A Model for Emerging Infectious Disease/Disaster Preparedness Training for Nursing Students

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UNIVERSITY OF MIAMI

A MODEL FOR EMERGING INFECTIOUS DISEASE / DISASTER PREPAREDNESS TRAINING FOR NURSING STUDENTS

By

Susana Barroso

A DISSERTATION

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A MODEL FOR EMERGING INFECTIOUS DISEASE/DISASTER PREPAREDNESS TRAINING FOR NURSING STUDENTS

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Disasters can occur due to natural events or environmental accidents, or they can be purposeful and man-made. Regardless of how they occur, disasters place extraordinary stresses on society’s ability to deal with the catastrophic effects. Given the prevalence of disasters and infectious disease pandemics, there is an urgent need to improve education of healthcare providers. Because nurses comprise the largest percentage of healthcare providers and are early disaster responders, disaster preparedness is critical.

Some studies have shown that an education gap exists between nursing school curricula and the expectations of nurses and nursing faculty with regard to disaster preparedness. While nursing students have traditionally received community health content related to natural disasters, there is an increasing concern among nursing faculty that students are not adequately trained to respond in the event of a disaster. Nursing students and nurses report not having the necessary knowledge and skills needed to respond to a disaster and unwillingness to respond to disasters. Through secondary analysis, the purpose of this study was to explore the relationship between current disaster preparedness education and training, and the associated changes in nursing student knowledge, perceptions, and skills acquisition through quantitative and qualitative analysis. Secondary data analysis of the Ebola Disaster Simulation Exercise Training was conducted employing independent samples t-test. Mixed analysis of
variance (ANOVA) was employed to analyze data obtained from the Zombie Apocalypse Point-of-Distribution Disaster Exercise. Analysis of The Ebola Focus Group study was conducted employing content analysis. While both the accelerated option and traditional nursing students reported an increase in knowledge and skills acquisition, only the accelerated option group had a statistically significant increase in willingness to respond. Through content analysis the major themes “Purpose”, “Realism”, “Incentive/Motivation”, and “Vulnerability/Empowerment” were determined to impact the students’ perceptions of the benefits and limitations of the disaster exercises.

Based on these findings, a preliminary model will be refined focusing on a step-wise instructional delivery method combining didactic content and hands-on learning. As nurse researchers, faculty members, and patient and community advocates, we are called upon to educate our future nurses in disaster preparedness and response. The results of this study provide a springboard for the development of an educational model for disaster preparedness education.
Sab, you are and always will be my greatest accomplishment. Thank you for choosing me. I love you through all times and spaces.
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Chapter 1

Introduction

Disasters can occur due to natural events or environmental accidents, or they can be purposeful and man-made. Natural events include earthquakes, floods, hurricanes, tornados, wildfires, droughts, tsunamis, infectious disease outbreaks and temperature extremes. Environmental accidents include oil spills, oil fires, chemical spills, and nuclear and radiation accidents. Man-made disasters include nuclear, biological and chemical terrorism; fire; explosions; transportation accidents; and acts of war. Whether natural or man-made, disasters will require: 1) effective management in response to resulting injury, death, and damage to property; 2) successful and coordinated response at the local, state, and federal levels; 3) dispersal of victims to different health care facilities; 4) evacuation and shelter for individuals, families, and communities; and 5) increased security and curfews for crime control (Patillo, 2003). Regardless of how they occur, disasters place extraordinary stresses on society’s ability to deal with the catastrophic effects. Due to global instabilities, such as mass shifts in populations, political and civil strife, economic decay and climate change, disasters and the number of people affected by them are increasing in number (Veenema, 2012; World Health Organization [WHO], 2010). Superstorm Sandy was the second-costliest weather disaster in American history with an economic loss of $67 billion and 159 fatalities (National Oceanic and Atmospheric Administration [NOAA], n.d.). It has been estimated that an influenza pandemic could infect approximately 90 million individuals, require the need for 45 million additional outpatient visits to healthcare agencies and 865,000 to 9,900,000 hospitalizations, result in 89,000 to 207,000 deaths, and cost between $71 and $166
billion in the United States alone (Matheny, Toner, & Waldhorn, 2007; Metzer, Cox, & Fukuda, 1999). Globally, an average of one disaster per week requires international assistance. In the United States, declared disasters have averaged 43 per year since 1976 (Federal Emergency Management Agency [FEMA], 2015).

In the aftermath of the terrorist attacks against the U.S. on September 11, 2001, President Bush combined FEMA along with 22 other agencies into the newly formed Department of Homeland Security (DHS). The Office of Emergency Response (OER), within the DHS, directs and manages the National Disaster Medical System (NDMS), which directs medical services and resources to local communities post-disaster (DHS, 2003; FEMA, 2009; Homeland Security Act, 2002). Disaster planning and management requires the cooperative efforts of agencies at the local, state, and federal levels with clearly defined lines of authority and accountability. The “National Response Framework” (NRF) is a guide to how the nation conducts an all-hazards response to disasters or Mass Casualty Incidents (MCI; FEMA, 2008a). This guide provides a national roadmap to guarantee adequate infrastructure, resources and communications are in place at all response levels (i.e., national, state and local).

**Disaster Response Requirements**

**Communication.** Communication can be defined as a process of exchanging information between individuals through a shared system of symbols, signs, or behavior (Merriam-Webster, 2015) and clear, dynamic, open communication is a necessary disaster response component. The communication flow in a disaster response between local, state, and federal agencies typically begins at the local level (DHS, 2008;
Veenema, 2003). The local agency, such as a hospital, will notify the local Office of Emergency Management (OEM) through the Emergency Support Function (ESF) system for the local and state level (FEMA, 2008b). Local OEMs and health departments communicate through the ESFs to the state OEM and State Health Department. The State Health Department communicates with the Governor’s Office. When the magnitude of a disaster exceeds local and state capabilities, the Governor will call upon the President of the United States, the State OEM will contact FEMA, and the State Health Department will communicate with the Department of Health and Human Services (DHHS) and the Centers for Disease Control and Prevention (CDC). The 1988 Stafford Act provides federal assistance to state and local governments during presidentially-declared disasters.

Communication issues, whether poor communication, lack of communication or miscommunication, are one of the most frequently cited problems during disaster response (Franco et al., 2006; Parmar, Arii, & Kayden, 2013; Rebmann, Carrico, & English, 2008; Stafford Act, 2008; Veenema, 2012).

**Resources.** The first response to a disaster occurs at the local level in the affected community. Disasters of mass casualty magnitude affect local hospitals of all sizes and geographic locations, testing hospital surge capacity (having adequate resources for managing a sudden increase in patients requiring acute medical care) and surge capability (having adequate specialized resources to treat specific patient groups such as trauma, burned or highly contagious patients) (Hick et al, 2004). When the community’s resources are depleted or overwhelmed during a disaster response, the local level then depends on assistance from the state and, possibly, the federal level (CDC, 2011). Cyganik (2003) reported that an analysis of disaster plans by the Emergency
Preparedness Committee, after September 11, 2001, revealed that local agencies and health care facilities need a strong framework that can function independently until state and federal resources arrive (CDC, 2011; FEMA, 2009; Homeland Security Act, 2002; Pandemic and All-Hazards Preparedness Act, 2006).

