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Nurse Educator Scholarly Project

Exploring Nursing Care for Heart Failure Through High-Fidelity Simulation

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Exploring Nursing Care for Heart Failure Through High-Fidelity Simulation

Background

Heart Failure and Societal Impact

Heart failure (HF) is a complex chronic syndrome resulting from structural or functional impairment of the pumping mechanism of the heart (ACCF/AHA, 2013). Progressive weakening of the heart leads to an inability for it to maintain pace with the body's demand for blood and oxygen, resulting in the cardinal manifestations of HF which include dyspnea, fatigue, and fluid retention (ACCF/AHA, 2013; Colandrea & Murphy-Gustavson, 2012). Notable risk factors and co-morbidities include hypertension, coronary artery disease, atrial fibrillation, diabetes mellitus, and renal disease (Ziaeeian & Fonarow, 2016; Hsiao & Greenberg, 2015).

Globally, HF is considered the most rapidly growing cardiovascular condition (Ziaeeian & Fonarow, 2016). In the U.S., as of 2011, 5.7 million adults were living with HF, with close to 900,000 new cases diagnosed every year (Ziaeeian & Fonarow, 2016). Ethnic and socioeconomic disparities are apparent, with African-Americans experiencing the highest incident rates of HF (Ziaeeian & Fonarow, 2016). HF is also the most common cause of hospitalization among U.S. adults age 65 years or older (Hsiao & Greenberg, 2015). Indeed, there is a disproportionate distribution of HF among the elderly population, with over half of patients hospitalized with HF age 75 years or older (Hsiao & Greenberg, 2015). Further, this population carries a high risk for hospital readmissions, ultimately leading to increased use of healthcare resources and substantial financial burden (Echevarria, 2016; Hsiao & Greenberg, 2015; Pere, 2012).

The likelihood of re-hospitalization within 30 days of discharge is 25 percent, and it increases to 67 percent at one-year post-discharge (Hsiao & Greenberg, 2015). Annual cost of care for patient with HF was close to \$21 billion in 2012 (Ziaeeian & Fonarow, 2016). There is

much evidence supporting the use of care coordination and medical management of HF to reduce readmission occurrences, cost of care, and mortality (Hsiao & Greenberg, 2015; Feltner et al., 2014; Colandrea & Murphy-Gustavson, 2012).

Care Coordination of Heart Failure

Transitional care – a form of care coordination – includes interventions that focus on patient and/or caregiver education, medication reconciliation, and interdisciplinary coordination (Feltner et al., 2014). Community-based programs, such as telehealth, have become a priority method for reducing readmission and mortality rates and improving patient self-management, medication adherence, and quality of care (DeBlois & Millefogie, 2015). The nurse care coordinator is often the link between the patient, community-based program, and health care clinic/medical home, emphasizing the integration of existing community services and support of patient caregivers (Haas & Swan, 2013; Vanderboom, Holland, Targonski, & Madigan, 2013).

Understanding Heart Failure in Nursing Education

Nurses as care coordinators work to promote patient-centered, cost-effective care that improves quality of life, which is imperative in the successful management of patients with HF (ACCF/AHA, 2013; Haas & Swan, 2013; Ivany & While, 2013; Colandrea & Murphy-Gustavson, 2012). Nurses need a deep understanding of the signs and symptoms associated with HF exacerbation, communication strategies tailored for people suffering with chronic illness, and the self-care education needs for this population (Ivany & While, 2013). Preparing undergraduate nursing students to consider the full spectrum of care, from admission through discharge and outpatient follow-up, will facilitate this deeper understanding (Colandrea & Murphy-Gustavson, 2012). High-fidelity simulation (HFS) in healthcare education is known to enhance problem-solving competency and communication, and is especially effective in knowledge application

and synthesis (Lee & Oh, 2015). Therefore, this project will assess the effectiveness of using HFS as a teaching strategy to reinforce care of the patient with heart failure in the hospital setting.

Review of Literature

To build and support safe, student-centered learning environments, nurse educators utilize learning theories and principles of learning as frameworks to intentionally select teaching strategies and learning activities (Candela, 2016; Utley, 2011). Nursing students, and especially those from the millennial generation, tend to prefer active learning approaches (Tutticci, Coyer, Lewis, & Ryan, 2016). HFS is one active learning strategy that enhances students' ability to apply knowledge of complex nursing care because it challenges students to strengthen critical problem-solving abilities, clinical reasoning, and professional communication (Leighton & Johnson-Russell, 2014). HFS provides a safe environment to assess and evaluate skills that are essential for high-quality nursing practice (Jeffries, Swoboda, & Akintade, 2016; Kirkpatrick & DeWitt, 2016).

Learning Theories

HFS is supported by many learning theories, primarily Constructivism. Constructivism meshes well with HFS because while students are interacting within a realistic, complex patient care environment, they are constructing knowledge that is meaningful and contextual (Meakim et al., 2013). Further, when novices practice a range of skills (that they are still learning) in collaboration with an expert, they are more likely to experience success (Tutticci et al., 2016). Situated Learning Theory, an application of Constructivism, is described as learning that occurs within the context of the actual nursing practice setting (Candela, 2016). To situate learning in HFS, the educator must create the conditions in which learners will experience the complexity of

real-world learning (Stein, 1998). Situated learning is comprised of content, context, community, and participation (Elfrink, Kirkpatrick, Nininger, & Schubert, 2010; Stein, 1998). HFS is an example of situated learning because students work to analyze and solve (*content*) clinical problems (*context*) within a safe, shared learning environment (*community*) in which learners partially construct and communicate their knowledge amongst the group (*participation*) (Elfrink, et al., 2010).

