Perceptions of medical students in India about the use of role-play as a teaching-learning method in Physiology

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Abstract

Introduction: Even though role-play promotes active learning, some students have considered it as the least preferred teaching method. This study was undertaken to determine the perceptions of first year medical students in an Indian medical college about the use of role-play in Physiology as a teaching-learning method and to determine if the perceptions varied between the role-players and the observers of the role-play as this has not been sufficiently explored by previous researchers.

Methods: 46 first year medical students took part in the role-play and 97 students were observers. All 143 students completed a 12 item questionnaire about their perceptions regarding the use of role-play in Physiology using a 5 point Likert response scale and results were analysed using SPSS 17.

Results: The majority of students perceived role-play to be interesting (95.80%), lively (86.01%), helpful in breaking monotony (96.50%) and in visualizing clinical features (86.71%). 83.22% felt that the role-play helped them learn attitudes of a doctor while treating patients and 87.41% felt that role-play was useful in learning communication skills. The role-play was considered to be realistic, facilitating the transition from classroom to clinical wards and while being appropriate for their level was also felt to be applicable to other undergraduate students. Comparison of the observers and role-players’ scores showed no significant difference in perceptions (p value 0.409) i.e., both groups perceived role-play positively.

Conclusion: From the perspective of first year Indian medical students, role-plays in Physiology are perceived positively.

Keywords: Role-play, Physiology, Medical students

1. Introduction

In medical education, there is an ongoing quest for student centered teaching-learning methods. Role-play is one such method which promotes active learning and reflection. Role-play “is an experiential learning technique with learners acting out roles in case scenarios to promote targeted practice and feedback to train skills”1. It is built on many educational theories like Kolb and Fry’s experiential learning theory as learning occurs in all four learning environments “affective (feeling), symbolic (thinking), perceptually oriented (watching) and behaviourally oriented (doing)” and Shon’s work on
reflective practice as learners are allowed to “reflect both in and on action” ². Role-play can be used to develop the cognitive, psychomotor and affective domains of learning. It is regularly used to develop communication skills in medical students and has even been shown to induce a level of realism when integrated into technical skill training, leading to improved patient-physician interaction³. 

Role-play has many benefits as it promotes active learning which is superior to passive learning. It arouses student interest; helps consolidate previous learning and more information is recalled from role-play than from lectures⁴. This simulation in the relative safety of the class-room helps students experience and understand both physician and patient perspectives and the complexity of the physician-patient interview. Even though fewer resources are required for role-play when compared to other experimental methods like standardized patients, it too has a high degree of acceptance by students⁵. Role-play helps students learn to empathize with each other and allows students to have fun while learning ⁶, ⁷.

Stevenson & Saunder however found that role-play and student presentation are the least preferred teaching method by 32% of new medical students⁸. In another study, 19.6% of first year Caribbean medical students chose student role-play as their least preferred communication teaching style⁹. Joyner and Young states that the reason medical students often dislike role plays could be because when role plays are unstructured and unplanned, active learning does not necessarily occur¹⁰. The present study was undertaken to determine the perceptions of first year medical students in an Indian medical college about the use of role-play in Physiology as a teaching-learning method. Another aim of the study was to determine if the perceptions varied significantly between the role-players and the observers of the role-play as this has not been sufficiently explored by previous researchers.

2. Methods

The study was conducted in the Department of Physiology of a private medical college in Chennai in India. 143 first year medical students participated in the study. Written informed consent was obtained. 46 students volunteered to take part in the role-play and 97 students were observers.

Five challenging and relevant cases were chosen and allotted to the role-players who were divided into five teams of 7-10 members each. The cases were nutritional anemia, peptic ulcer, myocardial infarction, mismatched blood transfusion and myasthenia gravis. The faculty were facilitators and guided each team. It was clarified that the objectives of the role-play were to provide an opportunity to the students to demonstrate their knowledge of applied physiology; practice communication skills and demonstrate attitudes that they as future physicians should possess. Student ‘patients’ and student ‘family of the patient’ were guided about the presenting complaints and relevant past history. Student ‘doctors’ were given an outline of the patient interview process and management. The time for each role play was fixed at 15-20 minutes. The important responsibility of the observers in critiquing both the process and the content of the role-play was also explained.

