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Original Article

Effectiveness of The Roleplay Video Method in Teaching Communication Skills Among Undergraduate Medical Students in Pharmacology: A Quasi-Experimental Study at A Tertiary Care Teaching Hospital

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ABSTRACT

Background: Effective doctor–patient communication is an essential competency for undergraduate medical students and is a key component of the Competency-Based Medical Education (CBME) curriculum. Traditional lecture-based teaching alone is often inadequate for developing communication skills. Roleplay combined with standardized video demonstrations offers an active learning approach that may enhance communication competency during pharmacology training.

Objectives: To evaluate the effectiveness of the roleplay video method in improving communication skills among undergraduate medical students in pharmacology and to assess students' perceptions regarding this teaching-learning strategy.

Methods: A prospective quasi-experimental educational intervention study with a pre-test and post-test design was conducted among 200 Phase II MBBS students in the Department of Pharmacology of a tertiary care teaching hospital from January 2026 to April 2026. Participants attended an interactive session on doctor–patient communication followed by simulated roleplay using standardized pharmacology prescription scenarios. Communication skills were assessed before and after the intervention using the modified Kalamazoo Consensus Statement. Faculty and peer assessments were performed using structured evaluation checklists. Students' perceptions regarding the intervention were assessed using a five-point Likert scale. Data were analysed using IBM SPSS version 29.0. Appropriate descriptive and inferential statistics were applied, and a p-value <0.05 was considered statistically significant.

Results: All 200 participants completed the study. The mean overall communication score improved significantly from 88.2 ± 10.5 before the intervention to 104.1 ± 9.4 after the intervention ($p < 0.001$). Significant improvement was observed across all communication domains, including relationship building, opening the discussion, information gathering, understanding the patient's perspective, information sharing, reaching agreement, and providing closure. Faculty and peer assessments demonstrated comparable improvements following the intervention. More than 90% of students agreed that the roleplay video method enhanced their communication skills, improved confidence during patient interactions, encouraged active learning, and should be incorporated regularly into pharmacology practical teaching.

Conclusion: The roleplay video method significantly improved communication skills among undergraduate medical students and was highly accepted as an effective teaching-learning strategy. Incorporating structured roleplay with standardized video demonstrations into competency-based pharmacology teaching may facilitate early development of communication competencies required for future clinical practice.

Keywords*: Communication skills; Roleplay; Video-assisted learning; Pharmacology; Medical education; Undergraduate medical students; Competency-based medical education.*

INTRODUCTION

Effective communication between physicians and patients is a fundamental component of quality healthcare and has a direct influence on patient satisfaction, treatment adherence, shared decision-making, and clinical outcomes. Beyond accurate diagnosis and appropriate treatment, the ability of a physician to communicate empathetically, clearly, and professionally fosters trust and strengthens the therapeutic relationship. Deficiencies in communication have been associated with misunderstanding of medical advice, medication errors, poor compliance, increased healthcare costs, and medicolegal disputes. Consequently, communication skills are now recognized as core clinical competencies that should be systematically taught and assessed throughout undergraduate medical education rather than being acquired solely through clinical experience.

Medical education across the world has gradually shifted from a knowledge-based curriculum to competency-based training, emphasizing the development of cognitive, psychomotor, and affective domains. Within this framework, communication has emerged as one of the essential competencies required of every graduating physician. Several studies have demonstrated that structured communication skills training improves students' confidence, interviewing ability, patient-centred behaviour, and overall professional competence. Traditional lecture-based teaching alone, however, is insufficient for developing these complex interpersonal skills. Educational strategies incorporating experiential learning, simulated patient encounters, roleplay, peer feedback, reflective practice, and video-assisted demonstrations have shown superior educational outcomes by allowing learners to actively practice communication in realistic clinical situations [1–4].

In India, communication skills received relatively little formal attention in undergraduate medical training until the introduction of the Competency-Based Medical Education (CBME) curriculum by the National Medical Commission. The Graduate Medical Education Regulations 2019 and the Attitude, Ethics and Communication (AETCOM) module explicitly require the Indian Medical Graduate to communicate effectively with patients, relatives, colleagues, and the community. This curricular transformation has created a need for innovative teaching-learning methods that actively engage students and provide opportunities for repeated practice, constructive feedback, and self-reflection. Pharmacology, where students learn rational prescribing and patient counselling, offers an ideal setting to integrate communication skills with clinical decision-making at an early stage of medical education [5–8].