Social Learning Theory is another application of Constructivism. The effectiveness of learning is enhanced through high self-efficacy and learning through observation (Candela, 2016). Students who believe they can perform well will take on complex tasks with confidence, thus role-modeling is a significant aspect of this theory (Candela, 2016). In HFS, students participate in the simulation scenes in cadres. As students progress through subsequent scenes, they observe the nursing care and decision-making of previous peers.

Cognitive Learning Theory focuses on mental processes such as perception, understanding, and thinking, not just learning how to perform a task (Candela, 2016). Learning is an active, cumulative, constructive process that is experiential and occurs through processing information (Candela, 2016).

Transformative Learning Theory incorporates disorienting dilemmas, which lead to self-examination, critical reflection, and an overall receptivity to learning (Cranton, 2012). Students work to understand their experiences and integrate them with what they already know, thereby making them meaningful (Cranton, 2012).

Learner Assessment Methods

Assessment is an interactive process between students and instructors that focuses on improving teaching and learning (Bourke & Ihrke, 2016). The learner assessment methods were

directly adapted from the work of Elfrink et al. (2010), as was much of the structure of the teaching project. To assess students' knowledge of the clinical content prior to HFS, students completed a pre-simulation quiz of five NCLEX-style questions. Then, to understand how well students learned the content related to care of the patient with heart failure, the same quiz was given following the simulation. Using complex clinical questions pre- and post-simulation helps in measuring the progression of higher order thinking in students and aids faculty in evaluating instruction (Elfrink et al., 2010). Debriefing HFS was specifically facilitated using the Promoting Excellence and Reflective Learning in Simulation (PEARLS) blended approach, which brings together several debriefing strategies based on learning context and learner need (Cheng et al., 2016). This debriefing technique was selected because of its alignment with Constructivism.

Educational Resources

Faculty. The project goals and outcomes were informed by Junior 2 medical-surgical course objectives, and the simulation script was adapted from a preexisting course HFS. This project depended on the support, knowledge, and expertise of the simulation faculty who utilized this method of instruction every day. They were experts in principles of HFS, clinical subject content, and technical operations. Simulation faculty collaborated with the nurse educator student – henceforth referred to as 'instructor' – to coordinate the planning and logistics of this extensive project. Examples of considered logistics included, 1) scheduling of students for HFS and availability of the simulation suite and equipment, 2) development of assessment quizzes and student preparation guide, and 3) development of the adapted HFS script.

Nursing students. Students prepared for HFS using a variety of reliable resources such as their textbooks and electronic search engines (Elfrink et al., 2010). The medical-surgical course page found on Moodle, the university's learning management system, contained an

electronic folder with preparation materials (see Appendix D). Students also utilized Docucare®, the nursing program's chosen simulated electronic health record, to research the patient's story. Each student was instructed to complete a clinical prep form on this patient and bring it to simulation.

Methods

Approval from the Institutional Review Board for Human Subjects (IRB) was granted for this teaching project. Because HFS hours were a portion of the required clinical hours, all students enrolled in the course (N = 140) were scheduled to participate in this 4-hour HFS. This project, however, was implemented with a portion of the total cohort, and their participation in the assessments and teaching effectiveness survey was voluntary.

Sample and Data Collection

Sample. Demographic data was not formally collected on participants, though all were second semester juniors in the upper division nursing program at the author's academic site. All were participating in this HFS for the first time. Additionally, all were given a participant consent form which informed them of their choice to voluntarily participate in the project. Students participated in HFS in groups of seven or eight, and the data was collected over four separate sessions held within eight days.

Data collection. Participants were given 5-10 minutes to complete both pre- and post-simulation assessment quizzes. Each participant was assigned a number, and both pre- and post-simulation assessment quizzes contained that one number. Thus, their results were kept anonymous. Teaching effectiveness surveys were also anonymous, but were not numbered.

Learning Outcomes

Implementation of this project included detailed methods as outlined in Appendix A.

Identified learning outcomes in this HFS directly related to the cognitive, psychomotor, and affective knowledge domains. Students cared for a post-operative patient with medical history *suggestive* of HF, who subsequently experienced fluid volume overload in the acute care setting. The instructor developed the following learning outcomes: 1) identify signs and symptoms of a patient experiencing fluid volume overload related to HF (cognitive), 2) effectively communicate the changing status of a patient experiencing fluid volume overload (psychomotor and cognitive), 3) identify and implement appropriate nursing interventions to manage the complex and dynamic hydration status of a patient experiencing fluid volume overload (psychomotor and cognitive), 4) work within an interdisciplinary team to create and communicate a discharge plan for a patient with HF who is returning to home (psychomotor and cognitive), and 5) in post-simulation debriefing sessions, reflect on feelings related to caring for the patient with chronic HF and functioning as a nurse in an interdisciplinary team (affective).

Teaching Strategies and Learning Activities

Students prepared for and participated in classroom lecture and discussion on the topic of cardiovascular nursing care, including that which was related to HF, during the fifth didactic class session of the term. The HFS took place several weeks following the class session. Prior to participating in the HFS, students reviewed the simulation scenario and objectives (see Appendix D), which were posted online in the Moodle course page and in DocuCare®.

The HFS consisted of six phases: pre-briefing, simulation scenes I-IV with PEARLS debriefing following each scene, and a final debriefing to capture student 'take-home' insights. Each patient care scene lasted approximately 20 minutes, with a 15-20 minute debriefing session following each scene. Content of simulation scenes is outlined in detail in Appendix A.