Our version of role-play differed from the traditional role-play method generally used in the following ways: A semi-structured format was followed and audio-visual aids were allowed. Power-point slides were allowed to be presented at the end of each role-play to summarize the depicted clinical features, investigations and management. Participants were encouraged to use set induction and humor in building up the case scenario leading to the depiction of the patient’s presenting complaints and past history instead of solely focusing on the doctor-patient interview. After the initial role-play performance, all students were encouraged to reflect on what they had witnessed. Then a debriefing session consisting of a group discussion after reviewing a video recording of the role-play was conducted. The role-players were first asked to assess their performance and facilitators encouraged reflection and feedback from observers.

After the debriefing session, the students completed a 12 item questionnaire that elicited their perceptions regarding the use of role-play in Physiology as a teaching-learning method (Table 1). The 12 items were closed ended questions with a 5 point Likert scale as a response scale ranging from 5= totally agree to 1=totally disagree. Items were devised from previous research ¹¹, ⁵; expert opinion; our observations and a basic conceptual framework. Face and content validity were addressed and the questionnaire was pilot tested to ensure understanding of the items, wording and adequacy of response. Means and standard deviations were calculated; unpaired student t test was used and p values calculated using SPSS17.
Table 1: Questionnaire on perceptions of medical students regarding use of role-play in Physiology as a teaching-learning method.

| I. General qualities       | Strongly agree | Agree | Total % (Strongly agree + agree) | Neutral | Disagree | Strongly disagree |
|----------------------------|----------------|-------|----------------------------------|---------|----------|------------------|
| 1 Interesting              | 69 (48.25%)    | 68 (47.55%) | 95.80%                          | 5 (3.55%) | 1 (0.70%) | 0                |
| 2 Lively                   | 63 (44.06%)    | 60 (41.96%) | 86.01%                          | 18 (12.95%) | 2 (1.40%) | 0                |
| 3 Breaks monotony          | 118 (82.52%)   | 20 (13.99%) | 96.50%                          | 4 (2.80%) | 1 (0.70%) | 0                |
| 4 Helps visualize clinical features | 45 (31.47%) | 79 (55.24%) | 86.71%                          | 19 (13.29%) | 0 | 0 |
| 5 Helps recollect key points of lectures | 31 (21.68%) | 66 (46.15%) | 67.83%                          | 30 (20.98%) | 16 (11.19%) | 0 |
| 6 Helps learn attitudes    | 62 (43.36%)    | 57 (39.86%) | 83.22%                          | 18 (12.59%) | 6 (4.20%) | 0                |
| 7 Useful for learning communication skills | 67 (46.85%) | 58 (40.56%) | 87.41%                          | 9 (6.29%) | 6 (4.20%) | 3 (2.10%) |
| 8 Cases were realistic     | 47 (32.87%)    | 71 (49.65%) | 82.52%                          | 21 (14.69%) | 4 (2.80%) | 0                |
| 9 Facilitates transition to ward | 67 (46.85%) | 64 (44.76%) | 91.61%                          | 10 (6.99%) | 2 (1.40%) | 0                |
| 10 Appropriate for level of understanding | 76 (53.15%) | 55 (38.46%) | 91.61%                          | 11 (7.69%) | 1 (0.70%) | 0                |
| 11 Can be adopted by other undergraduates | 72 (50.35%) | 50 (34.97%) | 85.31%                          | 14 (9.79%) | 7 (4.90%) | 0                |
| 12 Debriefing session helped learn more from role play | 74 (51.75%) | 55 (38.46%) | 90.21%                          | 12 (8.39%) | 2 (1.40%) | 0                |

Table 2: Responses of students to individual items of the questionnaire on the use of role-play in Physiology as a teaching-learning method.

3. Results

The majority of first year medical students’ perceptions on the qualities of role-play and perceived effect on knowledge (item 1-5 in Table 2) were positive; as was the perceived effect on learning attitudes and communication skills (item 6-7 in Table 2). Perceptions about realism and facilitation in transition towards (item 8-9 in Table 2), appropriateness and applicability (item 10-11 in Table 2) and perceptions about debriefing session (item 12 in Table 2) were also found to be positive.
There was no overall significant difference in perceptions on the use of role-play in Physiology between observers and role-players (Table 3)

Table 3: Comparison of the scores of observers and role-players to the questionnaire on the use of role-play in Physiology as a teaching-learning method.

| Observers | Role-players | p value |
|-----------|--------------|---------|
| Mean      | S.D          | Mean    | S.D    |
| 51.36     | 4.588        | 52      | 3.664  |

Results are expressed as mean and standard deviation of the total scores to the 12 item questionnaire (Max = 60) using a five point Likert scale with 5 = strongly agree, 4 = agree, 3 = neutral, 2 = disagree and 1 = strongly disagree. Significance (p value) obtained using an unpaired t test.

