



ELSEVIER



CrossMark

Available online at www.sciencedirect.com

ScienceDirect

Currents in Pharmacy Teaching and Learning 7 (2015) 851–863

Currents
in Pharmacy
Teaching
& Learning

<http://www.pharmacyteaching.com>

Review article

Standardized patients in pharmacy education: An integrative literature review

John Smithson, BPharm, BNSc^{a,*}, Michelle Bellingan, BPharm, PhD^a,
Beverley Glass, BPharm, PhD^a, Jane Mills, BNursing, PhD^b

^a Division of Tropical Health and Medicine, James Cook University, Townsville, Australia

^b Centre for Nursing & Midwifery Research, James Cook University, Cairns, Australia

Abstract

Background: The value of standardized patients in undergraduate health-related education is recognized broadly in the literature as it can improve patient safety, provides a nexus between theory and practice, can supplement limited placement experiences, and improves work readiness of graduates.

Aim: This integrated review examines the evidence for the use of standardized patients as a teaching strategy in pharmacy education programs that prepare the graduate for initial registration as a pharmacist.

Method: A systematic search of Scopus, CINHALL, PubMed, ProQuest, Science Direct, Medline, A+ Education, and ERIC of 2000–2013 was conducted, revealing 27 articles for inclusion into this review. Suitable articles were systematically analyzed to identify relevant data for this review.

Results: Four themes relating to the use of standardized patients have emerged from the literature: student satisfaction, effectiveness to confer knowledge, skills and interprofessional practices, and its use in assessment and the cost of the educational intervention. Findings from this review show student acceptance for standardized patients as a teaching strategy, benefit for the technique in imparting knowledge and skills related to pharmacy, evidence to support the notion of standardized patients as a valid and reliable assessment tool and cost as a commonly identified barrier to the use of the teaching strategy.

Conclusion: The use of standardized patients in pharmacy education is increasing. Standardized patients have been used to develop the essential knowledge, clinical skills, and professional attributes required for practice. Gaps in knowledge around transferability, scalability, and cost benefit of this technique still exist, and there is a need for pharmacy educators to address these gaps to justify this resource-intensive teaching method.

© 2015 The Authors. Published by Elsevier Inc. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Keywords: Patient simulation; Standardized patient; Simulated patient; Models educational; Pharmacy; Education

Introduction

Pharmacists are highly accessible health care providers¹ and feature prominently in an Australian health care system characterized by an aging and more demanding health

consumer.^{2–4} In response to increased demand for services and the down scheduling of prescription medicines, the pharmacy profession has extended its principle role of the supply of medicines and medicine information to include a range of other services that support a collaborative, patient-centered model of care.^{5,6} To ensure that recently graduated pharmacists are adequately prepared for this extended role, teaching methods utilizing patient simulation, including standardized patients, are being used increasingly to ensure that students practice and are

* Corresponding author: John Smithson, James Cook University, Building 25, 1 James Cook Drive, Townsville QLD 4811, Australia.

E-mail: john.smithson@jcu.edu.au

<http://dx.doi.org/10.1016/j.cptl.2015.08.002>

1877-1297/© 2015 The Authors. Published by Elsevier Inc. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

being assessed under conditions that reflect clinical practice.⁷

The use of standardized patients in educating students in entry-level health-related programs is widely reported in the literature.^{8–11} For the purpose of this paper, an entry-level program is defined as one designed to deliver the minimum required training and education for entry into the pharmacy profession. A student who has completed such a program is an entry-level graduate. The value of using simulation in health-related education and training has long been recognized and has been considered an integral part of nursing and medical curricula for decades.^{12–15} The main drivers for expansion of simulation-based learning and teaching include improved patient safety,^{16,17} a need to supplement increasingly limited practicum experiences, and the goal to produce “work-ready” entry-level graduates who are prepared for collaborative clinical practice from day one. Simulation is not as widespread nor as advanced in entry-level pharmacy programs as it is in medicine and nursing programs.¹⁸

Defining simulation

The term simulation in the context of clinical teaching encompasses a number of complementary but distinctive teaching modalities. Simulation has been described by many authors^{18–27} as substituting “real” patients for virtual-reality computer simulation, computer-aided mannequins, low-fidelity organ substitutions, or trained standardized patients role-playing a patient experience. Early work by Barrows and Abrahamson²⁸ describes the use of a “programmed patient,” in which the simulation of disease is carried out by a normal individual who is trained to accurately portray the history and findings of a patient’s condition in the manner of an actual patient. Patient simulation practices today echo that early work and can be defined as the substitution of a bona fide patient encounter with artificial models or mannequins, virtual reality, or live actors enacting a scenario that replicates substantial aspects of the real experience in a controlled environment.^{29–31}

Two broad classifications of patient simulations have emerged in the literature. The first is human patient simulation (HPS) that includes high-fidelity computer-aided mannequins^{32,33} and task trainers as well as low-tech, low-fidelity substitutions such as preserved animal organs.³⁴ The second is the “standardized patient” that commonly involves community volunteers or paid actors,⁷ student peers, or faculty academics, teaching and administrative staff (faculty staff) who role-play a patient-based scenario.

There is contrast in the use of the different simulation types across the health disciplines. For example, medicine and nursing commonly use patient simulation to teach a broad range of clinically related skills such as history taking, patient examination, the practice of physical therapy techniques, clinical decision making, and critical thinking and communication.^{18,33,35,36} This is demonstrated in a great number of articles describing the use of HPS

techniques such as task trainers, computer simulators, and medium- and high-fidelity mannequins in addition to standardized patients. Despite the perception that pharmacy practice does not necessitate the same degree of physical contact with patients, there is evidence for the use of simulation across a range of discrete pharmacy practice-related skills including communication,^{20,37,38} clinical decision making, patient history and physical assessment,^{39,40} and the application of pharmaceutical care.^{41,42} A *prima facie* assessment of the literature on pharmacy use of simulation suggests a bias toward the use of standardized patients in pharmacy programs with fewer examples of the application of HPS techniques found.^{39,43,44}

Defining the standardized patient

A standardized patient can be defined as someone who has been trained to portray a character or a patient problem as described in a scripted case scenario, and who can deliver a consistent, similar performance to different students.^{20,45–48} The experience exposes trainee practitioners to clinical scenarios in a safe and predictable learning environment.⁷ Standardized patients might also assess or provide feedback on student performance based on their experience of the patient–practitioner interaction.⁴⁵ Standardized patients often follow a script, allowing for varying levels of improvisation, to create a more fluid environment that mirrors an authentic situation more closely.

