



# Simulated patient training: Using inter-rater reliability to evaluate simulated patient consistency in nursing education<sup>☆</sup>

Sharon MacLean<sup>\*</sup>, Fiona Geddes, Michelle Kelly, Phillip Della

School of Nursing, Midwifery and Paramedicine, Curtin University, Perth, Western Australia, Australia

## ARTICLE INFO

### Keywords:

Simulated patient  
Simulation  
Inter-rater reliability  
Discharge communication skills

## ABSTRACT

**Background:** Simulated patients (SPs) are frequently used for training nursing students in communication skills. An acknowledged benefit of using SPs is the opportunity to provide a standardized approach by which participants can demonstrate and develop communication skills. However, relatively little evidence is available on how to best facilitate and evaluate the reliability and accuracy of SPs' performances.

**Aim:** The aim of this study is to investigate the effectiveness of an evidenced based SP training framework to ensure standardization of SPs. The training framework was employed to improve inter-rater reliability of SPs.

**Methods:** A quasi-experimental study was employed to assess SP post-training understanding of simulation scenario parameters using inter-rater reliability agreement indices. Two phases of data collection took place. Initially a trial phase including audio-visual (AV) recordings of two undergraduate nursing students completing a simulation scenario is rated by eight SPs using the Interpersonal Communication Assessments Scale (ICAS) and Quality of Discharge Teaching Scale (QDTS). In phase 2, eight SP raters and four nursing faculty raters independently evaluated students' ( $N = 42$ ) communication practices using the QDTS.

**Results:** Intra-class correlation coefficients (ICC) were  $> 0.80$  for both stages of the study in clinical communication skills.

**Conclusion:** The results support the premise that if trained appropriately, SPs have a high degree of reliability and validity to both facilitate and evaluate student performance in nurse education.

## 1. Introduction

In establishing a new simulation laboratory in our university, a need was identified to establish protocols to recruit, train and evaluate Simulated Patients (SPs) performance. SP encounters are utilized to give student nurses the opportunity to practice their clinical and communication skills prior to clinical placement (Nestel and Kneebone, 2010). SPs portray real patients presenting specific clinical scenarios (Barrows, 1987). After the simulation SPs can provide timely feedback to students to help improve on clinical performance (Nestel and Kneebone, 2010). While the importance SP training is well documented, a systematic review of the nursing literature identified that methods to evaluate SP training effectiveness are limited (MacLean et al., 2016). Nurse educators who adopt the use of SPs for assessment or research data collection must use validated SP training frameworks that will make the simulation experience consistent. The purpose of this article is to describe a process to prepare and evaluate SP training based on establishing inter-rater reliability.

## 2. Background

The reduction in clinical placements, higher patient acuity, and advances in health care has led to a demand for better-prepared health care students (Nestel and Kneebone, 2010). Simulation-based learning has the benefit of providing students with an environment in which to practice clinical skills, learn from errors, and develop confidence to provide patient care in the clinical setting (Nestel and Kneebone, 2010). The Australian Commission on Safety and Quality in Health Care (ACSQHC, 2015) recently reviewed strategies to assist the smooth transition of patients from one setting to another. The review recommended that the national communication standards be included in undergraduate nursing curricula. They suggest using educational experiences that allow students to practice engaging with patients in clinical and discharge communications, such as simulation, role play and case based learning (ACSQHC, 2015).

Rehearsing communication skills using SPs is one way of bridging the theory-practice gap that exists in healthcare education (Gaba,

<sup>☆</sup> Work undertaken for this article has been supported by an Australian Research Council, Linkage Project Grant (LP110100035).

<sup>\*</sup> Corresponding author at: School of Nursing, Midwifery and Paramedicine, Curtin University, GPO Box U1987, Perth, Western Australia 6845, Australia.

E-mail addresses: [Sharon.maclea@curtin.edu.au](mailto:Sharon.maclea@curtin.edu.au) (S. MacLean), [Fiona.Geddes@curtin.edu.au](mailto:Fiona.Geddes@curtin.edu.au) (F. Geddes), [Michelle.kelly@curtin.edu.au](mailto:Michelle.kelly@curtin.edu.au) (M. Kelly), [Phill.della@curtin.edu.au](mailto:Phill.della@curtin.edu.au) (P. Della).

<https://doi.org/10.1016/j.nedt.2017.12.024>

Received 27 January 2017; Received in revised form 20 November 2017; Accepted 20 December 2017  
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2004). To play the role of patients, SPs should be trained reliably and consistently to re-enact scenarios and to evaluate the student. Researchers have found that experienced clinicians were unable to differentiate between SPs and real patients, exemplifying their authenticity (Lucky and Peabody, 2002; Levine and Swartz, 2008). SPs play a vital role in ensuring the equivalence and realism of each participant's experience. However, the adequacy of reporting SP recruitment, training and evaluation to support replication or critical review has often been lacking (Howley et al., 2008).

Howley et al. (2008) proposed reporting standards for SPs to improve methodological rigour. The standards include criteria that can impact on the internal and external validity of the research. Howley et al. recommend providing a concise description of the encounter including: the type of encounter (high stakes, summative or formative assessment), number of participants, length of the encounter, and feedback provider (faculty, SP, preceptor or peer). Training methods should also be include: the amount of training, who conducts the training, and quality control checks such as inter-rater agreement. The final standard includes reporting the development, purpose, composition and psychometric properties of research instruments.

