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Prelicensure Simulation Program Best Practice

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Abstract

The prevalence of simulation in prelicensure nursing programs has increased, with most programs having integrated simulation into their nursing curriculum. Standards, guidelines, and recommendations defining best practice in prelicensure nursing simulation have been published since the inception of the St. Catherine University (SCU) Associate Degree (AD) nursing simulation program. Therefore, it is prudent to assess the simulation program to determine needed revisions to assure best practices are being met. The SCU AD nursing simulation program was compared to published standards to identify areas of strength and weakness. The program was also compared to two similar nursing programs in the community.

Recommendations to improve the simulation program to meet best practice in simulation include: basing the program on an identified educational theory; providing faculty training in simulation implementation, structure of debriefing, and debriefing models; and evaluating the effectiveness of the debriefing facilitation using valid and reliable tools. These recommendations meet expected core competencies for nurse educators and assure attention to continual improvement of student outcomes.

Keywords: Education, Nursing; Simulation; Simulation – Standards; Best Practice

Prelicensure Simulation Program Best Practice

Traditional clinical experiences allow students the opportunity to apply knowledge, skills, and attitudes in a patient care setting. However, schools of nursing face increasing challenges in finding quality clinical placements including but not limited to competition for placement sites, patient safety initiatives, restricted educational opportunities, variable patient acuity and decreased length of patient stay (Hayden, Smiley, Alexander, Kardong-Edgren, & Jeffries, 2014). As patient care has become more complex and clinical placement more challenging, nurse educators need to consider the ways in which prelicensure nursing students are educated to prepare graduates for practice (IOM, 2010). One approach to preparing students is through the use of simulation. Simulation, a technique that uses a created situation or environment to allow a person to experience a real situation or event, is one teaching methodology which has gained popularity (NLN, 2016a). Through simulation, students have the opportunity to integrate theory and practice without threatening patient safety. Within simulation, students can practice, learn, evaluate, test, and gain an understanding of systems or human actions (NLN, 2015a). With the prevalence of simulation in prelicensure nursing programs continuing to increase (Fey, 2014), determining best practices for the St. Catherine University (SCU) Associate Degree (AD) program is prudent and necessary.

The simulation program at SCU AD nursing program began in 2012 with the implementation of a new curriculum on the Minneapolis campus. The nursing curriculum is taught over four semesters following completion of prerequisite course work. During the four semesters, students participate in 14 formative simulations mapped to corresponding course objectives. The final semester concludes with one summative simulation which requires successful completion to graduate. Since this program began four years ago, much research has

been published regarding the benefits of simulation, needed components of a simulation program, and measures to implement simulation in the nursing curriculum. It is thus necessary to evaluate the AD nursing simulation program to assure that best practices are being used. The purpose of this project is to complete the evaluation process using best practices as a benchmark and two similar nursing programs as comparisons to determine necessary changes and improvements to meet recognized standards.

Background and Significance

Simulation has a history in nursing education since the early 1900s. Mrs. Chase, the first life-sized adult manikin used to practice basic nursing skills, was introduced in 1911 at Hartford Hospital. Development of task trainers soon followed for students to learn urethral catheter insertion, nasogastric tube insertion, wound care, and injection administration. In the 1960s, Resusci Anne was developed by Laerdal Company for cardiopulmonary resuscitation which led the way to development of high-fidelity, computer controlled manikins. In the late 1990s, the introduction of affordable human patient simulators transformed health education and simulation became available to more nursing programs (Cato, 2012).

Simulation is an activity in which students participate individually or in groups to provide care for a patient in a scenario observed by a faculty person. A variety of types of simulation are used in nursing education and is determined by the degree to which a simulated experience matches reality or fidelity. Fidelity ranges from low to high. Low fidelity simulation includes case studies, role-playing, partial task trainers, and static manikins. Midlevel fidelity includes two dimensional computer based simulations and manikins which may include breath sounds, heart sounds, and pulses. High fidelity simulation uses full scale computerized patient

simulators, virtual reality, or trained standardized patients. Higher levels of fidelity are more realistic and provide greater interactivity for the learner (Meakim et al., 2013).

The Institute of Medicine (IOM) (2010) calls for higher level of proficiency to provide care in a variety of clinical situations and care settings. Historically, clinical experiences within healthcare systems were the primary means for prelicensure nursing students to practice skills, expand critical thinking, apply knowledge to actual experiences, and prepare to enter practice (Hayden et al., 2014). The increased number of undergraduate nursing programs has created more competition for nursing schools to secure clinical placement though (Hayden et al., 2014). Hospitals are driven to create patient safety initiatives which limits the number of unlicensed students simultaneously permitted to work on a patient care unit or restricts permitted activities (Hayden et al., 2014). Average length of stay has decreased due to inpatient surgical procedural improvements, increased proportion of outpatient procedures, hospitals pressured to contain costs, and decreased third-party reimbursement (Santy-Tomlinson, 2016). The variability of patient acuity and facility census therefore effects availability of clinical placement sites for nursing students (Hayden et al., 2014). Educators can replicate many patient situations using high-fidelity simulation without putting a patient at risk and simulation can standardize the unpredictable and unequal clinical learning opportunities (NLN, 2015a).

In 2014, the National Council of State Boards of Nursing (NCSBN) reported on a Simulation Study which demonstrated that when delivered under the right circumstances, a quality simulation program can improve critical thinking of prelicensure nursing students to promote safer and more highly prepared nurse graduates entering the workforce (Hayden et al., 2014). No significant difference in nursing knowledge, clinical competency, or NCLEX pass rates were reported when 50% of traditional clinical experiences were replaced with simulation.

