



A Key to Transforming a Nursing Curriculum: Integrating a Continuous Improvement Simulation Expansion Strategy

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Abstract

Introduction: Changes in nursing, health care, and education warrant continued pedagogical innovations. Faculty are challenged to develop many innovative strategies in the clinical and simulation laboratory setting. Intentional simulation-based learning experiences are one method to prepare new graduates for nursing practice.

Methods: One college integrated intentional simulation-based learning experiences as an improvement strategy in a newly transformed undergraduate nursing curriculum, from mapping through evaluation and revision. Simulation-based learning experiences that were intentionally mapped, organized, and interactive enhanced the teaching and learning needs of students and faculty.

Conclusion: The positive outcomes from this curricular transformation serve as a platform for continuous improvement for future approaches to nursing education. This affirmed that the key to transforming a nursing curriculum encompasses intentional mapping, evaluation, and revision.

Keywords

undergraduate nursing program, simulation, curriculum design

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Introduction

Our College of Nursing faculty began a major undergraduate program revision in 2016. The goal of this revision was to prepare graduates to take responsibility and accountability for delivering personalized nursing care to diverse individuals, families, communities, and populations across the lifespan. To do this the faculty engaged in an intense creative process of curriculum transformation. A diverse, seven-member group of faculty, representing different departments, rank, and roles, led the process. Multiple task forces convened to examine best evidence, identify appropriate professional

nursing standards, revise foundational documents, and engaged student, alumni, and community stakeholders in the process.

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The new curriculum focuses on situated cognition and action with synthesis in clinical practice, integrates clinical and classroom learning, moves beyond critical thinking to clinical reasoning, and shifts from role socialization to identify formation (Benner et al., 2010). Recognizing the significance of clinical simulation in Nursing education, and seeing an opportunity for complete curriculum revision, the faculty wanted to fully incorporate simulation into a new Nursing educational program. The approach and lessons learned during the implementation of simulation during the first two semesters of the new curriculum is discussed.

Discussion

Background

Simulation-based experiences encompass a variety of teaching and learning methodologies. The INACSL Standards Committee (2016b) defines a simulation-based experience as, “A broad array of structured activities that represent actual or potential situations in education, practice, and research” (p. S45). The most significant research in the role and outcomes of simulation in prelicensure clinical nursing education was a national, multi-site, longitudinal study conducted by the National Council of State Boards of Nursing (NCSBN). The NCSBN National Simulation Study found no difference in educational outcomes for students who had 25% or 50% of their hours replaced with simulation. The results supplied substantial evidence that clinical hours for prelicensure nursing students can be effectively replaced by up to 50% simulation (Hayden et al., 2014). State boards of nursing have used the results of this landmark study to implement clinical guidelines for simulation-based education to replace clinical hours. There is evidence that students who spend at least 25% of their clinical time in simulation work more effectively in teams and make appropriate clinical decision more quickly than those students who spend less clinical simulation time (Masters, 2014). The National League for Nursing (2015) endorses the results of the NCSBN study and has made strong recommendations to the administrators and faculty of nursing programs to incorporate simulation into undergraduate nursing programs. The recognition of the importance of simulation has persuaded both nursing educators and state policy makers to focus on the use of simulation and a priority requirement for student clinical hours (Anderson et al., 2019; Florida Board of Nursing, 2019). In our state of Florida, up to 50% of simulation can be used for clinical training for each content area (Florida Board of Nursing, 2014). Through repetition using simulation, students may feel more confident in their learning. Students felt that simulation was

important to their learning and their confidence increased when simulations were repeated more than once in consecutive years of their training programs (Zapko et al., 2018).

Since simulation is a proven, effective teaching and learning strategy in nursing education, intentional simulation-based learning experiences were included as an improvement strategy in the new curriculum. With the guidance of a health science librarian, the faculty initially examined the literature to determine the best evidence for integrating simulation in the curricula. A wide array of outcomes has been measured to determine the impact of simulation. The literature described and summarized its positive impact on participant perceptions, such as satisfaction (Laschinger et al., 2008), self-confidence (Yuan et al., 2012), and attitude changes (Brown, 2015). Higher level outcomes as described by Kirkpatrick and Kirkpatrick (2006) have also been demonstrated by cognitive (Lapkin et al., 2010) and behavioral domains (Lee & Oh, 2015) from simulation-based learning experiences. The Kirkpatrick model is based on the premise that learning from training programs can be classified into four levels: level 1 reaction, how learners react to the learning process; level 2 learning, extent to which the learners gained knowledge and skills; level 3 behavior, capability to perform learned skills while on the job; and level 4 outcomes, impact of the training program (Adamson et al., 2013).

