

# Partnering to Establish and Study Simulation in International Nursing Education

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*The purpose of this article was to describe an international partnership to establish and study simulation in India. A pilot study was performed to determine interrater reliability among faculty new to simulation when evaluating nursing student competency performance. Interrater reliability was below the ideal agreement level. Findings in this study underscore the need to obtain baseline interrater reliability data before integrating competency evaluation into a simulation program.*

**Keywords:** competency evaluation; India; international partnership; interrater reliability; simulation

Simulation is an effective nursing education modality that incorporates best practices to stimulate critical thinking and problem solving and improve competency in performance.<sup>1</sup> However, the use of simulation in nursing curricula is just emerging in many international settings. Health care simulation centers in India are being established to introduce experiential learning in a culture where didactic lecture and rote memory are the traditional methods for education and teaching in the field of science.<sup>2,3</sup> The Ministry of Health in India recently called for improvement in nursing education throughout India in its draft National Healthcare Policy,<sup>4</sup> and the incorporation of simulation to improve clinical decision making among students is 1 example of an answer to this call.

Simulation research in the United States is providing evidence of the efficacy of simulation as a teaching strategy<sup>1</sup>; however, there is scant research on its efficacy in India and other low- and middle-income countries. This article describes an international collaboration between a university in the United States and a school of nursing in India to establish and study nursing simulation education. As part of the process of establishing simulation in a nursing curriculum in India, a pilot study on interrater reliability among faculty evaluating nursing student competency performance was completed as a baseline for which to shape and strengthen the simulation curriculum.

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## Background

### The International Partnership

The partnership between the 2 collaborating universities dates back to the 1970s, when a faculty member from the US institution was appointed as the first director of nurses at the hospital where the Indian school of nursing is located. Although the partnership waxed and waned through the decades, it was revitalized in 2011, with a series of US faculty and student trips to India with goals to build nurse capacity in India and increase cultural competency in the United States. This partnership has been mutually beneficial as the US faculty, and students have learned about different cultures to help them better care for culturally diverse patients in the United States while increased nurse capacity in India helps to improve patient outcomes in India.

In 2013, US faculty presented nursing simulation as a strategy for innovative teaching and learning at a faculty development workshop in India. The faculty in India were intrigued with the idea of simulation and wanted to learn more. The principal/director of the Indian nursing school traveled to the United States in 2014 to visit simulation centers and received additional training in simulation nursing education. This is important because an international initiative must have stakeholder investment for success.<sup>5</sup> The new watchwords for international collaborations are “nothing about us, without us.”<sup>6</sup> In 2015, the partnership became tangible when nursing stakeholders from the 2 schools collaborated to apply for a grant to obtain simulation resources. A federal grant was subsequently awarded by the US Agency for International Development American Schools and Hospitals Abroad<sup>7</sup> to build a Simulation Education and Research Center for Nursing Excellence in South India. The center will be opened in 2017, and simulation will be fully integrated into the curriculum at that time.

To prepare for full integration of simulation into the nursing curriculum, the collaborative international team began an emphasis on studying the International Nursing

Association for Clinical Simulation and Learning (INACSL) Standards of Best Practice. In the INACSL Standards of Best Practice, Standard VII outlines assessment and evaluation of the simulation participant including formative and summative assessment.<sup>8</sup> The international team agreed obtaining baseline data on interrater reliability among faculty during evaluation of student simulation performance would be an important first step to address this standard and begin a program of research on nursing simulation in India.

### Need for Consistency in Simulation Education

Attendees at the 2014 INACSL Town Hall Meeting expressed concern that fair and consistent methods be used when evaluating students participating in simulation-based experiences.<sup>9</sup> When planning simulation evaluation, it is recommended that faculty consider the purpose and focus of the evaluation (formative or summative), type of data to be gathered, and if participants will be evaluated as individuals or groups.<sup>10</sup> Formative assessment promotes individual and professional growth and includes constructive feedback such as coaching, cues, and prompting.<sup>8</sup> Feedback given during and after a simulation exercise can enhance behaviors associated with cognitive, affective, and psychomotor skills. The focus of summative evaluation is outcome measurement or participant competence. Summative evaluation for simulation should include a standardized format for scoring methods with preestablished criteria for rating the participant. It is important that summative evaluation is “based on evaluation tools previously tested with like populations for validity and reliability” and interrater reliability is established when there is more than 1 evaluator.<sup>8(e31)</sup>