Factors impacting the success of a simulation program and substitute for traditional clinical experiences included performance under the right circumstances, and adherence to simulation standards, and guidelines. As challenges of placing students in clinical sites continue, determining the ability of other teaching strategies to meet necessary student learning outcomes is necessary. Simulation, as described previously, is one educational method based on theory that has demonstrated positive outcomes. The theory used for this project is described next.

Kolb's Experiential Learning Theory

Simulation is a pedagogy, not a technology, and should be based on educational theory (Alexander et al., 2015). Although no single theory of simulation exists, Kolb's (1984) experiential learning theory is often used as a foundation for simulation learning (Fey, 2014). Understanding the experiential learning process and the learner's cognitive process during the experience assists the facilitator to structure the simulation scenario, debriefing reflection, and enhance the student's transfer of acquired learning into future experiences (Fey, 2014).

According to Kolb (1984), the learner sequentially moves through four steps of experiential learning: the concrete experience, reflective observation, active conceptualization, and active experimentation. The learner begins by being fully immersed in a concrete experience, the simulation scenario. Fidelity of the scenario must be maintained to provide realism to the learning experience. Fidelity includes the physical factors such as the environment, equipment, and technology and also psychological factors such as emotions, beliefs, and participant self-awareness (Meakim et al., 2013). The next step of reflective observation allows the learner to reflect from many perspectives. During the abstract conceptualization stage, the learner applies current observations with theory. Reflective observation and abstract conceptualization both occur during debriefing. The final step of active experimentation allows the learner to apply the

new learning to similar future situations. Active experimentation occurs at the conclusion of the simulation experience. The participant must be able to know how to transfer the knowledge gained from the simulated scenario and apply it to a real-life situation to make meaning of the learning. Kolb's experiential model not only provides the structure of the simulation experience but also explains the cognitive process of the learner.

In Kolb's model, the cognitive process of the learner is depicted along the horizontal and vertical axes inside the experiential cycle. The vertical axis connects the concrete experience with abstract conceptualization and demonstrates the learner's cognitive process of grasping new knowledge. This process begins with apprehension and shifts to comprehension. During the concrete simulation scenario, the learner perceives the experience with apprehension; absorbing and acting upon all the information presented. Through the debriefing process, apprehension shifts to comprehension as the perceived information is applied to theory. The horizontal axis connects reflective observation with active experimentation and depicts the learner's cognitive process of transforming the learning experience from intention to extension. Intention refers to the learner's inward reflection of the recent experience and examining the experience from multiple perspectives. The learner transforms from intention to extension as ways to apply the new learning to future situations are discovered. Not only should simulation be viewed as a whole compared to a larger theory, the individual components of a simulation experience should be explored. These are described next.

Simulation Components

Prebriefing. The first component of a simulation experience is prebriefing, or the orientation time before starting the simulation scenario. Prebriefing is an essential step of a simulation which includes student orientation to the equipment, environment, manikin, roles,

time allotment, objectives, and patient situation. The stage is set before the simulation scenario begins, the participant ground rules and expectations are established, and the learning objectives of the experience are reviewed. Another critical factor of prebriefing is reinforcing participant confidentiality. Learners are pushed out of their comfort zone and must feel free to act without fear of repercussions. Simulation should be a setting where participants can learn from their mistakes in a safe environment with no harm to real patients (Arafeh et al., 2010).

Simulation scenario. The simulation scenario is the second component of the simulation experience. The scenario chosen must be a good fit for the expected objectives and outcomes. The objectives need to be achievable within an appropriate timeframe and suitable to the participant's level of learning. The level of fidelity, as previously described, must be chosen to meet the desired outcomes of the simulation.

Debriefing. The final component of the simulation experience, debriefing, is also considered the most important component for student learning (Fey, 2014; Decker et al., 2013; Dismuskes, Gaba, & Howard, 2006; Fanning & Gaba, 2007; Issenberg, McGaghie, Petrusa, Lee-Gordon, & Scalese, 2005; McGaghie, Issenberg, Petrusa, & Scalese, 2010; Savoldelli et al., 2006; Shinnick, Woo, Horwich, & Steadman, 2011). Learning does not occur in simulation in the absence of debriefing (Mahmood & Darzi, 2004; Savoldelli et al., 2006; McGaghie, Issenberg, Petrusa, & Scalese, 2010; Shinnick, Woo, Horwich, and Steadman, 2011) and poorly conducted debriefing can result in persistently poor clinical judgment (Jeffries, 2012). In contrast, improved student performance is associated with higher quality debriefing facilitation (Tannenbaum & Cerasoli, 2013). Although the importance of debriefing is understood, only 40.1% of debriefing faculty report having received facilitator training (Fey, 2014). Several models of debriefing exist, including the Plus/Delta model (Fanning & Gaba, 2007), the Debriefing with Good Judgment

model (Rudolph, Simon, Dufresne, & Raemer, 2006), Debriefing for Meaningful Learning (Dreifuerst, 2009), and Promoting Excellence and Reflective Learning in Simulation (PEARLS) (Eppich & Cheng, 2015).

All debriefing models are based on the standard component of structure. An unstructured debriefing has minimal direction and allows the participants to guide the experience while the facilitator takes a passive role (Dreifurst, 2009). Structured debriefing is a valuable teaching-learning strategy that promotes significant learning experiences with guidance and feedback from a facilitator (Dreifurst, 2009). According to Dreifurst (2009), a debriefing that is not structured may not achieve the intended results. Debriefing structure includes a beginning (reactions phase), middle (analysis phase), and closing (summary phase). During the beginning reactions phase, the facilitator outlines the debriefing process and reinforces that this is a safe environment for sharing (Decker et al., 2013). Participants are encouraged to share their emotions experienced during the simulation which may range from sadness or fear to excitement. Sharing of emotions during the reactions phase allows the facilitator to prioritize areas of discussion (Rudolph et al., 2006). The middle analysis phase focuses on the objectives of the simulation based on the facilitator's and observer's observations of behaviors. Facilitators analyze events, elicit participant perspectives and thought processes, close the gap between performance and desired behavior, develop critical reflection skills, and identify performance strengths (Decker et al., 2013). The closing summary phase is a reflection of the overall simulation experience. During this phase, the facilitator and participants reflect on take-home messages or link learning back to clinical practice with the focus on future performance. Time is allowed during the final phase to complete simulation evaluations.

