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Featured Article

Integration of Simulation to Prepare Adult-Gerontology Acute Care Nurse Practitioners

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simulation;
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Abstract

Background: The nation's demographics and health care needs are changing, concurrent with the demand to double the number of doctorally prepared nurses by 2020. This combination has intensified challenges associated with finding quality clinical placements and appropriate preceptors for nurse practitioner (NP) students. Purposefully integrated simulations offer alternate experiences and expose students to deliberately crafted and consistent learning opportunities.

Methods: Scaffolded simulations were integrated within an Adult-Gerontology Acute Care Nurse Practitioner Program over the course of six semesters.

Results: Analysis is currently underway, but preliminary data show that simulation experiences helped to develop assessment, critical thinking, and decision-making skills. The students also felt better prepared to communicate with other health care providers in this new role.

Conclusion: Although resource intensive, simulation provides an unparalleled opportunity for NP students to independently perform, without direct supervision, as an NP. Presenting an example of simulation integration can aid other educators seeking to develop a similar program.

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The nation's demographics and health care needs are changing (Institute of Medicine, 2010). With a projected eight million people over the age of 65 years by 2025 (Federal Interagency Forum on Aging Related Statistics, 2016), caring for this population's unique challenges is a costly aspect of health care. According to the most recent published statistics from the Medicare Current Beneficiary Survey, the total dollars spent on inpatient hospitalization in the United States for individuals aged 65 years and older was in excess of $157 billion dollars (Federal Interagency Forum on Aging Related Statistics, 2016). Therefore, it is with urgency that educators prepare a workforce that is both cost-effective and qualified to care for these individuals, namely through increasing numbers of nurse practitioners (NPs).

There is an emerging problem, however, that is taxing the system responsible for preparing the NP workforce. In 2004, the American Association Colleges of Nursing converted the requirement for NP education from the Master's degree to

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the Doctor of Nursing Practice (DNP), expecting full implementation by 2015 (American Association of Colleges of Nursing, 2017). At the same time, the Future of Nursing Report from the Institute of Medicine recommended doubling the number of doctorally prepared nurses by 2020 (Institute of Medicine, 2010). The combination of the two initiatives has led to an increased enrollment in DNP programs. Between 2015 and 2016 alone, enrollment in DNP programs increased nearly 15%, and the number of DNP graduates increased nearly 19% (American Association of Colleges of Nursing, 2017).

Key Points

- DNP programs are experiencing significant growth.
- Inadequate clinical sites and preceptors are significant concern.
- Simulation offers valuable, clinically-relevant opportunities for NP students.

Unfortunately, however, the model used to educate NP students has not adjusted for the growing numbers of students (Giddens et al., 2014). Since the 1960s, the preceptor model used in NP education has not changed, despite the high demand for quality clinical sites and preceptors necessary for students to complete the required 500 hours of direct patient care (Aronowitz, Aronowitz, Mardin-Small, & Kim, 2017; Giddens et al., 2014; LeFlore & Thomas, 2016). The 2015 report by the APRN Clinical Training Task Force from the American Association of Colleges of Nursing identified a remarkable concern from practicing NPs on the inadequacy of clinical opportunities and the continuing issues associated with the standard of traditional apprenticeship models (American Association of Colleges of Nursing, 2015). The Task Force recommended use of simulation to alleviate disturbing disparities in clinical site restrictions and available, qualified preceptors (American Association of Colleges of Nursing, 2015).

Use of simulation has been used for decades in nursing education (Jeffries, Rodgers, & Adamson, 2015). Results from the National Council of State Boards of Nursing study on simulation in undergraduate nursing education showed that, when specific guidelines were followed, there were no differences in outcomes in students who substituted up to 50% of clinical hours with simulation (Alexander et al., 2015; Hayden, Smiley, Alexander, Kardong-Edgren, & Jeffries, 2014). However, for NP students, substitution of clinical hours with simulation is a debated topic (Wyatt & Krauskopf, 2014).