Reliability and validity data for simulation evaluation tools are increasingly prevalent in the literature.<sup>9,11,12</sup> In a quantitative study to compare student self-evaluation and faculty evaluation on caring efficacy, researchers found student self-ratings had a significant correlation with faculty ratings.<sup>11</sup> Another study was conducted to determine if differences existed between scores assigned by faculty to simulation participants from racial/ethnic backgrounds.<sup>9</sup> Findings provided validity evidence, as scores between groups of students did not differ significantly, suggesting rater bias based on race/ethnicity was not present.<sup>9</sup> These types of studies are important to ensure fair and consistent evaluation of simulation participants. Establishing reliability and validity of new tools is essential to advance the field of nursing simulation and education. However, limited research exists on the translation of these types of data across cultures, particularly in low- and middle-income countries where simulation is on the rise.<sup>12</sup>

### Theoretical Framework

The Middle Range Theory of Nursing Intellectual Capital<sup>13</sup> was used to guide this study. Nursing intellectual capital is described as “nursing knowledge that is translated into nursing and organizational performance.”<sup>(120)</sup> Theorists postulate that nursing human capital (registered nurses’ knowledge, skill, and experience) is directly related to patient and institutional outcomes. This Middle Range theory was derived from a business model of Intellectual Capital Theory.<sup>13</sup> Propositions of the Middle Range Theory of Nursing Intellectual Capital include nursing structure capital and

support for nurses continuing professional development.<sup>14</sup> Nursing structural capital includes the availability of protocols and practice guidelines for obtaining evidence-based practice information. The proposition, support for nurses, incorporates investing in educators to assist with fostering decision-making and critical thinking skills.<sup>13</sup> The collaborative stepwise approach to establish and study simulation in India using INACSL standards<sup>15</sup> exemplifies the advancement of nursing intellectual capital in an international setting.

### Purpose

The purpose of this pilot study was to evaluate interrater reliability among faculty new to teaching simulation in a nursing school in India when performing nursing student competency evaluation after observing a simulated scenario.

### Method

#### Design, Sample and Procedure

This study was approved by a university institutional review board in the United States and an ethics review committee in Bengaluru, India. A convenience sample of 14 faculty members teaching in a general nurse midwifery (GNM) and bachelor of science in nursing (BSc) program in Bengaluru, India, was used. Data were collected in April 2016. The faculty sample observed an evidence-based National League for Nursing Advancing Care Excellence for Alzheimer’s Patients and Caregivers simulated scenario using a standardized patient.<sup>16</sup> The scenario included nursing care of an elderly patient with Alzheimer’s disease who was admitted to the hospital with a diagnosis of pneumonia.<sup>16</sup>

The simulation team was made up of 2 faculty researchers from the United States who played the roles of instructor and patient and 2 faculty from India who played the role of nursing students. Two expert nurse faculty in India first reviewed the published scenario for face validity and cultural appropriateness. The simulation team practiced the scenario for a half day, and 3 student errors were planned a priori. The errors performed by the faculty acting as students included incomplete assessment, delayed recognition and response to hypoxia, and incorrect teaching of the incentive spirometer. The observed scenario lasted approximately 20 minutes, followed by 20 minutes of debriefing. After the scenario, the 14 faculty had 15 to 20 minutes to individually complete the evaluation without discussion with other faculty members.

#### The Evaluation Tool

Permission was obtained from tool developers, and The Seattle University Simulation Evaluation Tool<sup>17</sup> was chosen to measure observed nursing student competency performance, which is a type of summative evaluation. This tool uses a 0 to 5 point Likert-type scale to evaluate 5 categories of nursing student behaviors. Scores of 0 to 1 indicate below expectations; 2 to 3, meets expectations; and 4 to 5, exceeds expectations. Categories of behaviors were as follows:

- Assessment/intervention/evaluation,
- Critical thinking/clinical decision making
- Direct patient care

- Communication/collaboration
- Professional behaviors

A maximum score of 25 is possible using this scale. Tool reliability was established with a Cronbach's  $\alpha$  of .97 and intraclass correlation (ICC) of 0.858.<sup>17</sup> An expert nurse educator and experienced researcher in India reviewed the tool for face validity for use in India, and no modifications were made to the tool. An overview of the tool and instructions for use were given to the 14 faculty before observing the scenario.