**Procedures.** Although efforts to improve national preparedness have been made, such as the formation and reorganization of many agencies and an increase in federal funding, the burden of producing a timely response to an event is critically dependent on resources at the local level (Wetter, Daniell, & Treser, 2001). At the local level, hospitals and health agencies have disaster policies and procedures in place which have changed over the decades. Prior to 1996, disaster preparedness concentrated on an agent-specific disaster plan focusing on the most likely threats based on geographic location. The 1996 publication of the “Guide for All-Hazard Emergency Operations Planning” by FEMA signaled a paradigm shift from a concrete, scenario-based emergency management perspective to a focus on the common response elements across emergency events (FEMA, 1996). This paradigm shift brought to light the unpreparedness of medical facilities with the management of disasters that were infrequent and unpredictable. For example, Totenhofer and Kierce (1999) reported that emergency departments were ill-prepared to deal with chemical disasters because few disaster plans included a comprehensive decontamination component. In addition, deficient plans were found concerning adequate personal protective equipment, and isolation and decontamination education. Wetter et al. (2001) examined hospital preparedness for incidents involving chemical or biological weapons by surveying 224 hospital emergency departments in four northwestern states. Findings indicated large deficiencies in local hospital
preparedness. Less than 20% of hospital facilities had plans for biological or chemical weapons incidents, and most reported insufficient physical resources such as decontamination showers, isolated ventilated units, and self-contained breathing apparatuses. Results found that there was a tremendous gap between federal efforts and the level of preparedness for individual hospitals. Furthermore, healthcare facilities were found to be poorly equipped to handle infectious disease pandemics.

**Infectious Diseases**

After a period of optimism during the 1960s and 1970s due to medical and pharmaceutical advances treating infectious diseases, infectious disease containment and treatment continues to be a global concern. Since 1980, approximately one to three new human infectious diseases have been identified each year (e.g., Middle East Respiratory Virus), others have re-emerged causing greater numbers of cases than before (e.g., Ebola), and still others have developed resistance to available treatments (e.g., multi-drug resistant tuberculosis; Kaiser Family Foundation, 2014). According to Jones et al. (2008), the spread of infectious disease is a worldwide concern causing over 1500 deaths every 60 minutes. There is a resurgence of old epidemics such as tuberculosis, malaria, and measles, and there are newly emerging diseases, such as West Nile Virus, Ebola, and severe acute respiratory syndrome (SARS). In addition, for the past 3 decades AIDS has killed or debilitated millions of people (Zaba, Whiteside, & Boerma, 2004). Studies find that as the population continues to grow and with increasing international travel, the spread of infectious disease is becoming a global issue (Chen & Wilson, 2008; Cliff & Haggett, 2004; Knobler, Mahmoud, Lemon & Pray, 2006).
Between 1950 and 2010, the world population grew from 2.5 billion to over 7 billion (United States Census Bureau, 2010; Chen, & Wilson, 2008). During the same time, the number of international tourists increased from approximately 25 million to 135 million worldwide (Chen & Wilson, 2008; Cliff & Haggett, 2004). Increasing travel is expected to continue with a tenfold increase occurring with every generation (Haggett, 1994). This increasingly dynamic global mobility of individuals and microorganisms has powerfully reshaped infectious diseases and made local and national public health emergencies almost instantaneously assume global dimensions (Knobler et al., 2006). The pandemic effect from increasing global mobility of humans can be exemplified by historical outbreaks (e.g., influenza). Both the first spring wave of the H1N11918–1919 influenza pandemic and the 1957 H2N3 influenza virus pandemic took approximately 6 months to spread throughout the world (Tatem, Rogers, & Hay, 2006; Taubenberger, & Morens, 2006). In contrast, the 2009 pandemic H1N1 influenza strain spread worldwide in six weeks (Warren, Bell, & Budd, 2010). It is estimated that the 1918 influenza virus would require only 4 days to spread around the world today (Frenk, Gomez-Dantes, & Knaul, 2011). Another pandemic exemplifying spread through infectious travelers is the SARS coronavirus which spread from East Asia to North America and Europe within a few days and infected over 8000 people on five continents within a few weeks (Ali, & Keil, 2006; Tatem et al., 2006; Toner et al., 2011).
Infectious Disease Surveillance and Emergency Response

Similar to disaster preparedness, the U.S. approach to infectious disease surveillance has been largely decentralized (Fairchild, Bayer & Colgrove, 2007). Throughout the latter decades of the 19th century, while city and state boards of health were established, there were no national entities focused on disease surveillance and control. However, this began to change with the large influx of immigrants at the end of the century. Robert Koch’s work in bacteriology and the acceptance of the germ theory provided a push toward a more centralized and coordinated approach to infectious disease control. Consequently, The National Institutes of Health (NIH) was created in 1930 and the formation of the CDC followed in 1946. The NIH received significant financial and political support and experienced a period of rapid growth. The CDC did not establish itself as a central institution until the 1950’s, after its response to poliomyelitis and influenza outbreaks. Currently, the CDC assumes the principal role in federal communicable disease control efforts. However, even after the establishment of the NIH and CDC, protection of the public’s health remains within the purview of state and local health departments.

U.S. infectious disease data collection is a systematic process. In 1961, the CDC assumed responsibility for the collection and publication of data on nationally notifiable diseases. A notifiable disease is one for which regular, frequent and timely information regarding individual cases is considered necessary for the prevention and control of the disease (CDC, 2014). Healthcare providers, hospitals, laboratories and other public health reporters are required to report cases of nationally notifiable diseases (e.g., Anthrax, Pertussis, Tuberculosis, West Nile Virus) and conditions to local, county, state, or other
terриториal public health authorities (CDC, 2014). However, surveillance activities vary from state to state. Such variations have been attributed to state and local differences in surveillance resources and infrastructure, in terms of financial, technological and human capital, with voluntary reporting of nationally notifiable diseases directly tied to funding opportunities (Steinhardt, 1999). The CDC's Office of Public Health Preparedness and Response, Division of State and Local Readiness, administers funds for preparedness activities to state and local public health systems through the Public Health Emergency Preparedness (PHEP) cooperative agreement (Richmond, Hostler, Leeman, & King, 2010).

Since 2002, the PHEP cooperative agreement has provided nearly $9 billion to public health departments across the nation to enhance their ability to effectively respond to a range of public health threats, including infectious diseases, natural disasters, and biological, chemical, nuclear, and radiological events (CDC, 2015). In response to the 2001 terrorist attacks, which included the release of anthrax spores through the U.S. mail, the federal government instructed the CDC to develop and implement an emergency preparedness plan to respond to a bioterrorism incident or infectious disease outbreak (DHHS, 2001). One component of this plan was the development of the Strategic National Stockpile (SNS) program. The SNS is a system in which large quantities of medical supplies and medications have been gathered and are strategically warehoused across the country by the federal government. The SNS program would enable the dispersion of stockpiled medications and supplies to any region in the United States within 12 hours of a public health emergency that is severe enough to deplete local resources (DHHS, 2001). Another component of the CDC emergency preparedness plan
is the Cities Readiness Initiative (CRI), which is a federally funded effort to assist major
U.S. cities and metropolitan areas to dispense antibiotics to their entire identified
population within 48 hours of the decision to do so (CDC, 2004). Even with the federal
financial commitment, the current U.S. healthcare system remains unprepared for a major
infectious disease or bioterrorism event. Rebmann et al. (2007) reported that hospitals in
the U.S. lack the negative pressure rooms, trained healthcare workers, medical equipment
and supplies needed to handle a large influx of patients after a bioterrorism attack or
emerging infectious disease outbreak.

Nursing and Emergency Response

With the increased occurrence of natural and man-made disasters in our changing
world, there is a much greater likelihood that nurses in all specialty areas will be called
upon to assist in the case of a disaster. Since nurses make up the largest portion of the
healthcare workforce in the United States (Halpern & Chaffee, 2005), disaster knowledge
has become increasingly important to the practice of all nurses. The current knowledge
base of nurses related to disaster preparedness is somewhat limited, both in educational
preparation and clinical practice sites (Veenema, 2012). Although both the American
Association of Colleges of Nursing (AACN) and the American Nurses Association
(ANA) recommend appropriate basic education and continued education for all nurses in
emergency preparedness, neither group defines content.

