

Title:

Methodological Considerations in Simulation Research: Constructing Rigorous Investigations to Advance Practice

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Session Title:

Transforming Nursing Education Through Research and Practice

Slot:

F 04: Saturday, April 9, 2016: 2:45 PM-4:00 PM

Scheduled Time:

2:45 PM

Keywords:

methodological rigor, simulation-based research and study design elements

References:

1. Adamson K A, Kardong-Edgren S, Wilhaus, J (2013). An updated review of published simulation evaluation instruments. *Clinical Simulation in Nursing*. 2013; (9), e393-e400. <http://dx.doi.org/10.1016/j.ecns.2012.09.004>
2. Research Consensus Summit of the Society for Simulation in Healthcare: Conduction and a synthesis of the results. *Simulation in Healthcare*. 2011; 6, S1-S9. Dieckmann P, Phero JC, Issenberg S B, Kardong-Edgren S, Ostergaard D, Ringsted C. The first <http://dx.doi.org/10.1097/SIH.0b013e31822238fc>.
3. Issenberg SB, Ringsted C, Ostergaard D, Dieckmann P. Setting a research agenda for simulation-based healthcare education. *Simulation in Healthcare*. 2011; 6:155-167.
4. Aebersold M, Tschannen D. Simulation in nursing practice: The impact on patient care. *OJIN: The Online Journal of Issues in Nursing*. 2013: 18. <http://dx.doi.org/10.3912/OJIN.Vol18No02Man06>.
5. Hayden JK, Smiley RA, Alexander M, Kardong-Edgren S, Jeffries PR. The NCSBN National Simulation Study: A longitudinal, randomized, controlled study replacing clinical hours with simulation in prelicensure nursing education. *Journal of Nursing Regulation*. 2014; 5:S1-S66.
6. International Nursing Association for Clinical Simulation and Learning (INACSL). Standards of best practice: Simulation. *Clinical Simulation in Nursing*. 2013; 9:S1-S32.
7. Franklin AE, Leighton K, Cantrell MA, Rutherford-Hemming T. Simulation research for academics: Novice level. *Clinical Simulation in Nursing*. 2015; 11:214-221. Doi: 10.1016/j.ecns.2015.001.007

Abstract Summary:

There is agreement about the need for simulation-based research to increase the evidence of its efficacy in nursing education. Yet, many academic educators are unprepared to manage the rigors of designing and implementing a simulation-based investigations. This workshop will provide strategies to assist nurse researchers in conducting rigorous simulation-based studies.

Learning Activity:

LEARNING OBJECTIVES	EXPANDED CONTENT OUTLINE
The learner will identify the state-of-the science in simulation-based research and the required rigor of future studies to advance the science base in this area of research.	a. Plethora of studies focused on student satisfaction and confidence and self-efficacy b. Current call for studies focused on skill transfer to clinical settings, clinical reasoning,

	<p>clinical judgment, and medication administration to reduce errors. c. Conducting a thorough and objective review of the literature d. Areas for increased rigor: conceptualization of the studies and the role of theoretical frameworks in each step of the research process, intervention fidelity, measurement, sample size, and research integrity</p>
<p>The learner will describe the interrelatedness of the foundational elements of quantitative simulation-based research designs - purpose, problem statement, study outcomes, theoretical framework, intervention fidelity, measurement, sample size, and protection of human subjects and how the theoretical framework informs/guides the entire research process.</p>	<p>1. Why should research studies be built upon a theoretical framework? a. Provides logical congruence of all aspects of the study design b. How the theoretical framework serves as the foundation in the construction of each component of the study design 2. Connection between the design of a research study and the theoretical framework a. Identifying the problem, creating problem statement b. Problem statement guides the literature review c. What other work has been done in the area you are interested in? What theories have been tested in that work? What theories do you find that might be interesting to work with for your problem? d. What concepts have been identified in the literature review related to your problem statement? e. What frameworks exist that incorporate those concepts? Do you need to develop your own framework? f. Developing a research question that is supported by the framework 3. Relating the findings of the study back to the theoretical framework a. Do the study findings support the theoretical framework? b. If not, need to analyze why—study design, methodology, unique difference that requires further analysis</p>
<p>The learner will design a quantitative simulation-based study to include a problem statement, purpose of the study, a theoretical framework to inform all phases of the study, an outline of the simulation scenario, identification of possible measurement tools and approaches for the identified study outcomes.</p>	<p>Using provided materials (published research study exemplars in an identified area of simulation-based research and workshop handouts) study participants will work in small groups and brainstorm to outline a study to identify a: research question(s), purpose for the study, problem statement, study design, study outcomes all based on an identified theoretical framework, b. strategies to maintain intervention fidelity, c. tools to</p>

	measure study outcomes d. a plan to estimate sample size, and e. issues and strategies in maintaining the integrity of the research process.
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Abstract Text:

