

RESEARCH ARTICLES

Pharmacy Students' Preferences for Various Types of Simulated Patients

Casey Gallimore, PharmD,^a Angela K. George, BS Pharm, MA,^b and Michael C. Brown, PharmD^b

^aSchool of Pharmacy, University of Wisconsin*

^bCollege of Pharmacy, University of Minnesota

Submitted June 29, 2007; accepted August 18, 2007; published February 15, 2008.

Objective. To evaluate pharmacy students' preferences for various types of simulated patients.

Methods. Second-professional year (P2) pharmacy students participated in 7 learning activities that used simulated patients including community volunteers, College administrative staff, course instructors, and student peers. Students ranked each simulated patient type according to believability, skill development, and preference using a 5-point Likert scale.

Results. One-hundred seven of 155 students (69%) completed the survey instrument. Students preferred community volunteers as simulated patients (mean rank 1.39), followed by peers (2.22), instructors (2.63), and staff members (2.81) ($p < 0.001$). Greater than 89% agreed or strongly agreed that their work with simulated patients prepared them for actual patients, with community volunteers receiving the highest ratings ($p < 0.03$).

Conclusions. Although pharmacy students found value in interactions with all types of simulated patients, they preferred community volunteers over staff members and their peers. Future scholarship should explore the relationship among simulated patient types and student learning outcomes.

Key words: simulated patient, survey, practice laboratory

INTRODUCTION

The use of standardized patients has become widespread in medical education curricula.¹ This is largely based on the demonstrated value of standardized patients in the assessment and clinical training of medical students.² Standardized patients provide a standard assessment tool that can be used to evaluate pre-established educational objectives.^{3,4} The performance of medical students on standardized patient assessments has been correlated with performance during the first year of residency.⁵⁻⁷ In addition, standardized patients provide a consistent medium through which medical students can apply, practice, and develop clinical skills. Current doctor of pharmacy (PharmD) curricula also commonly engage pharmacy students in learning and assessment activities involving standardized or simulated patients based on similar education benefits.⁸⁻¹³ While the benefit of using simulated patients has been well documented in both the medical and pharmacy education literature,²⁻¹² less attention has been focused on the comparison of various simulated patient types. (Note: this manuscript uses the term

simulated patient, which is more specific to people who are trained to represent a patient with a history and laboratory profile, rather than the broader term of standardized patient.²) The objective of this manuscript is to describe pharmacy students' preferences for various simulated patient types, as well as describe students' perceptions of learning from each type.

METHODS

Pharmaceutical Care Skills III and *IV* are consecutive required laboratory courses offered during the second-professional year in the University of Minnesota College of Pharmacy PharmD curriculum. Table 1 lists the 7 separate laboratory activities in the 2 courses that use simulated patients. It also summarizes the types of patients used, the simulated patient care activities completed, and the approximate length of the patient interaction. All comprehensive patient interviews required students to acquire (1) demographic data, (2) past medical history and history of present illnesses, (3) medication history, (4) status of any previously identified drug therapy problems, and (5) review of systems and other pertinent health history. All care plan delivery sessions included (1) review of current conditions with focus on those with drug therapy problems, (2) discussion of any new therapeutic plans including medication education, and (3) discussion of follow-up plan. Each of the activities represented a different

Corresponding Author: Michael C. Brown, Pharm.D. 3-130 Weaver-Densford Hall, 308 Harvard St. SE, Minneapolis, MN 55455. Tel: 612.626.2340 Fax: 612.625.9931 E-mail: brown312@umn.edu

*At the time of this study, Dr. Gallimore was a pharmacy resident at the University of Minnesota, College of Pharmacy

Table 1. Summary of Second-Professional Year Pharmacy Students' Learning Activities Using Simulated Patients

Activity ^a	Learning Activity (length in minutes)	Simulated Patient Types
1	Medication history and education (15)	community volunteers, course instructors student peers
2	Comprehensive new patient interview (20)	community volunteers, administrative staff
3	Medication education (10)	community volunteers, administrative staff
4	Follow-up patient interview and care plan delivery, including medication education (30)	course instructors, student peers
5	Follow-up patient interview and care plan delivery, including medication education (30)	course instructors, student peers
6	Follow-up patient interview (15)	course instructors, student peers
7	Follow-up care plan delivery, including medication education (15)	community volunteers, course instructors, administrative staff