Learner Evaluation Methods

Students completed a five-question pre-simulation assessment to establish baseline knowledge about HF-related content (see Appendix B). The same five-question assessment completed post-simulation assisted instructor in determining if psychomotor and cognitive learning outcomes were met. Instructor observed student participation in HFS and facilitated subsequent debriefing discussions, helped to clarify and offer feedback, and asked open-ended questions to facilitate further discussion. Additionally, observation was used to assess ‘Situation-Background-Assessment-Recommendation’ (SBAR) formatted communication, application to clinical practice, and overall thematic ‘take-home’ insights. Instructor-facilitated discussion and observation contributed to understanding cognitive, psychomotor, and affective learning outcomes.

Evaluation of Teaching Effectiveness

Teaching effectiveness was evaluated using a Likert scale adapted from a current evaluation tool in use at the author’s academic site (see Appendix C). This survey was administered following completion of the final debriefing portion of HFS. Additionally, to promote quality improvement of teaching effectiveness, the instructor sought continuous peer review from the expert simulation instructor following the sessions (Ellis, 2016).

Results

A sample of nursing students (N = 31) participated in the HFS, and all consented to submit pre- and post-simulation assessments and teaching effectiveness surveys. See Appendix E for all results in table format.

Learner Evaluation Methods

Pre- and post-simulation assessments. Evaluation of the first learning outcome measured participants' understanding of the clinical picture of a patient with HF experiencing fluid volume overload. Questions #2 and #5 assessed their pre- and post-simulation understanding. The results for Question #2 indicated a 6.4 percentage point improvement from pre- to post-simulation. The results for Question #5 indicated a 6.5 percentage point improvement from pre- to post-simulation.

Evaluation of the third learning outcome measured students' understanding of appropriate nursing interventions for managing fluid volume overload. Questions #3 and #4 assessed their pre- and post-simulation understanding. The results for Question #3 indicated a 9.7 percentage point improvement from pre- to post-simulation. The results for Question #4 indicated a 3.2 percentage point decrease from pre- to post-simulation. Additionally, discussion of the underlying pathophysiology and plan of care was led in depth by the instructor during each debriefing session. All students participated in verbally interpreting what was noticed and then developing a plan of care, including prioritizing nursing interventions.

Evaluation of the fourth learning outcome measured students' understanding of patient education needs and discharge planning related to HF. Question #1 was a multiple-response question ('select all that apply') that assessed pre- and post-simulation understanding of risk factors related to HF. None of the participants selected all correct answers either pre- or post-simulation, thus demonstrating no improvement from pre- to post-simulation.

Facilitator observation and discussion. The second learning outcome measured students' ability to effectively communicate the patient's changing status and was evaluated through instructor observation. All participants either made an SBAR phone call during HFS

and/or gave a verbal SBAR handoff to the next student team to enter simulation. Subjective observation revealed participants were most successful providing the patient background (B) and recommendations (R), but were less able to succinctly state the current situation (S) and pertinent assessment (A) data.

Evaluation of the fifth learning outcome occurred during each scene's debriefing session. Also, the final debriefing session focused on each participant's 'take-home' insight for future nursing practice. All students participated in sharing how it felt to care for a patient with HF who was also experiencing acute post-operative pain. Typical participant responses included, "stressed", "nervous", "I had a plan, and as soon as I walked in the room, it went out the window", and "I feel like I didn't get anything done". Typical 'take-home' insight themes related to prioritization and communicating clearly with the care provider.

Evaluation of Teaching Effectiveness

Overall results revealed mean scores ranging between 4.38 – 5.00. The mean score across all assessed categories was 4.77 with an overall standard deviation of 0.23. Simulation was described as "a valuable learning experience", "encouraging and constructive", and the teaching style was "genuine and helpful".

Discussion of Project Findings

Interpretation of results.

Learning outcomes. From pre- to post-simulation, improvement on assessment questions was expected. Questions #2, #3, and #5 showed improvement, thereby demonstrating that learning occurred during HFS. This learning pertained specifically to identifying characteristic traits of the clinical picture of heart failure. Of interest, however, was the decrease in score on Question #4, which addressed positioning as a nursing intervention to aid breathing due to

pulmonary edema. During HFS, when students raised the head of the bed to allow the patient to take deeper breaths, he cried out in pain that was related to surgery. Additionally, the oxygen saturation showed no improvement with position change. Therefore, it is possible that students re-constructed their mental model that positioning was not an appropriate intervention during respiratory distress.

None of the students successfully chose all correct answers on Question #1, a multiple-response question. Multiple-response questions require students to select *all* correct answers to receive credit; there is no partial credit given (McDonald, 2014). This question assessed students' understanding of general heart failure-related risk factors. One of the choices was a history of preeclampsia, and none of the students selected it as a risk factor of heart failure. However, many students indicated a question mark on their quiz next to this choice, and some even asked the instructor to define the word. Upon reflection, this was not surprising since the students had not yet learned obstetrics care in the nursing curriculum. While multiple response questions are excellent for promoting critical thinking, they are also prone to causing confusion (McDonald, 2014). It is also possible that students did not connect this question with the patient story, since he was male, and his background did not explicitly state a HF diagnosis. Therefore, they did not know to include it in their mental construct of the unfolding situation. Constructivist teaching strategies, such as simulation, strengthen the development of these constructs (Meakim et al., 2013).

Participants had no previous knowledge that the patient was going to experience a HF exacerbation. This may have contributed to students struggling with portions of the SBAR communication approach. This seemed especially true for those student pairs who participated first or second in the progression of the simulation. As the clinical picture became clearer

through debriefing and other students' modeling of successful delivery of SBARs, subsequent students were more accurate and concise in all aspects of their own handoffs. Social Learning Theory supports this enhanced confidence in skills through role modeling (Candela, 2016).

