical technical skills through role-plays.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

REFERENCES

- Al-Elq A. Simulation-based medical teaching and learning. *J Fam Community Med.* 2010;17(1):35.
- Gordon JA, Wilkerson WM, Shaffer DW, Armstrong EG. "Practicing" Medicine without Risk: Students' and Educators' Responses to High-fidelity Patient Simulation. *Acad Med.* 2001 May;76(5):469–72.
- Ziv A, Wolpe PR, Small SD, Glick S. Simulation-Based Medical Education: An Ethical Imperative. *Simul Healthc J Soc Simul Healthc.* 2006;1(4):252–6.
- outcomes-for-graduates-jul-15-1216_pdf-61408029.pdf [Internet]. [cited 2024 Jul 2]. Available from: https://www.gmc-uk.org/-/media/documents/outcomes-for-graduates-jul-15-1216_pdf-61408029.pdf
- Das S, Das A, Rai P, Kumar N. Case-based learning: Modern teaching tool meant for present curriculum: A behavioral analysis from faculties' perspective. *J Educ Health Promot.* 2021;10(1):372.
- Nestel D, Tierney T. Role-play for medical students learning about communication: Guidelines for maximising benefits. *BMC Med Educ.* 2007 Dec;7(1):3.
- Duchenla Tshering Bhutia. Role lay as a teaching Learning Tool to impart Communication Skills among UG medical students - Printed.pdf.
- Nikendei C, Kraus B, Schrauth M, Weyrich P, Zipfel S, Herzog W, et al. Integration of role-playing into technical skills training: a randomized controlled trial. *Med Teach.* 2007 Jan;29(9–10):956–60.
- Bosse HM, Nickel M, Huwendiek S, Jünger J, Schultz JH, Nikendei C. Peer role-play and standardised patients in communication training: a comparative study on the student perspective on acceptability, realism, and perceived effect. *BMC Med Educ.* 2010 Dec;10(1):27.
- Modi JN, Anshu, Chhatwal J, Gupta P, Singh T. Teaching and assessing communication skills in medical undergraduate training. *Indian Pediatr.* 2016 Jun;53(6):497–504.
- Jackson VA, Back AL. Teaching Communication Skills Using Role-Play: An Experience-Based Guide for Educators. *J Palliat Med.* 2011 Jun;14(6):775–80.
- Nair B. Role play – An effective tool to teach communication skills in pediatrics to medical undergraduates. *J Educ Health Promot.* 2019;8(1):18.
- Stevenson K, Sander P. Medical students are from Mars - business and psychology students are from Venus - University teachers are

- from Pluto? Med Teach. 2002 Jan;24(1):27–31.
14. Lestari F. AN ANALYSIS OF STUDENT SPEAKING SKILL USING ROLE PLAY METHOD. Proj Prof J Engl Educ. 2020 Jan 27;3(1):114
 15. R. Arham, Abdul Hakim Yassi, Burrhanudin Arafah. The Use of Role Play to Improve Teaching Speaking. Int J Scietif Res Pun. 2016;6(3):239-41.
 16. Acharya S, Shukla S, Acharya N, Vagha J, Vagha J. Role play and effective tool to teach clinical medicine. J Contemp Med Educ. 2014;2(2):91.
 17. Joyner B, Young L. Teaching medical students using role play: Twelve tips for successful role plays. Med Teach. 2006 Jan;28(3):225–9.