Evaluation of Simulation Effectiveness

An important but not always used component of simulation is the evaluation of simulation effectiveness. This evaluation should ensure quality and effectiveness as determined by participant acquisition of knowledge, skills, and attitudes (KSAs) related to the simulation learning outcomes (Lioce et al., 2015) and an evaluation of the effectiveness of the debriefing facilitator. For assurance that student KSAs are being met valid and reliable tools should be used. Adamson et al. (2013) describe four instruments frequently cited to evaluate performance and attainment of learning outcomes: the Sweeney-Clark Simulation Performance Evaluation Tool (Clark, 2006), the Clinical Simulation Evaluation Tool (Radhakrishnan, Roche, & Cunningham, 2007), the Lasater Clinical Judgment Rubric (Lasater, 2007), and the Creighton Competency Evaluation Instrument (Hayden, Keegan, Kardong-Edgren, & Smiley, 2014). Although each tool is assessed for validity and reliability, the simulation facilitator must determine if the chosen tool is valid and reliable for the population of participants being evaluated (Adamson et al., 2013).

In addition to evaluating the quality and effectiveness of the simulation experience, the ability of the debriefer must also be considered. The skill of the facilitator influences the success of a debriefing discussion (Fey, 2014). Simulation learning outcomes are unlikely to be achieved if the facilitator is not skilled in debriefing (Fey, 2014). While all faculty who lead debriefing should have their competence evaluated, only 16.9% of facilitators have had their effectiveness in debriefing assessed (Fey, 2014). Further concerning is the fact that when competence was assessed, respondents reported not using an instrument with reported validity and reliability (Fey, 2014). The importance of evaluating debriefer effectiveness includes assuring that the facilitator is able to recognize areas needing development, seek continuing education to improve their skills and subsequently improve student learning outcomes. Several instruments are available to assess debriefing effectiveness including the Debriefing Assessment for Simulation in Healthcare

(DASH) (CMS, 2016), the Debriefing Experience Scale (Reed, 2012), and the Objective Structured Assessment of Debriefing (Arora, 2012). Of these evaluation tools, the DASH tool is the most frequently cited tool used to assess the competence of nursing debriefers (Fey, 2014).

The importance of using simulation as a teaching strategy in nursing education is clearly outlined in the literature. The background previously presented describes the history of simulation, the components of simulation and the importance of adding an additional measure, evaluation, to any simulation program. It is therefore necessary to evaluate the SCU AD nursing simulation program, the focus for this scholarly project, to assure that best practices and benchmarks are being used, and to determine necessary changes and improvements to meet recognized standards. In the next sections, a literature review on the state of simulation in nursing, standards of simulation, and best practices are outlined.

Literature Review

Limited research has been published regarding implementing simulation best practices in prelicensure nursing programs. Using CINAHL and Medline databases, a literature search was conducted using the search terms “simulation,” “education, nursing” and “best practice.” The search was limited to 2013 and after when the *Standards of Best Practice: Simulation* (INACSL, 2015) were published. Initially 36 articles were identified however, further limiting the search to “peer reviewed,” “English,” and “USA,” reduced the number of articles to 13. After reviewing the article abstracts, only one article by Rutherford-Hemming, Lioce, and Durham (2015) focused on implementing simulation best practice. The authors found that a common challenge is attempting to implement all the *Standards* at once. Key implementation strategies included having a trained and experienced facilitator who has time devoted to simulation implementation, and administrative support for a smooth implementation of best practice standards (Rutherford-

Hemming, Lioce, and Durham, 2015). Desiring more information about simulation and simulation in nursing education in particular the search was expanded. Using CINAHL and Medline databases, the search terms were expanded to include “simulation,” “education, nursing” and “critical thinking.” Limiting the search to “2005-2015,” “peer reviewed,” “English,” and “USA,” reduced the number of articles to 132. After reviewing the article abstracts, the author noted that most studies focused on student perception of learning while only nine articles measured critical thinking or knowledge acquisition. These articles are reviewed next.

Critical Thinking

Critical thinking was reported to increase with simulation use in prelicensure nursing students. All studies had limitations though which weakened their generalizability. Goodstone, Goodstone, Cino, Glaser, Kupferman, & Dember-Neal (2013) found that both high fidelity patient simulation and case study are associated with improvements in critical thinking test scores but the study was limited by a small sample size and the scenarios which were written for the study and had not been previously tested. Increased critical thinking with simulation use was also found by Lapkin, Levett-Jones, Bellchambers, & Fernandez (2010) but the small sample size and unclear demographic information renders the study ungeneralizable. Fisher & King (2013) found increased knowledge acquisition post-simulation but the study was also limited by a small sample size and unknown characteristics of the experimental population. According to Cant and Cooper (2010), simulation using medium and high fidelity manikins is an effective teaching method when best practice guidelines are followed and may have an advantage over other teaching methods. Weaknesses of the study include the limited sample size, unclear population characteristics, and faculty facilitators with various amounts of simulation experience.