Standardized patients may be selected for existing disease profiles but are equally valuable when free from the disease of interest if complementary scripts or scenarios are developed. Appropriate selection of the standardized patient and scenario can allow for a range of clinical learning opportunities not limited to patient history and physical assessment, interpersonal and interprofessional communication, clinical reasoning, and the selection and application of relevant clinical therapies.^{40,48–50}

The literature describes three distinct types of standardized patient: community volunteers or paid actors; faculty academic staff, teaching staff and administrative staff; and student peers. Each type of standardized patient has a unique combination of advantages and limitations, making each standardized patient type more or less suitable for different teaching and learning experiences. [Table 1](#) summarizes some of the relative advantages and limitations of each of the three main types of standardized patient.

Why use standardized patients to teach?

Simulation is an adaptable teaching method and can be used to develop a range of skills and knowledge in pharmacy teaching. Simulation can be used to address gaps in clinical exposure; it can develop communication techniques; facilitate exposure to interprofessional experiences; and allow for the practice of patient assessments and clinical interventions in a controlled and safe environment.

Table 1
Advantages and limitations of standardized patient types

Type	Advantages	Limitations
Community volunteers and paid actors	<ul style="list-style-type: none"> Unfamiliarity to and with students Increase the fidelity of simulation Generally flexible when scheduling and training Tend to stay close to script provided Provide valid feedback on the “patient experience” Cost is often less than that of academic staff when using for volunteers 	<ul style="list-style-type: none"> Require training Limited ability to provide feedback on technical aspects of performance Higher cost (if using paid actors) Significant time investment needed to design and implement¹
Faculty staff in role of patient	<ul style="list-style-type: none"> Enhanced feedback Feedback aligned with documented learning outcomes Experience with assessment and grading Requires less training Accepted by faculty and students Gives insight into efficacy of instructional program² 	<ul style="list-style-type: none"> Significant expense May stray from case or script² May provide unintended cues²
Peer (student) in role of patient	<ul style="list-style-type: none"> Requires less training Generally inexpensive² More readily available May reduce student anxiety² The student–patients benefit directly from experience themselves^{3–5} 	<ul style="list-style-type: none"> Less consistent feedback and rating²

From a curriculum perspective, standardized patient teaching methods can reliably deliver experiences that complement the planned curriculum and allow for targeted instructor feedback to the trainee.⁵¹ Standardized patient experiences can reduce undesired distractions that can occur in real life situations, while allowing for student exposure to high-risk or uncommon medical conditions in a safe and controlled environment. Standardized patients allow for repeated clinical scenarios, and cases can be offered on demand, increasing exposure and consistency of transferable learned knowledge to the patient-care context.²⁷ Arguably, the most important is the way standardized patients can enhance patient safety because students can practice clinical skills without risk to actual patients.^{16–18}

This integrative review examines evidence for the use of standardized patients as a teaching strategy in pharmacy education programs. This focus reflects the need for pharmacy educators to prepare entry-level graduates for modern pharmacy practice.

Design

An integrative review⁵² was conducted of the literature relating to the use, cost, and advantages of standardized patients as a teaching strategy in entry-level pharmacy education programs. The review purpose was established, search terms and databases identified, and inclusion and exclusion criteria set. A database search was undertaken and articles meeting the inclusion criteria were assessed using Critical Appraisal Skills Program (CASP) checklists.^{53,54}

Studies judged to be of sufficient quality were analyzed and synthesized for this paper.

Search methods

The following key terms were used: *patient simulation*, [*models*, *educational*], *pharma**, *educat**, *studen**, [*simulated patient* OR *standardi* patient*], “high-fidelity simulation”, “*patient education”, and “*education, pharmacy”. The term “high-fidelity simulation” was included to ensure that articles describing high-fidelity simulation in the context of human actor role-play were included (as opposed to high-fidelity simulation using human patient simulation (HSP) technologies). The terms were used to search the following databases: Scopus, CINAHL, PubMed, ProQuest, Science Direct, Medline, A+ Education, and ERIC. Where combinations of these terms failed to narrow the search to appropriate levels of fidelity in studies of simulation in pharmacy, appropriate permutations or limits were applied, “related searches” were used, or search terms were exploded. The search was limited to peer-reviewed articles, in English, published between January 2000 and December 2013: a date range that reflects a period of sustained increase in the number of pharmacy schools in Australia. A hand search using an ancestry approach was also undertaken for selected relevant articles.

Search outcome

In total, 1993 journal articles were identified. A primary review of the journal article titles was conducted, and 304

articles with titles identifying a relationship to the topic were retained. Abstracts of the 304 articles were reviewed and 44 articles reporting the use of and evidence for the efficacy of standardized patients as a teaching strategy in pharmacy education were retained. An additional nine records were identified through ancestry searches of these articles during the review process.

Quality appraisal

In all, 53 journal articles were comprehensively assessed for rigor and relevance to the purpose of the review. Criteria for assessing qualitative research, systematic reviews, and case control study as described by the Critical Appraisal Skills Program (CASP)^{54–56} were used. After this critical appraisal, 28 journal articles were included in this review. Table 2 provides an overview of these articles. An overview of the process of identification, screening, eligibility determination, and inclusion of articles used in this integrative review is illustrated in the Figure. This figure follows the PRISMA (Preferred Reporting Items for Systematic reviews and Meta-Analyses) process described by Moher et al.⁵⁷

Method of analysis

A data reduction process was used to extract, simplify, organize, and code data from the articles. Data sources were organized under pre-determined classifications as described by Whittemore and Knafl.⁵² Complete coding was undertaken simultaneously as described by Braun and Clarke.⁵⁸ Each journal article was systematically analyzed to identify data relevant to this review. Relevant data were initially marked on a hard copy of the journal article, and then a summary of the information was recorded in a memo under the relevant coding category to facilitate grouping and comparison. Categories were further refined and collapsed using pattern-based analysis as described by Braun and Clarke⁵⁸ and Saldana.⁵⁹ Pattern-based analysis captures ideas, concepts and relationships that recur across a data set to develop themes. Themes can evolve based on the frequency or saliency of the ideas, concepts, or relationships elucidated from the data.

Findings

Four main themes relating to the use of standardized patients as a teaching strategy in pharmacy education programs were identified in this integrative review:

1. students' preference for standardized patient type,
2. applications and efficacy,
3. student assessment, and
4. cost.

