A Systematic Review of the Use of Standardized Patients as a Simulation Modality in Nursing Education

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Abstract

AIM The objective of the study was to search, extract, appraise, and synthesize studies using standardized patients (SPs) in nursing academia to determine how this modality of simulation is being used.
BACKGROUND SPs are a common simulation modality used in nursing education.
METHOD This review was conducted using the Preferred Reporting Items for Systematic Reviews and Meta-analyses. Five databases were searched as well as keywords to retrieve nonindexed citations for the period January 2011 to September 2016. The inclusion criteria included nurses, a simulated experience with SPs, and original research published in English.
RESULTS Sixty-five studies were identified and analyzed.
CONCLUSION More randomized controlled trials and studies with power analyses and validated measurement instruments are needed. Studies that compare SPs to high-fidelity simulators are also desired to determine optimal student learning outcomes and standardize best practices in simulation.

KEY WORDS Nursing Education – Simulation – Standardized Patients – Systematic Review

Simulation-based education has rapidly expanded in health care in the past two decades due to decreased training opportunities, infrequent clinical events, increased attention to patient safety, and limited clinical placement opportunities. Utilizing standardized patients (SPs) is an example of a simulation approach used for teaching and learning in health care education. Introduced in 1963 by Barrows and Abrahamson, the term *SP* is "the umbrella term for both a simulated patient (a well person trained to simulate a patient's illness in a standardized way) and an actual patient (who is trained to present his or her own illness in a standardized way)" (Barrows, 1993, p. 443). Barrows saw the SP as being able to provide students with additional training outside a textbook by putting them face-to-face with "patients" who could provide the physical, psychological, and emotional aspects of clinical practice.

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SPs are used in a variety of health care curricula. In the last five years, reviews on the use of SPs have been published to disseminate the current state of science of this simulation approach. Ryall, Judd, and Gordon (2016) reported simulation-based assessments that included SPs in health professional education. Other reviews targeted specific health care disciplines such as physical therapy education (Pritchard, Blackstock, Nestel, & Keating, 2016) and pharmacy education (Kiersma, Plake, & Darbishire, 2011; Smithson, Bellingan, Glass, & Mills, 2015). Murdoch, Bottorff, and McCullough (2013) investigated the SP role in collaborative health care in simulation education.

Two meta-analyses have been completed in nursing. One provided a meta-analysis on the effectiveness of simulation-based nursing education depending on fidelity (Kim, Park, & Sulin, 2016). The other described the effects of simulation-based learning outcomes using SPs (Oh, Jeon, & Koh, 2015). No review to date has investigated the overall use of SPs in nursing academia.

The purpose of this systematic review was to search, extract, appraise, and synthesize studies using SPs in nursing academia to gain a better understanding of how this modality of simulation is being utilized. The research question that guided this study was: What research studies utilizing SPs within nursing academia emerged in the literature between January 2011 and September 2016? The specific aim was to synthesize research completed in the last five years to report the current state of the science on the use of SPs within nursing academia.

METHOD

Design and Search Methods

This systematic review was conducted consistent with the Preferred Reporting Items for Systematic Reviews and Meta-analyses (Liberati et al., 2009). The inclusion criteria were broad in order to disseminate information on future research needed; however, to be included in

this review, several criteria had to be met. The sample had to include nurses, prelicensure or postlicensure, in academia. The intervention had to include a simulated experience with SPs, describe original research, and be published in English between January 2011 and September 2016.

A thorough and comprehensive literature search was done at the start of the systematic review. Five databases (CINAHL, PubMed, Cochrane Library, Web of Science, and Psych/INFO) were searched using a combination of medical subject headings or Mesh terms, as well as key words to retrieve nonindexed citations.

Search Outcome and Quality Appraisal

The database search strategy yielded 194 citations. These results were narrowed down to 65 studies through an in-depth analysis of each article using identified inclusion criteria. An illustration of the study selection is presented in a figure available as Supplemental Digital Content 1 at http://links.lww.com/NEP/A99.

Authors independently completed a quality appraisal of articles (Johns Hopkins Hospital, 2017; National Heart, Lung, and Blood Institute, 2014). The authors were not blinded to any information in the study. Differences in quality appraisal were reconciled, and consensus reached between the authors. A table that provides an overview of the quality appraisal for each article is available as Supplementary Digital Content 2 at http://links.lww.com/NEP/A100.

A data extraction form was created for the 65 identified research studies. The authors divided the studies and initially extracted the following data: design, purpose, sample, intervention, control, measurements, outcomes, limitations, and notes. The data extraction form was revised and refined to capture data in a succinct and concise manner (see Supplementary Digital Content 3 at http://links.lww.com/NEP/A101). As a meta-analysis could not be performed because of the lack of similarities in study characteristics, a narrative summary was conducted.