As noted above, high quality quantitative studies measuring the impact of simulation on student learning outcomes is limited. Recognizing the need for a randomized, controlled, longitudinal study to measure the effectiveness of simulation, the NCSBN launched the National Simulation Study in 2010 (Alexander, 2015). The study included 666 students from five AD and five baccalaureate degree, geographically diverse nursing programs. Results of the NCSBN National Simulation Study in 2014 (Hayden et al.) as previously discussed, altered the perceived role of simulation in prelicensure nursing education and nursing programs looked for guidance as to what defined simulation best practice. The INACSL *Standards* published in 2013 provided direction for educators wanting to implement simulation in nursing programs but further guidance was needed to assure simulation education was implemented appropriately within a nursing curriculum and student learning outcomes to promote safe patient care would be safeguarded. Additional development of professional standards of simulation soon followed. These are reviewed next.

Professional Standards

Professional Standards which guide simulation in nursing practice were developed by three organizations with varied goals. The International Nursing Association for Clinical Simulation and Learning (INACSL) was founded in 2002 to serve the growing needs of the simulation community (Sittner, 2015). Development of the first *Standards of Best Practice: Simulation* began in 2010 and was published in 2011. The first *Standards* were then revised in 2013 to include specific guidelines for implementation of simulation in nursing practice. In contrast to INACSL which develop from the needs of simulation practitioners, NCSBN regulates simulation practice to protect the public. The NCSBN is a nonprofit organization which includes the boards of nursing from the 50 states, District of Columbia, and four U.S. territories (NCSBN,

2016). Working with individual boards of nursing, the NCSBN provides oversight to promote public health, safety, and welfare through the regulation of nursing practice (NCSBN, 2016). On the other hand, The National League for Nursing (NLN) promotes simulation for nursing education. The NLN is a professional organization which supports nursing education in an academic or professional setting to align education and practice, promote leadership development, and support professional enhancement opportunities (NLN, 2016b). These three organizations, each with varied goals, provide best practice standards which guide the implementation of simulation in nursing.

Standards, Guidelines and Recommendations

There are three sets of standards to consider when implementing and/or evaluating a simulation program. These include The *Standards of Best Practice: Simulation* (INACSL, 2015) (Table 1, p. 34), the *NCSBN Simulation Guidelines for Prelicensure Nursing Programs* (Alexander et al., 2015) (Table 2, p. 37), the *NLN Vision Series* guidelines (NLN, 2016c) *A Vision for Teaching with Simulation* (Table 3, p. 38) and *A Vision for Debriefing Across the Curriculum* (Table 4, p. 40). An overview of each set of standards is provided next.

The first standards to be published, the *Standards of Best Practice: Simulation*, were developed to advance simulation and provide guidelines for implementation and training. The nine INACSL guidelines include terminology, professional integrity of participants, participant objectives, facilitation, facilitator, debriefing process, participant assessment and evaluation, simulation enhanced interprofessional education, and simulation design. Adoption of the *Standards of Best Practice: Simulation* demonstrates a program's commitment to quality simulation education (INACSL, 2015). Additional standards were found to be necessary for the

development and evaluation of simulation programs. In response, the NCSBN simulation guidelines were developed.

Following the publication of the NCSBN Simulation Study (Hayden et al., 2014), prelicensure nursing programs wanted to replace traditional clinical experiences with simulation. The *NCSBN Simulation Guidelines for Prelicensure Nursing Programs* (Alexander et al., 2015) indicate under what circumstances simulation can replace clinical. These guidelines were developed by an expert panel of representatives from INACSL, American Association of Colleges of Nursing, National League for Nursing (NLN), Society for Simulation in Healthcare, boards of nursing, and the NCSBN. The guidelines provide explicit parameters for faculty and program directors so that they might successfully implement simulation into their nursing programs (Alexander et al., 2015).

Most recently, the National League for Nursing included simulation programming in their Vision Series. These guidelines, which cover more than simulation, are intended to provide a road map for nursing programming (NLN, 2016c). Two of the 13 statements are related to simulation and include recommendations for integrating simulation into nursing program curriculum. *A Vision for Teaching with Simulation* (NLN, 2015a) promotes excellence in nursing education using simulation as a teaching methodology while *A Vision for Debriefing Across the Curriculum* (NLN, 2015b) calls to develop reflective practitioners through the process of faculty integrating debriefing practices into various learning environments.

An analysis of the SCU AD nursing simulation program is prudent to determine needed revisions to assure best practices are being met. Best practice is determined by the standards, guidelines, and recommendations just discussed. Comparison of the simulation program to the benchmark established by the best practice standards will identify program strengths and

weaknesses which lead to needed recommendations. Analysis of the SCU AD nursing simulation program will follow.

Analysis of the SCU AD Simulation Program

Since the publication of the NCSBN Simulation Study, schools of nursing question whether simulation can replace clinical experiences in their program of study and together the three professional standards provide guidance. Development of a nursing curriculum takes time though and it was noted that the current simulation program at SCU was developed prior to the publication of the best practice standards. Working with the simulation coordinator at SCU AD program, a comparison of the simulation program to the professional standards and two like simulation programs was initiated. As the SCU AD program curriculum is in the process of revision, an understanding of areas for simulation program development is beneficial.

Strengths and Weaknesses

The SCU AD nursing simulation program was compared to the recognized standards and best practices to assess the program strengths and weaknesses. The best practice standards are broken down into expectations for individuals or programs to meet. Each of the nine *INACSL Standards of Best Practice: Simulation* are divided into criteria which contain a combined total of 193 expectations, the NCSBN guidelines contain 32 expectations, and the two *NLN Vision Series* contain a total of 19 expectations. The SCU AD nursing simulation program was assessed using each of the 244 total expectations. Determination of whether the expectation(s) was met or not was done in conjunction with the SCU AD nursing simulation coordinator. Expectations which were met were considered program strengths and expectations which were not met were considered program weaknesses. A description of these findings follows.