Action Steps

Building on the findings of the literature review, the faculty engaged in a series of action steps that resulted in the integration and evaluation of simulation for 120 traditional baccalaureate nursing students in the first two semesters of our curriculum. We adopted the International Nursing Association for Clinical Simulation and Learning (INACSL) Standards Committee definition of simulation. The definition of simulation is “an educational strategy in which a particular set of conditions are created or replicated to resemble authentic situations that are possible in real life.” (INACSL Standards Committee, 2016b). The next crucial step was to appoint a long-time faculty member with specialized training as Director of Simulation Based Learning (SBL). The Director in conjunction with the transformation team quickly agreed upon a strategy of progressive simulation integration. This strategy, now referred to as “A Continuous Improvement Simulation Expansion Strategy (CISES),” ensures faculty learning and full participation in the appropriate selection, delivery, and evaluation of student simulated experiences. The following are the components of CISES.

Table 1. Junior Year Courses With Simulation Components.

Course title & description	Simulation name & associated learning objectives	Description of the simulation components	Clinical time	Evaluation level (Kirkpatrick) & results
<p><i>Fall—2018 Junior</i></p> <p>Clinical Reasoning: Health Assessment (3 credits)</p> <p>Course description: The purpose of this course is to establish a foundation of clinical reasoning, data collection, and documentation for patient assessment. The focus is on normal findings and variations across the lifespan. The course allows students to acquire the knowledge, skills, and attitudes necessary to perform a health assessment.</p>	<p><u>Virtual simulation: online health assessment modules</u></p> <p>Learning objective: Demonstrate proper physical examination techniques and health assessment skills</p> <p><u>Low fidelity simulation: health assessment skills and patient safety scenarios</u></p> <p>Learning objective: Reinforce health assessment skills and demonstrate safe patient care</p>	<p>Digital Clinical Experiences (DCE) using Shadow Health aligned with weekly health assessment content</p> <ul style="list-style-type: none"> Comprehensive patient interviews with reflective questions to gain insight on patient interactions in a virtual environment System-focused and comprehensive physical examinations <p>QSEN competencies with infection control and fall prevention safety scenarios</p> <ul style="list-style-type: none"> 15–20 minute student role-playing scenario followed by debriefing post-simulation Infection control scenario: Assessment of an infectious patient, isolation precautions, and education on infection control precautions Fall prevention scenario: Identification of high fall risk patient and implementation of fall prevention measures 	20 hours	<p>Kirkpatrick: Level 1</p> <p>Tool: Shadow Health Digital Clinical Experiences</p> <p>End-of-Course Survey, 12 items, rating on 6-point Likert scale</p> <p>Results: 70% of 92 students agreed or strongly agreed that DCE improved physical assessment skills</p> <p>Kirkpatrick: Level 1</p> <p>Tool: Creighton Competency Evaluation Instrument (C-CEI), 19 items for faculty evaluation of assessment, communication, and patient safety</p> <p>Results: 95% of 120 students demonstrated competency on C-CEI tool for simulated patient safety experiences</p>
<p>Principles of Personalized Nursing Care I (6 credits)</p> <p>This course provides a foundation of personalized nursing care in individuals across the lifespan. Emphasis is on integrating and applying multiple dimensions of cultural and social determinants of health. The focus is on evidence-based, safe, quality care, and achievement of optimal</p>	<p><u>Virtual simulation: online communication modules</u></p> <p>Learning objectives: Communicate effectively with patients, families, peers and members of their team</p> <p>Manage self-health and work-related stress, and contribute and lead in a team environment</p> <p><u>Low fidelity simulation: environmental patient safety scenario</u></p> <p>Learning objective:</p>	<p>Assessment Technologies Institute (ATI) Nurses' Touch Professional Communication include online tutorials, case studies, assessments, and high-quality live-action videos.</p> <p>Completion of five learning modules:</p> <ul style="list-style-type: none"> Professional Communication Wellness and Self-care for Nurses Becoming a Professional Nurse Nursing Informatics and 	4 hours	<p>Kirkpatrick: Level 1</p> <p>Tool: ATI evaluation</p> <p>Results: 100% of 120 students successfully completed ATI communication modules with 80% or higher</p> <p>Kirkpatrick: Level 2</p> <p>Tool: Worksheet for Hospital Room Safety Issues</p> <p>Results: Positive student comments from worksheet and course evaluations</p>

