

ORIGINAL ARTICLE

ROLE-PLAY: A SIMULATED TEACHING TECHNIQUE IN PHYSIOLOGY

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Background: Simulation is an artificial representation of a situation to facilitate learning without the risks inherent in a similar real-life experience. Role-play is one type of simulation that focuses attention on the interaction of students in scripted scenarios. In the process, students learn about that patient or given situation. This study was conducted with an aim to record the response of undergraduates to role-play of clinical scenarios and to have their feedback. **Methods:** Two clinical topics were selected from second-year MBBS Physiology syllabus and assigned to two groups of students, having 7 students each. Case scenarios were formulated; scripted and roles were divided among students. Role-play of each scenario was followed by a presentation on the pathophysiology. Student feedback was recorded and analysed. **Results:** Out of the 137, 56 (40.88%) were male and 81 (59.12%) were female students who participated in the study, 50.4% considered role-play alone as a useful learning tool whereas 94.9% agreed that if role-play is combined with a multimedia tool then it is useful for learning ($\chi^2=110.43$, $p<0.001$). 95.9% said that role-play is enjoyable ($\chi^2=114.07$, $p<0.001$) and 97.1% said that it is a good technique to improve communication skills ($\chi^2=121.46$, $p<0.001$). Regarding future interest in more role-play scenarios, 56.9% of the study participants said they will be very interested. **Conclusion:** Hence, concluded that with careful planning and utilization of resources, role-play has the potential to be incorporated in the teaching of clinical scenarios to undergraduates to promote learning.

Keywords: Role play, simulation, medical education, undergraduate physiology teaching

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INTRODUCTION

Simulation is a rapidly evolving and promising pedagogical tool used to impart knowledge to students. It is the art of achieving goals and learning objectives¹ through artificially replicating sufficient components of a real-world situation² without associated risks and harms³. It aims to further the learning of skills or knowledge by enabling immersion of the learner, making them self-reflect⁴ through facilitating the process of feedback, and by putting the acquired skills or knowledge into practice⁵. Historically speaking the first use of simulation in healthcare was in nursing education employing Mrs. Chase, a full-sized doll in 1911 while use in aviation and military came into play in the form of early flight simulators being built in 1927.⁶ Simulation transcends from the undergraduate to graduate level, pre-clinical to the clinical setting, and beyond. It is a teaching strategy that is evidence-based contextual learning that promotes and facilitates experiential learning and helps the student to foster clinical reasoning and analytical thinking. Simulation can be used to help bridge the gap between theoretical knowledge and practice which could have been hindered previously due to safety concerns that are normally present in a real-life situation.⁷

The degree of realism and technical complexity offered by a particular simulation is termed as its fidelity.⁸ On the fidelity continuum, a question stem describing the patient's signs and symptoms or a

clinical scenario that expects from the examinee to reach a relevant clinical decision is a type of simulation which is at the lower end. Assessments that employ standardized patients are however at the opposite end of the fidelity spectrum, providing a more tangible method for quantifying the clinical competency and skills of the student in question.⁹ Simulations, be it low fidelity or high fidelity allow for the user to develop clinical skills safely in a healthcare setting. When used by undergraduate medical students during the degree duration, they are able to acquire clinical skills by practicing on the different modalities, which they would otherwise gain in medical practice at the risk of causing medical error-related deaths.¹⁰ Deaths caused due to medical negligence are the third leading cause of death in the US, amounting to almost 400,000 per annum.¹¹ High-risk clinical situations when learned and practiced through simulation can significantly enhance patient management and outcomes for the better in real-life situations, for instance, a study that explored the septic shock resuscitation knowledge and confidence of students concluded that the simulation improved both aspects for learners and equipped them better for real-life scenarios.¹²

Simulations could be compiler-driven mimicking a part of the physiology or anatomy such as intravenous-insertion arms or urinary catheter trainers. Or simulations could be event-driven standardized patients; these are professionals who have been trained

to play out the roles of patients who provide history and undergo physical examinations during a clinical case role-play.⁵ Historically role-play emerged from psychodrama. It calls upon participants to play the scenario. It is a type of experiential learning in which participants take on different personas and navigate through a scenario that is set to mimic the real situation, doing this all the while in their assumed roles. To simply put, role-play is a form of art in which you ask of someone to imagine that they themselves or someone else is in a particular situation. The imager is then called on to behave exactly as they feel that the said person would in the supposed scenario. Consequently, this would translate into them or the rest of the class, or both¹³, learning something about the person and/or the situation.

Role-play helps the students to develop certain soft skills such as understanding, better communication skills¹⁴, empathy¹⁵ and to pick up on verbal and non-verbal cues which are not stated overtly in an actual clinical setting¹⁶. Role-play enables students to become more mindful and has been proved to increase activity pertaining to elicitation, externalisation, and consensus-building.¹⁷ Through simulation-based learning such as role-play, team reflexivity could be increased leading to increased collective competence of healthcare teams.¹⁸ When compared to other simulation-based teaching methods, role-play turned out to be an economical and cost-effective method to engage students in active learning.¹⁹ Role-play was also reported by students as an effective method to teach them on how to manage workplace conflict.²⁰

In the light of the potential benefits of role-play, as a teaching method, such as sharpening the skills of expression, becoming observant, pragmatic, and analytical, providing exposure to the complicated and complex nature of real-life problems, and increasing empathy for individuals who undergo these circumstances in real-life, the study was conducted with an aim to record and assess the response of MBBS undergraduate students to role-play of clinical scenarios during the teaching of Physiology at CMH Lahore Medical College and Institute of Dentistry.