Strengths

Equipment, supplies, and technology. The SCU AD nursing simulation program includes adequate equipment, supplies, and technology. The facilities consist of three 4-bed lab rooms, four 2-bed lab classrooms which can each be divided in half, and one 1-bed simulation room with a control room behind one-way glass. Adult, pediatric, infant, and obstetric manikins of low, mid, and high-fidelity models are used. Designated physical space for education, storage, and simulation debriefing is available. Three computers are devoted to simulation technology, and an additional seven laptops are available for use during simulation and lab. The nursing program utilizes an online book package containing a simulated electronic health record which includes a library of NLN/Laerdal simulation scenarios. Although not currently being used, the book package includes Laerdal Virtual Simulation (vSim) at an additional cost to students.

Program support. The University is committed to the nursing simulation program. The SCU AD program director states interest in strengthening and increasing simulation in the curriculum. Faculty are supported to develop as simulation leaders, and resources are available for faculty members to participate in simulation-related professional development. The program has a dedicated, trained simulation faculty member to support students and faculty in simulation-based experiences. This faculty member also ensures that simulation is purposefully integrated into the curriculum with clear connections toward achievement of student learning outcomes.

Faculty support. Many faculty support the SCU AD nursing simulation program. The Applied Learning Lab Coordinator is the trained faculty member assigned primarily to program simulation. Each of the nursing courses has a lab liaison who coordinates the course specific weekly lab activities and simulations. Course faculty participate in simulation scenarios and have some experience with simulation debriefing.

Simulation design, implementation, and debriefing. Consideration has been devoted to simulation design, implementation, and debriefing in the SCU AD program. Each simulation is based on clear objectives that are communicated to students before the activity. Simulation objectives address the domains of learning, correspond to the participant's knowledge level, are congruent with the overall program outcomes, and are achievable within an appropriate timeframe. A safe learning environment is created in which participants are expected to demonstrate professional and ethical behavior. During the scenario and debriefing, students receive and provide constructive feedback to facilitate learning. Facilitation methods are congruent with simulation objectives and are appropriate to the participants' level of learning. Faculty provide subject-matter expertise for each debriefing scenario and foster participant learning with constructive feedback during debriefing. Simulation debriefing is conducted in a safe environment, by a person who observes the simulation, and is focused on the participant objectives.

Weaknesses

Educational theory and debriefing framework. Two areas which do not meet simulation best practice concern educational theory and debriefing framework. Although implied, the SCU AD nursing simulation program is not implicitly based on an educational theory such as experiential learning theory. Simulation debriefings are also not based on a structured model or framework.

Faculty training and education. A variety of course faculty participate in simulation and debriefing, but the program does not have a plan for orienting and training simulation faculty to their roles. Few faculty have had the opportunity to participate in theory-based debriefing education to develop their debriefing skills. Although general funding is available annually for

educational expenses, money is not specifically budgeted for simulation debriefing for faculty development in the SCU AD program.

Evaluation of simulation and debriefing. A final area of simulation program weakness is evaluation. Evaluation of simulation experiences to assess student acquisition of knowledge, skills, and attitudes does not occur nor is student performance shared with the clinical faculty. Further weaknesses in this area include the lack of evaluation of the effectiveness of the facilitator debriefing the simulation and lack of a process for evaluating the simulation scenario. Following a comparison of the simulation program to best practice standards, the program was also compared to two similar nursing programs in the community.

Comparison to Other Programs

After a comparison to the published standards, guidelines, and recommendations; comparing the program to other similar nursing programs in the community was done to identify any further opportunities to improve weaknesses and/or highlight strengths. The two simulation programs compared included a nursing program at Bethel University and a nursing program at St. Olaf College. These private, faith-based schools established simulation programs approximately the same time as SCU AD program. They both have similarly trained, dedicated simulation coordinators and space and equipment allocated to the program. Two differences were noted prior to comparison, including the number of students and the offering of a bachelor degree versus an AD. All factors are considered in the comparison described next.

Bethel University

Bethel University is a four-year baccalaureate nursing degree program located in St. Paul, MN. The nursing courses begin sophomore year with approximately 90 students in the second, third, and fourth-year classes. During the second year, students do not participate in simulation. Students participate in approximately 16 hours of simulation during the third year and about 24 hours of simulation the fourth year. These estimates do not include vSim and a public health nursing simulation which is part of the classroom learning.

The Bethel University nursing simulation coordinator identified weaknesses similar to those identified for the SCU AD nursing simulation program. Although implied throughout the curriculum, no educational theory is stated for a basis of the simulation program. Also, no particular debriefing model or framework is currently used. One debriefing model, Debriefing for Meaningful Learning (DML), was previously used, but the faculty found the method cumbersome. Now, clinical faculty facilitate simulation debriefing using Socratic questioning. New adjunct faculty, who lead simulation debriefing with their clinical students, participate in a group training session at the beginning of the school year. Additional training is one-on-one with another experienced faculty as needed. Faculty do not participate in further online or in-person simulation continuing education. Evaluation of simulation scenarios occurs with the end of semester course evaluations. No valid or reliable tools are used to measure participant's acquisition of knowledge, skills, and attitudes related to the simulation learning outcomes to determine the quality and effectiveness of the simulation. DASH tools were previously used to determine the effectiveness of the simulation debriefing, but these tools are no longer used because the resulting data was not utilized.

St. Olaf College

St. Olaf College is a four-year baccalaureate nursing degree program located in Northfield, MN. Nursing courses begin sophomore year with approximately 24 students second, third, and fourth years. Formative simulation is not included in the second year of the program. The third-year students participate in six formative simulations the first semester and six formative simulations the second semester. The fourth-year students participate in five formative simulations the first semester and 6-10 formative simulations the second semester. Each semester of the program, beginning the second year, concludes with a summative performance examination simulation.