The AACN defines a professional nurse as being a baccalaureate-prepared
graduate who can provide holistic care to clients from diverse cultural backgrounds,
practice independently within the domains of nursing practice roles, collaborate with
other health team members, and act responsibly in the event of a disaster (AACN, 2008). The ANA publication “Who Will be There? Ethics, the Law and a Nurse’s Duty to Respond in a Disaster” explores the nurses’ professional response to a disaster (ANA, 2010). In this document the ANA discusses the unresolved legal, ethical and professional considerations in responding to a disaster. Highlighted issues include the nurse’s duty to respond, the use of crisis standards of care and the legal and ethical impact of these standards, and the identification of potential safety hazards and the potential for physical and emotional harm. While nursing students have traditionally received community health content related to natural disasters, it is still unclear to what extent they have received education related to man-made disasters. Nursing faculty are increasingly concerned about the need to educate students about disaster preparedness and response (Patillo, 2003; Sanders, Frisch & Wing, 2005; Steed, Howe, & Pruit, 2004).

**Definition of Terms**

Terms pertinent to this study are disaster, mass casualty incident and disaster preparedness.

**Disaster.** A disaster can be defined in several ways: 1) ecological emergencies that result in deaths, illnesses, injuries and destruction of property that cannot be effectively managed using routine resources and require outside assistance (Landesman et al., 2001); 2) occurrences that cause damage, ecological disruption, loss of human life, or deterioration of health and health services on a scale sufficient to warrant an extraordinary response from outside the affected community area (Hurricane Katrina, Japan earthquake and tsunami of 2011, Nepal earthquake of 2015; WHO, 2002); 3)
Natural or man-made phenomena that result in the destruction or dysfunction of the available response infrastructure to meet the community’s need for healthcare (e.g., Chernobyl nuclear explosion, Bhopal disaster, Haiti earthquake, Superstorm Sandy; FEMA, 1996).

**Mass casualty incident.** Mass casualty incident is defined as an influx of patients from a single incident that exceeds the capacity of the Emergency Health Services System (WHO, 2007). According to the American College of Emergency Physicians (2001), mass casualty incidents can be man-made or naturally occurring, and the resulting injuries or illnesses can overwhelm the local or regional Emergency Management System and hospital capabilities. Unlike disasters, mass casualty incidents do not destroy or cause the dysfunction of the available health system infrastructure; they simply overwhelm the system. Veenema (2012) uses the terms disaster and mass casualty incident interchangeably, but states this difference should be noted.

**Disaster preparedness.** Disaster preparedness is defined as an iterative process which includes planning, organizing, training, equipping, exercising, evaluating, and taking corrective action in an effort to guarantee effective coordination during incident response (FEMA, 2010). This cycle is one component of a larger national preparedness system to prevent, respond to, and recover from natural disasters, acts of terrorism, and other disasters. Disaster preparedness addresses the problems posed by multiple events including MCIs, earthquake damage, acts of terrorism, and armed conflicts (Cummings & Stikova, 2007).
Statement of the Problem

Prior to September 11, 2001, nurses consistently responded to emergency situations: however, few received formal education in the areas of emergency preparedness or disaster response. The International Nursing Coalition for Mass Casualty Education (INCMCE, 2003) convened prior to the September 11 attacks and included organizational representatives of schools of nursing, nursing accrediting bodies, nursing specialty organizations, and governmental agencies, to promote mass casualty education for nurses. The INCMCE defined a mass casualty incident (MCI) as:

any single event caused by natural forces, by the physical failure of machinery or infrastructure systems or by the conduct of people that results in a significant disruption to the health and safety of the community or segment thereof, or to the nation and that results or is likely to result in numbers or acuity that initially exceeds the day-to-day operational capability of the local response community and healthcare system (INCMCE, 2003, p. 5).

INCMCE advocated for the knowledge and skills required of all nurses to effectively respond to a MCI. The INCMCE was charged with defining MCI core competencies, core knowledge, and professional role development. Again in 2002, the ANA House of Delegates again addressed the issue of nursing preparedness for weapons of mass destruction events and produced an Action Report entitled, “The Nursing Profession and Disaster Preparedness” (Gaffke, 2002). The report discussed nurses’ long history of responding to emergencies even without education and training. This delegation emphasized the need for appropriate education and continued training
regarding patient care and safety, personal safety, and suitable organizational responses to provide safe, effective, quality care during disasters (Gaffke, 2002). The delegation highlighted the challenges of providing the necessary training (Gaffke, 2002). In response to the ANA recommendations, the INCMCE conducted a review of disaster preparedness curricula that were taught in nursing schools across the United States. Several barriers that prevented the integration of disaster preparedness content into the curricula were identified and included demanding curricula with little opportunity to add new content, insufficient disaster course content, and inadequately prepared nursing faculty (Weiner, Irwin, Trangenstein, & Gordon, 2005).

It is accepted that disasters will result in mass injury or illness that will exceed the number of healthcare workers able to supply care. The majority of nurses will be unprepared and/or unwilling to respond because of a lack of knowledge or skills (Chaffee, Conway- Welch, & Sabatier, 2003; Hilton & Allison, 2004). In order to increase nurses’ abilities to safely, effectively and appropriately respond to disaster, there is a need to address knowledge and skill deficits at the pre-licensure level.

**Background of this Study**

**First training: Ebola disaster preparedness simulation exercise.** In response to the fall 2014 events surrounding the Ebola outbreak and the call to better educate and train nurses entering the workforce lead faculty for the School of Nursing and Health Studies population-focused nursing course and simulation staff developed an Ebola disaster simulation exercise. Exercise content was developed using Homeland Security’s Exercise and Evaluation Program methodology, and the CDC and the Florida Department
of Health guidelines to dispel fears, correct misinformation regarding Ebola, provide hands-on training with personal protective equipment (PPE), disaster preparedness, and response principles. The disaster simulation was designed as a five-step method of instruction consisting of a didactic lecture, drills and a final functional disaster exercise-based simulation. Senior baccalaureate degree nursing students (n=160): 50 traditional first semester senior nursing students enrolled in NUR411, 56 accelerated first semester senior nursing students enrolled in NUR308, and 54 accelerated final semester senior nursing students enrolled in NUR440 participated in the exercise (Appendices A & B for characteristics of accelerated option and traditional option students, and nursing course descriptions). First, students received a didactic lecture on the epidemiology of the West Africa Ebola outbreak, epidemiology of the U.S. Ebola patients, signs and symptoms of Ebola, and the infectious disease protocols for healthcare workers as recommended by CDC. Second, students were provided with self-study guides explaining donning and doffing procedures for PPE and educational materials on the recognition and treatment of Ebola. Third, take-home packets of PPE and links to educational videos were provided to reinforce donning and doffing procedures and techniques. Students were instructed to practice the techniques through self-study. The students were then drilled on their donning and doffing techniques during post-conference at their clinical sites with clinical instructors. The final step was participation in a functional disaster exercise-based simulation (i.e., Ebola Disaster Simulation Training).

The School of Nursing and Health Studies became a local hospital during a massive Ebola outbreak and a declared “state of emergency.” Nursing students played the roles of emergency room nurses in the simulated emergency department. Nursing
students were required to screen, triage and treat suspected Ebola patients, don and doff PPE, and employ infection control practices while caring for the simulated Ebola-infected patients and “worried well” patients. Students also received and admitted simulated Ebola patients arriving via Fire Rescue. Fire Rescue collaborated with the school and practiced their own transportation, donning and doffing, and decontamination plans.