Theme 1—Student preference for standardized patient type

The medical and nursing literature reports acceptance of the use of standardized patients in entry-level programs^{60–62} and these findings are confirmed in a number of articles that assessed pharmacy student preference for a type of standardized patient. While pharmacy students rate all types of standardized patients positively,^{39,63} they strongly preferred non-pharmacy participants such as community volunteers or actors rather than faculty academic staff, teaching staff and administrative staff, and student peers.^{39,41,63,64} Reasons commonly cited for this preference included the following:

- Volunteers were more believable as their chronological age often matched the patient scenario more closely, resulting in a more authentic experience.^{38,41,63–65} Faculty academic, teaching, and administrative staff were found to be less believable.⁶³
- Interactions with standardized patients made students feel more confident working with real patients during clinical rotations or placements.^{41,63}
- Standardized patients created a comfortable environment that allowed students to effectively engage in communication, improving their ability to collect pertinent patient information.⁶⁴
- Volunteers were less intimidating than faculty academic, teaching, and administrative staff as they were not usually involved with grading of performance.^{63,64}
- There was a reduced potential of embarrassment, which could be felt when interacting with peers.⁶³

Theme 2—Applications and efficacy

The intent of teaching strategies using standardized patients in pharmacy programs is to reinforce knowledge, teach a broad variety of professional skills, and develop professionally appropriate attitudes in the student population. Assessment of knowledge transfer is an important consideration and a small number of articles found that standardized patients were beneficial in facilitating knowledge transfer,^{43,66,67} but did not show benefit above other simulation methods.⁶⁷ Despite this, simulated-patient encounters can provide pharmacy students with the opportunity to integrate pharmaceutical knowledge and skills (for example, physical assessment and history taking, problem solving, and disease management) to a practice-oriented situation.⁴⁰

Evidence suggests that students acquire a range of professional pharmacy-related skills from standardized patient experiences. Two articles demonstrated that students

Table 2
Literature review summary

Title	Year	Author(s) and origin	Journal/source	Design	Sample size and participants	Summary of findings
<i>Theme 1—Student satisfaction with and preference for type of standardized patient</i>						
Community-based collaboration with high school theater students as standardized patients	2007	Schultz, K. and Marks, A., USA	American Journal of Pharmaceutical Education (AJPE)	Multiple methods study	97 PharmD students	Evaluate pharmacy students' preference for type of SP and acceptability of high school student as a SP
Pharmacy students' preference for various types of simulated patients	2008	Gallimore, C., George, A. and Brown, M., USA	American Journal of Pharmaceutical Education (AJPE)	Sample survey	107 Pharmacy students	Evaluates pharmacy students' preferences for various types of simulated patients
Comparison of patient simulation methods used in physical assessment course	2013	Grice, G., Wenger, P., Brooks, N., and Berry, T., USA	American Journal of Pharmaceutical Education (AJPE)	Prospective randomized case study?	N = 156 group-A, N = 76 (mannequin), groupB, N = 78 (SP)	Investigates potential difference in student pharmacists' learning or satisfaction when using standardized patients or manikins to teach physical assessment
Assessment of anticoagulation management in a simulated ambulatory care clinic.	2007	Raney, E., USA	American Journal of Pharmaceutical Education (AJPE)	Evaluation survey of experience and preference for using role-play	56 PharmD students	Investigates the effectiveness of adding a simulated anticoagulation clinic practical examination
The design and evaluation of a simulated-patient teaching programme to develop the consultation skills of undergraduate pharmacy students	2001	James, D., Nastasic, S., Horne, R., and Davies, G., UK	Pharmacy World and Science	Descriptive paper and case study	91 PharmD students	Describes the design and implementation of a structured "consultation skills" teaching program using SPs. Identify key skills and knowledge required for the delivery of an ideal patient consultation (to inform the development of a training program using SPs). Evaluate students' ability and confidence in performing effective consultation
Using volunteer simulated patients in development of pre-registration pharmacists: learning from the experience.	2007	Nestel, D., Calandra, A., and Elliott, R., Australia	Pharmacy Education	Survey	97 Pre-registration pharmacists	Describes the development of a communication session that uses volunteer SPs to support the training of pre-registrant pharmacists
<i>Theme 2—Use of standardized patients to develop professional skills, knowledge, and attitudes</i>						
Comparison of active learning strategies for motivational interviewing skills, knowledge, and confidence in first-year pharmacy students.	2012	Lupu, A., Stewart, A., and O'Neil, C., USA	American Journal of Pharmaceutical Education (AJPE)	Quasi-experimental double-blinded control design	143 PharmD students	Compares three strategies for pharmacy student learning of motivation interviewing skills, knowledge of motivational interviewing principles, and confidence and attitudes toward their application
A comparison of educational interventions to enhance cultural competency in pharmacy students.	2013	Sales, I., Jonkman, L., Connor, S., and Hall, D., USA	American Journal of Pharmaceutical Education (AJPE)	Quasi-experimental	84 PharmD students	Evaluates three different educational interventions designed to enhance cultural competency in pharmacy students
Comparing effectiveness of 3 learning strategies—simulation-based	2012	Smithburger, P., Kane-Gill, S., Ruby, C.,	Simulation in Health care: The Journal	Prospective, randomized crossover study	103 PharmD students	Compares the effectiveness of three commonly used learning strategies—(HF) simulation-

Table 2
Continued

Title	Year	Author(s) and origin	Journal/source	Design	Sample size and participants	Summary of findings
learning, problem-based learning, and standardized patients.		and Seybert, A., USA	of the Society for Simulation in Health Care			based learning, problem-based learning, and standardized patients
The impact of a standardized patient program on student learning of communication skills	2009	Rickles, N., Tieu, P., Myers, L., Galal, S., and Chung, V., USA	American Journal of Pharmaceutical Education (AJPE)	Blinded retrospective analysis	107 PharmD students	Evaluates the value of a lecture–laboratory course with standardized patients on communication skill. Investigates student attitude toward standardized patients
Development and assessment of social and emotional competence through simulated-patient consultations.	2012	Galal, S., Carr-Lopez, S., Seal, C., Scott, A., and Lopez, C., USA	American Journal of Pharmaceutical Education (AJPE)	Multiple methods study	212 PharmD students	Investigates if a quantitative tool could be used to measure social emotional competence and whether the development of social emotional competence through a pharmacy practicum course is possible. Intervention uses patient simulation
Skills development using role-play in a first-year pharmacy practice course.	2011	Rao, D., Australia	American Journal of Pharmaceutical Education (AJPE)	Multiple methods study	$N = 130$ in S1 and $N = 129$ in S2	Investigates the usefulness of a role-play model in developing students' patient-care skills in a first-year undergraduate pharmacy practice course
An interprofessional course using human patient simulation to teach patient safety and teamwork skills.	2012	Vyas, D., McCulloh, R., Gregory, G., and Higbee, D., USA	American Journal of Pharmaceutical Education (AJPE)	Multiple methods study	208 Students, including 23 PharmD students	Investigates the effectiveness of simulation (including standardized patients) to teach patient safety, teambuilding skills, and the value of interprofessional collaboration to pharmacy students.
The impact of an interprofessional standardized patient exercise on attitudes toward working in interprofessional teams.	2012	Wamsley, M., Staves, J., Kroon, L., Topp, K., Hossaini, M., and Newlin, B., Lindsay, USA	Journal of Interprofessional Care	Quasi-experimental design comparing intervention group (undertook ISPE) to convenience sample not exposed to intervention	Intervention group $N = 94$ pre- and 91 post-control $N = 152$ post-	Describes the creation, implementation, and evaluation of interprofessional standardized patient exercise (ISPE)
An interprofessional activity using standardized patients.	2006	Westberg, S., Adams, J., Thiede, K., Stratton, T. and Bumgardner, M., USA	American Journal of Pharmaceutical Education (AJPE)	Descriptive paper. Survey methodology with written responses	26 PharmD students	Describes the development and implementation of an interprofessional activity using standardized patients
Standardized patient assessment in a disease state management model.	2002	Glasser, D., Ahrens, R., Caffee, A. and Johnson, M., USA	American Journal of Pharmaceutical Education (AJPE)	Descriptive paper		Describes a workshop to teach basic patient assessment skills in a disease state management model using standardized patients
Human Simulators and Standardized Patients to Teach Difficult	2010	Marken, P., Zimmerman, C., Kennedy, C.,	American Journal of Pharmaceutical Education (AJPE)	Multiple methods study	11 Students	Evaluation of simulation to teach interprofessional teams to recognize and

