Journal of Carcinogenesis
Covering Genesis to Therapeutics

Journal of Carcinogenesis, ISSN: 1477-3163
2025; Vol 24: Issue 2s, https://carcinogenesis.com/

Role-Play as an Effective Teaching Tool in Medical Education: A Cross-Sectional Study Among Undergraduate Students

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ABSTRACT

Background: Effective communication is a cornerstone of medical practice, and role-play has emerged as an engaging method to enhance medical students' interpersonal and clinical skills. This study aimed to evaluate the effectiveness of role-play in improving knowledge and communication among undergraduate medical students.

Methods: A cross-sectional study was conducted among 50 second-year MBBS students at Madha Medical College, Chennai. After an interactive lecture on Empathy and autonomy students completed a pre-test (5 marks). A group of 10 students then performed a structured role-play on the same topic, followed by discussion and feedback. Subsequently, all students undertook a post-test with the same question. Data were analyzed using paired t-test in SPSS version 26. Additionally, students completed a structured questionnaire to assess their perceptions of the role-play session, with responses analyzed descriptively.

Results: The mean pre-test score was 54.28 ± 11.01, which significantly improved to 63.40 ± 10.56 in the post-test ($p < 0.05$). Questionnaire responses revealed that students perceived role-play as an enjoyable, interactive, and effective method that enhanced recall, improved understanding of concepts, and stimulated active participation compared to traditional lectures.

Conclusion: Role-play proved to be an effective teaching strategy for medical undergraduates, enhancing both knowledge retention and communication skills. It provides an engaging, student-centered approach that can complement conventional teaching methods in medical education.

Keywords: *Role-play, Medical education, Communication skills, Experiential learning, Undergraduate students*

How to Cite: Brundha M.P, Shrinivas V.C., Karthika Padmavathy, (20yy) Role-Play as an Effective Teaching Tool in Medical Education: A Cross-Sectional Study Among Undergraduate Students, *Journal of Carcinogenesis*, *Vol.24, No.2s*, 601-607

1. INTRODUCTION

The practice of medicine extends beyond diagnosis and treatment; it is fundamentally rooted in human interaction. The ability of a physician to communicate effectively with patients is as essential as clinical competence. In contemporary healthcare systems, where patients increasingly expect transparency, empathy, and involvement in decision-making, communication skills form the foundation for trust and patient empowerment. Effective communication improves treatment adherence, enhances patient satisfaction, and contributes to better health outcomes. Consequently, it is no longer sufficient for medical training to focus solely on theoretical knowledge or technical expertise(1). There is an urgent need to embed structured communication training into medical curricula to produce well-rounded physicians who can interact meaningfully with their patients.

Traditionally, medical education has been teacher-centered, relying heavily on didactic lectures and passive modes of knowledge delivery. While these approaches allow for the transmission of large amounts of information, they often fail to

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cultivate interpersonal skills or stimulate critical thinking. Over the past few decades, medical educators have advocated a paradigm shift towards student-centered learning, drawing inspiration from educational theories such as constructivism(2). Constructivist principles emphasize that learners actively build their knowledge base through experience, reflection, and interaction, rather than simply absorbing information. This shift has opened the door to innovative teaching methods, including problem-based learning, simulation, and experiential strategies such as role-play(3).

Role-play is one such dynamic technique that has gained recognition in health professions education(4).It is defined as an experiential learning strategy in which learners assume specific roles within a structured scenario. By enacting a clinical or interpersonal situation, students are exposed to realistic contexts that mimic professional challenges. Unlike traditional teaching approaches, role-play actively engages students in learning rather than relegating them to passive recipients of knowledge. The method encourages creativity, critical thinking, and empathy by allowing participants to step into the perspectives of both healthcare providers and patient(5).

The educational value of role-play lies in its flexibility and ability to serve multiple objectives. At its core, role-play fosters interaction and communication skills, but it also supports the acquisition of factual knowledge, refinement of technical competencies, and development of professional attitudes. For example, role-play can be used to simulate doctor–patient encounters, enabling students to practice history-taking, diagnostic reasoning, and counseling in a safe, controlled environment. This allows mistakes to be corrected without compromising patient safety. Furthermore, role-play nurtures empathy by encouraging learners to adopt the viewpoints of patients, thereby fostering cultural competence and sensitivity to diverse needs(6).

