Disaster Preparedness and Response: Using Competency-Based Simulation Activities to Achieve Outcomes

Regina Barr MSN RN
Cindy Drenning MSN CRNP
Nickole George PhD RN
Brenda Guzic MHSc MA BSW RN

Saint Francis University
Saint Francis University

• Founded in 1847
• Catholic, co-educational liberal arts University sponsored by the Franciscans of the Third Order Regular.
• Oldest Franciscan institution of higher learning in the United States
• Location: Loretto, PA (Allegheny Mountains) with a satellite in Ambialet, France
• Enrollment: 2,668 (1,745 undergraduate, 619 graduate)
Saint Francis University
Department of Nursing

• Undergraduate BSN Program:
  – Member of the American Association of Colleges of Nursing (AACN)
  – Accredited by Commission on Collegiate Nursing Education (CCNE)
  – 100% pass rate on the NCLEX-RN past three years
  – Experienced faculty
  – 1-8 maximum faculty-student ratio on clinical sites
  – Small class
Saint Francis University
Department of Nursing

• Master of Science In Nursing Leadership Education
  – Online program
  – CCNE Accredited

• Future Plans
  – Master of Science in Nursing
    • Family Nurse Practitioner
Disasters and Public Health Emergencies

• # of incidence has increased in the past 20 years

• Causes:
  – Overpopulation and urbanization
  – Population migration to coastal regions
  – Climate change
  – Terrorism and pandemics
  – Natural Disasters
Nurses at the Forefront of Disaster Response

• Are they adequately prepared?
• Are there variations in levels of integration of disaster preparedness education among programs?
• Will evidence-based disaster preparedness education improve training of nurses?
Background

• “Strengthening Nursing Curriculum to Support Humanitarian Assistance and Disaster Preparedness Competencies”
  – Supported by Saint Francis University’s Center of Excellence for Remote and Medically Under-Served Areas (CERMUSA) in Loretto, Pennsylvania
  – Funded by the U.S. Army Medical Research and Materiel Command (USAMRMC) Telemedicine and Advanced Technology Research Center (TATRC), Fort Detrick, Maryland
What Directs BSN Curriculum Content?

- American Association of Colleges of Nursing (AACN) Essentials of Baccalaureate Education
- National Council Licensure Examination- Register Nurse (NCLEX-RN) test plan
- National League for Nursing (NLN) Outcomes and Competencies for Graduates of Baccalaureate programs in nursing
Phase I

• Identified elements related to disaster nursing most likely to be included in BSN programs related to NLN, AACN, and NCLEX-RN standards and criteria.

• Cross walked *CDC-TIIDE DMPH core competencies for disaster medicine and public health with NLN, AACN, and NCLEX-RN standards and criteria

• Identified gaps in the accreditation and licensure standards as they relate to disaster preparedness education

*CDC-TIIDE DMPH – Centers for Disease Control and Prevention- Terrorism Injuries: Information, Dissemination and Exchange Disaster Medicine and Public Health
CDC – Terrorism Injuries: Information, Dissemination and Exchange

Highly-Specialized Competencies
Highly specialized and integrated competencies for responders regularly deployed.

Discipline/Profession Specific Competencies
ACEP • NEPEC • ASPH • VHA-EMA • ACS • AAP

Role/Function/Category Specific Competencies
Hospital workers • Healthcare workers • MRC • Humanitarian aid workers • Clinicians • Public health workers • Health profession students • DMPHP working group/NDLSEC

CORE COMPETENCIES
for all health professionals

- DM/DN fellowships
- NDMS teams (DMAT/DMORT)
- U.S. Public Health Service
- Humanitarian Foreign Medical/Surgical Teams

HPSN World 2017
Practice with a Purpose
Gaps Identified - Phase I

• Personal/Family Preparedness
• Internal and External Risk and Crisis Communication Strategies
• Ethical Principles for Disasters and Public Health Emergencies
• Legal Principles for Disasters and Public Health Emergencies
• Individual and Community Recovery
Phase II

• National survey of Deans of BSN programs
  – Are BSN programs teaching a competency-based disaster curriculum?
  – How is it being taught?
    • Stand alone modules?
    • Integrated into standard curriculum?