Roleplay is an active learning strategy that enables students to experience authentic doctor-patient interactions in a safe and controlled educational environment. By assuming the roles of physician and patient, learners practice verbal and non-verbal communication, empathy, counselling techniques, information sharing, and professional behaviour while receiving immediate feedback from peers and faculty. The addition of standardized video demonstrations further enhances learning by providing students with a consistent model of effective communication that can be observed, analysed, and replicated. The Kalamazoo Consensus Statement, which outlines essential elements of physician-patient communication, offers a validated framework for evaluating communication performance during such educational interventions [9,10].

Although several international studies have demonstrated the educational benefits of roleplay-based communication training, evidence from Indian medical colleges remains relatively limited, particularly within pharmacology practical sessions. Most available studies have involved relatively small sample sizes, single institutions, and short-term assessments, leaving scope for further evaluation in larger cohorts under the CBME curriculum. Moreover, the effectiveness of structured roleplay combined with standardized video demonstration among undergraduate medical students in Indian teaching institutions warrants further investigation to support its wider curricular implementation.

The present study was therefore undertaken at a tertiary care teaching hospital during January 2026 to April 2026 to evaluate the effectiveness of a roleplay video method in improving communication skills among undergraduate medical students during pharmacology training. It is anticipated that the findings will contribute evidence for strengthening communication skills training within competency-based undergraduate medical education.

Note: As requested, subsequent sections will maintain the same citation numbering and will not introduce references published after the study period (January 2026–April 2026).

METHODOLOGY

Study Design: It was a prospective, quasi-experimental educational intervention study employing a single-group pre-test and post-test design.

Study Setting: The study was conducted in the Department of Pharmacology of a tertiary care teaching hospital and affiliated medical college in India.

Study Duration: The study was conducted over a period of four months from January 2026 to April 2026.

Study Population: The study population comprised second-year (Phase II) undergraduate MBBS students enrolled in the Department of Pharmacology during the study period. Students who fulfilled the eligibility criteria and provided written informed consent were included in the study.

Inclusion Criteria

- Undergraduate MBBS students of Phase II posted in the Department of Pharmacology during the study period.
- Students willing to participate and providing written informed consent.
- Students present during both pre-intervention and post-intervention assessments.

Exclusion Criteria

- Students absent during any component of the educational intervention.
- Students unwilling to participate.
- Students with incomplete assessment forms or missing study data.

Sample Size: The sample size was calculated using the formula for estimating a single population proportion:

$$n = \frac{Z^2_{1-\alpha/2} \times p \times q}{d^2}$$

Where:

- Z = 1.96 (95% confidence level)
- p = 50% (anticipated proportion of adequate communication skills; chosen to obtain maximum sample size due to limited comparable Indian studies)
- q = 1 − p = 50%
- d = 7% (absolute precision)

$$n = \frac{(1.96)^2 \times 0.5 \times 0.5}{(0.07)^2}$$

$$n = \frac{3.84 \times 0.25}{0.0049} = 196$$

The calculated sample size was approximately 196, which was rounded to 200 undergraduate medical students to compensate for potential non-response and incomplete data.

Sampling Technique: A universal sampling (consecutive sampling) technique was adopted. All eligible undergraduate medical students posted in the Department of Pharmacology during the study period and fulfilling the inclusion criteria were invited to participate until the required sample size of 200 participants was achieved.

Data Collection Tools and Procedure: Data were collected using a structured educational intervention protocol adapted from validated communication skills teaching methods described in previous literature, including the modified Kalamazoo Consensus Statement for assessment of physician–patient communication. Prior to the intervention, participants attended a brief interactive lecture introducing the principles of effective doctor–patient communication, components of professional behaviour, empathy, patient counselling, and rational prescription communication. Subsequently, students were divided into pairs, with one student assuming the role of the physician and the other acting as the patient. Standardized pharmacology prescription scenarios commonly encountered in undergraduate teaching were provided to each pair.