Evaluation of the training consisted pre-and post-simulation training surveys (Appendices C & D for Ebola pre-simulation evaluation and Ebola post-simulation evaluation). The surveys aimed to assess 1) changes in knowledge among nursing students concerning the public health impact of an Ebola outbreak; 2) changes in willingness to respond to an Ebola outbreak; and 3) changes in the perceived importance of psychological support during and after a response to an Ebola outbreak. Prior to receiving any didactic content and immediately after the simulation, the students completed the eight item Ebola Disaster Simulation Evaluation survey. Demographic data was collected as part of the pre-simulation survey and included program of study, participant’s age and gender. Additional questions included previous work experience as a healthcare provider or first provider and identification of the previous profession. Pre- and post-simulation surveys were not linked. The 5-point Likert-like scale was used to measure changes in 1) knowledge about the potential of the public health impact of Ebola; 2) confidence about being safe in the nursing role when caring for an Ebola patient; 3) confidence that the health department would provide them with timely updates on the information needed to care for an Ebola patient; 4) confidence in addressing the Ebola related questions of a concerned member of the public; 5) perception of the importance of the role they would play in their agency’s overall response; 6) perception
of the value of receiving pre-Ebola outbreak training; 7) perception of the value of having psychological support available during a response to an Ebola outbreak; and 8) perception of the value of having psychological support available after a response to an Ebola outbreak (Appendix C). The post-simulation survey also included three open-ended questions evaluating participant’s feelings about the simulation exercise (Appendix D).

**Focus groups: an exploration of nursing student perspectives on the benefits and limitations of disaster exercise simulation training.** Following the Ebola disaster simulation exercise training it was determined that more information was needed to explore the rationale for why student knowledge and perception changed as a result of the disaster simulation. A focus group approach was chosen to explore nursing students’ perceptions of their experience. The study aimed to assess 1) the disaster simulation aspects that best facilitated the application of didactic disaster nursing concepts and skills; 2) the disaster simulation aspects that provided the least benefit in applying didactic disaster nursing concepts and skills and; 3) the extent of perceived stress response experienced from the simulation exercise and how this stress response affected practice. Focus groups were conducted with all traditional and accelerated nursing students who participated in the *Ebola Disaster Simulation* during the fall of 2014. The participants for this study were selected using purposeful sampling. A target group of 11 focus groups (six accelerated option senior nursing student focus groups and 5 traditional option senior nursing student groups) were conducted. Each focus group consisted of 10-12 students distributed by their assigned clinical groups for the NUR453 Role Transition course and lasted one hour. Demographic data was collected and included date of the focus group, focus group number, participant’s age and program of study (Appendix E
for focus group demographic data). Focus Group data was collected through semi-structured interviews using open-ended questions (Appendix F for focus group questions) and the focus groups were audiotaped.

**Second training: zombie apocalypse point of distribution (POD) disaster.** In response to the continued need for education and training in disaster preparedness and response, a second disaster exercise was developed by key personnel at the School of Nursing and Health Studies and members of the University Office of Emergency Management. Once again, exercise content was developed using Homeland Security’s Exercise and Evaluation Program methodology, the infectious disease protocols for healthcare workers and the Public Health Preparedness Capabilities for state and local public health preparedness recommended by the CDC. A point of dispensing (POD) site is a location designed to provide medications, vaccines, or medical supplies to a large community of healthy people during a health emergency (CDC, 2001). The goal of the POD sites is to provide prophylactic medications/vaccines to a large number of healthy people in a short period of time in order to decrease illness and prevent death. The POD disaster simulation was designed as a three-step method of instruction consisting of a didactic lecture, role-play and a final functional disaster exercise-based simulation. The aims of the study included to: 1) assess changes in knowledge among nursing students concerning a POD layout in a simulated disaster; 2) assess changes in knowledge among nursing students concerning the staffing roles for dispensing medication in a POD setting; 3) assess changes in knowledge among nursing students concerning complying with appropriate reporting procedures for adverse events that occur during the POD exercise simulation; 4) relate accurate health education to simulated person(s) in a POD setting,
keeping in mind health literacy and cultural competency; 5) assess changes in knowledge among nursing students concerning the use of therapeutic communication to diffuse stress experienced by simulated person(s) during the POD exercise simulation; 6) assess changes in knowledge among nursing students concerning interdisciplinary communication with key personnel in the POD setting and; 7) assess changes in knowledge among nursing students concerning the identification of simulated person(s) experiencing stress/anxiety during the POD exercise simulation and make appropriate referrals for mental health when needed.

Senior baccalaureate degree nursing students (n=106): 50 traditional second semester senior nursing students and 56 accelerated second semester senior nursing students participated in the exercise. First, students received a didactic lecture on the importance of disaster simulation, epidemiology of disasters, the operation of PODs and the infectious disease protocols for healthcare workers recommended by CDC. Second, students engaged in a role-playing exercise where they staffed and operated a POD in response to a biological terrorist attack. Finally, students assumed different nursing roles in a disaster simulation based on a large-scale biological terrorist attack. The simulation required that the nursing students staff and operate a POD, triage patients, dispense medications and transfer patients to acute care facilities.

Evaluation of the training consisted of pre-and post-simulation surveys. Prior to receiving any didactic content and one week after the simulation, the students completed the twenty-five item POD Simulation Evaluation survey. Demographic data was included as part of the pre-simulation survey. Pre-and post-simulation surveys were linked via a student-generated ID code consisting of the first two letters of the mother’s middle or
maiden name followed by the last four digits of the participant’s phone number.
Demographic data included the participant’s age, gender, ethnicity, language, and program of study (traditional or accelerated). Additional questions included previous work experience as a healthcare provider or first provider and identification of the previous profession, number of public health courses previously taken, and number of disaster preparedness related trainings previously attended. The 5-point Likert-like scale was used to measure changes in 1) knowledge of POD protocols, staffing, and griage (the first point of contact with a patient. Healthcare provider greets the patients, visually inspects for signs and symptoms of illness and, hands out screening forms) and triage principles (questions 1-6) ; 2) perception of the value of the disaster simulation and the availability of psychological support ( questions 7-12); 3) confidence with symptom recognition, infection control principles, and therapeutic communication principles (questions 13-22); 4) confidence in the ability to communicate effectively and complete nursing duties under the pressures of a disaster event (questions 23-25) (Appendix G for POD pre-simulation evaluation). The post-simulation survey also included four open-ended questions evaluating participant’s feelings about the simulation exercise (Appendix H for POD post-simulation evaluation).

**Significance of this Study**

Given the prevalence of disasters and infectious disease pandemics, there is an urgent need to improve the education of healthcare providers. Under current climate conditions, cholera, a highly contagious and lethal, water-borne pathogen, can thrive in all coastal regions on all continents (Escobar et al., 2015), facilitating a global outbreak. New Ebola cases continue to be reported in Liberia months after the country thought it
was rid of the virus (Hesman-Saey, 2015). Because nurses comprise the largest percentage of healthcare providers and are early disaster responders, disaster preparedness is critical. It is reasonable to assume that nurses must be educated about how to respond to these occurrences and care for these victims (Chaffee et al., 2003; Hilton & Allison, 2004). Existing research in disaster preparedness nursing education point out the challenges in determining the best teaching methods for delivering disaster preparedness content (Jose & Dufrene, 2013). Disaster curricula should prepare pre-licensure nursing students with generalist knowledge to respond to disasters when they enter practice. The School of Nursing and Health Studies faculty and staff incorporated Homeland Security’s Exercise and Evaluation Program disaster preparedness principles, CDC infection control guidelines, and a multi-method teaching approach in an effort to create serial training exercises that would expose students to the basic knowledge needed to safely, effectively and appropriately respond to disasters.