• How closely aligned is the curriculum with CDC-TIIDE DMPH competencies?
Phase II – Conclusions

• Progress has been made
• Gaps:
  – Prioritization of disaster education
  – Adoption of disaster competencies into BSN curricula
Development of Disaster Response Outcomes for the BSN Program

• Review of NURS 405 Community course content related to Emergency Preparedness and Disaster Management

• Comparison of the content with the NCLEX Test Plan, AACN Baccalaureate Essentials and Core Competencies for Disaster Medicine and Public Health.
Process Development

• Developed Objectives for the theoretical component, Evacuation Table-Top Exercise and Simulation activity

• Related objectives to the Core Competencies for the DMPH, AACN Essentials and NCLEX Test Plan
Part I:
Table Top Exercise – Evacuation of a long-term care facility

- Provided students with the opportunity to discuss the emergency operations process prior to participating in a simulated mass-casualty incident.
- Provided the opportunity for students to apply theoretical principles learned
- Reading assignments
Process Development

Part II:
Mass-casualty disaster simulation – Explosion and Fire at a Long-Term Care facility

- Provided students with the opportunity to implement the Emergency Operations Plan of the Agency, perform triage, prioritization and management of clients, delegation, evacuation and recovery efforts.
Tabletop Exercise
Evacuation of a Long-term Care Facility

• Objectives:
  – Enhance theoretical objectives for disaster planning and response
  – Preparatory work for participation in a disaster simulation

• Participants
  – Senior level nursing students
  – Community Nursing course
Tabletop Exercise
Evacuation of a Long-term Care Facility

• Preparation
  – Objectives distributed to students prior to day of exercise
  – Assigned Readings
    • Savage, C.L., Kub, J.E., Groves, S.L., 2016. *Public Health Science and Nursing Practice: Caring for Populations*
Tabletop Exercise
Evacuation of a Long-term Care Facility

• Student prep Sheet:
  – Goals
  – Ground rules
  – Explanation of the exercise
• Emergency Operations Plan for the Facility
• Patient Census
• Scenario and Question Sheets
• Instructor Evaluation
Multiple Casualty Incident Long-Term Care Facility Simulation

• Purpose: Provide students with the opportunity to implement the emergency response plan of the agency

• Performance Expectations:
  – Effective Communication
  – Delegation and prioritization
  – Implementation of triage procedures
  – Interventions
  – Uphold legal practices related to mandatory evacuation
  – Evaluation
  – Recovery efforts
Multiple Casualty Incident
Long-Term Care Facility Simulation

• Location
  – Nursing Skills Lab
• Preparation
• Participants:
  – Senior level nursing students
  – Nursing Faculty
• Role playing
  – Students and faculty
• Observers
  – Nursing Faculty
• Debriefing
• Evaluation
Multiple Casualty Incident
Long-Term Care Facility Simulation
Multiple Casualty Incident
Long-Term Care Facility Simulation
Multiple Casualty Incident
Long-Term Care Facility Simulation
SURVEY RESULTS
Disaster Planning and Simulation Activity Evaluation

- **Theory Evaluation (Item 1, M=3.86)**
  - Theory content prepared me for table top and simulation activities (64.3%)

- **Table Top Evaluation (Items 2-5, M=3.71)**
  - Understood
    - Evacuation process (57.2%)
    - Importance of teamwork and communication (71.5%)
    - Nursing roles (64.3%)
    - Preparation and prioritization (57.2%)

⚠️ Percentages reflect those who selected “Strongly Agree” or “Agree”
Disaster Planning and Simulation Activity Evaluation

• Disaster Simulation Evaluation (Items 6-12, M=4.04)
  – Felt prepared (items 6 & 11-12, m=3.60)
    • by pre-simulation activities (42.8%)
    • to plan drills and activities (64.3%)
    • participate in a real disaster and assume the appropriate nursing role (42.8%)

  – Understood (items 7-10, m=4.38)
    • nursing roles (92.9%)
    • use of clinical judgement and decision-making skills (92.8%)
    • importance of collaboration (100%)
    • how to implement an emergency response plan (92.8%)
Educational Practices Questionnaire (Student Version)

