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Designing Nursing Simulation Clinical Experiences To Promote Critical Inquiry

by Bev Beattie, Donna Koroll, Susan Price

Abstract

The use of high fidelity simulation (HFS) learning opportunities in nursing education has received increased attention in the literature. This article describes the design of a systematic framework used to promote critical inquiry and provide meaningful simulation clinical experiences for second year nursing students. Critical inquiry, as defined by the College of Nurses of Ontario, is incorporated in the three key aspects of the framework: (a) resources, (b) simulation, and (c) debriefing/ critical inquiry. Research is required to establish reliable and valid instruments that measure the identified learning outcomes associated with simulation.

Designing Nursing Simulation Clinical Experiences To Promote Critical Inquiry

The use of high fidelity simulation (HFS) learning experiences in nursing education has received increased attention in the literature. Fidelity, a term used in the description of simulation equipment, refers to the capability to control and accurately replicate real life situations.[1] Research has focused on the advantages linked to simulation, such as team building, problem solving, critical thinking, and students' self-report of confidence and self-efficacy in their clinical skills and clinical judgment.[2,3] The need for increased numbers of clinical sites, concerns about patient safety, and the necessity to prepare nursing graduates to work in a complex health care environment are also viewed as driving forces behind the inclusion of simulation in nursing education.[4]

Systematic Framework for Simulation Clinical Experiences

Many nursing programs have been actively involved with integrating simulation into the curricula to enhance student learning.[5] However, using a systematic framework to support the design of simulation clinical experiences (SCE) to promote critical inquiry among nursing students has received minimal attention in the literature. This paper describes a framework for the design of a nursing simulation clinical experience to promote critical inquiry, and to provide applicable and meaningful learning opportunities for second year baccalaureate nursing students. Critical inquiry as defined by the College of Nurses of Ontario (CNO) entry to practice competencies[6] is central to the framework. The three key elements of the systematic

framework are: (a) resources, (b) simulation, (c) debriefing/critical inquiry. (Appendix)

Resources

Multiple resources are required to develop and deliver SCE. Successful integration of simulation into any nursing program is enhanced by having a Simulation Coordinator who has a strong clinical background and a sound understanding of the operations of the simulation equipment. This role is instrumental in the design and development of clinical simulation scenarios and in the effective use of clinical simulation equipment.[7] A Simulation Coordinator must facilitate at all levels by acting in a consultant role and encouraging faculty expertise.[8] Key responsibilities were to: (a) identify any equipment and space needs; (b) examine the current use of human patient simulation; (c) survey current faculty beliefs and attitudes toward simulation; (d) determine which nursing courses would be the best 'starting point' for simulation integration; (e) assist in finding appropriate financial resources to support simulation; (f) support and train key 'champions' who would participate as the initial users of simulation technology.

Education and Support for Faculty

Ongoing support and guidance from the Simulation Coordinator was integral to the development and operation stages of the SCE. In order to keep nursing faculty current and informed, a Simulation Network of Information for Faculty (SNIFF) site was developed to provide up to date information regarding the institution's progress and future plans with simulation. Simulation research articles and a link to Laerdal's Simulation User Network site were also available. In addition, a Simulation Users Group committee was established.

Equipment

Simulations are categorized as low, medium, and high fidelity depending on the degree of realism they reflect.[8] During the orientation phase, students practiced assessment skills with both the medium and high fidelity simulators. However, in order to best replicate reality and maximize critical thinking, high fidelity mannequins were used to run the simulation scenarios. Critical thinking occurs in most cases when high fidelity simulation is used for student learning.[9,10]

Ideally, a simulation lab should contain equipment necessary to mimic reality as closely as possible. Some of the key elements include: (a) a separate control room for equipment operation; (b) audio-visual equipment with live feed into a separate observation room; (c) internet access located in the control room; and (d) readily available supplies pertaining to the specific scenario. Given the unpredictable nature of student intervention during a scenario, live audio feed to the mannequin's head enables the operator to provide a

'patient' verbal response to student interaction when necessary. This serves to promote both realism in the scenario and critical thinking as the instructor provides cues to students from within the control room.[11] As a result, students can function independently and realism is maintained.[12]

Conversely, Weis & Guyton-Simmons[13] reported mastery and application of content increased when an instructor was present to provide guidance and assistance.[13] However, the authors used a computer simulation consisting of questions posed for student response rather than a mannequin in a high fidelity simulation environment. If the goal is to provide an environment that imitates the 'real world' as closely as possible to maximize student learning, then it seems reasonable to suggest that the instructor not be present in the 'patient room' during the scenario. Literature supports that student learning may actually be stifled when faculty are present and interrupt the scenario.[14] Furthermore, critical thinking is fostered when uncertainty is present.[1] An instructor's role is therefore better served to provide cues from the control room and guided reflection[11] during the debriefing phase of simulation. This physical separation prevents the instructors from intervening and allows students to own the results of their actions.

Props and equipment play a fundamental role in ensuring the fidelity of the simulation and the ability of students to suspend disbelief in a simulated environment. Enhancing the reality of the simulation is best achieved through the use of real equipment with the goal being to re-create the desired environment as closely as possible.[15] In an effort to simulate an actual clinical setting, students were provided with patient charts which included current care provider orders, patient history, and relevant lab/diagnostic reports. Other resources included the medication administration record (MAR), patient care kardex, and a written nursing shift report. Wherever possible, chart forms replicated those of familiar clinical settings. Students were provided with an opportunity to review this data and incorporate the information during the simulation scenarios.

Simulation

All second year baccalaureate nursing students had the opportunity to participate in a two-day, non-evaluative simulation clinical experience (SCE). It was essential for the simulation designers to have knowledge of the second year nursing curriculum in order to align the HFS scenarios with the nursing courses and selected nursing student population. In addition, physical resources, student enrollment figures, and the number of faculty trained on the use of HFS had a direct impact on the time allotted for simulation.