In 2016, the National Task Force on Quality Nurse Practitioner Education updated criteria that allowed simulation to augment the 500 hours of required direct patient care clinical experiences (National Task Force on Quality Nurse Practitioner Education, 2016). However, debates continue on whether simulation can be counted as part of the required 500 hours (Rutherford-Hemming, Nye, & Coram, 2016; Wyatt & Krauskopf, 2014). In a point/counterpoint article, Dr. Wyatt argued that simulation offers a standardized experience where a student can learn without impacting patient safety and has been used to ensure quality learning through demonstrated and measured improvement in competencies of medical students for over 30 years (Wyatt & Krauskopf, 2014). However, Dr. Krauskopf's argument against simulation comes from an inconsistency in operationally defined simulation experiences in NP education, including case studies, low-fidelity simulations, and high-fidelity simulations (Wyatt & Krauskopf, 2014). This inconsistency ultimately inhibits demonstration of comparable learning outcomes and an inability to establish an evidence base to support the benefits of simulation in NP education (Rutherford-Hemming et al., 2016).

It is therefore the purpose of this article to operationally define simulation and describe how high-fidelity, scaffolded simulations were integrated in an Adult-Gerontology Acute Care Nurse Practitioner/Adult-Gerontology Clinical Nurse Specialist program. Using manikin-based simulations, experiences were integrated through increasingly complex Diagnosis and Management courses for these NP students.

Theoretical Framework

The experiences designed for the NP students were based on the foundations of the NLN Jeffries Simulation Theory (Jeffries et al., 2015). Briefly, the theory highlights the relationship of facilitators and participants who engage in a two-way interaction. This interaction is built in a learner-centered environment established in trust and collaboration.

Each scenario in this program was designed to include specific course objectives to place the experience within the appropriate context for learning. The International Nursing Association for Clinical Simulation and Learning (INACSL) Standards of Best Practice: Simulation^{SM} guided faculty in design and scaffolding of the simulations from one course to the next (The INACSL Standards Committee, 2016). In addition, reflective experiences were incorporated through debriefing and post-simulation assignments. This approach to learning allowed students to both build on existing knowledge and create new knowledge (Mann, Gordon, & MacLeod, 2009).

Brief Scenario Overview

The simulations included only students currently enrolled in the Adult-Gerontology Acute Care Nurse Practitioner Diagnosis and Management Courses and were not interdisciplinary. All scenarios were manikin based and included standardized participants in the roles of bedside nurse. Some scenarios also included standardized participants in the role of a family member.

Table 1 Scaffolded Objectives

Semester	Scenario Objectives	Objectives Added to Scenario
1	1. Gather patient history 2. Perform focus physical examination 3. Identify a primary diagnosis and 1-2 differential diagnoses	
2	1. Gather patient history 2. Perform focus physical examination 3. Identify a primary diagnosis and 1-2 differential diagnoses	1. Order and interpret diagnostic tests. Order appropriate clinical monitoring 2. Initiate evidence-based management of the priority diagnosis
3	1. Gather patient history 2. Perform focus physical examination 3. Identify a primary diagnosis and 1-2 differential diagnoses 4. Order and interpret diagnostic tests. Order appropriate clinical monitoring 5. Initiate evidence-based management of the priority diagnosis	1. Identify needed referral services for the patient's acute conditions 2. Introduction of comorbid health conditions
4	1. Gather patient history 2. Perform focus physical examination 3. Identify a primary diagnosis and 1-2 differential diagnoses 4. Order and interpret diagnostic tests. Order appropriate clinical monitoring 5. Initiate evidence-based management of the priority diagnosis 6. Identify needed referral services for the patient's acute conditions 7. Introduction of comorbid health conditions	1. Utilize principles of crisis management and therapeutic communication to assist the patient and family
5	CNS content. Simulation not included	
6	1. Gather patient history 2. Perform focus physical examination 3. Identify a primary diagnosis and 1-2 differential diagnoses 4. Order and interpret diagnostic tests. Order appropriate clinical monitoring 5. Initiate evidence-based management of the priority diagnosis 6. Identify needed referral services for the patient's acute conditions 7. Introduction of comorbid health conditions. 8. Utilize principles of crisis management and therapeutic communication to assist the patient and family	Function within scope of nurse practitioner

The scenarios were built using the Simulation Module for Assessment of Resident's Targeted Event Responses (SMARTER) tool (Haut, Fey, Akintade, & Klepper, 2014; Rosen, Salas, Silvestri, Wu, & Lazzara, 2008) and the INACSL Standards of Best Practice: Simulation^{SM} (The INACSL Standards Committee, 2016). The SMARTER tool, based on graduate medical education, identifies competencies that the scenario will focus on within each simulation (Rosen et al., 2008). This format allowed for alignment of National Organization of Nurse Practitioner Faculties Core Competencies (The National Organization of Nurse Practitioner Faculties, 2017) with simulation objectives.

