NURSING SIMULATION: A THREE-TIERED MODEL APPROACH

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Introduction

Purpose: The purpose of this research is to disseminate how one baccalaureate-nursing program in a highly diverse, liberal-arts university with novice simulation technicians and faculty defined various methods of simulation, students' response to various methods, and recommendations for use.

Background: Simulation has long been used as training in nonmedical facilities[1]. In nursing, it has had many definitions. The oldest definition found is using models to teach basic skills [1]. As simulation technology grows, changes, and improves, so does the need to clearly define terms and how we use them. Simulation, presently, includes varying degrees of interaction. Simulations promote teamwork through communication and collaboration[5], decrease situation anxiety[6], decreasing errors[7].

Usefulness of differing simulation mediums in student education needs to be fully explored, well-documented, and clearly defined. Recommendations for use of differing simulation methods are dependent on learning objectives and the level of the student [8].

Objectives: To enhance preparation and readiness for: hospital clinical skills; patient management in an assigned clinical shift, delegation and prioritization; for development of critical thinking and clinical decision making. To define an approach to simulation learning.

Nursing students with Nakisha Paul as SP during "Sim-Care."

About the Authors

Dr. Kristina Leyden is an assistant professor and a Family Nurse Practitioner. She is the Simulation Lab Faculty Liaison and develops simulation experiences. She holds her doctorate in chronobiology. She uses her knowledge of the discipline to promote and create individualized and innovative teaching methods.

Ms. Nakisha Paul is the nursing simulation director. She has developed a framework for how simulation works at the University of St. Thomas. She holds a master of business administration. She uses her expertise to enhance simulation for all users.

Ms. Katherine Simpson is a nursing instructor. Her clinical experience includes ICU/critical care nursing in the areas of neuroscience and coronary care. Ms. Simpson currently practices as a clinical nurse in the post anesthesia care unit.