A fundamental step in the design of the SCE was to incorporate teaching-learning models that support reasoning for nursing educational practice. Historically, nursing programs have focused on teacher-centered curricula that is content-weighted.[16,17,18] This can

present challenges when integrating HFS as a new and innovative learning strategy. Traditional nursing pedagogies need to be re-evaluated in an effort to acknowledge the complex healthcare environment and advances in technology, as well as the different ways in which students learn.[16,18] Responding to the paradigm shift from teacher-centered to learner-centered was foundational when designing the SCE in an effort to provide meaningful learning, incorporate applicable practice, and promote critical inquiry.

The teaching-learning models proposed by Fink[19] and by Joyce, Weil and Calhoun[20] guided the decision-making process during the design and implementation phases. Fink's taxonomy of significant learning as a learner-centered paradigm was incorporated through the support of active and experiential learning during the SCE. In this model, the learner goes beyond content mastery by learning how to use the content and integrate it with other areas of knowledge. Learners also increase their level of understanding about personal and social implications.[19] Additionally, the learner-centered paradigm encourages learning in multiple directions involving: (a) learning how to learn; (b) caring; (c) human dimension; (d) foundational knowledge; (e) integration; and (f) application.[19]

The second teaching-learning model, Joyce et al.[20] suggested that the facilitator's task is to raise a student's awareness through coaching and discussion, in relation to the concepts, theories, and individual reactions, when learning from simulation. Four phases are discussed in this model: (a) orientation, (b) participant training, (c) simulation, and (d) debriefing.[20]

The orientation phase is an important element of a successful simulation and assists in dispelling the fear and enhancing confidence associated with this new learning modality. During this phase, students familiarized themselves with the mannequins and reviewed specific clinical assessments and skills. This process provided an opportunity for the educator to share the inherent limitations concerning the fidelity of the equipment and to review the overall learning goal and objectives to ensure students had a clear understanding of the SCE. The educator's role as a simulation facilitator was to develop a trusting, respectful, and supportive learning environment during each of the four phases. Teamwork, inquiry, and open communication were encouraged, thereby empowering students to take on the role as active participants in their learning.

Applicable and meaningful learning outcomes that identified the educational purpose of the SCE were developed during the design process. The learning objectives were aligned with the nursing curriculum to promote integration of foundational knowledge, acquisition of new knowledge, and to promote critical inquiry. An SCE student manual was developed and provided in advance of the learning experience to facilitate communication amongst the students and clinical teachers. The student manual provided the learning

objectives and a framework for learners to identify their own learning needs in preparation for the SCE. During the simulation, students participated in three increasingly complex scenarios with an opportunity to rotate through various nursing roles.

Development of the HFS scenarios involved review of applicable Best Practice Guidelines from the Registered Nurses Association of Ontario (RNAO), relevant guidelines from the provincial nursing regulatory body (CNO), current nursing journal articles, student textbook resources, and relevant care pathways. Once the scenarios were developed, the resources were accessible to students for use during the planning phase, and during the simulation scenarios. As a result, learners were able to clarify information, identify and validate interventions, and support problem solving and decision making. The availability of these resources was an important aspect of the SCE to promote critical inquiry.

Debriefing/ Critical Inquiry

Debriefing is a vital component of simulation-based learning as it provides an opportunity for learners to reflect on their experience, perceptions, decision-making, and clinical competency .[21, 11] Debriefing sessions followed each of the HFS scenarios. Facilitation of the debriefing process involves listening to the students to learn how they perceived the scenario, as well as guiding the discussion by linking and evaluating the simulation experience to course concepts and real-world applications.[22,20] Facilitators need to address errors that have been made during the simulation scenario to ensure accurate knowledge acquisition. A supportive and respectful learning environment encourages students to be open and honest about their simulation experiences and serves to preserve their confidence and self-esteem. Different models of debriefing and levels of facilitation that can be adopted for HFS have been described in the literature.[21] The framework selected for the SCE debriefing focused on the CNO's definition of critical inquiry and participation in the reflective process. Simulation learning provides a unique opportunity for nursing students to apply their theoretical knowledge in a controlled setting and to demonstrate critical inquiry through active participation, purposive thinking, and reflection.

Following the SCE, students were requested to individually submit a reflective writing assignment by answering a series of debriefing questions. These questions were aligned with the critical inquiry themes and enabled the learner to reflect on the information, concepts, theories, and learning objectives for the selected HFS scenario. During the debriefing process, students were asked to examine their ideas, beliefs, and assumptions, as well as their actions and conclusions. The progression of critical thinking can be identified in reflective writing as learners reflect on the actions taken, analyze the patient simulation scenario, and evaluate the outcomes. [16] Critical analysis of the theory, best practice guidelines, and standards applicable to nursing practice were incorporated in the debriefing

discussions and reflective writing assignment. Students were also asked to reflect on how the simulation learning experience would influence their future nursing practice. The use of simulation in nursing education can promote learners to achieve the competencies that are required to provide safe, competent, and ethical nursing care in various clinical settings.

Conclusion

In health care education, simulation technology as an innovative and interactive teaching-learning strategy will continue to evolve. The challenge is to establish an effective systematic framework that facilitates the design of simulation learning experiences to promote critical inquiry, as well as provide applicable and meaningful learning opportunities. However, significant evaluation needs to be conducted and valid and reliable instruments need to be tested to measure achievable learning outcomes of simulation. Research is necessary to evaluate the effectiveness of the described SCE framework used to promote meaningful learning and critical inquiry for second year nursing students.

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Appendix

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