Conversations to Interprofessional Health Care Teams		Schremmer, R. and Smith, K., USA				engage in difficult conversations with patients
<i>Theme 3—Assessment</i>						
Simulated patients vs. standardized patients in objective structured clinical examinations.	2006	Austin, Z., Gregory, P. and Tabak, D., Canada	American Journal of Pharmaceutical Education (AJPE)	Multiple methods study	99 PharmD students, 14 in follow-up	Describes the use of patient actors as educators and to contrast the value and application of “standardized patient” and “simulated patient” educational methodologies
Traditional student, non-traditional student, and pharmacy practitioner attitudes toward the use of standardized patients in the assessment of clinical skills.	2000	Monaghan, M., Turner, P., Vandergush, R. and Grady, A., USA	American Journal of Pharmaceutical Education (AJPE)	Survey	64 PharmD students	Evaluates the assessment process using standardized patients from the perspective of the person being tested to determine differences in student type (traditional vs. non-traditional vs. BS-degree pharmacy practitioners)
Patient simulation to demonstrate students’ competency in core domain abilities prior to beginning advanced pharmacy practice experiences.	2012	Vyas, D., Bhutada, N. and Feng, X., USA	American Journal of Pharmaceutical Education (AJPE)	Quasi-experiment Multiple-method study Baseline control group using traditional methods	28 to intervention group, 60 to control group	Describes the implementation of IPPE with simulation and measure effect on student competency in core domain abilities prior to beginning advanced pharmacy practice experiences
Using first-year students as standardized patients for an objective structured clinical exam for third-year pharmacy students.	2001	Sibbald, D., Canada	American Journal of Pharmaceutical Education (AJPE)	Multiple-method study	120 PharmD students	Investigates the reliability, validity, feasibility, and acceptability of using first-year SP and faculty raters to evaluate performance in a third-year OSCE
Impact on the psychometric properties of a pharmacy OSCE: using first-year students as standardized patients.	2009	Sibbald, D. and Regehr, G., Canada	Teaching and Learning in Medicine: An International Journal	Quasi-experimental (comparison of outcomes for professional SPs and first-year student SPs)	<i>N</i> = 108 first-year PharmD students	Investigates the quantitative impact of using first-year pharmacy students as SPs
Use of standardized patients as an assessment tool at the end of an ambulatory care rotation	2000	Weathermon, R., Erbele, S. and Mattson, M., USA	American Journal of Pharmaceutical Education (AJPE)	Multiple-method study	28 PharmD students	Describes the use of standardized patients to evaluate clinical competence of PharmD students at the end of a four-week ambulatory care clerkship. Assesses communication skills, therapeutic judgement, and knowledge of technical tasks
An assessment program using standardized clients to determine student readiness for clinical practice.	2013	Ragan, R., Virtue, D. and Chi, S., USA	American Journal of Pharmaceutical Education (AJPE)	Multiple-method study	<i>N</i> = 103 and <i>N</i> = 170 PharmD students	Describes and evaluates a competence-assessment program to identify students at risk of underperforming at advanced pharmacy practice experience sites
Performance-based assessment: using pre-established criteria and continuous feedback to enhance a student’s ability to perform practice tasks.	2000	Beck, D., USA	Journal of Pharmacy Practice	Literature review		Investigates the issues limiting widespread use of performance-based assessment, based on findings from the pharmacy, medical, and general education literature. Proposes a model for successful implementation of performance-based assessment—part of which includes simulations involving standardized patients

Table 2
Continued

Title	Year	Author(s) and origin	Journal/source	Design	Sample size and participants	Summary of findings
<i>Theme 4—Cost of simulation</i>						
Simulation and introductory pharmacy practice experiences.	2011	Lin, K., Travlos, D., Wadelin, J. and Vlasses, P., USA	American Journal of Pharmaceutical Education (AJPE)	Literature review		Literature review reporting various types of simulation and their incorporation into health professions curricula, describing how simulation training is recognized in other professions and evaluates the feasibility of integrating simulation into experiential education programs of pharmacy schools. Positions the different simulation strategies in relation to each other
Use of Simulation-based Teaching Methodologies in US Colleges and Schools of Pharmacy	2013	Vyas, D., Bray, S. and Wilson, M., USA	American Journal of Pharmaceutical Education (AJPE)	Survey study	88 Colleges and schools	Characterizes the use of mannequins and standardized patients and the use and applications in US pharmacy course curricula. Brief discussion on barriers, including cost
Standardized patients: an ability-based outcomes assessment for the evaluation of clinical skills in traditional and non-traditional education	1997	Monaghan, M. Gardner, S, Schneider, Grady, A., and McKay, A., USA	American Journal of Pharmaceutical Education (AJPE)	Quasi-experimental		Describe the development of a Pharmaceutical Care Encounters Program and to assess the reliability and validity of the use of simulated patients (also described as standardized participants) in assessment