Using the above criteria, Howley et al. (2008) reviewed 121 articles on SPs and demonstrated that 38% of studies ( $n = 44$ ) reported adequate research instrumentation, 21% ( $n = 25$ ) sufficient details of the encounter, and only 14% ( $n = 15$ ) reported SP training and recruitment methods. More recently, MacLean et al. (2016) reviewed 19 articles focusing exclusively on the use of SPs in nursing to teach and assess communication skills. Approximately half the studies reported on the recruitment of SPs ( $n = 10$ ) and only 2% ( $n = 4$ ) mentioned training. Both reviews illustrated that authors significantly under report training details for replication and verification in SP literature (Howley, et al., 2008; MacLean et al., 2016).

Five different methods of SP training have been reported. Meier et al. (1982) initially published a set of self-instructional training materials to prepare SPs for their role as a patient. The material consisted of videotapes and written instructions containing the objectives and self-assessment tests. Meier et al. (1982) used a pre-posttest design to examine SPs knowledge and found that it is possible to train SPs to portray patients effectively. Wallace (2007) provided a framework and methodology to train SPs for high stakes assessments, involving four education sessions. In this approach SPs familiarize themselves with the scenario, learn to use a trainer checklist, apply performance and feedback strategies, and finish by performing a dress rehearsal which allows for the verification of authenticity.

Furman (2008) published a web-based program developed by the National Board of Medical Examiners (NBME®) called eCase. The eCase is a multimedia approach that links to demonstrations, quizzes and videos. Once trained, SPs are then selected for assessments and case scenarios. More recently, the IDEA framework (Howley, 2013) was published for use in training SPs. The framework consists of initiating, developing, executing and appraising SPs. Finally, Nestel et al. (2014) published evidenced based criteria for consideration when working with SPs. Their standard for training role portrayal is described in a four-stage model that draws from theory in the dramatic arts.

The first phase of Nestel et al.'s (2014) approach focuses on defining and developing the person's character. In the second phase, SPs examine the purpose and format of the learning activity, such as whether the activity is formative or summative, feedback requirements and whether the simulation will be recorded. The third phase focuses on the person as a patient to ensure that the SP understands the health issue and complexity of the scenario. The final rehearsal integrates the three phases and allows the SP to assume and rehearse the patient role. This model places the SP at the center of the training and encourages SPs' full engagement (Nestel et al., 2014).

Given that students often engage with different SPs in a learning experience or assessment, any inconsistent SP performance can bias results. To use SPs for research or assessment purposes, they must offer

valid and repeatable performances for reliable outcomes (MacLean et al., 2016). Where SPs act solely as facilitators, outcome validity can be defined as the extent to which the SP portrays the range of behaviors associated with a real patient. Reliability relates to the consistency of the SPs' performance over time. To achieve these goals quality training approaches are critical. However, methods and measures used to evaluate such criteria are not typically reported in the nursing literature. When using multiple SPs a further issue emerges - consistency across SPs performance. In the evaluation context the reliability of SP ratings should be measured using recommended psychometric methods, including inter-rater reliability (Swanson and Stillman, 1990; Tamblin et al., 1991; Adamson & Prion, 2018).

### 3. Inter-rater Reliability

A threat to the validity of student assessment is variation in assessors' perceptions or judgements (Shrout and Fleiss, 1979). One rater may judge participants differently to another rater (inter-rater reliability), or differently over time (intra-rater reliability) (Jonsson & Svingby, 2007). A robust way to determine if the data is reliable is to have more than one rater complete the evaluation on the same performance and quantify the variance in results (Fitz-Gibbon and Morris, 1987; Thistlethwaite, 2002). Adamson and Kardong-Edgren (2012) quote "inter-rater reliability of data is population specific and therefore must be established for each new sample"(p. 4). SP reliability can be influenced by factors pertaining to the rater, the tasks involved, and the rating scales used. When outcome criteria are clearly defined, well operationalized and measured, the likelihood of achieving a high inter-rater agreement is improved compared to when target skills and behaviors are complex, subtle, or poorly defined. The measurement instruments used can determine both the type of decisions made and the type of inter-rater reliability analysis performed. This ranges from agreement percentages, and Cohen's and Fleiss's kappa for nominal and categorical data, to correlations and intra- class correlations for interval data (Shrout and Fleiss, 1979). Establishing high inter-rater reliability amongst SPs, using performance-based evaluation instruments, is dependent on appropriately training the raters (Nestel et al., 2014). When used as raters, SPs must understand the content and purpose of the simulation. It is imperative that rigorous methods are applied to evaluate SPs' performance and their ability to accurately and consistently complete measurement instruments (Shirazi et al., 2014). Training should include a discussion of the expected level of achievement for each clinical component and skill to ensure agreement within the pool of raters (Walshe et al., 2017). In summary, training is recognised as being one of the most significant factors leading to a highly reliable simulation and SP performance (Barrows, 1987).

### 4. Aim

The purpose of this study is to examine the use of SPs in nursing education. More specifically the aim is to investigate if using an evidenced-based framework for SP training provides a reliable and valid approach for assessing students.

### 5. Methods

#### 5.1. Design

The research design is a quasi-experimental study. Data presented in this paper were collected in the preliminary phase of a Doctoral research project.

#### 5.2. Sample and Setting

Eight SPs (six females and two males) were purposely recruited through the university's patient volunteer database and researcher's

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