### Data Analysis

Faculty in this study evaluated the 2 simulation participants as a group. Intraclass correlations greater than 0.80 were considered acceptable.<sup>18</sup> As an additional measure of consistency, Krippendorff  $\alpha$  was computed to assess agreement across faculty raters. Consistency across raters was examined at both the domain-specific level as well as a total score. Intraclass correlations were conducted in SPSS v 21 (IBM, Chicago, Illinois) and Krippendorff  $\alpha$  was conducted in ReCal for Ordinal, Interval and Ratio Data (Freelon, Washington DC). Significance for all analyses was set at .05, and critical values for acceptable reliability were determined based on the benchmarks as described by Landis and Koch.<sup>18</sup>

### Results

The interrater reliability of faculty assessments was evaluated to examine consistency among raters. There were 12 female and 2 male faculty members with a mean (SD) of 5.1 (3.8) years of teaching experience. As shown in the Table, average pairwise agreement across all subdomains at the total scores was below the ideal threshold of ~80%. In addition, Krippendorff  $\alpha$  values were far below the critical value of .600.<sup>18</sup> Lastly, ICCs were computed for individual responses, which also fell below the critical value of 0.800.<sup>18</sup> These results suggest that overall agreement among raters was weak.

### Discussion

When nurses are able to access and incorporate evidence-based practice guidelines, such as the INACSL Standards,<sup>15</sup> into nursing education, it can strengthen nursing curriculum by fostering decision making and critical thinking. It is vital that nursing knowledge related to evidence-based practice is shared with the wider nursing profession.

Increasingly, nurses, educational institutions, and nursing organizations are forming global partnerships to build nurse capacity and uplift the nursing profession around the world.<sup>5,19</sup> Through these global partnerships, gaps in the nursing research can be addressed.

Findings in this study underscore the need to obtain baseline interrater reliability data before integrating competency or summative evaluation into a nursing curriculum, particularly when simulation is a new concept among faculty. Although the study was conducted in India, where simulation is just emerging in the field of nursing, findings emphasize the need to conduct more cross-cultural simulation evaluation research with a variety of populations. In addition, many nursing faculty around the world, even in regions where simulation is prevalent, may be newly assigned to simulation. Establishing interrater reliability among small groups of teachers assigned to nursing student simulation evaluation is 1 method toward ensuring fair evaluation processes.

When the results of this pilot study were shared with the faculty participants and international research team, all stakeholders agreed to continue to collaborate to build capacity in simulation evaluation until interrater reliability is achieved among the group. A workshop with hands-on simulation activities focusing on simulation evaluation will be planned and implemented. Another study, with a smaller cohort of faculty who are directly involved in simulation evaluation, will be conducted with increased observations and leveling of students per semester and per program and will involve Indian nursing students. These research results can be used to shape evidence-based practice, promote nursing program rigor, and improve international education outcomes.

### Limitations

Although this study models a method that can be duplicated to assess interrater reliability in a variety of educational settings and cultures, the sampling method limits the generalizability of the findings to broader populations. The program level and type of program (GNM vs BSc) were not assigned to the participants playing the role of the students and the evaluation tool used did not reflect leveling based on student progression in the program. According to Oermann,<sup>10</sup> evaluations may become increasingly difficult and more meaningful as students progress from their first to last year in a nursing program. In addition, this pilot study used a high number of raters and low number of observations, and the evaluation tool was new to the faculty.

### Conclusions

An international partnership was integral to establishing and researching nursing simulation in India. A pilot study on interrater reliability among faculty evaluating nursing student competency performance was completed as a baseline for which to shape and strengthen simulation curriculum in India. Overall agreement among the raters in this study was weak. Results reinforce the need to establish fair evaluation processes before incorporating simulation evaluation into nursing curriculum.

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**Table. Interrater Reliability Results of Faculty Evaluating Nursing Student Competency**

Evaluation Tool Categories of Behaviors	Average Pairwise Agreement	Krippendorff $\alpha$
Assessment	47.25	<.001
Communication	28.57	<.001
Critical thinking	26.37	<.001
Direct patient care	25.28	<.001
Professionalism	25.28	<.001
Total	34.73	.027

ICC for total = 0.308

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