^aActivities 1-3 are in fall semester, activities 4-7 are in spring semester. All 156 students rotate through each learning activity during a consecutive 2-4 week time period

independent scenario with a different patient except for the first 3 activities of the spring semester in which students were exposed to the same simulated patient through a progression of health problems, from dyslipidemia and hypertension, to coronary artery disease, to atrial fibrillation with warfarin anticoagulation. For each activity, students were either observed live or through the use of streaming video by an instructor and graded using an evaluation rubric. In addition, during the spring activities, the simulated patients provided feedback to students using a separate evaluation tool; this feedback was not associated with any score or grade. All simulated patients, regardless of type, met with the course coordinator and received approximately 30 minutes of training prior to serving as a simulated patient. Training was done with all simulated patients in the same session whenever possible, although this was not always logistically feasible. Training included an orientation of the learning activity, reading through the case/scenario, and discussing anticipated student questions and responses.

A survey tool was developed as part of the end-of-year course evaluation process to evaluate students' preferences and experiences working with the different types of simulated patients throughout the fall and spring semesters. One member of the teaching team (C.G.) drafted the original survey instrument and all co-authors provided feedback and subsequent revisions. The survey instrument was administered during a lecture period following the completion of all laboratory activities. Completion of the survey instrument was not a requirement of the course but was encouraged (standard procedure for our College of Pharmacy course evaluations process). Students were instructed to complete the survey instrument anonymously. On the survey instrument, students were asked to rank the 4 types of simulated patients on

a scale from 1 to 4, with 1 being the best and 4 being the least optimal. Students were instructed to only rank the patient types with which they had experience during the course, and they were allowed to give multiple patient types the same ranking if they deemed them equal. If a student worked with a given patient type at some point during the previous year, they were also asked to respond to a list of 9 statements regarding their perceptions of that specific patient type using a Likert scale of strongly disagree, disagree, neutral, agree, and strongly agree (Appendix 1). Space was provided for students to include additional comments regarding the use of specific simulated patient types or to provide insight into any of their survey responses.

The primary outcome was the mean student ranking of each simulated patient type. Secondary outcomes included why students preferred certain simulated patient types, which simulated patient types improved students' clinical and communication skills, which simulated patient types were perceived as being as believable as an actual patient, and whether students felt the patient types' lack of believability detracted from their learning experience. Differences in student ranking of the various patient types were tested using one-way ANOVA and a post-hoc least significant difference analysis. Student responses to secondary outcomes questions were analyzed with descriptive statistics, with differences between the frequencies of students agreeing with each statement being analyzed using a chi-square test. Alpha was set at 0.05 for all statistical comparisons.

RESULTS

One hundred seven of the 155 students (69%) completed the survey questionnaire. Of these 107 respondents, 103 (96%) indicated that they worked with a peer

student as a simulated patient at least once, while 101 (94%) indicated they worked with community volunteers, 65 (61%) with course instructors, and 56 (52%) with College administrative staff. The primary outcome results are shown in Table 2, including mean rank and median rank for each patient type. Overall students ranked community volunteers most favorably, followed by peer students, course instructors, and College administrative staff members.

Ninety-two percent (93/103) of students who reported working with community volunteers agreed or strongly agreed that community volunteers were believable as actual patients. This was significantly greater than that reported for course instructors (75%; 49/65; $p = 0.003$), College administrative staff (73%; 41/56; $p = 0.001$); or student peers (72%; 74/103; $p < 0.001$). When asked to rate whether the patient’s believability detracted from the learning experience, only 13% (13/101) indicated they agreed or strongly agreed with this statement for community volunteers. The percentage increased to 16% (9/56) for College administrative staff and 19% (20/103) for student peers. It was highest for course instructors with 22% (14/65) of students feeling a lack of believability as a patient detracted from their learning experience. None of these differences reached statistical significance.