• Active Learning
  – Items 1-10
  – Perception of learning through the process of simulation

• Collaboration
  – Items 11-12
  – Perception of opportunity to work with peers during simulation

• Diverse Ways of Learning
  – Items 13-14
  – Perception of simulation offering a variety of ways to learn and assess learning

• High Expectations
  – Items 15-16
  – Perception of clear objectives set and communicated
Educational Practices Questionnaire (Student Version)

Mean Scores by Subsection

- **Active Learning**
  - Assessment: 3.8
  - Importance: 4.1

- **Collaboration**
  - Assessment: 4.6
  - Importance: 4.5

- **Diverse Ways of Learning**
  - Assessment: 4.1
  - Importance: 4.2

- **High Expectations**
  - Assessment: 3.9
  - Importance: 4.4

HPSN World 2017
Practice with a Purpose
The Simulation Design Scale (Student Version)

• Objectives and Information
  – Items 1-5
  – Enough information provided in a clear manner to promote understanding

• Support
  – Items 6-9
  – Need for assistance identified and support provided

• Problem Solving
  – Items 10-14
  – Independence encouraged and did design support opportunities to utilize skills

• Feedback/Guided Reflection
  – Items 15-18
  – Constructive feedback was given in a timely manner to build knowledge

• Fidelity (Realism)
  – Items 19-20
  – Scenario resembled real life with real life factors, situations, and variables built in.
Simulation Design Scale (Student Version)

Mean Scores by Subsection

- Objectives and Information
- Support
- Problem Solving
- Feedback/Guided Reflection
- Fidelity (Realism)

Assessment
Importance
Student Satisfaction and Self-confidence in Learning

- **Satisfaction with Current Learning (Items 1-5, M=4.43)**

  - Methods were helpful and effective (100%)
  
  - Materials and activities were provided to promote learning the curriculum (100%)
  
  - Enjoyed how the instructor taught the simulation (92.9%)*
  
  - Materials were motivating and helpful (100%)
  
  - Taught the simulation suitable to the way the student learns (92.9%)*
Student Satisfaction and Self-confidence in Learning

• Self-confidence in Learning (Items 6-13, M=4.23)

  • Mastering the content of the simulation (50%)*
  • Simulation activities covered material necessary for the mastery of the curriculum (85.8%)*
  • Developing skills and obtaining knowledge applicable to clinical (85.7%)*
  • Helpful resources were used (92.8%)*
  • Learning is my responsibility as a student (78.5%)*
  • Knowing how to get help when not understanding (100%)*
  • Knowing how to use activities to learn (100%)*
  • Telling me what I need to learn is the instructor’s responsibility (64.3%)*
Discussion

• Students perceived a difference between understanding and feeling prepared.

• Students viewed opportunities to collaborate as the most important aspect of educational practices.

• Students perceived fidelity as the most important aspect of simulation design.

• Students report high levels of confidence related to learning materials being helpful and effective.
Discussion

• Students are confident that activities cover content necessary to expand their knowledge and skill set.

• Students are less confident when asked about mastery of content.
Tabletop Exercise
Limitations

• Need for expanded preparation

• Need for more detailed explanation of exercise expectations

• Time
Disaster Simulation
Limitations

• Space
• Time
• Lack of experience with multi-patient simulations
• All students did not participate in the professional roles
Tabletop Exercise
Considerations/Recommendations

• Team responsibilities/decision making
• Patient evacuation/transportation needs
• Participation levels
  – Collaboration
  – Acting together
  – Contribution to the process
  – Preparation
Disaster Simulations
Considerations/Recommendations

• Develop a Inter-professional Community Based Simulation experience
• Increase multi-patient simulations
• Increase the use of standardized patients
• Short and long term evaluation of effectiveness
• Incorporate Junior level nursing students as patients
References


Thank you for your attention!

Any questions?
Contact Information

Regina Barr MSN RN
814-472-3146
rbarr@francis.edu

Cindy Drenning MSN CRNP
814-472-3182
cdrenning@francis.edu

Nickole George PhD RN
814-472-3183
ngeorge@francis.edu

Brenda Guzic MHSc MA BSW RN
814-472-3273
bguzic@francis.edu