Weaknesses identified by the St. Olaf College nursing simulation coordinator were similar to the weaknesses identified at Bethel University and in the SCU AD nursing simulation program. The simulation program is not based on a stated educational theory but rather educational theory is implied throughout the curriculum. Only two faculty are trained to use the DML debriefing model, while remaining faculty who facilitate debriefing use Socratic questioning. Faculty are not formally trained to facilitate simulation or debriefing. Simulation education occasionally occurs as needed with their manikin vendors. Debriefing education takes place through role modeling with another experienced faculty member. No valid or reliable tools are used to measure participant's acquisition of knowledge, skills, and attitudes related to the simulation learning outcomes to determine the quality and effectiveness of the simulation. Simulation scenario evaluation occurs at the end of each course as part of the general course evaluation. Facilitator debriefing effectiveness is not evaluated using any tools.

Comparing the SCU AD nursing simulation program to other similar nursing programs in the community identified opportunities to improve weaknesses and/or highlight strengths. This

appraisal in addition to the program comparison to the benchmark best practice standards led to needed recommendations for program development.

Recommendations

The SCU AD nursing simulation program was compared to published standards to identify areas of strength and weakness and the program was also compared to two similar nursing programs in the community. Following this review, several weaknesses were noted. Attention to these weaknesses could vastly improve the quality of the simulation program at SCU as well as improve student learning outcomes. Recommendations to improve the simulation program include the use an educational theory, faculty development, and simulation evaluation. These recommendations are described in more detail next.

Educational Theory

The first recommendation is to base the simulation program on a clearly stated educational theory such as Kolb's theory of experiential learning which is often used as a foundation for simulation. Commitment to theory needs to be maintained to advance simulation knowledge through research, education, and practice (Jeffries, 2012). Use of an educational theory is the basis for any curriculum design, including simulation. An understanding of how a student learns is essential for developing and implementing each component of a simulation experience. Curriculum design based on educational theory will support achievement of student learning outcomes. Simulations designed and implemented based on experiential learning theory will guide students following the scenario through the reactions, analysis, and summary phases of debriefing; ultimately resulting in improved critical thinking and understanding how the simulation learning can be applied to future real-life experiences.

Basing the simulation program on educational theory can readily be implemented in the SCU AD nursing simulation program. The simulation coordinator is a master's prepared nurse educator who is dedicated to simulation implementation in the nursing program. Each of the individual course lab liaisons are also masters prepared nurse educators that can assist the simulation coordinator with implementation of educational theory in the simulation program at the course level. All course faculty participate in simulation experiences and should receive training regarding educational theory as a basis for simulation learning to facilitate appropriate implementation of each simulation experience and attainment of student learning outcomes.

Faculty Development

Based on simulation best practice standards, the second recommendation is that all faculty who participate in simulation receive faculty development education regarding the components of a simulation experience and the structure of debriefing. Most Nurse Educator programs do not teach simulation skills and faculty need to have formal coursework, continuing education, and work with an experienced mentor to gain this knowledge (Boese et al., 2013). Often more than one room of simulation is run concurrently and the simulation coordinator cannot simultaneously facilitate both rooms. Faculty need to understand the components of simulation so all students receive the same scenario experience and optimum student learning occurs. Most important to this recommendation is the attention to facilitator debriefing effectiveness. Specialized training is needed to support educators and assure that participant reflection during the debriefing component is deep and meaningful. Deep reflection during simulation debriefing is complex and requires specific facilitation techniques (Fey, 2014). Common debriefing models in nursing include: the Plus/Delta model (Fanning & Gaba, 2007), the Debriefing with Good Judgment model (Rudolph, Simon, Dufresne, & Raemer, 2006),

Debriefing for Meaningful Learning (Dreifuerst, 2009), and Promoting Excellence and Reflective Learning in Simulation (PEARLS) (Eppich & Cheng, 2015). Despite models being available less than a third typically use a theory or model to guide debriefing (Fey, 2014). While there is limited research available on which debriefing theory is most effective, choosing to use a model is an important first step that can guide the facilitator using their own expertise level and ultimately assure that learning outcomes are being met (Eppich & Cheng, 2015).

Although the importance of debriefing is understood, less than half of debriefing faculty report receiving facilitator training. Since debriefing training is not received in Nurse Educator programs, training needs to be available to promote participant reflection and improve student learning outcomes. Offering faculty development is recommended prior to when course work and associated simulations begin. Simulation coordinators and the course level lab liaisons for the SCU AD program can provide simulation facilitation education during back-to-school workshop week the last week of August before fall classes. Here a core group of faculty who are interested in further debriefing education could receive more debriefing training. This core group could be responsible for the course level simulation debriefings, using a “train the trainer” type of philosophy.

Simulation Evaluation

Implementing all simulation best practice needs at once is difficult (Rutherford-Hemming et al., 2015) and debriefing is the most important part of simulation, therefore the third recommendation of simulation evaluation focuses specifically on debriefing effectiveness. All faculty who lead debriefing should have their effectiveness evaluated. Although a few instruments are available, the DASH tool is the most frequently cited valid and reliable tool used in nursing simulation (Brett-Fleegler et al., 2012). The tool is available online through the Center

for Medical Simulation at no cost to programs and both student and faculty versions are available. The short version of the form can be completed in two to three minutes or the longer version completed in five to seven minutes. Both form lengths and versions assess six elements of debriefing: setting the stage, maintaining engaging learning, organizing structure, provoking engaging discussions, identifying performance gaps, and closing performance gaps (CMS, 2016).