Ninety-three percent (94/101) of students agreed or strongly agreed that working with community volunteers prepared them to work with actual patients. The percentage agreeing or strongly agreeing that working with simulated patients prepared them to work with actual patients fell to 88% (57/65) when the patient was a course instructor and to 86% when the patient was either a College administrative staff member or a student peer (48/56 and 88/103, respectively). None of these were significantly different. When presented with the option of recommending the future use of each type of simulated patient, a significantly greater percentage of students agreed or strongly agreed that they would recommend community volunteers (98/101; 97%) compared to the percentages of students that would recommend course instructors (54/65 (83%), $p = 0.002$), student peers (84/

103, 82%; $p < 0.001$), and College administrative staff members (44/56, 79%; $p < 0.001$).

The secondary outcome of perceived improvement in clinical skills is summarized in Figure 1. For each clinical skills component (verbal communication, nonverbal communication, medication education, and history taking and assessment), no less than 75% of respondents agreed or strongly agreed that their work with any type of simulated patient contributed to their clinical skills development. Although students rated community volunteers the best at helping them develop individual skills, a significant difference only existed between students’ ratings of community volunteers and College administrative staff members for improvement in history taking and assessment skills ($p = 0.041$), and between community volunteers and instructors for improvement in verbal communication skills ($p = 0.044$).

Several themes could be identified when reviewing students’ free-text comments. Students indicated that community volunteers were more believable and realistic as patients than other simulated patient types because they were previously unknown to the students and were often closer in age to the patient they portrayed. It was also mentioned that use of community volunteers resulted in a more authentic experience for students. Some students reported feeling more nervous and intimidated with staff members and instructors because they knew each other and because the instructors were also grading the students (even though all encounters involving a faculty member were actually graded by a separate instructor observing the encounter either live or by streaming video). Students also expressed that they liked the immediate feedback that staff members and instructors provided at the end of the patient interaction. Some students expressed feeling more pressure and intimidation when a student peer played the simulated patient because they did not want to “look bad” in front of a fellow classmate. Other students felt less nervous and more comfortable interacting with a peer. Occasionally, students commented that it was challenging to approach the simulated patient interaction seriously when a peer portrayed the patient.

Table 2. Students’ Mean Rank of Simulated Patient Types

Simulated Patient	Mean Rank (SD)^a	Median Rank	P
Community volunteers	1.39 (0.79)	1	< 0.001 vs staff, peer and instructor
Student peers	2.22 (1.00)	2	< 0.001 vs volunteer and staff = 0.002 vs instructor
Course instructors	2.63 (0.87)	3	< 0.001 vs volunteer = 0.002 vs peer
Administrative staff	2.81 (1.00)	3	< 0.001 vs volunteer and peer

^aScale of 1 to 4 (1 = the best; 4 = least optimal)

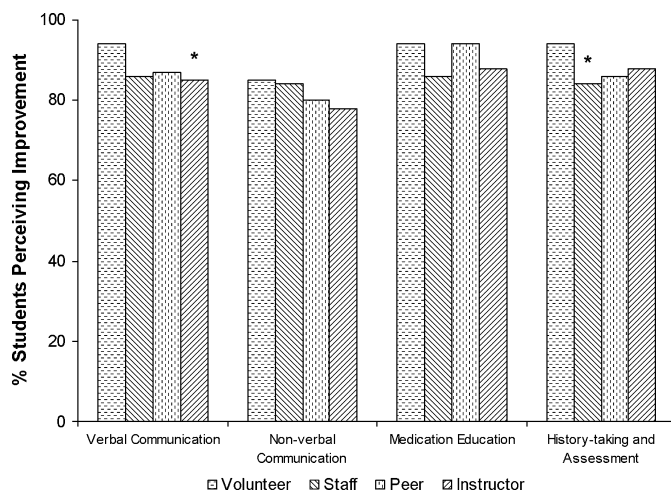


Figure 1. Percent of students reporting perceived skill improvement for various simulated patient types (* $p < 0.05$, volunteer vs instructor; ** $p \leq 0.003$, staff vs volunteer).