There was however a significant difference in perceptions between observers and role-players on the helpfulness of role-play in visualizing the clinical features and in breaking monotony with the role-players perceiving it more positively than the observers. All other items were perceived positively by both the observers and the role-players (Table 4)

Table 4: Comparison of sub-scores of observers and role-players for each item in the questionnaire on perceptions regarding use of role-play in Physiology.

| S. No | Variable                               | Observers | Role-players | p value |
|-------|----------------------------------------|-----------|--------------|---------|
| 1.    | Interesting                            | 4.44      | 0.539        | 4.41    | 0.717   | 0.779   |
| 2.    | Lively                                 | 4.27      | 0.729        | 4.33    | 0.762   | 0.662   |
| 3.    | Breaks monotony                        | 4.71      | 0.594        | 4.93    | 0.250   | 0.016*  |
| 4.    | Helps visualize clinical features       | 4.10      | 0.637        | 4.35    | 0.640   | 0.034*  |
| 5.    | Helps recollect key points of lectures  | 3.76      | 0.944        | 3.83    | 0.851   | 0.700   |
| 6.    | Helps learn attitudes                   | 4.20      | 0.841        | 4.30    | 0.785   | 0.472   |
| 7.    | Useful for learning communication skills| 4.23      | 0.896        | 4.33    | 0.944   | 0.544   |
| 8.    | Cases were realistic                    | 4.15      | 0.740        | 4.13    | 0.749   | 0.908   |
| 9.    | Facilitates transition to ward          | 4.32      | 0.685        | 4.48    | 0.658   | 0.192   |
| 10.   | Appropriate for level of understanding  | 4.49      | 0.709        | 4.33    | 0.560   | 0.159   |
| 11.   | Can be adopted by other undergraduates  | 4.36      | 0.793        | 4.20    | 0.934   | 0.274   |
| 12.   | Debriefing session helped learn more from role play | 4.41      | 0.718        | 4.39    | 0.682   | 0.868   |

Sub-scores for each item in the questionnaire on perceptions regarding use of role-play in Physiology are expressed as mean ± standard deviation using a five point Likert scale with 5 = strongly agree, 4 = agree, 3 = neutral, 2 = disagree and 1 = strongly disagree. Significance (p value) obtained using an unpaired t test.

4. Discussion

This study was done to determine the perceptions of first year medical students in India about the use of role-play in Physiology as a teaching-learning method and to determine if the perceptions varied significantly between the role-players and the observers of the role-play.

4.1. Perceptions of qualities of role-play and perceived effect on knowledge

The majority of students in our study perceived the role-play to be interesting, lively, helpful in breaking monotony and in visualizing clinical features they had seen or heard. This is in agreement with De Neve and Heppner’s observation that role-play when used effectively arouses student interest and helps consolidate previous learning⁴. The reason for this
positive perception could be because role-play is a student-centered teaching learning method unlike the usual teacher-centered methods. Thus, there is scope even in the predominantly didactic non-problem based learning curriculum presently being followed in many Indian medical colleges, including the present one, to use role-play as a supplement to lectures and independent learning to make the learning of Physiology by first year medical students active.

4.2. Perceived effect on learning attitudes and communication skills

The majority of students also felt that the role-play helped them learn attitudes of a doctor while treating patients. Early exposure of first year medical students in the classroom to the right behavioral attributes of a doctor with subsequent reinforcing later during their clinical posting could possibly ensure better chances of them practicing what they learn. The majority of our students too felt that role-play was useful in learning communication skills, as did students in other studies. Clinical practice requires a complex combination of knowledge, skills and attitudes which is difficult to acquire in a curriculum that does not specifically address learning of attitudes. Medical students usually end up learning the affective domain from a hidden curriculum. Role-play in a simulated scenario gives medical students a chance to develop in all three educational domains-cognitive, psychomotor and affective with the possibility of feedback and correction of errors.