(continued)

Table 1. Continued.

Course title & description	Simulation name & associated learning objectives	Description of the simulation components	Clinical time	Evaluation level (Kirkpatrick) & results
patient outcomes using the nursing process.	Identify compromises in the hospital room environment	<p>technology</p> <ul style="list-style-type: none"> Leadership and Management QSEN competencies with Hazards in Patient Room 30 minute scenario to identify hospital room safety issues followed by debriefing post-simulation 	1 hour	
<p><i>Spring—2019 Junior</i></p> <p>Clinical Reasoning and Personalized Nursing Care: Adult Acute Conditions (4 credits)</p> <p>This course provides foundational knowledge and principles of personalized nursing care while caring for adults with acute illnesses or injury. Emphasis is on care coordination and interprofessional collaboration to optimize wellness and recovery of adults. Focus is on evidence-based, safe, cost effective, quality care to achieve optimal health outcomes.</p>	<p>Low and high fidelity simulation: <u>adult acute condition scenarios</u></p> <p>Learning objectives: Educate newly diagnosed diabetic patient on disease process, self-management, and prevention strategies Manage the care of the intraoperative patient</p>	<p>Multi-station simulations based on care processes for diabetes and perioperative</p> <ul style="list-style-type: none"> 15-20 minute scenarios followed by debriefing post-simulation for each station Five diabetic scenarios: Medication use and safety, nutrition and meal planning, blood glucose monitoring, management of hypoglycemia, foot care and prevention of complications Five perioperative scenarios: Preoperative education, immediate postoperative care, postoperative education, postoperative wound complication, postoperative blood transfusion reaction 	10 hours	<p>Kirkpatrick: Level I</p> <p>Tool: National League for Nursing (NLN) Simulation Design Scale, 5 items, 20 questions, rating on 5-point Likert scale</p> <p>Results: 90% of 87 students participating in diabetic simulation and 80% of 53 students participating in perioperative simulation agreed or strongly agreed that simulation provided objectives and information, support, problem-solving, feedback/guided reflection, and fidelity (realism)</p>
<p>Clinical Reasoning and Personalized Nursing Care: Mental Health (4 credits)</p> <p>This course provides foundational knowledge and principles of personalized nursing care in prevention, treatment, and recovery of mental illness and substance misuse disorders across the life span.</p>	<p><u>Standardized patient mental health scenario</u></p> <p>Learning objectives: Demonstrate self-awareness of emotional reactions, attitudes, and beliefs related to experiences with suicide. Develop and maintain empathy and rapport with patient (standardized patient) Therapeutic relationship with</p>	<p>Simulated experience on suicidality</p> <ul style="list-style-type: none"> Prebriefing discussion on three videos of individual survivors of suicide attempts 45 minute scenario focused on assessing a standardized patient with suicidal ideation Scenario followed by debriefing post-simulation 	2 hours	<p>Kirkpatrick: Level I</p> <p>Tool: Suicidal Ideation Assessment Questionnaire, 8 items, rating on 10-point Likert scale</p> <p>Results: 71% of 95 students reported an increased awareness and understanding of suicidality post-simulation as compared to 54.8% of students pre-simulation</p>

(continued)

Table 1. Continued.