For the AD simulation program at SCU, implementation of the DASH tools can occur during the previously discussed August workshop week education. Faculty can receive information regarding the use of DASH tools and then the tools can be implemented by the simulation coordinator and course lab liaison following each course simulation. The data gathered from these evaluations would be used to identify faculty development areas. It would be recommended that faculty members be mentored throughout the school year with further simulation debriefing education and support provided as needed.

Implications for Nurse Educator Practice

Implementation of the recommendations previously provided not only provide an opportunity to improve student learning outcomes, but could facilitate the SCU AD simulation program and faculty in meeting the expectations of the Core Competencies of Nurse Educators. To optimize the benefit simulation programs can provide students and healthcare systems, the programs should be based on an educational theory. Doing so provides simulation faculty with the foundational knowledge to design, implement, and evaluate simulation experiences which facilitate attainment of student learning outcomes. Faculty also need to have continuing education opportunities available to improve their practice as a simulation facilitator. Debriefing education as a priority not only supports faculty but has the potential to improve student's critical thinking skills. These benefits highlight the requirements of core competency one where Nurse

Educators are called to facilitate learning. Facilitation of learning includes implementing a variety of teaching strategies grounded in educational theory, engaging in continued learning to improve teaching practice, and creating opportunities for students to develop critical thinking skills (NLN, 2016d).

Additional competencies are met through socialization and self-reflection. Simulation scenarios allow students to try on different roles such as the primary nurse, charge nurse, or family member. Faculty who have knowledge of simulation prebriefing know how to acclimate students to the simulation environment and to successfully facilitate role immersion. This role immersion provides needed insight for the self-reflection process. Self-reflection occurs during the simulation debriefing, which as outlined previously, must be done with structure and knowledge so that students are reflecting on the important concepts and experiences. Faculty provide direction and guide students from reaction to analysis and finish with an understanding of how the experience can be applied to future practice. It is through this guided reflection that students develop critical learning skills and thereby meet expected student learning outcomes. Facilitating learning development and socialization meets the second core competency of Nurse Educators (NLN, 2016d).

Lastly, Nurse Educators are expected to use assessment and evaluation strategies. Following use of evidence-based evaluation strategies, the resulting data should enhance the teaching-learning process (NLN, 2016d). Evaluation tools which are shown to be valid and reliable are available to assess the effectiveness of the debriefing facilitator. The debriefing evaluation data that is proposed could be collected and used to enhance the simulation experience and facilitate faculty development in their role as simulation educators. Meeting this third core competency of Nurse Educators has the potential to improve student learning

outcomes as faculty become more proficient at simulation debriefing and facilitate student achievement of critical thinking skills.

Conclusion

A quality simulation program can improve critical thinking of prelicensure nursing students to promote safer and more highly prepared nurse graduates entering the workforce. Standards, guidelines, and recommendations define simulation program quality. The *Standards of Best Practice: Simulation* (INACSL, 2015), *NCSBN Guidelines for Prelicensure Nursing Programs* (Alexander et al., 2015), and the *NLN Vision Series* guidelines (NLN, 2016c) define prelicensure nursing simulation program best practice. Nursing simulation programs developed before publication of simulation best practice standards need to be assessed and revised as recommended. Meeting simulation best practice meets the core competencies of nurse educators and ultimately improves learning outcomes for prelicensure nursing students.

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Tables

Table 1

Standards of Best Practice: Simulation (INACSL, 2015)

Standard I: Terminology (Meakim et al., 2013)
Standard II: Professional integrity of participant(s) (Gloe et al., 2013)
Criterion 1. Protecting the content of the scenario and the simulation
Criterion 2. Demonstrating professional and ethical behavior
Criterion 3. Receiving and providing constructive feedback
Standard III: Participant objectives (Lioce et al., 2013)
Criterion 1. Address the domains of learning
Criterion 2. Correspond to the participant's knowledge level and experience
Criterion 3. Remain congruent with overall program outcomes
Criterion 4. Incorporate evidence-based practice
Criterion 5. Include viewing of client holistically
Criterion 6. Be achievable within an appropriate timeframe
Standard IV: Facilitation (Franklin et al., 2013)
Criterion 1. Using facilitation methods congruent with simulation objectives
Criterion 2. Using facilitation methods congruent with expected outcomes
Standard V: Facilitator (Boese et al., 2013)
Criterion 1. Clearly communicates the objectives and expected outcomes to the participant(s)
Criterion 2. Creates a safe learning environment that supports and encourages active learning, repetitive practice, and reflection

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- Criterion 3. Promotes and maintains fidelity
 - Criterion 4. Uses facilitation methods appropriate to the participants' level of learning and experience
 - Criterion 5. Assesses and evaluates the acquisition of knowledge, skills, attitudes, and behaviors
 - Criterion 6. Models professional integrity
 - Criterion 7. Fosters participant learning by providing appropriate support throughout the simulation activity, from preparation through reflection
 - Criterion 8. Establishes and obtains evaluation data regarding the effectiveness of the facilitator and the simulation experience
 - Criterion 9. Provides constructive feedback and facilitates debriefing with the participants
-

Standard VI: The debriefing process (Decker et al., 2013)

- Criterion 1. Facilitated by a person(s) competent in the process of debriefing
 - Criterion 2. Conducted in an environment that supports confidentiality, trust, open communication, self-analysis, and reflection
 - Criterion 3. Facilitated by a person(s) who observes the simulated experience
 - Criterion 4. Based on a structured framework for debriefing
 - Criterion 5. Congruent with the participants' objectives and outcomes of the simulation-based learning experience
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Standard VII: Participant assessment and evaluation (Sando et al., 2013)

- Criterion 1. Formative assessment
 - Criterion 2. Summative evaluation
 - Criterion 3. High-stakes evaluation
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Standard VIII: Simulation-enhanced interprofessional education (Sim-IPE) (Decker et al., 2015)