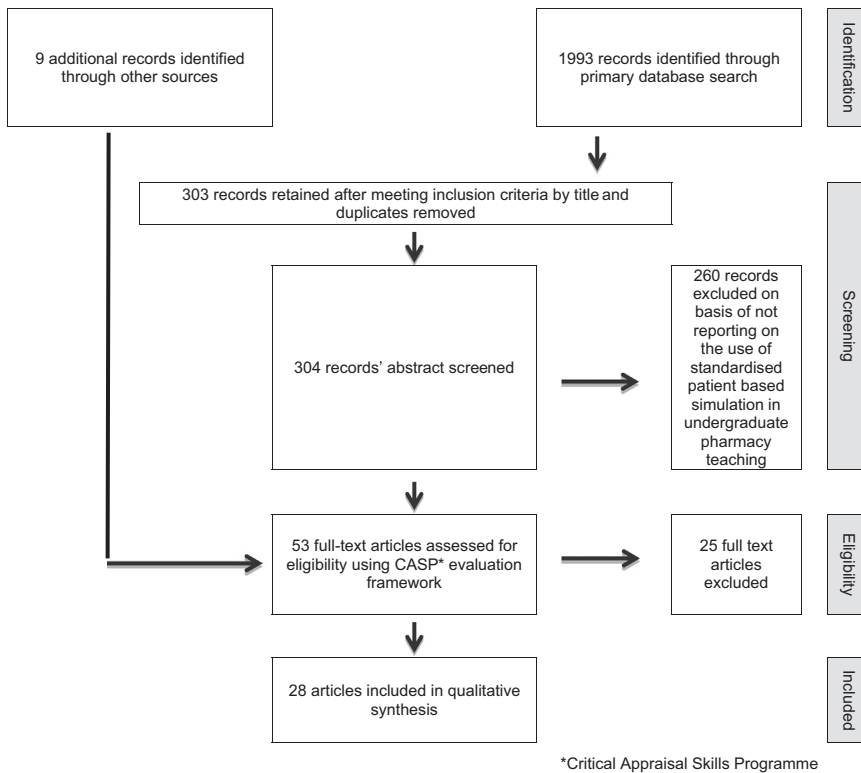


Fig. Flow diagram of the study selection process.

performed significantly better on skill-based assessments,^{39,67} particularly during the formative phase of assessment, and one article found that students were better prepared for the minimal-competency examinations when standardized patients were used.⁶⁶ Further adding to the benefit of standardized patients, students' self-reported confidence levels improved across a range of skills.^{37,66,67} Despite the improvement in skill level demonstrated by students exposed to standardized patient methods, there is conflicting evidence to support the benefit of one standardized patient type over another for skill development,^{39,45,63,67} and little evidence from longitudinal studies showing a sustained advantage over other teaching methods.⁶⁷

Four articles evaluated the use of standardized patients in teaching communication skills to pharmacy students. Two studies found positive, significant, and progressive improvements in student communication,^{7,20} while another found a high degree of student satisfaction with the method and self-reported improvement in verbal skills.⁴² Another study found significant improvement and better performance in motivational interviewing, knowledge of motivational interviewing principles, and confidence in and attitudes toward their application compared with peer role-play or written instructional techniques.⁶⁷ While students exposed to standardized patients were found to perform better during the practice-laboratory sessions, the difference

was not significant among the three instructional techniques at the final examination.⁶⁷

Two papers reported the use of standardized patients in improving cultural competency⁶⁸ and social emotional competency⁶⁵ of pharmacy students. Both articles found an improvement in student cultural and social emotional competency scales compared with case study instructional techniques.^{65,68}

Standardized patients have also been used successfully to teach team-based skills and interprofessional collaboration.^{7,48,69–71} Three articles reviewed the impact of standardized patients on interprofessional outcomes such as teamwork, interprofessional communication, and understanding of professional role for pharmacy students. Pharmacy students demonstrated positive improvements in knowledge, skill, and attitudes toward team-based care, had a more developed understanding of the roles of other professions, and had greater confidence in interacting with other health professionals.^{71–73} While one study found that students were not more confident reacting to patient safety concerns, in general, there were improvements in knowledge, skill, and attitudes toward team-based behaviors,^{72,73} specifically:

- Improvements in student knowledge of the role of other health professionals^{71–73};
- fewer students felt that the interprofessional experience diluted the quality of training in their own field⁷³; and

- students responded more positively to questions about interprofessional communication and teamwork.^{72,73}

Theme 3—Student assessment

The broader health literature reports widely on the use of standardized patients in assessment, most commonly in the medical profession. The pharmacy literature contains fewer articles.^{21,23,45,66,74,75} The articles reported on the use of standardized patients in objective structured clinical examinations (OSCEs), in formative assessment, and the acceptability and quality of feedback provided by the standardized patient and its correlation to “expert” feedback from experienced teaching staff. One of these articles investigated the use of standardized patients to identify students at risk of poor performance in an advanced pharmacy practice experience (APPE).⁶⁶

Standardized patients are used in both formative and summative assessment to test a variety of skills and knowledge in a context that replicates clinical settings. Evidence supports the notion that students trained using standardized patients are better prepared for competency exams; the instruction technique is an effective method to measure knowledge and communication ability and can indicate future performance in real clinical encounters.^{66,75} Four articles reported on aspects of students’ acceptance of and comfort level in working with standardized patients during assessment:

- The strategy is authentic, that is, standardized patients can effectively portray the patient condition⁷⁴ and the process reflected real world practice^{21,75,76};
- assessments using standardized patients provided a good indication of the student’s strengths or weaknesses²¹;
- OSCEs or similar examinations using standardized patients challenged students to think critically⁷⁶; and
- feedback improved their pharmaceutical care skills.⁷⁴

One article described student concern over the fairness of grading because of the potential bias introduced by differences in portrayal when using multiple standardized patients but researchers concluded that these concerns were more than offset by the educational experience.⁷⁴

High costs can be associated with assessment methods that use standardized patients; therefore, students are sometimes used to perform the role of standardized patient to reduce the cost.⁷⁷ Two articles assessed the reliability and validity of student—standardized patient performance ratings or assessments. The scores produced by students were adequately reliable and valid for formative assessment⁴⁵ or OSCE scores.²³ Additional benefits of the student—standardized patient were networking with other (often more senior) students, improved communication skills, and a deeper understanding of the patient experience and future course expectations.²³

Supporting the relatively limited pharmacy literature about reliability and validity in assessment using standardized patients, a small number of articles also comment on the lack of reliability of using standardized patients as part of an assessment program or as assessors themselves. Evidence from the pharmacy and medical literature suggests that reliability can be achieved through adequate sampling of tasks,^{76,78} increased length of test, and the use of multiple examiners.⁷⁸ Achieving reliability in this way requires significant resources and can reduce assessment validity.⁷⁸ Even when high levels of reliability cannot be achieved, the validity that standardized patients offer is considered to be of significant value and therefore the trade-off of reliability for validity is acknowledged in the context of a broader assessment program.¹³

Theme 4—Cost

Simulation can be a cost-effective^{23,45} but expensive^{20,77} teaching method. The high cost of simulation is often associated with high- and medium-fidelity HPS where initial purchase costs remain very high.¹⁸ Even when volunteer patients or students are used, significant investments of time and resources to plan the intervention, develop scenarios, and recruit and adequately train the standardized patients are needed to achieve a consistent case portrayal and use an associated student rating (assessment) tool.^{7,23,45} Where volunteers or students were not used and pharmacy programs remunerated their standardized patients, the cost of the simulation was obviously greater, though one study suggested that the cost of implementing simulation in pharmacy education—specifically in the application of OSCEs—may be lower than that experienced in medical education.⁴⁸ The reason for the cost differential was not explained. In addition, simulation spaces, irrespective of simulation type, require significant spatial and human resources to be used to their full potential.^{18,44}