Different formats of role-play exist depending on the educational goal. In some instances, role-plays are fully scripted, with learners following predetermined dialogues. This approach ensures the inclusion of key teaching points but may limit spontaneity. In partially scripted role-plays, participants are given prompts or opening lines, allowing for improvisation while still retaining structure. Alternatively, learners may be assigned roles with detailed background information, requiring them to improvise responses as the scenario unfolds. This format simulates real-life unpredictability and encourages adaptability. Rotating roles among participants allows them to experience multiple perspectives, while observers can contribute feedback and insights during debriefing sessions. Importantly, the choice of role-play format should align with the intended learning outcomes, whether focused on knowledge acquisition, attitude formation, or skills development(7).

The literature supports role-play as an effective tool in medical education. Rumore in 2015 highlighted how role-play can be adapted to target specific objectives: when designed for knowledge acquisition, it encourages observation and reflection; when used to modify attitudes, loosely structured scenarios allow participants to experience emotions naturally; and when aimed at developing practical skills, repeated practice with constructive feedback is key. Nestel and Tierney (2007) further emphasized that role-play creates a safe environment where learners can experiment, make mistakes, and receive immediate feedback, thus bridging the gap between theoretical knowledge and clinical practice. Compared with traditional lectures, role-play has been shown to improve knowledge retention, stimulate engagement, and make learning more enjoyable(7).

Beyond cognitive benefits, role-play contributes to professional identity formation by cultivating empathy and interpersonal skills. By placing students in the shoes of patients or family members, role-play humanizes the medical encounter and sensitizes learners to the psychosocial dimensions of healthcare. This aspect is particularly relevant in today's multicultural societies, where physicians must be equipped to handle patients from diverse cultural and socioeconomic backgrounds. Role-play thus prepares students not only to be competent clinicians but also compassionate caregivers(8).

Incorporating role-play into medical curricula also addresses another pressing challenge: the transition from pre-clinical to clinical training. Many students struggle with applying theoretical concepts in real-life patient interactions. Role-play serves as a bridge by offering simulated experiences that mirror authentic clinical situations. These low-risk environments enable students to practice clinical reasoning, communication, and decision-making without the fear of harming patients. Furthermore, role-play sessions often generate lively discussions and critical reflection, thereby deepening understanding and reinforcing key concepts(9).

The adaptability of role-play makes it suitable across different stages of medical education. In pre-clinical years, role-play can be used to contextualize basic science concepts within patient scenarios, enhancing retention and application. In clinical years, it can simulate complex consultations, ethical dilemmas, or team-based interactions. Importantly, role-play sessions can be tailored in duration and complexity, making them feasible within varied curricular structures(10).

Despite these advantages, role-play is not without challenges. Some students may feel self-conscious or resistant to performing in front of peers. Others may struggle to take scenarios seriously, perceiving role-play as less rigorous compared to conventional teaching methods. These barriers can be overcome through careful planning, clear instructions, and supportive facilitation. Skilled educators play a crucial role in setting the tone, ensuring psychological safety, and guiding reflective debriefings that transform the experience into meaningful learning(11).

The present study was designed to explore the effectiveness of role-play in enhancing both knowledge and attitudes among second-year undergraduate medical students. The focus was on evaluating whether role-play, when combined with conventional teaching, improved recall, engagement, and conceptual clarity compared to traditional lectures alone. The study also aimed to gather student feedback on their perceptions of role-play, which could inform future modifications and integration of this method into the curriculum. By adopting both quantitative and qualitative approaches, the study sought to provide a comprehensive assessment of the educational value of role-play.

In summary, medical education is evolving to meet the demands of a patient-centered healthcare system. Role-play, as an experiential and student-centered strategy, aligns with these demands by promoting communication, empathy, and active learning. It provides a safe, engaging, and effective platform for medical students to practice clinical and interpersonal skills. Through this study, we aim to contribute evidence supporting the integration of role-play into undergraduate teaching, thereby enriching the learning experience and ultimately shaping more competent and compassionate physicians.