- Criterion 1. Simulation-enhanced interprofessional education should be based on theory
 - Criterion 2. Follow best practices in simulation-based and interprofessional education
 - Criterion 3. Address institutional and local issues
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Criterion 4. Include an evaluation plan

Standard IX: Simulation design (Lioce, Meakim, Fey, Chmil, Mariani, & Alinier, 2015)

Criterion 1. Needs assessment

Criterion 2. Measurable objectives

Criterion 3. Format of simulation-based experience

Criterion 4. Clinical scenario or case

Criterion 5. Fidelity

Criterion 6. Facilitator/facilitative approach

Criterion 7. Briefing

Criterion 8. Debriefing and/or feedback

Criterion 9. Evaluation

Criterion 10. Participant preparation

Criterion 11. Pilot testing of the simulation-based experience

Table 2

NCSBN Guidelines for Prelicensure Nursing Programs (Alexander et al., 2015)

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- Guideline 1. There is commitment on the part of the school for the simulation program.
- Guideline 2. Program has appropriate facilities for conducting simulation.
- Guideline 3. Program has the educational and technological resources and equipment to meet the intended objectives.
- Guideline 4. Lead faculty and sim lab personnel are qualified to conduct simulation
- Guideline 5. Faculty are prepared to lead simulations
- Guideline 6. Program has an understanding of policies and processes that are a part of the simulation experience.
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Table 3

NLN Vision Series: A Vision for Teaching with Simulation

Recommendations for deans, directors, chairs of nursing programs

- Recommendation 1. Create strategic partnerships with schools and clinical agencies to capitalize on shared simulation resources.
- Recommendation 2. Ensure an adequate number of dedicated simulation faculty with training and expertise in the pedagogy of simulation.
- Recommendation 3. Include operational support staff as a part of the simulation team.
- Recommendation 4. Budget annually for faculty development in simulation pedagogy and theory based debriefing.
- Recommendation 5. Support the development of simulation leaders among the faculty.

Recommendations for nurse faculty

- Recommendation 1. Purposefully integrate simulation into the curriculum with clear connections toward achievement of student learning outcomes.
- Recommendation 2. Incorporate simulation standards of practice in the design, implementation, and evaluation of simulation-based experiences.
- Recommendation 3. Use evidence-based consistently to ensure competence in debriefing.
- Recommendation 4. Partner with faculty from other disciplines to create interprofessional simulation experiences.
- Recommendation 5. Pursue the development of expertise as a simulation leader.

Recommendations for the NLN

- Recommendation 1. Provide professional development resources for faculty to:
 - Recommendation 2. Incorporate standards of practice in simulation pedagogy and theory based debriefing
 - Recommendation 3. Integrate simulation into nursing curricula
 - Recommendation 4. Enhance faculty expertise in the use of theory based debriefing in simulation.
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Recommendation 5. Evaluate simulation experiences using valid and reliable instruments.

Recommendation 6. Collaborate with key stakeholders (e.g., INACSL, SSH, NCSBN, Laerdal, Wolters Kluwer) to develop and disseminate best practices in the use of simulation in teaching and learning and integrating debriefing into learning activities throughout the curriculum to better engage students in the learning process.

Recommendation 7. Provide opportunities for the development of simulation research scholars through the NLN Center for Innovation in Simulation and Technology.

Recommendation 8. Increase support of multi-site research studies in simulation pedagogy.

Recommendation 9. Partner with simulation scholars and nurse theorists to study and further develop the NLN/Jeffries Framework.

Table 4

NLN Vision Series: A Vision for Debriefing Across the Curriculum

Recommendations for deans, directors, chairs of nursing programs

- Recommendation 1. Ensure an adequate number of faculty with training and expertise in theory-based debriefing.
- Recommendation 2. Provide a simulation leader to assist other faculty as they learn; reinforce the process of incorporating debriefing across the curriculum.
- Recommendation 3. Budget annually for faculty development in theory-based debriefing.
- Recommendation 4. Support the development of debriefing experts among the faculty.

Recommendations for nurse faculty

- Recommendation 1. Integrate debriefing across the curriculum to shape student thinking.
- Recommendation 2. Pay attention to the impact of implicit and explicit personal bias during debriefing.
- Recommendation 3. Use evidence-based resources consistently to ensure evaluation of and competence in debriefing.
- Recommendation 4. Seek development opportunities to enhance debriefing skills.
- Recommendation 5. Pursue continuing education to develop expertise in the use of debriefing techniques in the classroom, clinical post-conference, and patient care settings.

Recommendations for the NLN

- Recommendation 1. Provide professional development for all faculty (full-time, part-time, and clinical) to:
 - Incorporate standards of theory-based debriefing.
 - Integrate debriefing across the curriculum.
 - Enhance faculty expertise in the use of theory-based debriefing.
 - Utilize reliable and valid instruments to evaluate the debriefing experience.
 - Recommendation 2. Remain focused on the NLN mission, which is primarily devoted to nursing education faculty, including
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clinical education faculty.

- Recommendation 3. Expand Leadership Institute programs in the NLN Center for Transformational Leadership to include resources related to theory-based debriefing across the curriculum.
- Recommendation 4. Collaborate with key stakeholders (e.g., INACSL, SSH, NCSBN, Laerdal, Wolters Kluwer) to develop and disseminate best practices in theory-based debriefing.
- Recommendation 5. Continue to support grants and scholarships to fund nursing education research in the use of theory-based debriefing and student learning, through the NLN | Chamberlain College of Nursing Center for the Advancement of the Science of Nursing Education and the NLN Foundation for Nursing Education.
- Recommendation 6. Serve as a resource for the global community.
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