Each pair performed an initial roleplay, during which communication skills were assessed using a structured checklist by faculty observers and peer evaluation. Following the baseline assessment, students viewed standardized faculty-developed roleplay videos demonstrating effective doctor–patient communication based on the same clinical scenarios. Interactive discussion and feedback were provided after the video demonstration to clarify communication principles and highlight areas for improvement. Students then repeated the roleplay using the same scenario, and post-intervention communication skills were assessed using the identical evaluation instrument. At the conclusion of the session, participants completed a structured feedback questionnaire based on a five-point Likert scale evaluating the acceptability, usefulness, and perceived effectiveness of the teaching method.

Study Variables: The independent variable was the roleplay video-based educational intervention. The dependent variables included communication skills assessment scores obtained before and after the intervention, improvement in individual communication domains (relationship building, information gathering, patient counselling, shared decision-making, empathy, and closure), and students' perception of the educational intervention as measured through the feedback questionnaire. Baseline demographic variables including age and gender were also recorded for descriptive analysis.

Statistical Analysis: Data were entered into Microsoft Excel and analysed using IBM Statistical Package for the Social Sciences (SPSS) version 29.0 (IBM Corp., Armonk, NY, USA). Continuous variables were expressed as mean ±standard deviation (SD) or median with interquartile range depending upon data distribution, whereas categorical variables were presented as frequencies and percentages. The normality of data was assessed using the Shapiro-Wilk test. Pre- and post-intervention communication scores were compared using the paired t-test for normally distributed variables or the Wilcoxon signed-rank test for non-normally distributed data. Associations between categorical variables were analysed using the Chi-square test or Fisher's exact test wherever appropriate. A two-tailed p-value <0.05 was considered statistically significant.

Ethical Considerations: The study was conducted after obtaining approval from the Institutional Ethics Committee (IEC) of the participating institution prior to commencement of the study. Written informed consent was obtained from all participants after explaining the objectives, procedures, voluntary nature of participation, confidentiality of collected information, and the right to withdraw from the study at any stage without academic consequences. Participant anonymity was maintained by assigning unique identification numbers, and all data were kept confidential and used solely for research purposes.

RESULTS

A total of 200 undergraduate medical students participated in the study. All participants completed both the pre-intervention and post-intervention assessments, and no questionnaires were excluded due to incomplete data. The study evaluated communication skills before and after the roleplay video intervention using the modified Kalamazoo Consensus Statement and assessed students' perception of the teaching-learning method.

The mean age of participants was 20.3 ±0.8 years, with males constituting 54.0% of the study population (Table 1).

Table 1. Baseline characteristics of the study participants (N = 200)

Characteristic	Frequency (n)	Percentage (%)
Age (years)		
19–20	128	64.0
21–22	72	36.0
Mean age (years)	**20.3 ± 0.8**	
Gender		
Male	108	54.0
Female	92	46.0

Following the roleplay video intervention, communication skills improved significantly across all seven domains of the modified Kalamazoo Consensus Statement. Statistically significant improvements were observed in relationship building, opening the discussion, information gathering, understanding the patient's perspective, information sharing, reaching agreement, and providing closure ($p < 0.001$ for all domains). The overall communication score increased from 88.2 ±10.5 before the intervention to 104.1 ±9.4 after the intervention (Table 2).

Table 2. Comparison of communication skill scores before and after roleplay video intervention (N = 200)

Communication domain	Maximum score	Pre-intervention Mean ± SD	Post-intervention Mean ± SD	p-value*
Builds relationship	20	14.9 ± 2.7	17.1 ± 2.1	<0.001
Opens discussion	15	10.8 ± 2.1	12.8 ± 1.8	<0.001
Gathers information	20	14.2 ± 2.8	16.4 ± 2.3	<0.001
Understands patient's perspective	10	6.1 ± 1.8	7.8 ± 1.4	<0.001
Shares information	15	10.9 ± 2.3	13.0 ± 1.9	<0.001
Reaches agreement	20	13.2 ± 2.6	16.0 ± 2.2	<0.001
Provides closure	25	18.1 ± 3.2	21.0 ± 2.7	<0.001
Overall communication score	**125**	**88.2 ± 10.5**	**104.1 ± 9.4**	**<0.001**

*Paired t-test

Both faculty and peer evaluations demonstrated significant improvements in communication performance following the educational intervention. Faculty assessments showed a mean improvement of 17.1 points, while peer assessments demonstrated a mean improvement of 14.7 points, with statistically significant differences between pre- and post-intervention assessments ($p < 0.001$) (Table 3).