2. MATERIALS AND METHODS

Study Design and Setting

This was a cross-sectional interventional study conducted among second-year MBBS students at Madha Medical College and Research Institute, Chennai. The study was designed to evaluate the effectiveness of role-play as a teaching-learning tool in comparison with traditional lecture-based instruction.

Participants and Sample Size

A total of 50 undergraduate medical students enrolled in the second year of the MBBS program participated in the study. Inclusion criteria consisted of students who were present on the scheduled day of the intervention and provided consent to participate. No exclusion criteria were applied.

From this cohort, 10 students were randomly chosen to enact the role-play activity, while the remaining students participated as observers. The chosen sample size (n = 50) represented the entire batch and was considered adequate for this exploratory study, allowing both quantitative assessment and qualitative feedback collection.

Educational Intervention

The teaching session focused on the Empathy in Attittude Ethics and communication session. The methodology was implemented in three phases:

1. Lecture and Pre-test: All students attended an interactive lecture delivered by the faculty on the Empathy in patient care. Immediately after, they completed a pre-test (written exam for 5 marks) to assess baseline knowledge.
2. Role-Play Activity: The group of 10 selected students performed a 10-minute structured role-play in which they enacted clinical interactions related to the topic. The enactment was designed to simulate realistic situations, encourage active participation, and challenge their peers to think critically. Observers were encouraged to engage in discussion, provide input, and reflect on the learning process. Faculty facilitated the session by offering constructive feedback.
3. Post-test and Feedback: Following the role-play, all students were reassessed with the same written test to measure knowledge gain. Finally, a structured questionnaire (developed in Google Forms) was administered to capture students' perceptions, attitudes, and suggestions regarding the use of role-play.

Data Collection Tools

- Knowledge Assessment: Pre-test and post-test written exams (5 marks each).
- Perception Assessment: A structured questionnaire containing both closed-ended and open-ended questions, designed to evaluate students' attitudes towards role-play, perceived benefits, and limitations.

Data Analysis

The pre-test and post-test scores were tabulated in Microsoft Excel and analyzed using SPSS version 26. A paired t-test was employed to compare the mean differences between pre- and post-test scores. A p-value <0.05 was considered statistically significant.

Feedback data obtained from the questionnaire were analyzed descriptively. Quantitative data were summarized as percentages, while open-ended responses were thematically grouped to identify recurring patterns and suggestions.

Ethical Considerations

Institutional approval was obtained prior to conducting the study. All participants were informed about the purpose of the study, and their voluntary consent was obtained. Confidentiality of responses was maintained throughout the process. Since the study was educational in nature and did not involve patient data or invasive procedures, it posed minimal ethical risk.

3. RESULTS

A total of 50 second-year MBBS students participated in the study. All students completed both the pre-test and post-test assessments, as well as the feedback questionnaire.

Quantitative Findings

The mean score of students on the pre-test (before exposure to role-play) was 54.28 ± 11.01. Following the role-play activity, the post-test mean score increased to 63.40 ± 10.56. The improvement in scores was found to be statistically significant ($p < 0.05$) using a paired t-test. This indicates that role-play facilitated better comprehension and recall of the topic compared to lecture alone.

Table 1: Comparison of Pre-test and Post-test Scores

Assessment	Mean Score	N	Standard Deviation	p-value	Interpretation
Pre-test	54.28	50	11.01	<0.05	Baseline knowledge after lecture alone
Post-test	63.40	50	10.56	<0.05	Significant improvement after role-play intervention

Interpretation:
The mean difference of approximately 9.1 marks demonstrates a notable improvement in knowledge retention. The statistical significance confirms that role-play was effective in enhancing learning outcomes.

Qualitative Findings from Student Feedback

Analysis of the questionnaire responses provided further insights into students' perceptions of the role-play session:

- Enhanced Engagement: Most students reported that role-play made the session more interactive and enjoyable compared to conventional lectures.
- Improved Recall: Students highlighted that the enactment and peer discussion helped them remember key concepts better.
- Confidence Building: Several participants expressed that performing or observing role-play improved their confidence in communication and presentation skills.
- Peer Learning: Observers indicated that they learned not only from the role-players but also from the subsequent feedback and group discussion.
- Preference Over Traditional Methods: A majority of students stated that they found role-play more effective than passive lecture-based learning and recommended its inclusion in future sessions.