Teaching effectiveness. UPSON's mean benchmark pertaining to teaching effectiveness is 4.3. Participants rated overall teaching effectiveness in this simulation higher than the institution benchmark, indicating strong agreement with 1) instructor's ability to maintain a conducive learning environment and provide feedback, and 2) practical and relevant learning activities were experienced in this HFS. One student commented, "Usually, sim labs make me super nervous, so I never look forward to them, but I felt more comfortable and prepared for this one!"

The lowest mean score pertained to the evaluation statement, "I was well informed about the simulation objectives", and was 4.38. While this could certainly become an area of improvement in future HFS sessions, interpretation of the words 'well informed' likely varied amongst participants. Their responses reflected the meaning they assigned to that phrase. Some participants may not have felt 'well informed' prior to coming to simulation. Some may not have felt 'well informed' even as the HFS was beginning and/or underway. The results leave some ambiguity. If there was any data gathered from previously conducted HFS's, the nurse educator could compare those data to this project's data to help clarify this issue and determine its relevance across the entire HFS program.

Limitations

Simulation is a resource-intensive teaching and learning strategy, especially related to time, expertise, collaboration, capital equipment, and logistics (Jeffries, 2008). For this project, the resources of time and collaboration will be emphasized as key limitations. According to the

evaluations, only half of the students agreed strongly that the pace of the simulation was appropriate. Students verbalized and commented in the evaluation that they would have liked more time with the patient in the simulation room. To ensure each student worked with the patient, and to allow time for reflection and debriefing, the instructor adhered to time constraints. Jeffries (2008) notes that, often students will not be able to accomplish *all* desired nursing care, and indeed, most participants did not have time to address care coordination during this HFS.

Time also proved to be a limitation for faculty. In the planning phase, there was limited opportunity to collaborate and plan in person. Coordinating meeting time was especially challenging because the HFS team had full teaching schedules beyond simulation instructing.

Related to HFS content, a noted limitation was the compartmentalization of learning within the existing curriculum, making it difficult to know what knowledge students had prior to coming to simulation. For instance, students did not understand the word ‘preeclampsia’, as previously mentioned in the learner assessments. These students had not yet studied obstetrics in nursing, so most did not know the meaning of the word and if it related to heart failure. Further, compartmentalization of learning may be a barrier to developing the clinical reasoning skill of prioritization. The instructor observed that students entered each scene and repeated full assessments and vital signs, even though their peers had just previously done so (and had not yet intervened). These students had just developed a prioritization plan immediately prior to entering the room, yet did not follow their own plan. When asked about this, students commented that they thought they “had to” perform full assessments and vital signs every time they walked in the room in simulation – though that was never specified in pre-briefing. Further elaborating, students said that was “how it was done in the first simulation of the semester”. These students had only completed or were just beginning their first medical-surgical clinical rotation, so this

may have represented the concreteness of a novice. It is also possible that students were not able to suspend their belief enough to truly immerse in the simulation, or that they were overly concerned with “doing things right”. Learning to perform focused assessments may help future students prioritize the many aspects of their nursing care.

Limitations related to student responses on the teaching effectiveness survey focused on interpretation of evaluation statements and potential bias of responses. Because students may have interpreted the meaning of ‘well informed’ differently, results of those evaluation statements may not be entirely reliable. Additionally, the instructor was present during completion of the assessments and teaching effectiveness survey. Even though surveys were anonymous, it is possible that students responded in a socially desirable way, especially to statements related specifically to the instructor (Richardson et al., 2014). In future, teaching effectiveness evaluations should be administered by an independent instructor or set up through Moodle to minimize potentially biased responses (Richardson et al., 2014).

Key insights.

This teaching project highlighting HFS has demonstrated the effectiveness of Constructivist teaching and learning strategies in nursing. Most remarkable was the effectiveness of HFS as a learning activity assisting students to construct mental models congruent with heart failure. At the outset of the HFS, students knew the patient had a medical history of hypertension and myocardial infarction, but they were not provided with explicit evidence defining the pathology of heart failure. Across the HFS, students *constructed* the cellular, tissue, and systemic changes in status and determined appropriate assessments and interventions, thereby creating a plan of care and a strong mental model for nursing care related to heart failure. In fact, because the same instructor facilitated this HFS four times with four separate groups, debriefing became

smoother. By the fourth group, students began incorporating more patient education in their interaction with the patient, not just focusing on accomplishing tasks.

Implications and Recommendations

HFS should continue to be part of students' clinical experience, and we should strive to enhance its fidelity, such as utilizing standardized patients. As adapted, this HFS does currently meet course outcomes and is an asset to the simulation program because of the opportunity to strengthen and solidify mental constructs of caring for elders with chronic co-morbidities, a common population these students will encounter. In fact, this scenario has great potential to carry over into the population health simulations, as well, as nursing students gain understanding of the complex components of care coordination. Future research is needed to determine ideal curriculum placement of care coordination topics.

Faculty should continue to develop simulations in which prioritization is a key aspect of the progression of the simulation. Students should learn and practice the concept of focused assessments as they work to prioritize patient care among multiple complex patients.

To further meet the didactic course outcomes of which the HFS is a part, didactic and simulation faculty must collaborate. To prevent altered construction of mental models from what students have correctly learned previously, it is crucial for simulation faculty to meet prior to the session to verify learning outcomes and establish shared goals and strategies. Faculty should plan to match HFS content with HFS objectives (Jeffries, 2008). And, while specific goals do orient the students to key concepts underlying the HFS scenario (Garrett, MacPhee, & Jackson, 2010), working from a flexible script allows for the potential of disorienting dilemmas, resulting in individualized discovery. High-fidelity simulation is constructive and transformative learning at its best!