RESULTS

In a span of five years, 65 research studies were published that incorporated SPs to educate nurses within the academic setting. The largest gaps discovered included a lack of randomized controlled trials, lack of power analyses, and comparative studies to elicit outcomes on best practices.

Study Characteristics

DESIGN Forty-five percent (29 studies) were quantitative in design. Of the other studies in this review, 15 were qualitative, 14 used mixed methods, 5 were literature or systematic reviews, and 2 were meta-analyses. Table 1 outlines the studies by design. A power analysis was completed on only three studies (Alfes, 2015; Shin & Kim, 2014; Shin, Park, & Shim, 2015c), and only one qualitative study stated saturation was met (Defenbaugh & Chikotas, 2016

SAMPLE Undergraduate and graduate nursing students were participants in all the studies reviewed (a table available as Supplemental Content 4 at http://links.lww.com/NEP/A102 shows the classification of nursing students). Seven studies incorporated health care professionals outside nursing in an interprofessional education study (Bays et al., 2014; Corcoran, Lysaght, Lamarra, & Ersek, 2013; Eid, Petty, Hutchins & Thompson, 2009; MacDonnell, Rege, Misto, Dollase, & George, 2012; Nikendel et al., 2016; Solomon & Salfi, 2011; Turrentine et al., 2016).

Table 1: Designs

	Study
Quantitative design (*n* = 29)	
Randomized controlled (*n* = 4)	• Bays et al., 2014 • Bornais et al.,2012 • Cowperthwait et al., 2015 • Luebbert & Popkess, 2015
One group pre-post test (*n* = 10)	• Eid et al., 2016 • Kameg et al., 2014 • MacDonnell, George, Nimmagadda, Brown, & Gremel, 2016 • MacDonnell et al., 2012 • Phillips et al., 2011 • Shin & Kim, 2014 • Shin, Ma, et al., 2015 • Terzioglu et al., 2016 • Unver et al., 2013 • Webster, 2014
One group descriptive (*n* = 4)	• Lu et al., 2016 • Palumbo, Sandoval, Hart, & Drill, 2016 • Shin, Park, et al., 2015 • Zheng et al., 2014
One group posttest (*n* = 3)	• Bagnasco et al., 2015 • Schram & Mudd, 2015 • Zhu et al., 2016
Two group randomized posttest (*n* = 3)	• Karadag et al., 2016 • Sarmasoglu et al., 2016 • Schlegel et al., 2011
Two group pre-post test (*n* = 2)	• Fink et al., 2014 • Wamsley et al., 2012
Two group descriptive cross-sectional (*n* = 1)	• Shin, Sok, et al., 2015
Two group randomized crossover (*n* = 1)	• Alfes, 2015

(Continued)

Table 1: Designs, Continued

	Study
Three group randomized posttest (*n* = 1)	• Luctkar-Flude et al., 2012
Qualitative (*n* = 15)	• Alexander & Dearsley, 2013 • Choi, 2012 • Defenbaugh & Chikotas, 2015 • Jacobs & Jaarsveldt, 2016 • Jo & An, 2014 • Kenny et al., 2014 • Koo et al., 2014 • Kowitlawakul et al., 2015 • McWilliam & Botwinski, 2012 • Miles et al., 2014 • Nikendel et al., 2016 • Pilkenton et al., 2015 • Schlegel et al., 2016 • Schwindt & McNelis, 2015 • Smeltzer et al., 2015
Mixed methods (*n* = 14)	• Ching-Lan Lin et al., 2013[a] • Corcoran et al., 2013 • Dearmon et al., 2013 • Doolen et al., 2014 • Goh et al., 2016 • Guvenc et al., 2016 • Ignacio et al., 2015[a] • Kim-Godwin et al., 2013 • Ndiwane et al., 2014 • Rutherford-Hemming, 2012 • Slater et al., 2016 • Solomon & Salfi, 2011 • Turrentine et al., 2016 • Tuzer et al., 2016*

(Continued)

Table 1: Designs, Continued

	Study
Systematic/literature reviews (*n* = 5)	• Kiersma et al., 2011 • McNett, 2012 • Murdoch et al., 2013 • Murray, 2014 • Ryall et al., 2016
Meta-analyses (*n* = 2)	• Kim et al., 2016 • Oh et al., 2015

[a]The study is a randomized controlled trial and mixed methods.