*Figure 2.* Witte’s Extended Parallel Process Model (1994)

**Extended Parallel Process Model**

**Message components.** In the healthcare arena, fear appeals (persuasive threat messages that evoke some level of fear) have been used successfully to spread various types of information to the general public. Fear appeals can be found in drinking and driving advertisements, AIDS awareness posters, seatbelt compliance laws, antismoking campaigns, antidrug messages, disaster preparedness campaigns and heart disease messages (Perloff, 2003). The Extended Parallel Process Model (EPPM; Witte, 1992) is the most recent fear appeal theory that attempts to explain when and why these
persuasive messages may work or fail (Witte, 1992, 1994, 1998; Witte & Allen, 2000). The EPPM addresses both the emotional and cognitive factors associated with message processing and relates these processes to a fear appeal’s success or failure (Witte, 1992, 1994). According to the main tenets of the EPPM, when an individual is exposed to a fear appeal, two cognitive appraisals of the message will occur; initially the individual will assess the threat, followed by assessment of the efficacy of the message’s suggested response to the threat (Witte, Meyer, & Martell, 2001).

**Message processing: susceptibility and severity.** Susceptibility and severity are two critical components during the assessment of the perceived threat and influence the individual’s response to the perceived threat. Perceived severity is the belief about the significance or the magnitude of the threat and the severity of the consequences (Witte, 1992). Perceived susceptibility is the belief about the probability of personally experiencing the threat (Witte, 1992). It is posited that the more severe an individual perceives the threat to be or the more susceptible they perceive they are to the threat, the more likely they are to move on to the second component (i.e., assessment of efficacy).

**Message processing: response efficacy and self-efficacy.** When assessing the efficacy of the message’s suggested response, the EPPM emphasizes two different types of efficacy: response efficacy and self-efficacy. Response efficacy pertains to beliefs about the effectiveness of the recommended response in deterring the threat (Witte, 1992). An individual needs to believe that the recommended action will deter or mitigate the threat. Self-efficacy is the second type of efficacy. Self-efficacy (Bandura, 1977) is a person’s perception of his or her ability to perform the recommended response to avert the threat. According to Bandura's theory, people who believe they can perform well
(e.g., high self-efficacy) are more likely to view difficult tasks as something to be mastered rather than something to be avoided (Bandura, 1977). Bandura (1977) states the four major sources of self-efficacy are mastery experiences; social modeling; social persuasion; and psychological responses. Mastery of experiences refers to an individual’s ability to successfully perform a task. Successfully performing a task increases self-efficacy (Bandura, 1977). Witnessing a peer successfully complete a task (e.g., Social Modeling) is another important source of self-efficacy (Bandura, 1977). Bandura (1977) also asserted that people could be persuaded to believe they have the skills and capabilities to successfully complete the task (e.g., Social Persuasion). Psychological responses are an individual’s own responses and emotional reactions to a situation. Moods, emotions, physical reactions and stress levels can all affect how an individual feels about their personal abilities in a specific situation. However, Bandura (1977) noted that it was not the intensity of the emotional or physical response but how an individual perceived and interpreted the response that was important to self-efficacy. If, when facing a challenging or difficult task, an individual could learn how to minimize stress and elevate mood, self-efficacy would increase (Bandura, 1977).

**Outcomes: protective motivation and defensive motivation.** Witte (1992) explains two opposite outcomes based on perceived threat and perceived efficacy. The outcomes associated with danger control processes are protective motivation. With protective motivation, the individuals are motivated to accept the message, adopt the recommended response and begin to protect themselves (Witte, 1992, 1994). During defensive motivation, the individual rejects the message and denies the existence of the threat (Witte, 1992, 1994).
**Outcomes: adaptive changes and maladaptive changes.** One important concept of the EPPM is the critical point that occurs when perceptions of the threat portion of a message begin to outweigh perceptions of the efficacy of the recommended response (Witte, 1992). Such perceptions will often cause individuals to shift from danger control responses (adaptive changes, e.g., a positive reaction to a threat such as following the recommended response), to fear control responses (maladaptive changes, e.g., letting emotions dominate the thought process or denying their own perceived susceptibility). This shift occurs when individuals start to believe that they cannot avoid a significant threat from happening or they cannot effectively respond to the threat (Witte, 1992, 1994; Witte et al., 2001).

**Process: danger control, fear control and no response.** Once the individual has assessed the threat and the efficacy of the response, the EPPM proposes three types of responses: danger control, fear control, and no response (Witte, 1992, 1994, 1998). When perceived threat and efficacy are high, individuals will follow the course of danger control, meaning they will focus cognitively on dealing with the threat and possible solutions to avert the threat. When perceived threat is high, but efficacy (self and/or response) is low, individuals will follow the course of fear control. In fear control, individuals will allow their emotions to guide their behavior and use maladaptive coping mechanisms to allay their fears, such as denial, reactance, or avoidance (Witte, 1992, 1994, 1998; Witte et al., 2001). When perceived threat and efficacy (self and/or response) are low, individuals will follow the course of no response (Witte, 1992, 1994, 1998; Witte et al., 2001). These individuals may not be aware a threat exists.
Study Purpose

Through secondary analysis, the primary aims of this study were to:

1) Explore nursing student perception of the effectiveness of the Ebola and Zombie Apocalypse disaster exercises in preparing them for real-world disasters.

2) Examine nursing student perception of the effectiveness of the Ebola and Zombie Apocalypse disaster exercises in preparing them to safely provide care for patients during a disaster or infectious disease pandemic.

3) Explore nursing student perception of their willingness to care for patients during an infectious disease pandemic after receiving training.

4) Develop a preliminary model for training nursing students in emerging infectious disease/disaster preparedness and response that will be tested in a future study.
Chapter 2

Literature Review

A literature search was conducted on three major electronic databases. The Biomedical databases used for this study were Ovid MEDLINE, PubMed, and the nursing database the Cumulative Index of Nursing and Allied Health Literature (CINAHL). The key terms included Disaster Preparedness, Disaster and nursing education, disaster response and nursing education, disaster education and competencies, and infectious disease pandemics and nursing education. The limiters of English language and published from 1984 through 2015 were used. The literature review is organized into the following sections: infectious disease pandemics, Acquired Immune Deficiency Syndrome (AIDS), Ebola, disaster preparedness, disaster preparedness and nursing, disaster preparedness competencies, Extended Parallel Process Model and the Ebola outbreak, and secondary analysis.

Infectious Disease Pandemics

The events of September 11\textsuperscript{th} and the anthrax scares that followed, the continuing AIDS epidemic, the H1N1 outbreaks, the most recent Ebola outbreak, increasing global mobility, and ease of travel have shown that anything that once happened “over there” can just as easily happen “over here” (Chen, & Wilson, 2008; Cliff, & Haggett, 2004; Escobar et al., 2015; Haggett, 1994). Nurses need to be prepared not for the “if” but the “when” of an infectious disease pandemic.

In 2008, the Association of Community Health Nursing Educators (ACHNE) recommended that all nurses have basic competencies for responding to disasters (Kuntz,
Frable, Qureshi, & Strong, 2008). Basic essential curricular content for public health disaster preparedness should include competencies for disaster assessment, planning, implementing interventions, and evaluation of process and outcomes. Competencies include recognition of uncommon presentations of common diseases, common presentations of uncommon diseases, and emerging patterns or clusters of unusual signs and symptoms of illness or injury that may be related to a terrorist event or an emergent infectious disease. Additional competencies included the ability to implement population-based care interventions, manage stress and anxiety during emergency events, and initiate appropriate infection control measures (ACHNE, 2008). However, Rebmann et al. (2008) identified gaps in disaster preparedness from past disasters that included infection prevention and control in MCIs. The focus group participants, were primarily infection control and public health nurses, and indicated that one of the most difficult aspects of disaster response was assessing and identifying uncommon diseases or conditions. These findings indicate that although the ACHNE competencies include recognition of uncommon diseases, education is still lacking.