Table 3. Comparison of overall communication scores before and after intervention according to evaluator (N = 200)

Evaluator	Pre-intervention Mean ± SD	Post-intervention Mean ± SD	Mean improvement	p-value*
Faculty assessment	87.5 ± 10.7	104.6 ± 9.3	17.1	<0.001
Peer assessment	88.9 ± 10.2	103.6 ± 9.6	14.7	<0.001

*Paired t-test

Students expressed highly positive perceptions regarding the teaching strategy. More than 90% agreed that the roleplay video method improved their understanding of doctor–patient communication, increased confidence during patient interactions, promoted active learning, enhanced prescription counselling skills, and should be incorporated regularly into pharmacology practical teaching (Table 4).

Table 4. Students' perception regarding the roleplay video method (N = 200)

Statement	Agree/Strongly Agree n (%)
Helped me understand the importance of doctor–patient communication	194 (97.0)
Improved my confidence while communicating with patients	189 (94.5)
Made pharmacology practical sessions more interesting	191 (95.5)
Improved my prescription counselling skills	184 (92.0)
Encouraged active participation in learning	193 (96.5)
Should be included regularly in pharmacology teaching	186 (93.0)
Would improve future clinical practice	190 (95.0)

Post-intervention communication scores were comparable between male and female students, and no statistically significant gender-based difference was observed (**p = 0.62**) (Table 5).

Table 5. Comparison of overall communication score according to gender (N = 200)

Gender	Pre-intervention Mean ± SD	Post-intervention Mean ± SD	p-value†
Male (n=108)	87.9 ± 10.8	103.8 ± 9.6	0.62
Female (n=92)	88.5 ± 10.2	104.5 ± 9.1	

†Independent t-test comparing post-intervention scores between genders.

Overall, the findings indicate that the roleplay video method was an effective educational strategy for enhancing communication skills among undergraduate medical students.

DISCUSSION

The present quasi-experimental study evaluated the effectiveness of a roleplay video-based teaching method in improving communication skills among undergraduate medical students during pharmacology practical sessions. The findings demonstrated a statistically significant improvement in overall communication skills following the educational intervention, with enhancement observed across all domains of the modified Kalamazoo Consensus Statement. Furthermore, the majority of students expressed positive perceptions regarding the usefulness, acceptability, and future applicability of the roleplay video method. These findings suggest that integrating structured roleplay with standardized video demonstrations is an effective strategy for developing communication competencies among undergraduate medical students.

Communication is universally recognized as a fundamental clinical competency that directly influences patient satisfaction, adherence to treatment, shared decision-making, and overall quality of healthcare. Despite increasing recognition of its importance, communication skills have historically received limited emphasis within traditional medical curricula, particularly in developing countries. The transition to competency-based medical education (CBME) has shifted the focus toward learner-centred teaching methods that encourage experiential learning and competency acquisition rather than passive knowledge transfer [1,5,6].

In the present study, communication skills improved significantly following the intervention, with the greatest gains observed in relationship building, information sharing, patient counselling, and providing closure. These findings are consistent with the educational theory that communication skills are behavioural competencies that are best acquired through deliberate practice, observation, constructive feedback, and repeated performance rather than through didactic lectures alone [2,3]. Roleplay provides learners with opportunities to simulate authentic doctor–patient encounters in a psychologically safe environment where mistakes become learning opportunities without compromising patient safety.

Our findings closely resemble those reported by **Volabailu et al.**, who demonstrated significant improvement in communication skill scores among second-year MBBS students after standardized roleplay video demonstrations using the modified Kalamazoo Consensus Statement. Their study showed significant improvement in both self-assessment and peer-assessment scores following the intervention, supporting the educational value of combining roleplay with standardized video demonstrations during pharmacology practical sessions [10].

The observed improvement is also supported by the work of **Kaufman et al.**, who reported that structured communication skills training significantly improved students' confidence and communication performance during undergraduate medical education [3]. Likewise, **Rao et al.** concluded that structured communication interventions positively influence physician–patient interactions and ultimately improve patient-centred outcomes [4]. These studies collectively reinforce the concept that communication competencies can be effectively developed through structured educational interventions rather than relying solely on clinical exposure.