4.3. Realism and facilitation in transition to wards

Our study also revealed that the majority of our students felt role-play cases were realistic and would facilitate the transition from classroom to clinical wards. Clinical settings are fast paced and require quick response, where as classrooms are relatively calmer. As students become immersed in the realistic yet non-threatening classroom environment during the role-play, they get an opportunity to practice clinical skills and attitudes without harming real patients. This assumes even more significance given that it is being planned to implement early clinical exposure of first year medical students as one of the curricular reforms in India.

4.4. Appropriateness and applicability

The results of our study differed from those of Stevenson and Sander with the majority of our students even suggesting based on their role-play experience that it could be adopted by other undergraduate students, while also stating that it was appropriate for their level. The reason for the overall positive perception of role-play by our students could be because we attempted to follow Joyner and Young’s tips for successful role-play.

This included proper preparation; clarifying the learning objectives; creation of challenging cases; packaging the role-play; allowing adequate time; involving all students; defining ground rules; keeping observers busy; using structured assessment; debriefing; feedback and reflection and maintaining a sense of humor.

4.5. Perceptions about debriefing session

The majority of our students felt that the debriefing session with group discussion and feedback after reviewing the video recording of the role-play helped them learn more from the role-play. The guidelines for maximizing benefits of role-play set out by Nestel and Tierney are similar to Joyner and Young’s tips for successful role-play, the additional guideline advised being to use audio-visual recording devices for play back, which we followed. The system of multiple re-enforcement consisting of power point slides summarizing features presented in the role-play and later the viewing of the video recording of the physician-patient scene of the role-play could be the reason for perceived better learning. Also, the open-ended questions of the facilitator during the debriefing session prompted student reflection and subsequent discussion, thus ensuring their active involvement in the learning process. Nestel and Tierney’s role-play guidelines are based on some of the principles of adult learning identified by Knowles et al, like “the need to know, readiness to learn and orientation/problem centeredness”, which could explain why our students too perceived the role-play positively. The role-play and feedback session also involved students in all four learning environments of Kolb and Fry’s experiential learning theory (ie) doing, watching, feeling and thinking environment. The feedback session especially helped reflection ‘on’ action, while the role-play aided reflection ‘in’ action, in accordance with Schon’s work on reflective practice.

4.6. Comparison of perceptions of role-players and observers

Comparison of the total questionnaire scores showed that there was no significant difference in scores between the role-players and the observers. The reason for this could be the active involvement of the observers too in the process of learning. The implications are that if conducted properly, it is possible to use role-play even in large groups. Comparison of sub-scores of each of the questions between the role-players and the observers revealed that there was a significant difference in perceptions only in two out of the twelve items-helpfulness of role-play in visualizing clinical features that they had in text books and breaking of monotony.
4.7. Limitations:

Limitations of the study include the possibility of social desirability bias; the failure to use pre and post tests to establish the efficacy of role-play; insufficient emphasis on the psychomotor domain of learning and limitation in applicability of results of this study to medical students studying Physiology and not necessarily to other subjects or to students of other courses studying Physiology.

4.8. Future research:

Future studies could focus on why a small percentage of students felt neutral about the role-play or why an even smaller percentage did not perceive the role-play as favorably as the majority did. Further studies can also be done on the perceptions of students regarding the use of role-play in learning psychomotor skills commonly taught in Physiology. It will be worthwhile getting the perceptions of the faculty who served as facilitators during the role-play to add another perspective. Student performance could be assessed objectively by pre and post tests in future studies. Future research could also be done to assess the long term effects of the role-play.

5. Conclusion

From the perspective of the 143 first year Indian medical students in our study, carefully planned and structured role-plays in Physiology are perceived positively by both the role-players and the observers. The majority of students felt that role-play was interesting, lively, and helpful in breaking monotony and in visualizing clinical features. It helped them learn attitudes of a doctor while treating patients and was useful in learning communication skills. The cases were considered to be realistic, facilitating the transition from classroom to clinical wards and while being appropriate for their level were also felt to be applicable to other undergraduates. They also felt that the debriefing session with group discussion and feedback after reviewing the video recording of the role-play helped them learn more from the role-play. Indian medical colleges using a didactic, non-problem based learning curriculum can therefore consider using role-play as a supplement to lectures in Physiology, to promote active learning even in large groups.

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