**Acquired Immune Deficiency Syndrome (AIDS)**

On June 5, 1981 the CDC published a report describing the first five cases of an atypical presentation of *Pneumocystis carinii pneumonia* (CDC, 1981). This was the first published report about an illness that would become known as AIDS. By the end of 1981, 75% of the cases being reported to the CDC were in California or New York and all but one case were men. Within six months of the published report, it became clear that a new, highly concentrated epidemic of a life-threatening illness was occurring in the U.S. (CDC, 1981). The original case definition for this new disease, created for the purposes
of surveillance and investigation, was released by the CDC in 1982 (CDC, 1982). This case definition was modified three times before it became the case definition we now recognize as AIDS (CDC, 1985, 1987, 1993). During the initial year, after the first patients were identified with what was at the time called the “gay plague” or a “Haitian problem,” the disease received minimal attention from mainstream media, the public, and politicians (Shilts, 1987). By the end of 1982, AIDS cases were diagnosed among heterosexuals, injection drug users, transfusion recipients, hemophiliacs and newborn infants, and the virus was identified as a blood-borne infection (CDC, 1982). The press labeled AIDS a disease of the “four H club” - homosexuals, heroin addicts, hemophiliacs and Haitians - even though cases had been reported that did not fall into these groups (Grmek, 1990). Indifference turned into serious concern and panic (Shilts, 1987).

Locally, press accounts from the 1980’s included reports of people with AIDS and people suspected of having AIDS being evicted from their homes, fired from their jobs, and shunned by family and friends (Altman, 1986; Clendinen, 1983; Herek & Capitano, 1993). Misunderstanding of AIDS occurred at the national level. On September 17, 1985 President Reagan publicly mentioned AIDS for the first time (Shilts, 1987). President Reagan refused to advocate for safer sex and condom use, choosing instead to press for a ban on HIV-positive immigrants entering the country. Later, sexual abstinence was recommended as a primary method for preventing the epidemic (Shilts, 1987).

Misinformation about HIV transmission was being reported, which increased public concern and panic (Shiltz, 1987). For example, two physicians from Florida incorrectly hypothesized that the high prevalence of AIDS in a small town in southern Florida was
the result of mosquito transmission of HIV (Whiteside, Withum, Tavris, & McCleod, 1985).

During the 1980s, many individuals caring for AIDS patients were concerned about their own safety and some healthcare workers refused to care for these patients. Blumenfield et al. (1987) reported that 50% of the nurses surveyed in a large medical center in New York State indicated they would request a transfer to work on another floor if they were regularly scheduled to work with AIDS patients, and 85% believed that pregnant nurses should not care for AIDS patients. These findings indicated that healthcare workers (HCWs) were worried about becoming infected with the AIDS virus while caring for AIDS patients.

In November, 1982, the CDC issued guidelines based on those previously recommended to protect against Hepatitis B viral infection to protect clinicians and laboratory workers who managed patients with AIDS and their biologic samples (CDC, 1982). In 1983, the CDC identified all major routes of HIV transmission and ruled out transmission by casual contact, food, water, air, or environmental surfaces. During the same year and in response to concerns about the transmission of AIDS in healthcare settings, the CDC published the first set of occupational exposure precautions for healthcare workers and allied health professionals (CDC, 1983). On June 23, 1989, the CDC released guidelines for prevention of HIV and Hepatitis B transmission to healthcare workers (CDC, 1989). In an ongoing effort to manage the AIDS epidemic during the first eight years, the CDC published nearly 50 sets of recommendations and guidelines for AIDS, which included use of PPE, and recommendations for prevention of transmission and HIV counseling and testing (CDC, 2015).
In response to CDC guidelines and recommendations, early HIV/AIDS education received by nurses was primarily related to transmission, contagion and infection control policies (Preston, Koch, & Young, 1991). Regardless of the education, there were nurses who refused to care for patients with AIDS. Wiley, Acklin, and Heath (1988) surveyed undergraduate and graduate nursing students and found that 43% of the MSN students and 53% of the BSN students believed that nurses should be allowed to refuse assignment to HIV-positive patients. The refusal to care for these patients stemmed from fear of becoming infected, continued lack of education, and misinformation. In England, 41% of nursing students did not understand the meaning of ‘universal precautions’ (Snowden, 1997). Globally, nursing students reported a lack of education as one of the major causes of fear, negative attitudes and reluctance to care for people with HIV/AIDS (Earl & Penny, 2003; Madumo & Peu, 2006; Ngan et. al, 2000; Rondahl, Innala, & Carlsson, 2003; Uwakwe, 2000). This fear of infection and lack of HIV/AIDS knowledge was identified as the primary reasons contributing to 24% of nursing students being reluctant to hold the hand of an HIV/AIDS patient with 14% indicating that they would refuse to shake hands with a person infected with HIV (Rondahl et al., 2003). In the U.S., rural nursing students believed that mosquitoes and fishing hooks were potential carriers of the HIV virus (Earl & Penny, 2003). Many nurses believed that that healthcare workers were at significantly higher risk for contracting AIDS (Brown & Brown, 1988), were concerned about their personal safety (Feinblum, 1986; Gruber et al., 1989; Leo, Taylor, & Thompson, 1983; Rubinow, 1984; Viele, Dodd, & Morrison, 1984) and feared being shunned by loved ones (Blumenfield et al., 1987; Feinblum, 1986). During the 1980s and 1990s HIV/AIDS education was lacking and focused on nurses’ knowledge, attitudes and
willingness to care for patients with AIDS (Wiley et al., 1990; Williams, Benedict, & Pearson, 1992). Over the last three decades, much research has been done regarding mode of transmission, risk factors and risk for HCWs. Although educational materials and information regarding AIDS is more readily accessible, nursing students and nurses continue to fear and may be reluctant to care for patients with HIV/AIDS (Chen, & Han, 2010; Mullins, 2009).

**Ebola**

Since December 2013, the outbreak of Ebola in the West African nations of Guinea, Liberia, and Sierra Leone has resulted in 25,591 suspected, probable, and confirmed cases, and has taken the lives of 10,604 people (CDC, 2015). On July 31, 2014, the CDC warned U.S. residents to avoid “nonessential travel” to Sierra Leone, Guinea, and Liberia (CDC, 2014). During the summer of 2014, public concern in the U.S. regarding the Ebola outbreak was limited. The Ebola outbreak continued to escalate and on August 8, 2014, the WHO declared the Ebola epidemic an international health emergency (WHO Ebola Response Team, 2014). Two months later in October 2014, a patient in the U.S. was diagnosed with the Ebola virus. The Ebola virus was diagnosed and was the cause of death for Thomas Eric Duncan. After caring for Duncan, Nina Pham and Amber Joy Vinson were confirmed to have the disease. Although, reports indicated that the nurses contracted the Ebola Virus Disease (EVD) due to a breach of protocol, Texas nurses reported that hospitals were not providing them with enough education or interactive training and that there were no PPE protocols in place to properly and safely care for Ebola patients (Blinder, 2014; Emily & Poole, 2015; Horowitz, 2014) However, shortly after Pham and Vinson tested positive, the CDC released updated Ebola
guidelines stressing the importance of more training and supervision and recommending that no skin be exposed while wearing PPE (CDC, 2014).

The initial response to the Ebola outbreak is reminiscent of the early response to the AIDS epidemic (Barrett & Brown, 2008; Hayter, 2015; Heitz, 2014; Kinsman, 2012). The panic that Ebola has brought to hospitals and clinics throughout Western Africa, as well as to the United States and Europe, following the return of Ebola-infected individuals, is reminiscent of attitudes towards HIV during the first years of the epidemic (Naimah, 2015; Wainberg et al., 2014). Patients with Ebola, families, friends, and the people caring for them (i.e., licensed healthcare providers and volunteers) were stigmatized and ostracized (Davtyan et al., 2014). In Liberia, Guinea, and Sierra Leone, survivors of the current epidemic were prohibited from returning to their homes and work, and have been shunned by their friends, families and coworkers (Heitz, 2014). Healthcare workers and educators around the world were ostracized, hurt and killed (Doctors Without Borders, 2015; Hartocollis & Schwebber, 2014). In the United Kingdom, nurses expressed reluctance to care for a patient suspected of having Ebola even when assured of the availability of full PPE (Hayter, 2015). In the U.S., politicians responded to this crisis by demanding border closures and refusal of entry for any traveler potentially exposed to Ebola into the U.S. (Gillman, 2014; Naimah, 2015; N.B., 2014).