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Methods

- Development of introductory simulation of one-on-one care HFM with adult/older adult medical/surgical scenarios prior to hospital clinical rotation (Fall 2015)
- Mimicked general medical/surgical hospital unit; 6-hour rotation in laboratory
- Pre- and post-simulation briefing
- Objectives:
    - Hospital unit preparation
    - Setting expectations
    - Understanding hospital routine
    - Beginning clinical reasoning
    - Effective communication
- Duties:
    - Charge nurse
    - One-on-one assigned care
    - Assessment; carrying out orders; medication administration
    - Communication: calling on-call provider; facilitating care with radiology, laboratory, social work, families
   - Documentation
- Advanced simulation increased in intensity in Pediatric course (Spring 2016)
- Increased intensity/acuity
- Shorter period in small groups of 2-3 students
- Two scenarios completed in phases
- Pre- and post-simulation testing and briefing
- Objectives:
    - Clinical reasoning
    - Identification of acuity and facilitation of care
- Students' positive feedback and request for more simulations prompted faculty to develop a step-approach to simulation in courses.
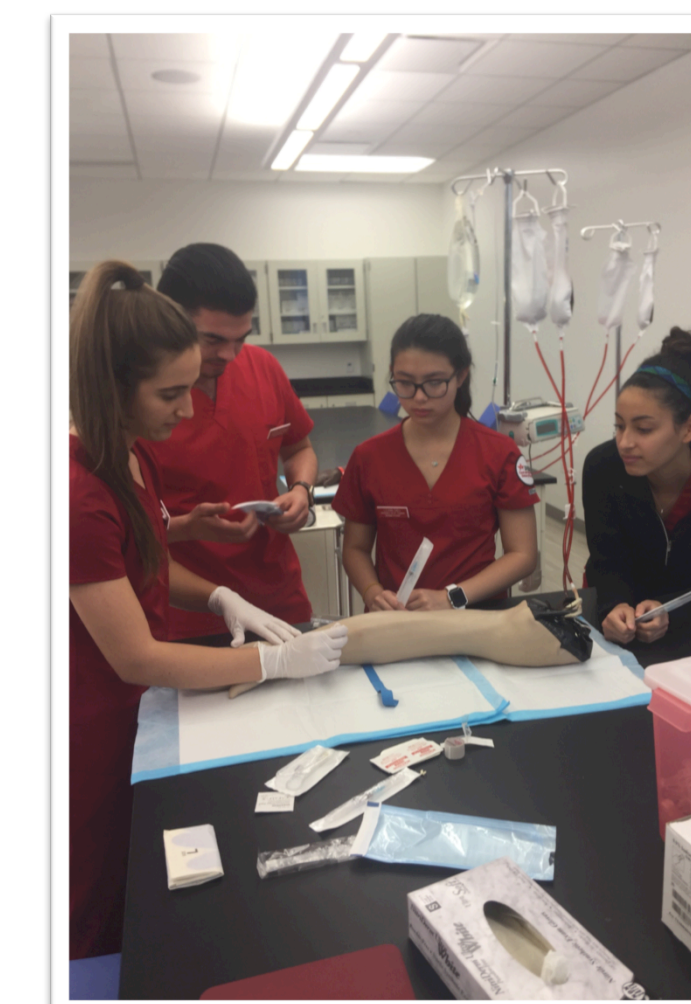
Nursing students practicing IV insertion during "Sim-Skill."
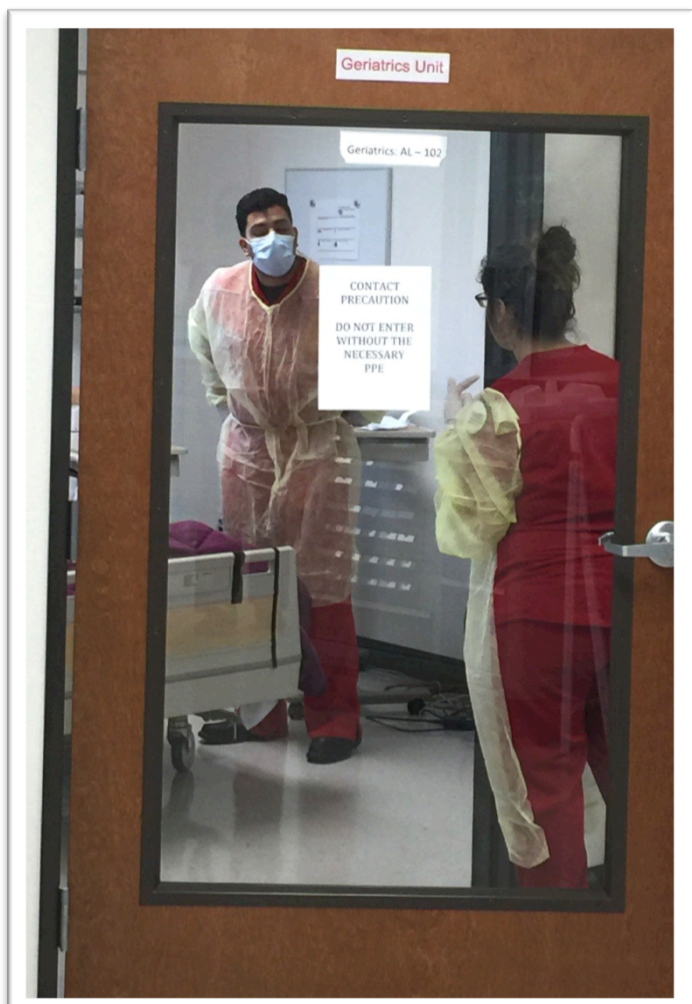
Nursing student practicing during "Sim-Shift."
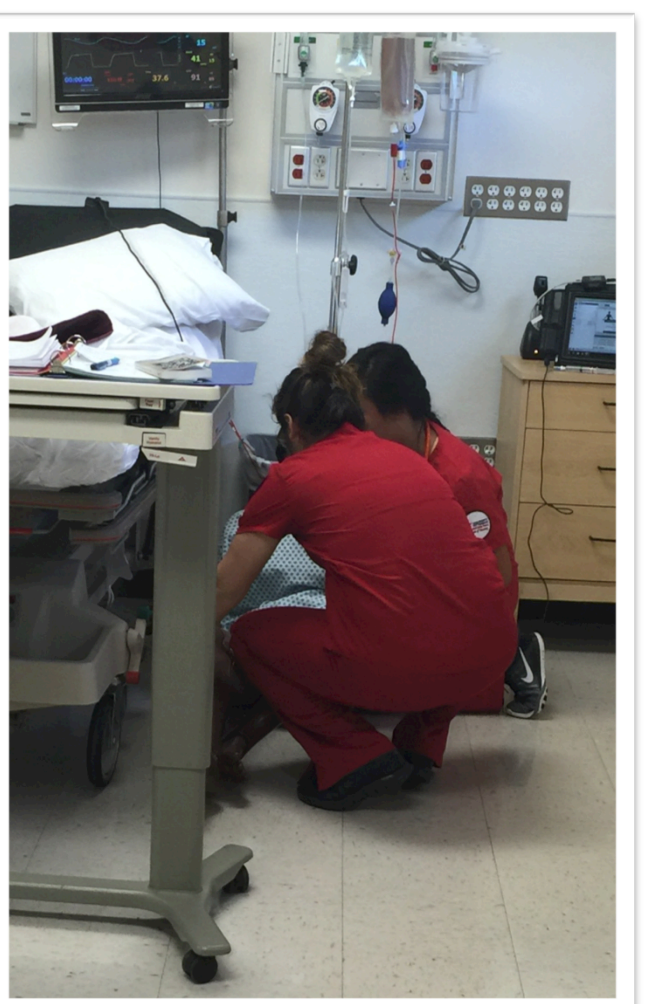
Nursing students helping a HFM fall during "Sim-Shift."