METHODOLOGY

This descriptive cross-sectional study was conducted in the Department of Physiology, CMH Lahore Medical College during an ongoing academic session of 2nd Year MBBS after seeking approval from the institutional Ethical Review Board. Two clinical topics were selected from Endocrinology and Renal Physiology and two groups of students were allocated these topics purely on a voluntary basis. Case scenarios were formulated, scripted, and specific roles were divided.

Role-play on acute renal failure was based on a scenario in which a young boy ate mushrooms on a hiking trip, developed lethargy, confusion, rashes, and pain. The boy was brought to the doctor for an examination and the doctor explored the possible diagnosis through history taking and physical examination. While the actors played out their roles, the rest of the class watched how the scenario unfolded. The role-play scenario on hyperthyroidism was presented to the whole class in a similar way along with an oral presentation of the pathophysiology of the disease on PowerPoint and Prezi. Factors that make a session interesting were incorporated into the scenarios. The actors used a variety of expressions using verbal and paraverbal communication. The conversation was kept interesting and the performance of clinical methods was incorporated to break the monotony. There was a reinforcement of concepts in the script and in the presentation that followed the role-play.

The learning outcomes of both sessions at the level of 2nd year MBBS were identified at the beginning and were displayed again at the end of each session. Discussion and a question-answer session of the audience and presenters were carried out for further elaboration. Feedback of the sessions and student responses were recorded on a predesigned proforma. This included questions regarding the role-play if it was able to generate interest in the given topics in comparison with the traditional way of teaching clinical scenarios. Students were also asked to comment on the over-use of PowerPoint in the traditional teaching methods. The attitude of students in terms of the session being enjoyable was also recorded and the aspect of peer learning was also explored. The response was graded on the Likert scale. Responses were analysed by using SPSS-19. Chi-square test was applied and a $p < 0.05$ was considered statistically significant.

RESULTS

Out of 150 students, 137 students participated in the feedback study out of which 56 (40.88%) were male and 81 (59.12%) were female students. 50.4% of the students considered role-play alone as a useful learning tool and 94.9% agreed that if role-play is combined with a multimedia tool then it is useful for learning ($\chi^2 = 110.43$, $p < 0.001$). How useful or useless the various teaching methodologies were deemed by the students is summarised in Table-1.

A total of 95.9% said that role-play is enjoyable ($\chi^2 = 114.07$, $p < 0.001$) and 97.1% said that it is a good technique to improve communication skills ($\chi^2 = 121.46$, $p < 0.001$). 96.4% of students agreed that it was useful for promoting learning in small groups ($\chi^2 = 117.73$, $p < 0.001$) and 85.4% said that they enjoyed

learning from their peers instead of the teacher ($\chi^2=68.67, p<0.001$). Table-2 summarises the perception of students towards different teaching methodologies.

A majority of students have expressed a positive response towards role play as a teaching methodology in the teaching of clinical scenarios in Physiology (Figure-1 and 2).

Table-1: Usefulness or uselessness of various teaching methodologies as reported by students

Teaching methodology	Frequency	%	χ^2	<i>p</i>
Power Point alone as a teaching tool				
Useful	47	34.3	13.49	0.001
Useless	90	65.7		
Teacher centered teaching and PowerPoint as a teaching tool				
Useful	108	78.8	45.55	0.001
Useless	29	21.2		
Role-play alone as a teaching tool				
Useful	69	50.4	0.007	0.932
Useless	68	49.6		
Role-play and PowerPoint as a teaching tool				
Useful	130	94.9	110.43	0.001
Useless	7	5.1		

Table-2: Students' perception as enjoyable or boring towards various teaching methodologies

Teaching methodology	Frequency	%	χ^2	<i>p</i>
Attitude towards role-play				
Enjoyable	131	95.9	114.07	0.001
Boring	6	4.4		
Attitude towards traditional lectures				
Enjoyable	22	16.1	63.13	0.001
Boring	115	83.9		
Role-play for improving communication skills				
Useful	133	97.1	121.46	0.001
Useless	4	2.9		
Role-play for small group learning				
Enjoyable	132	96.4	117.73	0.001
Boring	5	3.6		
Learning from peers instead of teachers in role-play				
Enjoyable	117	85.4	68.67	0.001
Boring	20	14.6		