However, a few challenges were noted:

- Some students felt initial hesitation or self-consciousness during enactment.
- A minority reported that time constraints limited the depth of discussion.
- A suggestion was made to include more clinical scenarios to strengthen applicability to real-life situations.

Overall Interpretation

The combination of quantitative and qualitative findings strongly suggests that role-play is an effective, student-centered teaching strategy in medical education. The significant improvement in test scores demonstrates its ability to reinforce factual knowledge, while student feedback highlights its benefits in promoting communication, teamwork, and critical thinking. Moreover, the element of enjoyment associated with role-play contributed to greater participation and motivation.

Thus, role-play not only enhanced short-term knowledge retention but also fostered positive attitudes towards active learning. These results support the integration of role-play into undergraduate curricula as a complement to conventional lectures, particularly in subjects requiring both conceptual understanding and interpersonal skills.

4. DISCUSSION

The purpose of this study was to assess the effectiveness of role-play as an educational tool in enhancing both knowledge and communication skills among second-year medical undergraduates. Our findings (Table-1) demonstrated a statistically significant improvement in post-test scores following a role-play session when compared with pre-test results after a conventional lecture. In addition, qualitative feedback revealed strong student support for role-play, which they perceived as an enjoyable, interactive, and beneficial learning experience. These findings underscore the potential of role-play as a pedagogical approach that bridges the gap between theoretical knowledge and clinical application.

Medical education has undergone significant transformation in recent decades, moving away from traditional lecture-based instruction to more interactive and student-centered approaches. Constructivist theories of learning emphasize that knowledge is not passively absorbed but actively constructed through experience, reflection, and engagement. In this context, role-play represents an ideal teaching strategy because it immerses students in scenarios that replicate real-life clinical situations, allowing them to learn through direct participation(12).

In our study, the improvement in post-test scores following role-play clearly indicated that active involvement deepened student understanding of the subject matter. Unlike lectures, where students may adopt a passive stance, role-play required active thinking, recall, and application of knowledge. This is consistent with findings from Dang et al in 2025, who reported that students retain more information from role-play compared to traditional lectures(13). Similarly, Brown and Chidume (2023) described role-play as an “active learning” strategy that encourages deeper comprehension by engaging both cognitive and affective domains(14).

One of the most critical competencies for medical practitioners is the ability to communicate effectively with patients. While lectures can provide theoretical frameworks for communication, they seldom create opportunities for practice. Role-play, however, allows students to simulate patient interactions, thereby refining their communication, empathy, and interpersonal skills in a safe environment(15).

In this study, students highlighted that role-play increased their confidence in expressing ideas and interacting with peers. Observers, too, reported that the enactment and subsequent discussion improved their ability to recall and present concepts. These findings resonate with Atkins in 2019, who emphasized that role-play develops essential interpersonal skills, such as active listening, negotiation, and empathy, which are vital for effective doctor–patient relationships(16). By stepping into the roles of both doctor and patient, learners begin to appreciate multiple perspectives, fostering cultural competence and sensitivity.

Moreover, communication practice in role-play carries transferable benefits beyond academic contexts. As Bosse et al in 2012 noted, standardized patients and role-play have become increasingly common in medical training precisely because they provide realistic practice opportunities without exposing real patients to the risks of novice errors. Our study’s outcomes support this pedagogical shift(17).

Another important finding of our study was that students overwhelmingly perceived role-play as a more engaging and enjoyable teaching method compared to lectures. Engagement is a critical determinant of learning outcomes, as motivated students are more likely to pay attention, participate, and retain information. The enjoyment associated with role-play contributed positively to students’ willingness to learn and participate actively.

In a study in 2017, similarly reported that role-play stimulates enthusiasm and increases motivation, making students more receptive to learning. Importantly, such engagement does not undermine academic rigor but, rather, strengthens learning by maintaining student attentiveness(18). In our study, several students explicitly stated that they would prefer more sessions involving role-play in future courses, reflecting its perceived effectiveness and motivational impact.