Resources are a commonly reported barrier to the use of simulation⁴⁴ and there is a paucity of evidence about the potential return on investment.¹⁸ Therefore, the careful selection of experiences, sites, and resources most suited for simulation and student assessment can optimize what can be a significant resource investment.⁶⁶

Discussion

Simulation-based training has been used extensively in high-risk professions such as aviation, mining, military, and the nuclear industry in an effort to maximize training opportunities and minimize risks.^{16,79} Recognizing the potential for nursing and medical education, a variety of simulation techniques have been adopted in health education to improve learning outcomes, student preparedness for practice, and patient safety. Beginning with the early work of Barrows and Abrahamson²⁸ who first described the use of the “programmed patient” in a medical course, the application of the

standardized patient method and the potential benefits in teaching and learning have been extensively described in nursing and medicine.^{50,80–84} This literature presents findings consistent with that found in the four themes identified in the pharmacy literature describing the use of standardized patients in entry-level pharmacy courses.

Consistent with the findings in the pharmacy literature, both students and instructors reported high levels of satisfaction with standardized patient methods. Students reported that the experiences created a safe and authentic environment; instructors said the experiences could be tailored to the student and integrated theory with practice. Further, students and instructors reported that standardized patients allowed for the synthesis of knowledge; sharing of strategies and communication at an individual level^{7,80,85}; can promote interdisciplinary collaboration and interprofessional education⁸⁶; and improve the student knowledge and skills.

Standardized patients are used for a broad range of knowledge and skill development activities. Frequently, knowledge and/or skills (such as interdisciplinary experiences, communication, patient assessment, and clinical decision making) are reported in the literature, as are changes to attitudes. The majority of articles described benefits during the course with a smaller number of articles reporting on the effect on learning in clinical practice. In the nursing and medical literature, standardized patients have been used to develop communication,^{25,50,81,87} clinical skills,^{50,85} improve learning satisfaction,⁸⁵ improve confidence in managing clinical problems,⁸² improve knowledge and skill acquisition,^{31,88} enhance cultural⁸⁹ and ethical awareness, improve patient assessment skills,⁹⁰ expose students to interdisciplinary activities,^{71,86} and develop clinical decision making.⁸³ Standardized patients are commonly employed as part of assessment programs such as OSCEs, becoming a standard method of evaluation for high-stake and registration examinations in both pharmacy and medical examinations.^{78,79,84,91} While the high degrees of assessment reliability desired in high-stake assessment can be difficult to obtain with modest resources, the validity offered by standardized patient in assessment remains valuable.¹³

While it is agreed that the training of health professionals requires exposure to real patients at some stage, the educational imperative must be balanced against patient safety and well-being.⁹² Standardized patient teaching methods have been used across health disciplines to mitigate the ethical tensions of using real patients in clinical training⁴⁹ and provide scaffolded exposure to relevant clinical scenarios in a safe environment. Simulation as a learning, teaching, and assessment strategy is increasing in pharmacy. Despite the extensive reporting in the literature, there exist gaps in knowledge around the transferability, scalability, cost benefit, and alignment with educational theory and design. More robust research is required to properly understand the benefits in relation to the costs of this teaching method.⁹³ There is an opportunity to increase the use of simulation in pharmacy education and this requires

pharmacy educators to borrow from the experiences of other health professions and to be creative in incorporating this teaching method into existing curricula.

Conflict of Interest and Financial Disclosure Statements

We wish to confirm that there are no known conflicts of interest associated with this publication and there has been no financial support for this work that could have influenced its outcome.

References

1. Benrimoj SI, Frommer MS. Community pharmacy in Australia. *Aust Health Rev.* 2004;28(2):238–246.
2. *Health Workforce Australia.* Health Workforce 2025—Doctors, Nurses and Midwives. Vol. 1. South Australia: Health Workforce Australia; 2012.
3. *Australian Health Workforce Advisory Committee, Australian Medical Workforce Advisory Committee, Australian Health Workforce Officials' Committee.* Demand for Health Services and the Health Workforce—Information Paper. Sydney; 2005.
4. Scott I. Health care workforce crisis in Australia: too few or too disabled? *Med J Aust.* 2009;190(12):689–692.
5. Khalil H. A review of pharmacist recommendations in an aged care facility. *Aust J Prim Health.* 2011;17(1):35–39.
6. Um IS, Armour C, Krass I, Gill T, Chaar BB. Weight management in community pharmacy: what do the experts think? *Int J Clin Pharm.* 2013;35(3):447–454.
7. Marken PA, Zimmerman C, Kennedy C, Schremmer R, Smith KV. Human simulators and standardized patients to teach difficult conversations to interprofessional health care teams. *Am J Pharm Educ.* 2010;74(7): Article 120.
8. Carter MB, Wesley G, Larson GM. Lecture versus standardized patient interaction in the surgical clerkship: a randomized prospective cross-over study. *Am J Surg.* 2006;191(2): 262–267.
9. Bennett AJ, Arnold LM, Welge JA. Use of standardized patients during a psychiatry clerkship. *Acad Psychiatry.* 2006;30(3):185–190.
10. Prochaska J, Gali K, Miller B, Hauer K. Medical students' attention to multiple risk behaviors: a standardized patient examination. *J Gen Intern Med.* 2012;27(6):700–707.
11. McAllister M, Levett-Jones T, Downer T, et al. Snapshots of simulation: creative strategies used by Australian educators to enhance simulation learning experiences for nursing students. *Nurse Educ Pract.* 2013;13(6):567–572.
12. DeCarlo D, Collingridge D, Grant C, Ventre K. Factors influencing nurses' attitudes toward simulation-based education. *Simul Healthc.* 2008;3(2):90–96.
13. Vessey JA, Huss K. Using Standardized patients in advanced practice nursing education. *J Prof Nurs.* 2002;18(1):29–35.
14. McManus IC, Vincent CA, Thom S, Kidd J. Teaching communication skills to clinical students. *Br Med J.* 1993; 306(6888):1322–1327.
15. Whitehouse C, Morris P, Marks B. The role of actors in teaching communication. *Med Educ.* 1984;18(4):262–268.
16. Bradley P. The history of simulation in medical education and possible future directions. *Med Educ.* 2006;40(3):254–262.