Course title & description	Simulation name & associated learning objectives	Description of the simulation components	Clinical time	Evaluation level (Kirkpatrick) & results
Emphasis is on using behavioral theories to design personalized nursing care for promoting mental health and recovery.	the patient Collect accurate suicide assessment information Understand the need to communicate the assessment of risk to the treatment team and appropriate persons			Kirkpatrick: Level 2 Tool: Pre and post suicidality quiz generated by faculty, 5 items, 4 multiple choice answer responses Results: Will be reported elsewhere
	Total clinical simulation hours			
	Fall 2018 = 27 hours			
	Total clinical simulation hours			
	Spring 2019 = 12 hours			
	Total clinical simulation			
	Junior year = 39 hours			

Simulation Mapping

Integrating simulation into the curriculum began with developing a curriculum map to determine its placement in the clinical courses through the identification of student learning outcomes and key concepts. The development, implementation, and evaluation of the simulation-based learning experiences in the new curriculum was aimed for 10% for each clinical course, with the intention of expansion for sustainability.

The INACSL Standards of Best Practice were selected as the basis for the intentional simulation experiences being integrated into the new curriculum (INACSL Standards Committee, 2016a). The new curricular design included virtual simulation (also known as computer-based simulation), standardized patients (also known as simulated patients), and low, medium, and high-fidelity simulations (based on the level of realism). The simulation experiences were aligned according to each clinical course in the first year of the curriculum. See Table 1 for the simulation mapping components of the first two semesters of the clinical nursing courses.

Faculty Development

Nursing faculty were highly involved in the planning process. With the emphasis on collaboration and teamwork, the faculty worked together to plan which simulation-based experiences would be most appropriate in the clinical courses. There were four clinical nursing courses in the first two semesters with simulation components. Once the type of simulation was determined, faculty were given development time to expand their knowledge and use of simulation. The Director of SBL met one on one and in groups with faculty to assess simulation-learning needs. Learning experiences were set up to build faculty confidence in the selection and use of simulation in clinical courses. The Director utilized the evidence based INACSL Standards of Best Practices to create meaningful learning activities for faculty (Beroz, 2017). Instructional activities offered to faculty include conducting a needs assessment, creating measurable objectives, identifying, and selecting appropriate simulations, debriefing techniques, and evaluation strategies. Faculty development activities helped to ensure consistency with all simulation-based experiences. Regular meetings were held between simulation faculty and faculty who taught didactically and clinically to better integrate course content with simulation (Masters, 2014; Taplay et al., 2014).

Interpretations of Lessons Learned

In our previous curriculum, simulation was a minor component of our clinical experiences and utilized, most often, at the discretion of the individual instructor.

While some faculty members were engaged in developing simulations, there was no systematic approach in place to guide appropriate selection, use, and evaluation of simulations. However, in the new curriculum, the simulation mapping and faculty development embedded more organized simulation-based learning experiences. This gave students the opportunity to better apply and synthesize their didactic knowledge from the beginning of their nursing education. The students evaluated their perception of the simulation-based learning experiences, and overall, the feedback was positive. Students perceived the eclectic simulation experiences helped them to solidify learning the content while engaging them in their learning. Their satisfaction with the simulation experiences aligned with their course grades. To summarize the assessment of student learning, there was a positive impact on student learning outcomes.

The development and implementation of the simulations were organized, interactive, and well perceived by students and faculty. However, one caveat was quickly determined, the area of evaluation needs improvement. The simulation-based experiences were primarily evaluated for level 1 learning using Kirkpatrick's framework. Evaluations at level 2 learning will be added to assess the knowledge and skills students gained from the simulation experiences. Continued faculty development of the simulation evaluations is ongoing.

Conclusion: The Next Steps

Our College of Nursing has transformed its nursing curriculum and is continuing to improve the integration of simulation-based learning experiences. The outcome data from the implemented simulations will be the driving force, as it further guides the improvement of integrating course content with active learning through simulation experiences. The goal is to build on previous student experiences and provide simulated practice in safety prevention, communication, and teamwork.

Future plans include building upon our simulation experiences and evaluative measures will be assessed, revised, and amplified throughout the new curriculum. The initial goal for simulation time was set at 10% for each clinical course in the first year of the new curriculum. Additional experiences will be planned in the junior year to eventually reach 20% of simulation time. Besides increasing the amount of simulation experiences in the first two semesters, simulation experiences are being planned for the third and fourth semesters of our upper division traditional BSN program. Simulation experiences will continue as an expansion strategy. Ongoing evaluation of our simulation program will provide faculty with the information needed to continuously improve our curriculum transformation.


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