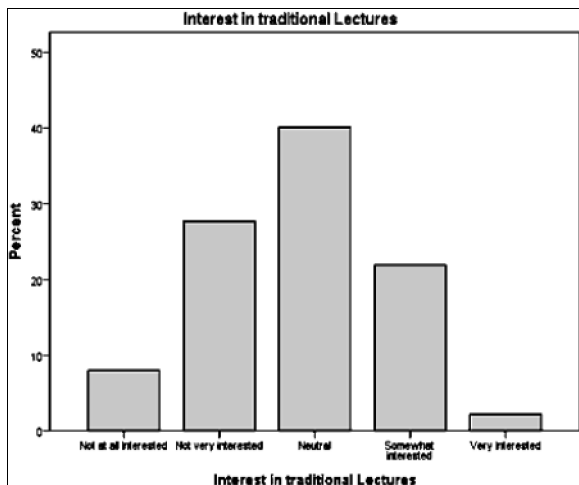


Figure-1: The response of students to traditional lectures in undergraduate Physiology classes

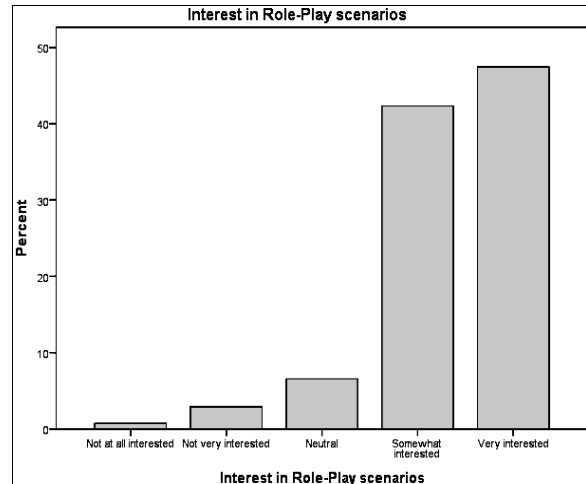


Figure-2: Response of undergraduates towards Role-play in undergraduate Physiology classes

DISCUSSION

Role-play is a type of simulation technique in which people are asked to assume roles and act out exactly as the person would have in a similar situation in real life, often made clear of the objectives needed to be achieved through the given scenario.²¹ This technique is used in a wide variety of fields to teach knowledge and skills to the learner. To the best of our knowledge, in CMH Lahore Medical College and Institute of Dentistry, this technique was not previously employed in Physiology classes to teach students physiological concepts and this study was the first of its kind done in the department during an ongoing academic session.

Students in this study found role-play based teaching more enjoyable than traditional lectures; which they recounted as being boring. Role-play was considered a good technique to improve communication skills as reported by 97.1% of the students. These findings are supported by a similar study done in India in which 80% of students said they enjoyed role-playing as a teaching methodology and 90% reported it as being an effective method for learning and improving communication skills.²²

Our study finding, that 95.9% of the students found role-play an enjoyable teaching methodology, was also supported by a previous study conducted in Chicago USA, in which 85% of the students found the role-play activity enjoyable.²³ Adding to this, our study determined that 50.4% of the students found roleplay a useful teaching technique, this was supported by a study done in South Africa, in which 71% of the students found roleplay a useful technique.²⁴

Traditional lectures tend to be more didactic in nature, monotonous, and less engaging while role-play based teaching breaks the monotony, has livelier active class participation, and also helps students to transition easily from these role-play scenarios to

actual cases in the ward while maintaining effective communication skills and increased empathy for real patients. Employing role-play to teach curricula can help students score higher on tests and retain knowledge more as shown in a study done in the USA in which students in the role-play group scored 76% higher after their role-play activity on a post-test.²⁵

Various studies explored role-play as a teaching tool in medical education through various research methodologies including pre and post-tests. Our study, however, did not evaluate the students academically to gauge the effectiveness of the technique neither did our study have a large sample size. The learning outcomes of both sessions were assessed by a verbal discussion, and in a large group setting, this discussion was dominated by more vocal students. Thus, the shy students remained away from the limelight.

The actors who volunteered for the role-play scenarios, also spent more time on scripts, props and costumes, and acting, instead of topic discussion, and the question-answer session was mostly tackled by the student who had to present the topic on PowerPoint or Prezi. This study could be further improved on, by future researchers, by using a larger sample size, evaluating the students academically to see a gain in knowledge via pre-test and post-tests, and checking long-term knowledge retention by spaced testing. Also, more sessions may be held on various other topics to involve more students and to present a variety of topics.

CONCLUSION

Role-play not being used as a teaching tool in classrooms is depriving students of an enrichment opportunity, which if planned and executed well by utilizing the resources, could enhance the learning experience of undergraduate medical students in the Physiology classes. The problems associated with role-play lie more in theory than in practice. With careful planning, role-play has the potential to be incorporated in the teaching of clinical scenarios to undergraduate classes to promote learning.

RECOMMENDATIONS

Role-play is an underutilized teaching tool for the demonstration of basic physiological concepts in undergraduate physiology classes. Role-play on its own and in combination with other teaching tools be used in physiology classes to impart knowledge to the students and better prepare them for real-life situations which involve patient management and interaction.

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HSK: Conception of idea, role-play script writing, data collection, data analysis, manuscript writing and proof-reading.

NSS: Data collection, manuscript writing and proof-reading, reference cross-checking

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