17. Decker S, Sportsman S, Puetz L, Billings L. The evolution of simulation and its contribution to competency. *J Contin Educ Nurs*. 2008;39(2):74–80.
18. Lin KP, Travlos DVP, Wadelin JWP, Vlasses PHP. Simulation and introductory pharmacy practice experiences. *Am J Pharm Educ*. 2011;75(10): Article 209.
19. Seybert AL. Patient simulation in pharmacy education. *Am J Pharm Educ*. 2011;75(9): Article 187.
20. Rickles NM, Tieu P, Myers L, Galal S, Chung V. The impact of a standardized patient program on student learning of communication skills. *Am J Pharm Educ*. 2009;73(1): Article 4.
21. Monaghan MS, Turner PD, Vanderbush RE, Grady AR. Traditional student, nontraditional student, and pharmacy practitioner attitudes toward the use of standardized patients in the assessment of clinical skills. *Am J Pharm Educ*. 2000;64(1):27–32.
22. Arthur C, Levett-Jones T, Kable A. Quality indicators for the design and implementation of simulation experiences: a Delphi study. *Nurse Educ Today*. 2013;33(11):1357–1361.
23. Sibbald D, Regehr G. Impact on the psychometric properties of a pharmacy OSCE: using 1st-year students as standardized patients. *Teach Learn Med*. 2009;15(3):180–185.
24. Harris DM, Ryan K, Rabuck C. Using a high-fidelity patient simulator with first-year medical students to facilitate learning of cardiovascular function curves. *Adv Physiol Educ*. 2012;36(3):213–219.
25. Lane JL, Slavin S, Ziv A. Simulation in medical education: a review. *Simul Gaming*. 2001;32(3):297–314.
26. May W, Park JH, Lee JP. A ten-year review of the literature on the use of standardized patients in teaching and learning: 1996–2005. *Med Teach*. 2009;31(6):487–492.
27. Kane-Gill SL, Smithburger PL. Transitioning knowledge gained from simulation to pharmacy practice. *Am J Pharm Educ*. 2011;75(10): Article 210.
28. Barrows HS, Abrahamson S. The programmed patient: a technique for appraising student performance in clinical neurology. *J Med Educ*. 1964;39:802–805.
29. Murray WB, Wood J, Schwab M, Fritz M, Karpa KD. Human patient simulation in pharmacology graduate education: bridging the bench-to-bedside gap. *Mol Interv*. 2010;10(3):127–132.
30. Gaba DM. The future vision of simulation in health care. *Qual Saf Health Care*. 2004;13(suppl 1):i2–10.
31. Okuda Y, Bryson EO, DeMaria S. Jr, et al. The utility of simulation in medical education: what is the evidence?. *Mt Sinai J Med*. 2009;76(4):330–343.
32. Rosen KR. The history of medical simulation. *J Crit Care*. 2008;23(2):157–166.
33. Beyea SC, Kobokovich LJ. Human patient simulation: a teaching strategy. *AORN J*. 2004;80(4):738–742.
34. Dawson DL, Meyer J, Lee ES, Pevec WC. Training with simulation improves residents' endovascular procedure skills. *J Vasc Surg*. 2007;45(1):149–154.
35. Cant RP, Cooper SJ. Simulation-based learning in nurse education: systematic review. *J Adv Nurs*. 2010;66(1):3–15.
36. Norcini J, Boulet J. Methodological issues in the use of standardized patients for assessment. *Teach Learn Med*. 2003;15(4):293–297.
37. James D, Nastasic S, Davies JG, Horne R. The design and evaluation of a simulated-patient teaching programme to develop the consultation skills of undergraduate pharmacy students. *Pharm World Sci*. 2001;23(6):212–216.
38. Nestel D, Calandra A, Elliott RA. Using volunteer simulated patients in development of pre-registration pharmacists: learning from the experience. *Pharm Educ*. 2007;7(1):35–42.
39. Grice GRP, Wenger PP, Brooks NP, Berry TP. Comparison of patient simulation methods used in a physical assessment course. *Am J Pharm Educ*. 2013;77(4): Article 77.
40. Glasser D, Ahrens R, Caffee A, Johnson M. Standardized patient assessment in a disease state management model. *Am J Pharm Educ*. 2002;66(1):72–78.
41. Raney EC. Assessment of anticoagulation management in a simulated ambulatory care clinic. *Am J Pharm Educ*. 2007;71(5): Article 97.
42. Rao D. Skills development using role-play in a first-year pharmacy practice course. *Am J Pharm Educ*. 2011;75(5): Article 84.
43. Smithburger PL, Kane-Gill SL, Ruby CM, Seybert AL. Comparing effectiveness of 3 learning strategies: simulation-based learning, problem-based learning, and standardized patients. *Simul Healthc*. 2012;7(3):141–146.
44. Vyas D, Bray BS, Wilson MN. Use of simulation-based teaching methodologies in US colleges and schools of pharmacy. *Am J Pharm Educ*. 2013;77(3): Article 53.
45. 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(4):404–412.
46. Fiscella K, Franks P, Srinivasan M, Kravitz RL, Epstein R. Ratings of physician communication by real and standardized patients. *Ann Fam Med*. 2007;5(2):151–158.
47. Woodward CA, McConvey GA, Neufeld V, Norman GR, Walsh A. Measurement of physician performance by standardized patients. Refining techniques for undetected entry in physicians' offices. *Med Care*. 1985;23(8):1019–1027.
48. Monaghan MS, Gardner SF, Schneider EF, Grady AR, McKay AB. Standardized patients: an ability-based outcomes assessment for the evaluation of clinical skills in traditional and nontraditional education. *Am J Pharm Educ*. 1997;61(4):337–344.
49. Datta R, Upadhyay KK, Jaideep CN. Simulation and its role in medical education. *Med J Armed Forces India*. 2012;68(2): 167–172.
50. Rutherford-Hemming T, Jennrich JA. Using standardized patients to strengthen nurse practitioner competency in the clinical setting. *Nurs Educ Perspect*. 2013;34(2):118–121.
51. Nestel D, Tabak D, Tierney T, et al. Key challenges in simulated patient programs: an international comparative case study. *BMC Med Educ*. 2011;11(69):10.
52. Whittemore R, Knaf K. The integrative review: updated methodology. *J Adv Nurs*. 2005;52(5):546–553.
53. Emeis CL. Current resources for evidence-based practice, March/April 2012. *J Midwifery Womens Health*. 2012;57(2): 196–200.
54. *Critical Appraisal Skills Program (CASP) UK*. Critical Appraisal Skills Programme 10 questions to help you make sense of qualitative research. (<http://www.casp-uk.net/-/casp-tools-checklists/c18f8>); 2013 Accessed August 2, 2015.
55. *Critical Appraisal Skills Program (CASP) UK*. Critical Appraisal Skills Programme 10 questions to help you make sense of a review. (<http://www.casp-uk.net/-/casp-tools-checklists/c18f8>); 2013 Accessed August 2, 2015.
56. *Critical Appraisal Skills Program (CASP) UK*. Critical Appraisal Skills Programme 11 questions to help you make sense of case control study. (<http://media.wix.com/ugd/>