The scaffolded simulations (see Table 1) were implemented in the first semester of the five Diagnosis and Management courses that integrated simulation. The first semester included two scenarios in which students were expected to gather the patients' history and identify appropriate differential diagnosis based on findings. The two simulation scenarios in the second semester included collection of history, identification of potential differential diagnosis, and management of the priority diagnosis. During the third semester simulations, students were expected to diagnose, manage, and identify needed referral services for the patient's acute conditions in the presence of comorbid health conditions. The fourth semester simulation experiences maintained the same expectations with the addition of using principles of crisis management and therapeutic communication to assist the patient and family. The fifth semester was dedicated to content relevant to the role of clinical nurse specialist, and no high-fidelity simulations were included. In the final semester, students were expected to "put it all together" and integrate all aspects of the NP scope of practice.

Student Participation and Preparation

All students enrolled in the Adult-Gerontology Acute Care Nurse Practitioner/Adult-Gerontology Clinical Nurse

Specialist program participated as simulation was mandatory for each of the courses. Because of the ongoing, national debate regarding substitution of simulation for clinical hours, these simulation experiences did not count toward the program's required clinical hours. Scenarios integrated into each course were aligned with course content, and all students were provided didactic information before the simulation. Students were concurrently engaged in precepted clinical experiences in urban and community settings. No additional prework was required, and no patient information was disclosed before implementation.

Implementation

Before implementation, course faculty reviewed each simulation to ensure accurate content and alignment with course objectives. The simulations were facilitated by trained members of the university's simulation team and NP course faculty served as content experts and cofacilitators. Each simulation was implemented during normal class hours, and students were only required to attend during their scheduled simulation time.

The prebrief included information to help establish a safe environment for the entire simulated clinical experience, including the Basic Assumption from the Center for Medical Simulation (Rudolph, Simon, Raemer, & Eppich, 2008), a confidentiality agreement to keep the contents of the scenario, performance of peers, and debriefing conversations private, and a verbal fiction contract regarding the fidelity limitations for each simulation. Students were informed that simulations would end either when all objectives had been met or when time had run out. They were also told that part of the learning process included mistakes, especially as they functioned without a preceptor's oversight. It was important to stress during prebrief and debrief that simulation pushes students to the edge of their expertise; therefore, comparisons between simulation performance and clinical performance were not necessarily direct or reasonable.

Students participated in the simulation in groups of 2 to 3. They were instructed to function in the role of a single NP, and each group was given time during prebrief to determine how the role would be divided. This format was designed to allow focus on one aspect of the NP role without overwhelming the students. As students progressed through the program, the number of students per group decreased, thereby increasing role responsibilities. The ability to demonstrate teamwork was also frequently included as an objective, so this dissection allowed that opportunity.

The simulations were conducted in a hospital setting, either in the emergency department or the intensive care unit. The simulations lasted 25 to 30 minutes, immediately followed by a 50- to 60-minute debriefing. The simulation objectives were scaffolded to build upon the previous semesters. Behavioral assessment tools, collaboratively created by NP and simulation faculty using the SMARTER tool, were used to identify appropriate behaviors performed by the NP students and provide the foundation to guide the debriefing conversation.

Debriefing immediately followed the scenario, allowing for facilitator-guided student reflection and an opportunity to link their experiences to new and existing knowledge (Mann et al., 2009). Debriefing was led by a facilitator formally trained in simulation and the Debriefing with Good Judgement theory—based method of debriefing (Rudolph, Simon, Dufresne, & Raemer, 2006; Rudolph, Simon, Rivard, Dufresne, & Raemer, 2007; Rudolph et al., 2008). This method allows for genuine inquiry during phases of reaction, analysis, and summary. NP faculty cofacilitated and served as the content expert during the debriefing sessions.

Debriefing conversations focused on concepts derived from the simulation objectives, students' identified areas of concern, and parts needing clarification. These included aspects of teamwork and communication, diagnostic reasoning, prioritization, and management of care.