Simulation has become a focal point of academic education across health care disciplines.¹ While not a new teaching-learning strategy, the way simulation is employed in many academic settings is novel. There is agreement about the need for simulation-based research to advance the science of nursing education and specifically to explicate simulation as an effective teaching-learning strategy to influence practice among all levels of learners.²⁻⁴ Yet, many academic educators are unprepared to manage the rigors of designing and implementing a simulation-based research study. Likewise, there are many relevant gaps in the literature and research opportunities that exist pertaining to simulation as pedagogy. Thus simulation is a rich area for rigorous education research. Findings of the recent NCSBN study support the further development and evaluation of simulation as an effective teaching-learning strategy in healthcare education, especially, to engender safe conscious practice among learners.⁵ Also it is imperative that educators move forward using evidence-based practice such as that outlined in the Standards of Best Practice: Simulation.⁶ The field of simulation-based research has moved beyond investigations of learner satisfaction to more complex questions. As complexity of research design increases, so does the risk of conducting studies that do not adequately address the research question.⁷ The current state of the science in simulation-based research calls for intervention studies that examine skill development and skill transfer from simulation to actual patient care settings to support positive health outcomes in patients.⁷

The intent of this presentation is to provide mentorship to academic nurse researchers who are novice in the area of simulation-based research. The goal is for workshop participants to gain the knowledge and skills to conduct rigorous simulation-based studies that will yield important findings to advance the science of simulation. Developing studies that focus on skill transfer of learner outcomes from the simulation environment into actual practice settings will be emphasized.

While standard research textbooks provide the majority of the methodological information to conduct studies, there are some challenges unique to conducting rigorous simulation-based research. This workshop will focus on the current state-of-the science in simulation-based research in nursing, as well as areas in simulation-based research that require increased rigor to systematically develop the evidence base. The workshop will focus on five elements in constructing a research study: 1) developing the conceptual basis of the study with an emphasis on the role of a theoretical framework in all phases of the research process, 2) maintaining intervention fidelity, 3) choosing reliable and valid instruments that match the identified study outcomes, 4) determining the unit of analysis and sample size, and 5) preserving the ethical integrity of the research process.

Using adult learning theory, the presenters will review the agenda, ask for input into areas that may not be clear, and describe how the workshop will use experiences, examples, analogies, and small group work so that a variety of teaching/learning methods will be experienced. During the workshop, the presenters will also explain the rationale for the concepts that are being taught—the purpose, why this material is important for the audience to learn. It is vital that the audience see an immediate applicability to what they are learning.

The presentation of materials will be problem-centered, rather than content-oriented so that the audience learns within the context of reality, rather than just memorizing or recalling what they are told. It will be important to make the direct link from what the learners experience in the workshop to what they are doing/planning for research in their daily work so participants will be asked for examples to share with the group. It is important for adult learners to share their experiences and backgrounds; this will help to inform

other learners as well as aid the person in their own ability to incorporate the learning into their daily work life.

Small group work will encourage self-direction so that learners can discover information for themselves, with the presenters' guidance. A variety of instructional resources, as described in the next section, to meet auditory, visual, and kinesthetic learning needs will be used. Teaching will be kept to a minimum and experiencing the information will be maximized since adult learning theory purports learners are more engaged by participating in an educational experience, rather than being taught (told) how it should be done.

A standard PowerPoint presentation will provide the foundation for the workshop, but as indicated above, the presenters will strive to keep talking to a minimum, while maximizing the involvement of the audience. Examples from the literature, de-identified if needed, within and outside of healthcare simulation, to show the relationships between the salient elements of a research design as noted above will be provided. Examples of rigorous and flawed past research designs will be shared with workshop participants that they will analyze individually and in small groups. Sections of research papers will be analyzed to discover what is missing or what strong connections have been made between and within the elements of the research design. Examples from published studies will vary in regard to theoretical frameworks, outcomes measured, measurement tools, intervention protocols, and strategies to maintain research integrity to expose the audience to a variety of available possibilities in each element of a simulation-based research design.

In summary, this session will highlight simulation articles and other references pertaining to best practices for simulation-based research. Presenters will provide strategies to help learners avoid common pitfalls in research design, implementation, and dissemination in this area. Analogies and other examples to support the outlined material will be used in an effort to make the material clear and easy for the audience to comprehend and apply to their current work. At different points, participants will be encouraged to share with the group of workshop participants to make the connection with the current content to their work. Handouts will guide the discussions and provide the learners with a place to make their own notes and document their ideas as they are taken through the process of designing a logically cohesive simulation-based research study.