- dded87_19dd1d558a9977c0e0b30cedf86a9da7.pdf); 2013 Accessed August 2, 2015.
57. Moher D, Liberati A, Tetzlaff J, Altman DG, Group P. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *J Clin Epidemiol*. 2009;62(10):1006–1012.
 58. Braun V, Clarke V. *Successful Qualitative Research. A Practical Guide for Beginners*. London: SAGE; 2013.
 59. Saldana J. *The Coding Manual for Qualitative Researchers*. London: SAGE Publications; 2010.
 60. Mavis B, Turner J, Lovell K, Wagner D. Developments: faculty, students, and actors as standardized patients: expanding opportunities for performance assessment. *Teach Learn Med*. 2006;18(2):130–136.
 61. Brown R, Doonan S, Shellenberger S. Using children as simulated patients in communication training for residents and medical students: a pilot program. *Acad Med*. 2005;80(12):1114–1120.
 62. Becker KL, Rose LE, Berg JB, Park H, Shatzer JH. The teaching effectiveness of standardized patients. *J Nurs Educ*. 2006;45(4):103–111.
 63. Gallimore C, George AK, Brown MC. Pharmacy students' preferences for various types of simulated patients. *Am J Pharm Educ*. 2008;72(1): Article 04.
 64. Schultz KK, Marks A. Community-based collaboration with high school theater students as standardized patients. *Am J Pharm Educ*. 2007;71(2): Article 29.
 65. Galal S, Carr-Lopez S, Seal CR, Scott AN, Lopez C. Development and assessment of social and emotional competence through simulated patient consultations. *Am J Pharm Educ*. 2012;76(7): Article 132.
 66. Vyas D, Bhutada NS, Feng X. Patient simulation to demonstrate students' competency in core domain abilities prior to beginning advanced pharmacy practice experiences. *Am J Pharm Educ*. 2012;76(9): Article 176.
 67. Lupu AM, Stewart AL, O'Neil C. Comparison of active-learning strategies for motivational interviewing skills, knowledge, and confidence in first-year pharmacy students. *Am J Pharm Educ*. 2012;76(2): Article 28.
 68. Sales I, Jonkman L, Connor S, Hall D. A comparison of educational interventions to enhance cultural competency in pharmacy students. *Am J Pharm Educ*. 2013;77(4): Article 76.
 69. Gough S, Hellaby M, Jones N, MacKinnon R. A review of undergraduate interprofessional simulation-based education (IPSE). *Collegian*. 2012;19(3):153–170.
 70. Dufrene C. Health care partnerships: a literature review of interdisciplinary education. *J Nurs Educ*. 2012;51(4):212–216.
 71. Westberg SM, Adams J, Thiede K, Stratton TP, Bumgardner MA. An interprofessional activity using standardized patients. *Am J Pharm Educ*. 2006;70(2): Article 34.
 72. Wamsley M, Staves J, Kroon L, et al. The impact of an interprofessional standardized patient exercise on attitudes toward working in interprofessional teams. *J Interprof Care*. 2012;26(1):28–35.
 73. Vyas D, McCulloh R, Dyer C, Gregory G, Higbee D. An interprofessional course using human patient simulation to teach patient safety and teamwork skills. *Am J Pharm Educ*. 2012;76(4): Article 71.
 74. 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.
 75. Weathermon RA, Erbele S, Mattson M. Use of standardized patients as an assessment tool at the end of an ambulatory care rotation. *Am J Pharm Educ*. 2000;64(2):109–113.
 76. Ragan RE, Virtue DW, Chi SJ. An assessment program using standardized clients to determine student readiness for clinical practice. *Am J Pharm Educ*. 2013;77(1): Article 14.
 77. Beck DE. Performance-based assessment: using pre-established criteria and continuous feedback to enhance a student's ability to perform practice tasks. *J Pharm Pract*. 2000;13(5): 347–364.
 78. Wass V, Van der Vleuten C, Shatzer J, Jones R. Assessment of clinical competence. *Lancet*. 2001;357(9260):945–949.
 79. Ziv A, Wolpe PR, Small SD, Glick S. Simulation-based medical education: an ethical imperative. *Acad Med*. 2003;78(8):783–788.
 80. Bokken L, Rethans JJ, Scherpbier AJ, van der Vleuten CP. Strengths and weaknesses of simulated and real patients in the teaching of skills to medical students: a review. *Simul Healthc*. 2008;3(3):161–168.
 81. Konkle-Parker DJ, Cramer CK, Hamill C. Standardized patient training: a modality for teaching interviewing skills. *J Contin Educ Nurs*. 2002;33(5):225–230.
 82. Luctkar-Flude M, Wilson-Keates B, Larocque M. Evaluating high-fidelity human simulators and standardized patients in an undergraduate nursing health assessment course. *Nurse Educ Today*. 2012;32(4):448–452.
 83. Terry R, Hiester E, James GD. The use of standardized patients to evaluate family medicine resident decision making. *Fam Med*. 2007;39(4):261–265.
 84. Roberts C, Newble D, Jolly B, Reed M, Hampton K. Assuring the quality of high-stakes undergraduate assessments of clinical competence. *Med Teach*. 2006;28(6):535–543.
 85. Ebbert DW, Connors H. Standardized patient experiences: evaluation of clinical performance and nurse practitioner student satisfaction. *Nurs Educ Perspect*. 2004;25(1): 12–15.
 86. Koo LW, Idzik SR, Hammersla MB, Windemuth BF. Developing standardized patient clinical simulations to apply concepts of interdisciplinary collaboration. *J Nurs Educ*. 2013;52(12):705–708.
 87. Yoo MS, Yoo IY. The effectiveness of standardized patients as a teaching method for nursing fundamentals. *J Nurs Educ*. 2003;42(10):444–448.
 88. Coleman EA, Stewart CB, Wilson S, et al. An evaluation of standardized patients in improving clinical breast examinations for military women. *Cancer Nurs*. 2004;27(6):474–482.
 89. Rutledge CM, Garzon L, Scott M, Karlowicz K. Using standardized patients to teach and evaluate nurse practitioner students on cultural competency. *Int J Nurs Educ Scholarsh*. 2004;1:Article 17 [Epub ahead of print].
 90. Gibbons SW, Adamo G, Padden D, et al. Clinical evaluation in advanced practice nursing education: using standardized patients in Health Assessment. *J Nurs Educ*. 2002;41(5): 215–221.
 91. Gormley G, Sterling M, Menary A, McKeown G. Keeping it real! Enhancing realism in standardized patient OSCE stations. *Clin Teach*. 2012;9(6):382–386.
 92. Lynoe N, Sandlund M, Westberg K, Duchek M. Informed consent in clinical training-patient experiences and motives for participating. *Med Educ*. 1998;32(5):465–471.
 93. Razavi D, Delvaux N, Marchal S, et al. Does training increase the use of more emotionally laden words by nurses when talking with cancer patients? A randomised study. *Br J Cancer*. 2002;87(1):1–7.