DISCUSSION

The pharmacy education literature has little data regarding students' preferences of various simulated patient types. In one portion of a work by Sibbald, students were surveyed regarding their perceptions of first-professional year pharmacy students and professional actors as standardized patients in a senior student objective structured clinical examination (OSCE).⁸ Unlike our study, the Sibbald study did not ask respondents to indicate their preference for any single patient type, but did determine that 74% of surveyed examination candidates preferred having both first-professional year pharmacy students *and* actors as patients in the examination as opposed to only one patient type or the other. Eighty percent of students in the Sibbald study indicated that the use of first-professional year students should be continued, which is almost identical to the 82% of our students suggesting that the use of peer students be continued. An analogous question regarding the use of actors was not asked in the Sibbald work, but our study found that 97% of students suggested the use of volunteers be continued. Also similar to our findings, the majority of examination candidates from the Sibbald work reported both increased confidence in their ability to deliver pharmaceutical care and solve clinical problems and the perception of increased skills in oral communication and professional practice following their work with simulated patients.

Research in the area of medical education has explored the association between various standardized patient types and students' perceived learning experiences. Mavis et al specifically looked at the use of actors, peer students, and instructors as standardized patients in performance-based assessments.¹⁴ As with our students'

free-text comments, Mavis' students reported feeling most intimidated by instructors and least nervous with peers. Instructors gave the best feedback, while actors were found to be most believable as a patient. Despite these differences, Mavis' students were confident in their simulated diagnosis, did not feel their performance was inhibited, and had a positive learning experience with each type of standardized patient utilized. This finding is also consistent with our students' perceptions of their skill development with any of the simulated patient types.

It is intriguing that despite students' perceptions that their skill development was practically the same regardless of patient type, students still overwhelmingly preferred community volunteers, with 76% of students giving them the number one ranking. As previously mentioned, believability and the opportunity to work with someone who a student does not otherwise know are 2 reasons for this preference. As one of the educational goals of any simulated patient learning activity is to provide students with a realistic practice experience in a controlled environment, one should use community volunteers as simulated patients at least some of the time in formative assessments. There are some additional reasons to encourage the use of community volunteers as simulated patients. The College's use of community volunteers has built relationships with the community and improved the community's understanding of pharmacy students' education, albeit one simulated patient at a time.

On the other hand, it is unlikely that community volunteers could or should be used exclusively. For those students who feel more comfortable with 1 patient type, it is good experience to also have to work with simulated patients with whom they are less comfortable. In our learning activities, instructors (independent of the simulated patient) evaluate clinical content, but Mavis et al reported that instructors gained insight into the abilities of their students by acting as patients.¹⁴ Resources also influence the ability to use only community volunteers, including the time necessary to develop relationships with potential patient pools and the money needed if paid actors are necessary. The resources consumed by finding standardized patients who are either paid actors or actually have the conditions being portrayed could be prohibitive. However, by using peers, staff members, instructors, and volunteers, the strain on resources is less burdensome, and patient care situations can be simulated on a regular basis.

In addition, lack of believability did not detract from the learning experience with any simulated patient type, which may indicate that going through the process of a pharmacist-patient interaction is more important than actual believability when it comes to students' perceived

learning. In the end, exposing students to multiple types of simulated patients may better emulate the variety of patients seen in actual patient care settings.

As survey research, this study has the limitation that it does not capture all 155 students' perceptions or preferences, although a response rate of 69% is respectable. The students' perceptions and preferences are all drawn from weekly work and formative assessments as our teaching laboratory series has not yet finalized its implementation of high-stakes summative examinations. It is difficult to know whether the findings would be transferable to such examinations. Although it is likely that students' perceptions of paid actors would be similar to those seen with our community volunteers given the reported reasons why students liked the volunteers, one can not guarantee that our findings would be directly transferable.

This study does not address objective learning outcomes and their correlation with simulated patient types. Such an analysis is beyond the scope of this research as patient types were placed out of logistical and educational necessity and were not stratified by any student cohort for an objective learning outcome analysis. Clearly this is an area that would benefit from future scholarship.

CONCLUSION

While students perceive value from interactions with all simulated patient types, second-professional year pharmacy students preferred working with community volunteers, followed by peer students, and then course instructors and administrative staff members. Better believability as a patient appears to set the community volunteers apart from the other patient types. Despite this difference, students rated all patient types positively, with more than 3 in 4 attributing perceived skill improvement to all types of simulated patients. Future scholarship should explore the learning experience when peer student are used as simulated patients and the potential relationships among simulated patient types and students' skill development.