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References

- American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines [ACCF/AHA]. (2013). ACCF/AHA Guideline for the management of heart failure. *Journal of the American College of Cardiology*, 62(16), e147-239.
- Bambini, D. (2016). Writing a simulation scenario: A step-by-step guide. *AACN Advanced Critical Care*, 27(1), 62-70.
- Bourke, M. P. & Ihrke, B. A. (2016). Introduction to the evaluation process. In D. M. Billings & J. A. Halstead (Eds.), *Teaching in nursing: A guide for faculty* (5th ed.) (pp. 385-397). St. Louis, MO: Elsevier.
- Candela, L. (2016). Theoretical foundations of teaching and learning. In D. M. Billings & J. A. Halstead (Eds.), *Teaching in nursing: A guide for faculty* (5th ed.) (pp. 211-229). St. Louis, MO: Elsevier.
- Colandrea, M., & Murphy-Gustavson, J. (2012). Patient care heart failure model: The hospitalization to home plan of care. *Home Healthcare Nurse*, 30(6), 337-344.
- Cranton, P. (2012). Theoretical framework. *Planning instruction for adult learners* (3rd ed.) (pp. 1-20). Toronto, ON: Wall & Emerson, Inc.
- DeBlois, D., & Millefogie, M. (2015). Telehealth: Enhancing collaboration, improving care coordination. *Nursing Management*, 46(6), 10-12.
- Echevarria, M. (2016). Translating knowledge into practice through an academic-practice partnership for exploring barriers that impact management of homebound patients with heart failure. *Care Management Journals*, 17(2), 81-96.

- Elfrink, V. L., Kirkpatrick, B., Nininger, J., & Schubert, C. (2010). Using learning outcomes to inform teaching practices in human patient simulation. *Nursing Education Perspectives, 31*(2), 97-100.
- Ellis, P. (2016). Systematic program evaluation. In D. M. Billings & J. A. Halstead (Eds.), *Teaching in nursing: A guide for faculty* (5th ed.) (pp. 463-507). St. Louis, MO: Elsevier.
- Eppich, W., & Cheng, A. (2015). Promoting excellence and reflective learning in simulation (PEARLS): Development and rationale for a blended approach to health care simulation debriefing. *Simulation in Healthcare, 10*(2), 106-115.
- Feltner et al. (2014). Transitional care interventions to prevent readmissions for persons with heart failure. *Annals of Internal Medicine, 160*(11), 774-784.
- Garrett, B., MacPhee, M., & Jackson, C. (2010). High-fidelity patient simulation: Considerations for effective learning. *Nursing Education Perspectives, 31*(5), 309-313.
- Haas, S., & Swan, B. A. (2013). Quality and safety outcomes for patients and families. In G. Lamb (Ed.), *Care coordination: The game changer* (133-151). Silver Spring, MD: American Nurses Association.
- Hsiao, R., & Greenberg, B. (2015). Contemporary treatment of acute heart failure. *Progress in Cardiovascular Diseases, 58*, 367-378.
- Ivany, E. & While, A. (2013). Understanding the palliative care needs of heart failure patients. *British Journal of Community Nursing, 18*(9), 441-445.
- Jeffries, P. (2008). Getting in S.T.E.P. with simulations: Simulations take educator preparation. *Nursing Education Perspectives, 29*(2), 70-73.

- Jeffries, P. R., Swoboda, S. M., & Akintade, B. (2016). Teaching and learning using simulations. In D. M. Billings & J. A. Halstead (Eds.), *Teaching in nursing: A guide for faculty* (5th ed.) (pp. 304-323). St. Louis, MO: Elsevier.
- Kirkpatrick, J. M., & DeWitt, D. A. (2016). Strategies for evaluating learning outcomes. In D. M. Billings & J. A. Halstead (Eds.), *Teaching in nursing: A guide for faculty* (5th ed.) (pp. 398-422). St. Louis, MO: Elsevier.
- Lee, J., & Oh, P. (2015). Effects of the use of high-fidelity human simulation in nursing education: A meta-analysis. *Journal of Nursing Education, 54*(9), 501-512.
- Leighton, K., & Johnson-Russell, J. (2014). Innovations in facilitating learning using simulation. In M. J. Bradshaw & A. J. Lowenstein (Eds.), *Innovative teaching strategies in nursing and related health professions* (6th ed.) (pp. 239-265). Burlington, MA: Jones & Bartlett.
- Meakim, C., Boese, T., Decker, S., Franklin, A. E., Gloe, D., Lioce, L., ... Borum, J. C. (2013). Standards of best practice: Simulation standard I: Terminology. *Clinical Simulation in Nursing, 9*(6S), S3-S11.
- McDonald, M. E. (2014). Selected response format: Developing multiple-choice items. *The nurse educator's guide to assessing learning outcomes* (3rd ed.) (pp. 79-131). Burlington, MA: Jones & Bartlett.
- Pere, K. (2012). Developing nursing expertise in caring for older advanced stage heart failure patients and their families – palliative and end-of-life care. *Canadian Journal of Cardiovascular Nursing, 22*(3), 12-17.
- Richardson, H., Goldsamt, L. A., Simmons, J., Gilmartin, M., & Jeffries, P. R. (2014). Increasing faculty capacity: Findings from an evaluation of simulation clinical teaching. *Nursing Education Perspectives, 35*(5), 308-314.

Stein, D. (1998). Situated learning in adult education: ERIC digest. Retrieved from

<https://www.ericdigests.org/1998-3/adult-education.html>

Tutticci, N., Coyer, F., Lewis, P. A., & Ryan, M. (2016). High-fidelity simulation: Descriptive analysis of student learning styles. *Clinical Simulation in Nursing, 12*(11), 511-521.