In response to Ebola exposure and endangerment, Nina Pham filed a lawsuit against the Dallas hospital and its parent company. She alleged that the hospital and parent company were negligent because there were no policies in place and proper protective gear to treat Ebola patients was not available (Emily & Poole, 2015). According to Pham, training was limited to a printout of guidelines that were found on
the worldwide web by her supervisor (Emily & Poole, 2015). Nina Pham’s exposure, the surrounding media coverage, along with the public panic and healthcare providers’ fear of contagion, has drawn attention to the necessity and importance of the proper education and training of health workers. Nurses are often the first healthcare personnel who will assume the roles of first responders, direct care providers, and coordinators of care when disasters occur (Veenema, 2006).

**Disaster Preparedness**

Events including September 11th, and the anthrax panic that followed, Hurricane Katrina, Hurricane Rita, and multiple other disasters impacting the U.S., placed governmental focus on national preparedness and homeland security (Homeland Security Act, 2002; Pandemic and All-Hazards Preparedness Act, 2006). Since 2002, more than $5 billion in Federal investments have increased the number of emergency preparedness tools, and the amount of education and assistance disseminated to the American public (Pandemic and All-Hazards Preparedness Act, 2006). Despite these efforts, multiple surveys have revealed that healthcare providers remain unclear about their roles and responsibilities during a disaster and in their abilities to maintain the safety of themselves, loved ones, coworkers and patients (Markenson, DiMaggio, & Redlener, 2005; Weiner et al., 2005).

When disasters occur, nurses are often the first healthcare personnel required to assume the roles of first responders, direct care providers, on-site coordinators of care, information providers or educators, mental health counselors, and triage officers (Veenema, 2006). There is a growing consensus in the international nursing community
regarding the importance of equipping all nurses with a knowledge base and a minimum set of skills in order to enable them to meet the challenges they face in dealing with the complexities of disasters (Hsu et al., 2006; Markenson et al., 2005; Rebmann et al., 2006; Veenema, 2012). Although nurses responded to emergency situations, prior to the events of September 11th, few nurses received any formal education in the areas of disaster preparedness. In order to increase nurses’ abilities to safely, effectively and appropriately respond to disaster, these deficits should be initially addressed at a pre-licensure level.

**Disaster Preparedness and Nursing**

The American Association of Colleges of Nursing (AACN) envisions a professional nurse as a graduate of a baccalaureate program who is capable of providing holistic care to clients from diverse cultural backgrounds, practices independently as a professional nurse, collaborates with other health team members, and acts responsibly in the event of a disaster (AACN, 2001). There is evidence that an education gap exists between current nursing school curricula and the expectations of nurses and nursing faculty with regard to disaster preparedness (Chaffee et al., 2001; Hutchinson et al., 2011; Kaplan et al., 2011; Pang, Chan, & Cheng, 2009; Weiner, et. al., 2005; Whitty, & Burnett, 2009; Wisniewski, Dennik- Champion, & Peltier, 2004). While nursing students have traditionally received community health content related to natural disasters, there is an increasing concern among nursing faculty that students are not adequately trained for disaster preparedness and response in the event of a disaster (Patillo, 2003; Sanders et al., 2005; Steed et al., 2004).
In 2011, there were 302 worldwide natural disasters that claimed more than 29,780 lives, affected nearly 206 million others, and resulted in record economic damages within the United States of $366 billion (Guha-Sapir, Hoyois, & Below, 2013). In the past, the nurses who responded to disasters lacked clear instructions and guidelines were not present. For example, nurses who volunteered during the 1985 Puerto Rico flooding reported a lack of clarity and direction and recommended that basic nursing disaster preparedness guidelines be added to nursing curricula (Rivera, 1986). Most nursing personnel asked to respond to the 1995 Great Hanshin-Awaji Earthquake reported they needed direction because they were accustomed to working in an environment with clearly defined, expected duties (Kako, Mitani, & Arbon, 2012). Rose and Larrimore (2002) surveyed 291 healthcare staff (including nurses) on knowledge and awareness of chemical and biological terrorism. Findings demonstrated 53% of the participants claimed a willingness to work during a terrorist event; however, only 23% answered knowledge questions correctly. Orr (2002) reported that although many nurses receive training in first aid and infectious disease outbreaks, burn and smoke inhalation care, multiple vehicle accidents, plane and train accidents, they lacked formal preparation to respond to MCIs or disasters. However, Suserud and Haljamae (1997) found that disaster education could have a positive impact. They compared the performance and psychological experiences of two groups of Swedish nurses involved in disaster nursing. Nurses who had received specific disaster situation education coped better mentally and consistently provided better care in emergency situations than the nurses who had not received disaster education. In addition, the nurses who lacked disaster education often doubted their own competence and indicated a lack of confidence in their abilities to
adequately care for victims. Given the prevalence of disasters, there is an urgent need to improve the education of HCWs. Because nurses comprise the largest percentage of HCWs and are early disaster responders, disaster preparedness is critical. It is reasonable to assume that nurses must be educated about how to respond to these occurrences and care for these victims (Chaffee et al., 2003; Hilton & Allison, 2004;).

**Disaster Preparedness Competencies**

Currently, there is no formally designated disaster nurse specialty through certification or standardized education (Gebbie & Qureshi, 2002; Stanley, 2015). Although a number of nursing organizations have published position or white papers, formal reports, and briefs (International Council of Nurses [ICN] & WHO, 2009; Kuntz et al, 2008; Markenson et al., 2005; WHO, 2008), the ANA has not published a scope or standards of practice for disaster nursing as there are for other specialties such as rehabilitation, emergency, and pediatric nursing. However, there are some guidelines available.

Similar to standardized education, there is no one set of disaster-preparedness competencies that are globally accepted for curriculum development, in nursing or other health professions. There is paucity in the literature regarding data validating disaster-related healthcare competencies. Because formalized training in schools is not mandatory, faculty may also hesitate to incorporate disaster preparedness content into their courses due to their own lack of disaster preparedness education and training (Weiner et al., 2005; Whitty & Burnett, 2009). Weiner et al. (2005) found that 79% of nurse educators felt that curriculum plans would be the best place to increase emphasis on
disaster preparedness. However, 75% of nursing faculty felt inadequately prepared in the area of disaster preparedness. Whitty and Burnett (2009) found a relationship between knowledge and level of importance placed on the material. They found that when instructors perceived they had a high level of knowledge regarding core competencies for the mass casualty incidents, a higher level of importance was placed on inclusion of these competencies into the nursing curriculum.

The importance of disaster preparedness at a pre-licensure level has been stressed (Duarte and Haynes, 2006). However, there is a paucity of literature regarding how best to integrate the content into nursing curriculum and a lack of consensus regarding the competencies needed to prepare future nurses to successfully function during disasters. The three most commonly used competency sets in nursing education are: Educational Competencies for Registered Nurses Responding to Mass Casualty Events (INCMCE, 2003); the ICN Framework of Disaster Nursing Competencies (ICN & WHO, 2009); and the Core Competencies for Disaster Medicine and Public Health (Walsh et al., 2012). Specialty-specific competencies have also been proposed: public health nursing (Polivka et al., 2008) and a competency framework around psychosocial responses (Cox & Danford, 2014).