Despite the clear benefits, some limitations of role-play were also noted. A subset of students expressed initial discomfort or self-consciousness during enactments. This performance anxiety is a commonly reported barrier, particularly in cultures where public speaking is not strongly emphasized. Boyd in 2007 also highlighted similar concerns, noting that role-play may initially intimidate learners, potentially affecting participation(19). However, such barriers can be mitigated by creating a supportive environment, preparing students in advance, and normalizing mistakes as part of the learning process.

Another challenge identified was time constraints. In our study, the role-play session was limited to ten minutes, followed by a short discussion. While this format was adequate to demonstrate its utility, some students felt that longer or repeated sessions would have allowed deeper exploration of concepts. This aligns with a study by Jackson and Back in 2011 recommendations that repeated practice with constructive feedback is essential when role-play is used to teach skills. Curriculum planners must therefore allocate sufficient time and resources for role-play activities to maximize their benefits(20).

The results of this study suggest that role-play is a valuable complement to traditional teaching methods in medical education. While lectures remain important for delivering large volumes of factual knowledge, role-play enhances learning by promoting application, recall, and interpersonal skill development. The dual benefit of improving both cognitive and affective learning outcomes makes role-play especially relevant in medical training, where students must not only master

scientific content but also develop empathy, communication, and professionalism.

Role-play is also adaptable across various stages of medical education. In pre-clinical years, as demonstrated in this study with anatomy, it contextualises theoretical concepts in patient-centred scenarios. In clinical years, role-play can simulate consultations, ethical dilemmas, or teamwork situations, thereby preparing students for real-world practice. Furthermore, role-play can be used to standardise learning experiences, especially when clinical exposure is inconsistent due to patient variability or time constraints.

By integrating role-play systematically into curricula, medical schools can help students bridge the gap between classroom knowledge and clinical practice. Additionally, incorporating structured debriefings ensures that students reflect critically on their experiences, reinforcing learning and encouraging self-improvement.

One of the strengths of this study is the combined use of quantitative and qualitative methods. The statistically significant improvement in post-test scores demonstrated the measurable impact of role-play on knowledge retention. Meanwhile, student feedback provided rich insights into the experiential and attitudinal aspects of learning. This mixed-methods approach allowed for a more comprehensive evaluation of role-play's effectiveness.

Another strength was the use of a unfamiliar academic topic—empathy in patient care—ensuring that students could focus on the method of learning rather than their regular familiar content. This minimized confounding factors and provided a clear assessment of role-play's impact.

Despite these strengths, the study has some limitations. The sample size was relatively small and drawn from a single institution, limiting the generalizability of findings. Future research should include larger, multi-institutional samples to validate these results.

Furthermore, only short-term knowledge gain was assessed through pre- and post-tests conducted within the same session. While the improvement was significant, the long-term impact of role-play on knowledge retention and clinical performance remains unknown. Longitudinal studies assessing retention over months and evaluating real patient interactions would provide stronger evidence of role-play's effectiveness.

Additionally, while student perceptions were largely positive, self-reported feedback may be influenced by response bias. Observational studies or objective assessments of communication skills following role-play may strengthen conclusions about its impact on interpersonal competence.

Given the promising results of this study, future research should explore several avenues:

1. Long-term retention: Assess whether knowledge gained through role-play is retained better over extended periods compared to lectures.
2. Clinical application: Evaluate whether students who participate in role-play perform better in real patient interactions, particularly in history-taking, counseling, and empathy.
3. Scalability: Investigate how role-play can be integrated into larger classes or across different medical subjects without compromising effectiveness.
4. Faculty training: Explore strategies for training faculty to design, facilitate, and debrief role-play sessions effectively.

5. CONCLUSION

In conclusion, this study demonstrated that role-play significantly enhances learning outcomes among medical undergraduates by improving both factual knowledge and communication skills. Students perceived role-play as an engaging, enjoyable, and effective teaching strategy that fostered active participation and recall. While challenges such as performance anxiety and time constraints exist, these can be addressed through supportive facilitation and thoughtful curriculum design.

Overall, role-play represents a powerful, student-centered approach that complements traditional lectures. By bridging the gap between theory and practice, role-play not only improves academic performance but also nurtures the interpersonal and empathetic skills essential for future physicians. Its incorporation into undergraduate curricula should therefore be strongly considered as part of the broader shift towards experiential and patient-centered medical education.

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