INTERVENTION In six studies, SPs were compared to another type of simulation (Alfes, 2015; Cowperthwait et al., 2015; Ignacio et al., 2015; Luctkar-Flude, Wilson-Keates, & Larocque, 2012; Sarmasoglu, Dinc, & Elcin, 2016; Tuzer, Leyla, & Elcin, 2016). Only two studies (Schlegel, Woermann, Shaha, Rethans, & van der Vleuten, 2011; Slater, Bryant, & Ng, 2016) compared SPs to student peers and two studies compared SPs to lecture alone (Goh, Selvarajan, Chng, Tan, & Yobas, 2016; Shin, Sok, Hyun, & Kim, 2015). Case studies (Karadag, Caliskan, & Iseri, 2016), feedback from an SP versus no feedback from an SP (Ching-Lan Lin et al., 2013), scenario-based learning video recordings (Lu, Hsu, & Shu, 2016), and community volunteers (Luctkar-Flude et al., 2012) were other comparison interventions.

ROLE AND TRAINING SPs participated in simulation as a patient or as a patient and evaluator. Information on the role of the SP as well as who portrayed the SP is available as Supplemental Content 5 at http://links.lww.com/NEP/A103.

Twenty-three studies indicated the training that occurred for SPs to play the role of a patient. Some studies provided the time spent in training (Bays et al., 2014; Doolen, Giddings, Johnson, Guizado de Nathan, & O Badia, 2014; Kameg, Szpak, Cline, & Mcdermott, 2014; Kim-Godwin, Livsey, Ezzell, & Highsmith, 2013; Luctkar-Flude et al., 2012; Pilkenton, Collins, & Holley, 2015; Schlegel et al., 2011; Slater et al., 2016; Webster, 2014; Zhu et al., 2016). The time for training ranged from one hour (Schlegel et al., 2011) to two months (Webster, 2014). Rehearsals or dry-runs were mentioned in five studies (Karadag et al., 2016; Koo et al., 2014; Slater et al., 2016; Webster, 2014; Zhu et al., 2016). Only one study (Schlegel et al., 2011) mentioned the training was based on a set of standards, and only one study stated that SPs had to pass an examination (a checklist that assessed how the SP portrayed the patient role) before they were able to participate as a SP (Zhu et al., 2016). In studies where the SP was also an evaluator, most (*n* = 17) stated the SP had been trained to evaluate the student; only two did not (Sarmasogly et al., 2016; Schwindt & McNelis, 2015).

MEASUREMENT INSTRUMENTS Twenty-six studies used validated tools. Qualitative studies used six types of measurements: 1) open-ended questions or a questionnaire (*n* = 11; Goh et al., 2016; Guvenc et al., 2016; Ignacio et al., 2015; Jacobs & van Jaarsveldt, 2016; Jo & An, 2014; Kim-Godwin et al., 2013; Miles, Mabey, Leggett, &

Stansfield, 2014; Ndiwane, Koul, & Theroux, 2014; Pilkenton et al., 2015; Rutherford-Hemming, 2012; Slater et al., 2016); 2) focus groups (n = 7; Kenny, Cargil, Hamilton, & Sales, 2016; Koo et al., 2014; Kowitlawakul, Chow, Salam, & Ignacio, 2015; Nikendel et al., 2016; Smeltzer et al., 2015; Solomon & Salfi, 2011; Tuzer et al., 2016); 3) interviews (n = 6; Alexander & Dearsley, 2013; Choi, 2012; Defenbaugh & Chikotas, 2016; McWilliam & Botwinski, 2012; Schlegel, Bonvin, Rethans, & van der Vleuten, 2016; Smeltzer et al., 2015), and 4) written feedback/reflection (n = 4; Ching-Lan Lin et al., 2013; Corcoran et al., 2013; Schwindt & McNelis, 2015).

CLINICAL FOCUS/TOPICS There were a variety of clinical foci, or topics, and purposes for incorporating SPs into simulations, including skill assessment/competency, communication, objective structured clinical examination, interprofessional education, psychiatric mental health, and student satistaction and self-efficacy. See Supplemental Content 6 at http://links.lww.com/NEP/A104 for the most common topics in the research study.

Outcomes

Less than one third of the studies reported negative outcomes (outcomes that did not support the research question or hypothesis; Alfes, 2015; Bornais, Raiger, Krahn, & El-Masri, 2012; Corcoran et al., 2013; Cowperthwait et al., 2015; Guvenc et al., 2016; Ignacio et al., 2015; Jo & An, 2014; Kowitlawakul et al., 2015; Luctkar-Flude et al., 2012; Phillips, Lie, Encinas, Ahearn, & Tiso, 2011; Sarmasoglu et al., 2016; Shin, Sok, et al., 2015; Solomon & Salfi, 2011; Tuzer et al., 2016; Wamsley et al., 2012; Webster, 2014). Educational outcomes primarily targeted the lower levels of Kirkpatrick's training evaluation model (i.e., Level 1, reaction; Level 2, learning; Kirkpatrick, 1998).