In addition, students were assigned a guided reflection paper after each simulation. The papers were structured to employ the Gibbs Reflective Cycle, a well-established model designed to encourage deeper reflection (Paterson & Chapman, 2013). By having the student address aspects of the simulation including description, feelings and thoughts during the scenario, analysis of the event, and conclusions drawn, students were able to develop an action plan for transfer of knowledge into future experiences.

All but the last of the simulations were formative experiences. During the final semester, the first simulation in the course was formative in nature yet implemented as if it were summative. This meant that students had a formative experience, yet received feedback on what the grade would have been so that they would have a preview to better prepare them for the graded experience. The final summative simulation provided students feedback on their performance and identified areas needing improvement. Although there was a grade associated with this simulation performance, it served as only a portion of their overall grade and was not deemed a high-stakes simulation (Meakim et al., 2013).

Discussion

The purpose of these simulations was to provide consistent, measurable, learning opportunities to augment clinical rotations of Adult Gerontology Acute Care NP students. The ability to observe and hear students' perspectives during the learning process and offer feedback on aspects of the NP role while also identifying gaps in knowledge, skills, and attitudes throughout the program provided valuable insight into course faculty. Evaluations gathered

after the scenarios, along with reflective assignments, are currently undergoing quantitative and qualitative analysis. However, preliminary review of quantitative data shows that simulation experiences helped to develop assessment, critical thinking, and decision-making skills. The students also felt better prepared to communicate with other providers in this new role. Students also shared that debriefing and group discussion were extremely valuable. Qualitative comments from one student included "I think having this gave us an example of how we will need to make decisions and observations while working. We will not always be well-rested or clear thinking. This was a great simulation of real life," while another wrote "I feel simulation is a valuable asset to my learning."

Working in groups provided the opportunity to focus on a portion of the NP role, collaborate in diagnostic reasoning, and demonstrate communication and teamwork. Although it is difficult at times to focus on multiple students, simulation and NP faculty worked together to clarify and confirm observed behaviors in the simulation to discuss during the debriefing discussion. Students often worked together outside of their simulation role to gather needed information or to problem-solve. For example, the student working on gathering the history would help the student responsible for ordering diagnostic tests. Although each took primary responsibility for an aspect of the NP role, they worked together to best care for the patient.

Aligning the simulation experiences with the didactic content ensured all students were exposed to the application of information in a clinical setting, otherwise not guaranteed in precepted clinical experiences. Over the course of the program, decreasing the number of students in each group gradually moved the students toward functioning independently and encompassing the full scope of the role. In addition, engagement in the reflective process during debriefing, as well as through the reflective assignment, provided a structure for future application in reflective practice.

A key component to the success of this resource-intensive experience was detailed planning months before the experience as it required an "all hands-on deck" approach. The simulations ran three times in four rooms over the course of a single day. On average, this experience required four simulation faculty, four NP faculty, four teaching assistants in the role of bedside RN, four simulation technicians to run the high-fidelity manikins, and four additional staff (when needed per scenario) to play the role of a family member.

Recommendations

Future simulation educators should consider the terminology used to report simulation findings. Creating a consistent definition for simulation in NP education is needed to create a robust evidence base needed to update clinical education of NP students and decrease the burden placed on preceptors and clinical sites. Additional recommendations include collection of valid and reliable data demonstrating the impact of simulation on the transfer of knowledge, skills, and attitudes in NP practice.

Conclusion

With over eight million people aged 65 years or older projected within the next decade, preparing enough health care providers places increased demand on DNP programs. Use of the archaic and inefficient apprenticeship model to meet the required numbers of clinical hours in NP education highlights the disturbing disparities in clinical site restrictions and available, qualified preceptors. What used to be considered the gold standard for clinical education is now "learning by random opportunity" (LeFlore & Thomas, 2016, p. 188).

Although resource intensive, simulation provides an unparalleled opportunity for NP students to independently perform, without direct supervision, as an NP. The design and implementation of scaffolded simulations supports consistent exposure to increasingly complex scenarios and decision making (Gore & Thomson, 2016). Identifying this kind of methodological approach to integration of high-fidelity simulation is a start to providing consistency in the simulation literature.

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