Limitations

- Differing Fidelity, differing objectives
- HFM power source, battery life
- Lab size; interference of signals
- Scenario length
- Facilitator time and ability
- Great need for classification of simulations for faculty and student communication for clear definition of terms.

Simulation Model Differences

	Specifications	Example	Pro	Con
LFM	No electronic functionality	Task trainer intravenous arm	For task	No patient interaction
MFM	Minimal computer function	Chest model illustrating heart rhythms	For task	No patient interaction
HFM[2,3]	Fully functioning	Full-bodied mannequin mimicking a living patient	Full simulation	Scenario development; facilitator knowledge
SP[4]	Human Being	Live person participating in scenario	Human interaction	Availability;

Implementation

Fall 2016: Three-Tiered Model Development

1. Sim-Skill: focus on skill development only using LFM
    - Beginning during first semester of nursing courses, continued for adult/older adult course, and new skill development for specialty courses
2. Sim-Shift: focus on hospital unit preparation for complete care of patient; development of prioritization and communication using HFM
    - Beginning second semester of nursing courses in adult/older adult.
3. Sim-Care: focus on critical thinking, communication, clinical reasoning; pre-/post-simulation testing occurred
    - Beginning end of second semester in adult/older adult. Continued through specialty courses. Only tier used during senior year.

Nursing students charting in nursing unit during "Sim-Shift."

Results

- Sim-Skill
    - Continue to be helpful in learning how to do and practice a skill
- Sim-Shift
    - Sim-Shift helps students understand clinical expectations/role.
    - Sim-Shift helps student translate theory into practice and make clinical manifestations seen in HFM concrete.
    - Students liked when HFM were placed on contact or respiratory isolation mimicking a disease. This helped the student with prioritization.
    - Students learned importance of communication and preparedness before reporting case to simulated on-call provider.
- Sim-Care
    - Students reported positive and stressful experience.
    - All students request more Sim-Care scenarios to translate didactic content into practical environment
    - Post Sim-Care testing increased knowledge base in 57% of students for both scenarios and 83% of students for one scenario.
- Students request more time in lab to develop technique and facilitate practice.
- Overall positive experience.
- Students report of freedom in lab practice without risk of causing harm to live patient.

Viewing recording of "Sim-Care" scenario during debriefing session.

Conclusions

Simulation definitions helped facilitators communicate needs and student expectations to faculty and students. In addition, the clear definitions helped students understand a step-approach to clinical preparedness. The three-tier model approach assists faculty in deciding simulation levels appropriate to student level. Technical limitations helped form simulation length and intensity. Faculty will continue to use this three-tier model to facilitate learning.

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