International Studies

Forty percent (n = 27) of the studies in this systematic review were completed outside the United States (Alexander & Dearsley, 2013; Bagnasco et al., 2016; Bornais et al., 2012; Ching-Lan Lin et al., 2013; Choi, 2012; Goh et al., 2016; Guvenc et al., 2016; Ignacio et al., 2015; Jacobs & van Jaarsveldt, 2016; Jo & An, 2014; Karadag et al., 2016; Kenny et al., 2016; Kowitlawakul et al., 2015; Lu et al., 2016; Luctkar-Flude et al., 2012; Nikendel et al., 2016; Schlegel et al., 2011, 2016; Shin & Kim, 2014; Shin, Ma, Park, Ji, & Kim, 2015; Shin, Park, et al., 2015; Shin, Sok, et al., 2015; Solomon & Salfi, 2011; Terzioglu et al., 2016; Tuzer et al., 2016; Unver et al., 2013; Zheng, Jing, Wang, Jin & Gao, 2014; Zhu et al., 2016; see Supplemental Content 7 at http://links.lww.com/NEP/A105 for illustration of distribution).

Bias

Several biases were detected during the review. Selection bias was evident; randomization was incorporated into the design of only nine studies (Bornais et al., 2012; Ching-Lan Lin et al., 2013; Cowperthwait et al., 2015; Ignacio et al., 2015; Karadag et al., 2016; Luctkar-Flude et al., 2012; Sarmasoglu et al., 2016; Schlegel et al., 2011; Tuzer et al., 2016). Fink, Linnard-Palmer, Ganley, Catolico, and Phillips (2014) hinted at the possibility of a Hawthorne effect. Two studies implemented measures to avoid evaluator bias (Slater et al., 2016; Zhu et al., 2016). Ignacio et al. (2015) recognized the potential for attrition bias in the focus group sessions of their study.

DISCUSSION

There is lack of rigorous research studies producing empirical evidence in simulations that have used SPs as a modality. Only seven randomized controlled trials were published in the last five years. More studies employed a one-group design versus a two-group design, decreasing findings from comparison studies and further highlighting an abundance of weak study designs. Without a power analysis, it is unclear if the findings of quantitative studies are meaningful. The same is true for qualitative studies completed. Only one group of authors (Defenbaugh & Chikotas, 2016) stated saturation was met, leaving the reader unclear as to whether saturation was met even in studies with sample sizes greater than 75 participants.

In studies in this review, SPs were used twice as often in simulations with undergraduate nursing students compared to graduate nursing students. It is difficult to determine where in the undergraduate nursing curriculum SPs are being used because nursing programs do not have a standardized entry point into the nursing curriculum. Some schools allow students to begin taking nursing courses in their very first semester of college; others allow students to only take nursing courses during the final four semesters.

Graduate nursing programs may use SPs less than undergraduate nursing programs because simulation is not fully embraced by the National Task Force on Quality Nurse Practitioner Education (2012). When SPs were used in the graduate curriculum, the sample often consisted of nonacute nurse practitioner students. Because a hallmark of nurse practitioner practice is the ability to diagnose and treat patients, it would seem that placing students in simulations with live individuals who can provide a more realistic face-to-face interaction would be preferred. It is plausible that SPs are used more than high-fidelity manikins in academia, and this was not seen in the research studies included in this review.

It was surprising that only 12 studies were interprofessional, including disciplines outside of nursing in the sample. The Institute of Medicine (2011) called for a transformation in the nursing profession to include greater emphasis on interprofessional education. However, this is not evident in the number of studies that included various health care disciplines. It may be that the research is only now being conducted and more studies will be published in the future.

SPs were compared to a variety of interventions. High-fidelity simulators were most often compared to SPs, but the number of studies that compared the two types of simulation was small, leaving unanswered questions as to whether one type of simulation is better than the other, and if so, SPs are better suited than manikins to implement certain topics. It is often assumed that SPs are a better teaching methodology for communication skills, but no studies have completed head-to-head comparisons to determine if this is true.