Utley, R. (2011). Facilitate learning – competency 1. *Theory and research for academic nurse educators: Application to practice* (pp. 17-135). Sudbury, MA: Jones and Bartlett.

Vanderboom, C. E., Holland, D. E., Targonski, P. V., & Madigan, E. (2013). Developing a community care team: Lessons learned from the Community Connections Program, a health care home-community care team partnership. *Care Management Journals, 14*(3), 150-157.

Ziaieian, B., & Fonarow, G. C. (2016). Epidemiology and aetiology of heart failure. *Nature Reviews, 13*, 368-378. doi:10.1038/nrcardio.2016.25

Appendix A

Teaching Plan Title: Exploring Nursing Care for Heart Failure Through High-Fidelity Simulation
Michelle Collazo BSN RN-NE Student

Purpose: Assess students’ understanding of: 1) heart failure exacerbation as a post-operative complication in the acute care setting, and 2) the role of the nurse as patient advocate in a multidisciplinary team who is planning discharge care for the patient with chronic heart failure.

Goal: Students will correctly identify fluid volume overload (heart failure exacerbation) in a post-operative patient, effectively communicate findings via SBAR with care provider, and intervene appropriately using nursing interventions and provider orders. Additionally, students will collaborate with an interdisciplinary team to develop a home discharge and community follow-up plan.

Learning Context/Environment: Students will participate in a pre-briefing session, simulation scenes, and debriefing session during their on-campus clinical simulation hours.

Project Outcomes (knowledge domain level)	Learning Theories (to support project focus)	Content Outline (with key concepts)	Method of Instruction (teaching strategies & learning activities for key concepts)	Simulation & Debriefing Plans (NESP only)	Session Resources (for anticipated class enrollment)	Method of Learner Assessment & Evaluation
<p>1) Identify the signs and symptoms of patient experiencing fluid volume overload related to chronic HF in the simulated acute care setting. (Cognitive)</p> <p>2) Effectively communicate the changing status of patient experiencing fluid volume overload related to HF in the simulated acute care setting. (Psychomotor & Cognitive)</p>	<p>*Constructivism: Students construct knowledge for themselves through interacting with the environment; learning is contextual and occurs when situated in a realistic setting (Meakim et al., 2013).</p> <p>*Situated Learning Theory Learning occurring within the context of the actual (or simulated) nursing environment;</p>	<p>*During week 5 of spring term, NRS 322 students will learn nursing care to support cardiovascular function; heart failure content and interdisciplinary care, will be taught.</p> <p>*During simulation pre-briefing:</p> <ul style="list-style-type: none"> • Pre-simulation assessment quiz. • Review HF exacerbation/fluid volume overload as a post-op complication and expected nursing interventions. 	<p>Primary method: High-Fidelity Simulation</p> <p>Student Prep: Classroom instruction on CV nursing care and individual review of simulation scenario.</p> <p>1) Pre-briefing: Instructor reviews scenario with students, including basic pathophysiology and implications of nursing care. To help promote fidelity and clarify expectations, the instructor will orient students to the simulation room prior to</p>	<p>Adapted from Elfrink, Kirkpatrick, Nininger, & Schubert, 2010).</p> <p>*Student Preparation: Use textbook, class notes, and Docucare® to prepare for HF scenario.</p> <p>*Pre-simulation Assessment: 5-question assessment of knowledge based on <i>clinical</i> content of scenario.</p>	<p>*Electronic resources via internet and Moodle: HF Zone Tool, Scenario outline.</p> <p>*NRS 322 course text.</p> <p>*Simulation suite 303 with high fidelity manikin and associated props (collaborate with Mary Oakes on existing “Terry Van Dyke” scenario – adjust to include med hx of chronic HF and</p>	<p>*Pre-simulation assessment: 5 non-graded questions (paper-and-pencil) related to content knowledge.</p> <p>*Post-simulation assessment: same 5 questions as pre-sim assessment (paper-and-pencil) related to content knowledge.</p> <p>*Faculty observation of student participation in simulation scenarios and debriefing discussions.</p>