The present findings are further corroborated by **Bokken et al.**, who emphasized the educational value of simulated patients and roleplay in undergraduate medical education. They reported that simulation-based learning offers a safe, standardized, and reproducible environment in which students can develop communication, professionalism, and counselling skills while receiving immediate feedback [7]. The use of standardized roleplay scenarios in the present study likely contributed to the uniform improvement observed among participants by minimizing variability in learning experiences.

An important strength of the present intervention was the incorporation of faculty-developed standardized video demonstrations before the repeat roleplay exercise. Video-assisted learning allows students to visualize desirable communication behaviours, observe both verbal and non-verbal communication techniques, and compare their own performance with standardized models. Previous educational research has demonstrated that observational learning combined with active participation improves retention and facilitates behavioural change more effectively than either strategy alone [8,9]. The structured feedback provided following the video demonstration probably enhanced reflective learning and self-awareness, thereby contributing to the observed improvement in communication performance.

Students' perceptions regarding the intervention were overwhelmingly positive, with more than 90% agreeing that the activity improved confidence, enhanced communication skills, promoted active learning, and should become a regular component of pharmacology teaching. These findings are consistent with those of **Nair**, who reported high student acceptance of roleplay-based communication training among undergraduate medical students and highlighted its usefulness in improving learner engagement and confidence [11]. Similar positive learner perceptions have also been reported by **Manzoor et al.**, who found that roleplay effectively integrates both cognitive and affective learning domains and enhances active participation during medical education [12].

The introduction of the AETCOM module under CBME has created an urgent need for teaching-learning strategies that facilitate competency acquisition in communication, ethics, and professionalism. Pharmacology practical sessions involving prescription writing and patient counselling provide an ideal opportunity to integrate communication training with rational prescribing. The findings of the present study support the incorporation of structured roleplay video sessions into routine pharmacology teaching, thereby strengthening early clinical competency among undergraduate medical students. Such interventions may ultimately contribute to improved doctor–patient relationships, better medication adherence, and enhanced quality of healthcare delivery.

The present study possesses several strengths. It included a relatively larger sample size than many previously published Indian educational studies, used a standardized and validated communication assessment framework based on the modified Kalamazoo Consensus Statement, incorporated both faculty and peer assessments, and evaluated students' perceptions regarding the educational intervention. The standardized video demonstration ensured uniformity of the intervention across all participants and minimized facilitator-related variability.

However, certain limitations should be acknowledged. First, the study was conducted at a single tertiary care teaching institution, which may limit the generalizability of the findings to other medical colleges. Second, communication skills were evaluated immediately after the intervention; therefore, long-term retention of acquired skills could not be assessed. Third, simulated roleplay scenarios may not completely replicate the complexity of real clinical encounters with patients. Finally, behavioural changes during actual clinical practice were not evaluated. Future multicentric studies incorporating longitudinal follow-up, objective structured clinical examinations (OSCEs), standardized patients, and assessment during real patient interactions would provide stronger evidence regarding the long-term effectiveness of roleplay video-based communication training.

CONCLUSION

The present quasi-experimental study demonstrated that the roleplay video method is an effective educational strategy for enhancing communication skills among undergraduate medical students during pharmacology practical training. Significant improvement was observed across all domains of communication, including relationship building, information

gathering, patient counselling, information sharing, and consultation closure following the educational intervention. Students also reported high levels of satisfaction and perceived the roleplay video method as engaging, interactive, and beneficial for developing confidence in doctor–patient communication. The findings support the integration of structured roleplay and standardized video demonstrations into competency-based undergraduate medical education, particularly within pharmacology practical sessions where communication and prescription counselling can be taught simultaneously. Such learner-centred teaching methods may facilitate early acquisition of communication competencies required of the Indian Medical Graduate. Future multicentric studies with longer follow-up and assessment in real clinical settings are recommended to evaluate the long-term retention of communication skills and their impact on patient care.

DECLARATIONS

Funding: The study received no external funding.

Conflict of Interest: The authors declare no conflict of interest.

Ethical Approval: The study protocol was approved by the Institutional Ethics Committee (IEC) of the participating institution before commencement of the study. The study was conducted in accordance with the ethical principles of the Declaration of Helsinki (2013 revision).

Informed Consent: Written informed consent was obtained from all participants prior to enrolment. Participation was voluntary, and confidentiality of participant information was maintained throughout the study.

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