It is evident that a variety of individuals from various backgrounds and training experiences are used as SPs. Again, it is unclear if one group is better than another. For example, do individuals who have had a diagnosis or currently have a diagnosis provide a more realistic and thorough history than individuals who have been trained to portray the illness but have no personal experience with the diagnosis? It would seem likely that having the diagnosis would aid in the simulation, but no comparative studies have been done to investigate if and how this might be beneficial.

Another unanswered question in the literature is how individuals are chosen to be SPs. At times, it is clear why certain individuals are selected. For example, in some studies individuals from culturally diverse backgrounds were selected to more accurately portray a

patient from a particular culture. However, in other instances, the decision of who to use as an SP is less clear. Not all schools of nursing have access to SP consortiums associated with a medical school and therefore must seek alternate individuals to serve as patients. Are drama students used because of their ability to enact performance art? Are nurses used because they possess a medical background related to the patient presentation? Are volunteers used because of financial constraints associated with the school's budget? What is the rationale for using particular groups of individuals as SPs? Perhaps there are no underlying assumptions that one group will perform better than another and merely a decision based on feasibility.

When nursing students portray the SP, it leaves more unanswered questions and an area rich for further inquiry. As the patient, the student would be taught the patient perspective while also having a bird's eye view of the actions of the student provider. Are the learning outcomes the same for both students at the end of the encounter? If the student (as the patient) participates in debriefing, he or she is exposed to reflective inquiry in the same manner as the student provider. Are there differences in knowledge, skills, and attitudes between the two students at the end of the debriefing? These are some of the unanswered questions that exist.

Regardless of who portrays the SP, training is necessary to ensure standardization. Yet, only 26 studies mentioned training the SP. The time involved in training varied from hours to weeks, and objectively determining if the SP was ready to accurately portray the patient in the scenario was stated in only a few studies. It would seem that when the simulation is part of a research study, verification of an accurate portrayal by the SP would be essential in order to ensure valid findings. The same would be true if the SP is an evaluator of student performance, yet absent from most studies in this review was objective documentation evaluating the SP prior to the simulation and/or a standardized process for providing feedback to SPs. This is consistent with previous literature documenting a deficiency in standards with regard to effective feedback training for SPs (Bokken, Linssen, Scherpbier, van der Vleuten, & Rethans, 2009).

The lack of standardization and rigor in the training process exposes gaps in the literature related to the use of SPs in research studies and in some instances may affect the validity of the findings of the study. The Association of Standardized Patient Educators (2016) Core Curriculum provides modules on training SPs that are rooted in best practices and standards of practice. It is unclear if the training that takes place in practice reflects the best practices in the literature.

At times, SPs are part of the debriefing process. It is unknown if and how this affects student learning. It would be interesting to assess student outcomes with and without the SP present to determine if any differences exist between groups.

Validated measurement instruments were used in less than half the studies reviewed. Validation of the tool helps ensure that the findings in a study are meaningful. Therefore, conclusions from studies that did not utilize a validated measurement instrument should be interpreted cautiously.

SPs are used in simulations involving a variety of topics, which demonstrates the versatility of SPs and their ability to provide diverse learning opportunities. Communication training appears to be the most common topic when utilizing SPs in the academic setting. However, more research is needed to determine if SPs are a better teaching method for effective communication training than other types of simulation experiences. What is inherently missing in the literature is research focused on the SP. Except for two studies (Schlegel et al., 2016; Smeltzer et al., 2015), which examined perspectives of the SP, research studies utilized SPs, but SPs were not the focus of the research questions. Rather, they were the vehicle of the intervention.

Positive and negative outcomes were reported in the studies included in this review. Because the topics and research questions of studies are so diverse, it is difficult to ascertain definite conclusions from the findings. It is clear SPs are used to portray a variety of health care topics, and students report increased confidence and satisfaction in simulations with SPs.

Another unanticipated finding in this review was having 40 percent of studies completed outside the United States. With 12 countries represented in this systematic review, it is apparent that the use of SPs has become a global trend. At the same time, it is evident there are areas that are either not using SPs or are not publishing research studies that include SPs.

CONCLUSION

The purpose of this systematic review was to search, extract, appraise, and synthesize research related to the use of SPs to train nurses within the academic setting to gain a better understanding of how SPs are being used to facilitate student learning. This systematic review synthesized the research completed in the last five and a half years and reported on the current state of the science on the use of SPs within nursing academia.

Our review found that SPs are used in a variety of health care curricula to portray diverse patient diagnoses and have become an integral part of simulation methodology. However, gaps remain in the literature regarding their impact on student learning outcomes. More randomized controlled trials and studies with power analyses and validated measurement instruments are needed. Studies that compare SPs to high-fidelity simulators are also desired to determine optimal student learning outcomes and standardize best practices in simulation.

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