<p>3) Identify and implement appropriate nursing interventions to manage the complex and dynamic hydration status of patient experiencing fluid volume overload related to chronic HF in the simulated acute care setting. (Psychomotor & Cognitive)</p> <p>4) Within an interdisciplinary team, create and communicate a discharge plan for patient with chronic HF who is returning to home. (Psychomotor & Cognitive)</p> <p>5) In a post-simulation debriefing session, reflect on feelings related to caring for the patient with chronic HF and functioning as a nurse in an interdisciplinary team. (Affective)</p>	<p>content, context, community, & participation (Candela, 2016; Elfrink et al., 2010).</p> <p>*Transformative Learning Theory: Disorienting dilemmas lead to self-examination, critical reflection, and an overall receptivity to learning; options are explored for new approaches; students need to understand their experiences and integrate them with what they know, then make them meaningful (Cranton, 2012).</p> <p>*Social Learning Theory: Active information processing; students learn by observing others as models of behavior; students with high self-efficacy will take on complex learning activities</p>	<ul style="list-style-type: none"> Review SBAR reporting to care provider, essential components. <p>*Debrief after each phase using PEARLS approach, instructor is facilitator of discussion.</p> <ul style="list-style-type: none"> Review roles of interdisciplinary team members (RNs, care provider, social work, patient). Discuss relevant pathophysiology related to HF as students observed in scenario. <p>*Final reflection: how did it feel to care for this patient? How did it feel to advocate for him? What concerns do you still have? What challenges do you anticipate once the patient is home?</p>	<p>the simulation. (45-60 min).</p> <p>2) Scene 1: Students enter the scenario to assess the post-op patient and find elevated BP, RR, and decreased SpO₂; patient c/o feeling tired; students should perform focused assessment and assess pain (painful); then, the trigger event occurs (pt begins to c/o SOB and not feeling well). Students should intervene accordingly (likely w/O₂). This will also prompt call to care provider (SBAR report) (20 min).</p> <p>*Scene 2: Next student pair will enter to carry out further orders and begin patient education/reinforcement of knowledge of chronic HF; VS improving after admin of IV diuretic and app of O₂ per NC. (20 min).</p> <p>*Scene 3: Next student pair will represent nursing role as care coordinators in the interdisciplinary team care conference, actor to</p>	<p>*Pre-briefing: Orientation to the setting and scenario specifics, as well as student roles and expectations.</p> <p>*Students plan care: In small groups, students will be assigned to one of three scenes, and will briefly discuss their plan for their portion of care (10 min).</p> <p>*Simulation: In pairs, students will carry out their assigned simulation scene.</p> <p>*Debriefing: This will occur after each scene, using PEARLS debriefing, and will address expected learning outcomes and critical nursing actions, as well as opportunity for reflection (Cheng et al., 2016).</p> <p>*Post-simulation assessment: Same 5-question assessment</p>	<p>resulting fluid volume overload post-op); adapting existing scenario aids in minimizing time resource demands on faculty.</p> <p>*BC 309 conference room for debriefing.</p> <p>*Simulation operating staff (to be present in control booth for pt. response and adjustment of VS).</p> <p>*Additional simulation instructor to play the voice of the care provider over the telephone.</p> <p>*Hired actor (?) to play the part of the social worker in ending phase.</p> <p>*NE instructor to orient/pre-brief, assess pre- and post-simulation, and debrief students.</p>	<p>*Optional: 2-3 simulation-related questions on the final exam to assess for retention of knowledge.</p>
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	<p>with confidence (Candela, 2016).</p> <p>*Cognitive Learning Theory: The focus is on mental processes such as perception, understanding, thinking, not just learning how to perform a task. Learning is an active, cumulative, constructive process that depends on student’s mental activities; learning is processing information and is experiential (Candela, 2016).</p>		<p>play social worker (?), addt’l instructor to play care provider (?); discuss needs and patient wishes...maybe begin to discuss a palliative care consult for home. (20 min).</p> <p>*Debriefing: Instructor assists students to connect actions taken during scenario with the learning outcomes (reflection on action). (20 min debriefing following each scene). Bambini (2016)</p>	<p>as done during pre-simulation.</p> <p>*Optional: 2-3 simulation-related questions on the final exam to assess for retention of knowledge.</p>	<p>*Printing of pre- and post-simulation assessment quizzes for approx. 40 students.</p>	
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Plans for potential issues, problems, or barriers:

***Technical Difficulties** (related to technology): First, I plan to collaborate with experienced simulation instructors who are very knowledgeable on troubleshooting technical issues that may arise with the equipment. We will run through the scenario as a practice session prior to running it with students. We will adapt existing props and data from the current “Terry Van Dyke” scenario, so all props have already been purchased and tested to work correctly. However, if a technical issue does arise, we will do our best to improvise in the scenario and debrief accordingly.

***Lack of student preparation:** While this is a potential barrier, preparation is a requirement for participation. Students will know ahead of time that this simulation is part of a teaching project, and we will obtain their consent to participate in the study portion. For students who opt not to participate in the study, the simulation will still be carried out the same, including pre- and post-simulation assessments (except their data will not be included in the final analysis).

***Lack of student engagement:** The NE instructor will be prepared with 2-3 debriefing techniques so that discussion is appropriate to the level of engagement. The PEARLS approach allows for a variety of debriefing techniques, based on knowledge and skill level of participant, level of engagement, and learning outcomes. The literature referenced for this approach provides an extensive description of each phase of PEARLS, including common pitfalls, consequences, and

solutions (Cheng et al., 2016; Eppich & Cheng, 2015). The NE instructor will remind students that simulation is a very safe environment in which to learn, and mistakes are inevitable. Their active engagement, however, is central to the learning process.

Teaching Plan References

- Bambini, D. (2016). Writing a simulation scenario: A step-by-step guide. *AACN Advanced Critical Care*, 27(1), 62-70.
- Candela, L. (2016). Theoretical foundations of teaching and learning. In D. M. Billings & J. A. Halstead (Eds.), *Teaching in nursing: A guide for faculty* (5th ed.) (pp. 211-229). St. Louis, MO: Elsevier.
- Cheng, A., Grant, V., Robinson, T., Catena, H., Lachapelle, K., Kim, J., ...Eppich, W. (2016). The promoting excellence and reflective learning in simulation (PEARLS) approach to health care debriefing: A faculty development guide. *Clinical Simulation in Nursing*, 12(10), 419-428.
- Cranton, P. (2012). Theoretical framework. *Planning instruction for adult learners* (3rd ed.) (pp. 1-20). Toronto, ON: Wall & Emerson, Inc.
- Elfrink, V. L., Kirkpatrick, B., Nininger, J., & Schubert, C. (2010). Using learning outcomes to inform teaching practices in human patient simulation. *Nursing Education Perspectives*, 31(2), 97-100.
- Eppich, W., & Cheng, A. (2015). Promoting excellence and reflective learning in simulation (PEARLS): Development and rationale for a blended approach to health care simulation debriefing. *Simulation in Healthcare*, 10(2), 106-115.
- Meakim, C., Boese, T., Decker, S., Franklin, A. E., Gloe, D., Lioce, L., ... Borum, J. C. (2013). Standards of best practice: Simulation standard I: Terminology. *Clinical Simulation in Nursing*, 9(6S), S3-S11.

