Clinical Simulation in Nursing (2018) 22, 1-4

Clinical Simulation in Nursing

www.elsevier.com/locate/ecsn

Short Communication

The Simulation Research Rubric: A Pilot Study Evaluating Published Simulation Studies

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KEYWORDS
simulation research rubric;
research reporting;
simulation-based research reports

Abstract: It is important to assess the effectiveness of simulation through research. This pilot project used the Simulation Research Rubric developed in 2014 to appraise the quality of published simulation research. Sixty-nine simulation-based research articles published in the *Clinical Simulation in Nursing* journal in 2013 to 2014 were scored by an eight-member team using the Simulation Research Rubric. Of the 69 articles reviewed, 15 (21.8%) received a rating of excellent (76%-100%), 47 (68.1%) were rated as good (51%-75%), and 7 (10.1%) were rated as fair (26%-50%). In conclusion, the strengths and weaknesses of two years of published simulation-based research reports were identified. Recommendations were made to improve reporting, which may strengthen the evidence guiding simulation in education and practice. In addition, results may be used to guide the design of published research in the future.

Cite this article:
Mariani, B., Fey, M. K., & Gloe, D. (2018, September). The simulation research rubric: A pilot study evaluating published simulation studies. *Clinical Simulation in Nursing, 22*, 1-4. https://doi.org/10.1016/j.ecns.2018.06.003.

Simulation is an important educational strategy in nursing education, including its use as a substitute for clinical hours, and in clinical practice. As with any strategy, reliable evidence supporting its effectiveness is essential. Simulation specialists, faculty, and practitioners must provide solid evidence of the effectiveness of simulation to administrators, other faculty, and students.

The aim of this pilot study was to apply the Simulation Research Rubric (SRR) (Fey, Gloe, & Mariani, 2015) to the simulation intervention research studies published in *Clinical Simulation in Nursing* from January 2013 to December 2014. Although psychometrics were calculated on the SRR (Fey et al., 2015) during its development, this project was intended to further pilot the rubric with a larger sample of published articles.

Simulation research began with assessing student and faculty satisfaction with the simulation experience (McGaghie, Issenberg, Petrusa, & Scalese, 2010; Shinnick, Woo, & Mentes. 2011). By 2013, it progressed to the comparison of other educational strategies to simulation and simulation to clinical experiences, as well as other

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1876-1399/$ - see front matter
https://doi.org/10.1016/j.ecns.2018.06.003

pertinent simulation topics (Cook et al., 2013). The varied quality and lack of standardization for reporting these studies have been acknowledged in the literature (Laschinger et al., 2008; Cook, Levinson, & Garside, 2011; Kardong-Edgren, Gaba, Dieckmann, & Cook, 2011; Raemer et al., 2011). Issues related to the rigor of the studies and/or the subsequent reporting make it difficult to interpret the results, often preventing replication or generalization. Simulation is recognized as an important strategy for educating health care professionals and improving patient safety (McGaghie, Draycott, Dunn, Lopez, & Stefanidis, 2011; Griswold et al., 2012; Schmidt, Goldhaber-Fiebert, Ho, & McDonald, 2013). However, the science of health care simulation continues to require a sound body of research evidence if it is to mature in a way that allows practitioners to make informed decisions about the best use of the methodology.

Key Points

- Reporting of reliable evidence to support simulation as an educational strategy is important.
- The strength of published reports and manuscripts on simulation research will help to further advance the science of simulation.
- The use of valid and reliable instruments are needed to further the rigor of simulation research.

Standards for reporting require researchers to report elements of the study which allow readers to determine the value of a study's contribution to the state of the science. The importance of this has recently been addressed in the simulation literature with the publication of Cheng et al. (2016), an extension to the STrengthening the Reporting of OBservational studies in Epidemiology (STROBE) and Consolidated Standards for Reporting Trials (CONSORT) reporting guidelines for simulation research.

Transparent reporting of simulation studies must include information about the simulation intervention not normally captured by other reporting conventions or research quality assessment rubrics. Elements that were required, yet often missing from simulation-based research reports, included adequate descriptions of the guiding theoretical framework, the specific simulation intervention, aspects of validity and reliability, instructional design principles, and the debriefing method used (Dieckmann et al., 2011; Raemer et al., 2011).

The use of a guiding theoretical or conceptual framework has been identified as a key element in guiding researchers in formulating hypotheses, collecting data, and interpreting results (Polit & Beck, 2012; Rourke, Schmidt, & Garga, 2010; Dieckmann et al., 2011). In a review of published studies on debriefing, Raemer et al. (2011) found that most studies rarely reported debriefing in depth, which prevented replication.

Sample and Procedures

A total of 73 articles published in *Clinical Simulation in Nursing* between January 2013 and December 2014 were chosen for review. A two-year time frame was selected to make the project manageable for this pilot-phase work. Research reports in which simulation was the educational intervention were included. Literature reviews, integrative reviews, systematic reviews, and research related to tool development or program analysis were excluded. Thus, four articles were eliminated, for a total of 69 articles retained for review. A list was generated, and articles were assigned to each reviewer. The articles were reviewed over a two-month period.

Reviewers

In addition to the three primary researchers, five nurses with expertise in simulation research participated as reviewers for this phase of the project. Seven of the reviewers were doctorally prepared, had experience conducting simulation-based research, and were geographically dispersed across the United States. All reviewers were involved in the initial development, psychometric testing, and inter-rater reliability of the SRR (Fey et al., 2015).

Data Collection and Analysis

The SRR (Fey et al., 2015) is a five-point rating scale ranging from 0 (unsatisfactory) to 4 (excellent) which is used to rate the rigor of published simulation research. The categories of the SRR are introduction/background/rationale; literature review; problem statement/objective of the study/research question; guiding or conceptual framework; study design; strength of study design (quantitative/qualitative); sample and setting; simulation development; description of simulation implementation; description of simulation feedback or debriefing; study instruments (quantitative/qualitative); results; discussion; and institutional review board.

Pilot and psychometric testing of the SRR was conducted and reported (Fey et al., 2015). Overall, inter-rater reliability (IRR) was reported as 0.92, and the content validity index was 0.96. This current article reports the SRR findings on the published research reports of the 69 articles from 2013 to 2014. Each reviewer appraised the articles on the 14 (or 16 for mixed-method studies) identified elements on the SRR, using the detailed definitions provided on the SRR for each item.

Ratings from the completed SRRs were entered into a spreadsheet to obtain an overall raw score and a percentage score. In articles in which the study was reported as quantitative or qualitative, the total possible SRR raw score was 56; for an article reporting a mixed-methods study, the total possible SRR raw score rating was 64. These raw