REFERENCES

1. Barzansky B, Etzel SI. Education programs in US medical schools, 2003-2004. *JAMA*. 2004;292:1025-31.
2. Barrows HS. An overview of the uses of standardized patients for teaching and evaluating clinical skills. *Acad Med*. 1993;68:443-51.
3. Vu NV, Barrows HS, Marcy ML, Verhulst SJ, Colliver JA, Travis T. Six years of comprehensive, clinical, performance-based assessment using standardized patients at the Southern Illinois University School of Medicine. *Acad Med*. 1992;67:42-50.
4. Howley LD. Performance assessment in medical education: where we've been and where we're going. *Eval Health Prof*. 2004;27:285-303.
5. Vu NV, Distlehorst LH, Verhulst SJ, Colliver JA. Clinical performance-based test sensitivity and specificity in predicting first-year residency performance. *Acad Med*. 1993;68:S41-5.
6. Smith SR. Correlations between graduates' performances as first-year residents and their performances as medical residents. *Acad Med*. 1993;68:633-4.
7. Rutala PJ, Fulginiti JV, McGeagh AM, Leko EO, Koff NA, Witzke DB. Predictive validity of a required multidisciplinary standardized-patient examination. *Acad Med*. 1992;67:S60-2.
8. Sibbald D. Using first-year students as standardized patients for an objective structured clinical exam for third-year pharmacy students. *Am J Pharm Educ*. 2001;65:404-12.
9. Collett JH, Rees JA, Mylrea S, Crowther I. Performance based assessment in pharmacy education. *Int J Pharm Prac*. 1994;3:38-41.
10. Austin Z, Tabak D. Design of a new professional practice laboratory course using standardized patients. *Am J Pharm Educ*. 1998;62:271-9.
11. Monaghan MS, et al. Student attitudes toward the use of standardized patients in a communication course. *Am J Pharm Educ*. 1997;61:131-6.
12. Austin Z, Gregory P, Tabak D. Simulated patients vs. standardized patients in objective structured clinical examinations. *Am J Pharm Educ*. 2006;70(5):Article 119
13. Glasser D, Ahrens R, Caffee A, Johnson M. Standardized patient assessment in a disease state management model. *Am J Pharm Educ*. 2002;66:72-8.
14. Mavis B, Turner J, Lovell K, Wagner D. Faculty, students, and actors and standardized patients: Expanding opportunities for performance assessment. *Teach Learn Med*. 2006;18:130-6.

Appendix 1. Survey questions for secondary outcomes. Respondent completed 1 survey for each patient type (volunteer, peer, instructor, and staff) that they encountered.

Survey on Simulated Patients

Please circle one response for each item.

1. At some point during the past year I worked with this type of simulated patient.	Yes	No	Unsure		
2. Simulated patient WAS believable as a patient.	Strong Disagree	Disagree	Neutral	Agree	Strongly Agree
3. Believability of simulated patient detracted from my learning experience.	Strong Disagree	Disagree	Neutral	Agree	Strongly Agree
4. The simulated patient's reliance on notes distracted from simulation as patient.	Strong Disagree	Disagree	Neutral	Agree	Strongly Agree
5. I improved my interviewing/assessment skills working with this simulated patient.	Strong Disagree	Disagree	Neutral	Agree	Strongly Agree
6. I improved my verbal communication skills working with this simulated patient.	Strong Disagree	Disagree	Neutral	Agree	Strongly Agree
7. I improved my non-verbal communication skills and reduced mannerisms working with this simulated patient.	Strong Disagree	Disagree	Neutral	Agree	Strongly Agree
8. I improved my care plan delivery and drug education skills working with this simulated patient.	Strong Disagree	Disagree	Neutral	Agree	Strongly Agree
9. I am better prepared to work with actual patients because of my work with this simulated patient.	Strong Disagree	Disagree	Neutral	Agree	Strongly Agree
10. I WOULD recommend using as a patient next year.	Strong Disagree	Disagree	Neutral	Agree	Strongly Agree

Please provide your written comments regarding (a) any insight into your answers above and/or (b) other comments regarding using these individuals as simulated patients.