Appendix B

Pre-Simulation & Post-Simulation Quiz

1. The healthcare provider is teaching a group of senior citizens about risk factors for heart failure. Which of these factors will the healthcare provider include in the teaching?

Select all that apply.

- A. High sodium intake
- B. Obesity
- C. History of preeclampsia
- D. Sleep apnea
- E. Hypertension
- F. Increased high density lipoproteins (HDL)

2. You assess your patient with chronic heart failure and note the following data:

BP 160/90, HR 85, RR 24, T 98.0, SpO2 88%; bounding pulse, lung sounds w/crackles bilaterally, 3+ pitting edema to lower legs. What is your priority nursing action?

- A. Position patient upright, check function of oxygen flowmeter, and call for help
- B. Elevate lower legs and turn patient to side-lying to ease work of breathing
- C. Position patient in high Fowler's, ensure adequate delivery of O2, and assess level of consciousness
- D. Call a Code Blue

3. Which of the following would be a priority nursing diagnosis for the client with heart failure and pulmonary edema?

- A. Activity intolerance related to pump failure
- B. Impaired skin integrity related to pressure
- C. Constipation related to immobility
- D. Risk for infection related to stasis of alveolar secretions

4. Which of the following positions would best aid breathing for a client with acute pulmonary edema?

- A. Lying flat in bed
- B. In high Fowler's position
- C. Left side-lying
- D. In semi-Fowler's position

5. A nurse caring for a client in one room is told by another nurse that a second client has developed severe pulmonary edema. On entering the 2nd client's room, the nurse would expect the client to be:

- A. Extremely anxious
- B. Slightly anxious
- C. Moderately anxious
- D. Mildly anxious

Appendix C

Simulation and Faculty Evaluation

University of Portland, School of Nursing

INSTRUCTIONS: Please circle your response to the numbered items. Rate your level of agreement or disagreement with simulation and the instructor on a 1 to 5 scale:

1: Strongly disagree, or the lowest, most negative impression

3: Neither agree nor disagree or an adequate impression

5: Strongly agree, or the highest, most positive impression

Choose N/A if the item is not appropriate or not applicable to this presentation.

Simulation title: _____

Date: _____

(Circle your response to each item.)

Strongly disagree (1) → Strongly agree (5)

- | | | | | | |
|---|---|---|---|---|---|
| 1. I was well informed about the simulation objectives. | 1 | 2 | 3 | 4 | 5 |
| 2. I was well informed about how to prepare for simulation. | 1 | 2 | 3 | 4 | 5 |
| 3. The simulation content was relevant to my learning needs. | 1 | 2 | 3 | 4 | 5 |
| 4. The simulation activities stimulated my learning. | 1 | 2 | 3 | 4 | 5 |
| 5. The activities in simulation gave me practical experience. | 1 | 2 | 3 | 4 | 5 |
| 6. The pace was appropriate. | 1 | 2 | 3 | 4 | 5 |
| 7. The instructor was well prepared. | 1 | 2 | 3 | 4 | 5 |
| 8. The instructor maintained an environment conducive to learning. | 1 | 2 | 3 | 4 | 5 |
| 9. The instructor observed students and provided adequate feedback. | 1 | 2 | 3 | 4 | 5 |

Your constructive feedback is appreciated. Thank you for your participation!

Comments:

Appendix D

Student Guide to Simulation 2- Griffin- Nursing 322

You are the RN working on the surgical unit taking care of Jared Griffin. You will receive report, review the scheduled medications, assess the client, provide medications and treatments as ordered and respond to the client needs as they arise.

Before you come to your simulation:

Fill out a clinical prep sheet on Jared Griffin using information found in his AEHR record from Docuare. **Access the Docuare system.** Find **322 Simulation 2-JG Spring 2017 class # 16052B76.**

- **Study** from your textbooks as you need to answer any questions you may have about nursing care after Knee replacement.
- **View** the short videos on Moodle for this simulation, including the morphine dilution, hanging a secondary IV, and the Knee replacement surgery clips from YouTube. If you need to review oxygen delivery and simulation phone use view those videos again.

YouTube video: Knee replacement

<https://www.youtube.com/watch?v=m8LDBIZN-XM> 4:46min

Dress the part

- Dress as if attending clinical. Wear your scrubs, student ID badge, bring a stethoscope, drug book, and bring a watch with second hand.
- Bring your laptop if you have one. All other equipment will be provided by the Simulation Lab.

Appendix E

Table 1.

Pre- and post-intervention student responses

Question item	Pre-intervention % correct	Post-intervention % correct
Question #1	0%	0%
Question #2	83.9%	90.3%
Question #3	64.5%	74.2%
Question #4	77.4%	74.2%
Question #5	77.4%	83.9%

Table 2.

Teaching effectiveness mean scores

Question item 5=strongly agree and 1=strongly disagree	Mean (Standard Deviation)
1. I was well informed about the simulation objectives	4.38 (0.88)
2. I was well informed about how to prepare for simulation	4.54 (0.72)
3. The simulation content was relevant to my learning needs	4.83 (0.37)
4. The simulation activities stimulated my learning	4.74 (0.51)
5. The activities in simulation gave me practical experience	4.93 (0.25)
6. The pace was appropriate	4.52 (0.57)
7. The instructor was well prepared	5.00 (0.00)
8. The instructor maintained an environment conducive to learning	5.00 (0.00)
9. The instructor observed students and provided adequate feedback	4.97 (0.18)
Overall Mean	4.77 (0.23)