Multiple studies have been conducted to assess suitable disaster preparedness competencies and methods of instruction at a pre-licensure level (Chan et al., 2010; Farra et al., 2013; Hutchinson et al., 2011; Kaplan et al., 2012; Landry & Stockton, 2008; Morrison & Catanzaro 2010; Pang, et al., 2009) with positive results that include students’ perceptions of increased knowledge and confidence. Unlike the majority of studies which used either the INCMCE or ICN competencies (Chan et al., 2010; Farra et
al., 2013; Landry & Stockton, 2008; Morrison & Catanzaro, 2010; Pang et al., 2009), Hutchinson et al. (2011) used the CDC guidelines and a tiered, interdisciplinary approach to curriculum development and Kaplan et al. (2012) designed the curriculum based on competencies developed by the American Medical Association National Disaster Life Support Foundation (AMA-NDLSF). Participants in both studies reported increased confidence with their roles during a disaster. Although Hutchinson et al. (2011) designed an interdisciplinary exercise, the authors did not discuss how content was integrated into the psychology and public health curricula, or what roles these students were assigned in the simulation activity. Pang et al., (2009) were the only authors to use both the ICN framework and the three principles of curriculum design advocated in the Global Standards for the Initial Education of Professional Nurses and Midwives (WHO, 2009) to align course content, learning and teaching activities, and assessment methods with the expected disaster nursing competencies with the goal of developing a disaster training program for undergraduate nursing students in China. The authors discussed the creation and use of rubrics to assess multiple competencies (e.g., communication skills, immediate response to a disaster, care of vulnerable populations, formulation of a disaster preparedness plan). However, neither the rubrics nor the student scores were provided. The authors only reported findings based on students’ perceived level of competency both prior to and after the training program. All the studies used a combination of didactic content and other varied teaching modalities including high fidelity simulation (Hutchinson et al., 2011), virtual reality simulation (Farra et al., 2013), role-playing (Chan et al., 2010; Landry & Stockton, 2008; Morrison & Catanzaro, 2010; Pang et al.,
2009), and a hybrid model combining patient simulators, task trainers and live actors (Kaplan et al., 2010) to deliver disaster preparedness principles.

The research studies reviewed varied in terms of the disaster preparedness content and competencies used to guide the curriculum. Most studies did not use standardized tools to measure variables, included participants from multiple programs (Associate or Baccalaureate programs), and at different levels in their education (sophomore, junior or senior level). In addition, the length of programs varied greatly, from eight hours of didactic content with a two hour disaster exercise to a two-week intensive course with five of the 60 hours dedicated to didactic content and the remainder of the time dedicated to hands-on, small group activities (Landry & Stockton, 2008; Pang et al., 2009). Delivery of disaster preparedness and response content was not standardized and included PowerPoint presentations, web-based learning, guest speakers, or a combination of different content delivery methods (Chan et al., 2010; Farra et al., 2013; Hutchinson et al., 2011; Kaplan et al., 2010; Landry & Stockton, 2008; Morrison & Catanzaro, 2010; Pang et al., 2009). Data collection included pre-test/post-tests to assess student knowledge, pre-and post-simulation surveys to assess students’ perceived level of competency, individual student reflections to assess perceived learning and provide feedback about the simulated disaster exercise, and self-administered surveys to provide feedback about the program (Chan et al., 2010; Hutchinson et al., 2011; Kaplan et al., 2010; Landry & Stockton, 2008; Morrison & Catanzaro, 2010; Pang et al., 2009).
The Extended Parallel Process Model and the Ebola and Zombie Apocalypse

Exercises

References to EPPM are beginning to appear in the disaster preparedness literature. Some studies have emphasized the need to develop willingness to respond training using diverse health education and health communication methods to influence threat and efficacy factors (Balicer et al., 2011; Barnett et al., 2009; Barnett et al., 2010). According to Barnett et al. (2009) perceived self-efficacy was one of the strongest predictors of self-reported willingness to respond. Additionally, health care providers meeting the “concerned and confident” (high threat/high efficacy) EPPM profile reported greater willingness to respond to multiple hazard scenarios than their non–high threat/high efficacy profile counterparts (Barnett et al., 2009). Vírseda et al. (2010) found that hospital personnel were reluctant to vaccinate against H1N1 and seasonal influenza when their concern about becoming infected with either disease (perceived susceptibility) was low and if they had doubts about the effectiveness of the vaccine (response efficacy).

Barnett et al. (2014) examined the attitudinal impact of an EPPM-based training curriculum on local health department employees’ willingness to respond to a natural disaster (a weather-related emergency) and a man-made disaster (a radiological event). The authors developed a training curriculum which included facilitator-led discussion, individual learning activities, and group experiential learning (Barnett et al., 2014). The training intervention was an EPPM-based curriculum designed to engage the participants in a variety of activities to increase comprehension of public health threat severity and susceptibility. Additionally, the activities were designed to bolster self-efficacy and response efficacy. The authors posited that increasing comprehension and efficacy would
improve public health employees’ willingness to respond (Barnett et al., 2014). Study findings demonstrated that the EPPM was a useful guide for designing interventions for public health emergency preparedness and that increasing efficacy versus enhancing threat perceptions was a better method of increasing willingness to respond. The authors also discussed the potential applicability of the EPPM-based interventions for increasing the willingness to respond of other healthcare providers (Barnett et al., 2014).

The curriculum for both the Ebola and Zombie exercises was similar to the curriculum developed by Barnett et al. (2014). Both exercises focused on the training as the message component used to draw the attention of the nursing students to the threats inherent in an Ebola outbreak or an infectious disease pandemic (e.g., the Zombie Apocalypse) and to propose feasible solutions to those threats. The Ebola and Zombie Apocalypse exercises used a step-wise process to deliver content that included didactic and hands-on activities to potentially increase knowledge and skills acquisition. The EPPM can be used to examine if there was an increase in self-efficacy and willingness to respond after training.

Secondary Analysis

Literature regarding the use of secondary data analysis was extensive. Original survey research rarely uses all of the data collected and this unused data can provide answers or different perspectives to other questions or issues (Heaton, 2004). Heaton (2004) defines secondary data analysis as a research approach which makes use of pre-existing quantitative or qualitative data for the purposes of studying new questions or verifying previous findings. A number of reasons for conducting secondary data analysis
were discussed including using old data to generate new ideas (Fielding, 2004); applying new research questions (Heaton, 2004); and exploring data from a different perspective (Hinds, Vogel, & Clark-Steffen, 1997). Secondary analysis was used to examine the psychological impact on staff working in children and adult palliative care units when prevented from being truthful with patients (Noble, Price, & Porter, 2014). The original parent studies examined staff perspectives in a palliative children’s and a palliative adult care setting, respectively. The first study explored the experiences of health and social care among professionals caring for children at the end of life (Price et al. 2011, 2012, Price et al. 2013). The second study explored the experiences and trajectories to death of adults with end-stage renal disease (Noble et al. 2009, 2010, 2012). The secondary analysis aimed to draw out the shared issues faced by staff caring for two terminally ill populations and the dilemmas faced when truth-telling was blocked by primary caretakers (Noble et al., 2014).

The advantages of secondary data analysis have also been reviewed. Heaton (2004) suggests that secondary data analysis is an effective means of analyzing data when dealing with sensitive issues, small populations, rare phenomena, and accessing marginalized populations. Baker et al. (2014) conducted a secondary analysis of baseline data of African American women who participated in Protect and Respect (a sexual risk reduction program for women living with HIV/AIDS) and found that a majority of these women were satisfied with their medical services. This study was one of the first studies to find high rates of satisfaction with healthcare services among African American women living with AIDS. Another benefit includes verifying original research, thus increasing the trustworthiness and credibility of the original findings (Heaton, 2004).
Secondary data analysis also minimizes the time and financial expense associated with data collection (Corti, 2008). Results of studies employing secondary data analysis can be compared to the results generated in the parent study and can validate or lead to further understanding of the topic or illuminate areas for further research (Coyer & Gallo, 2005). Glaser (1963) recognized secondary data analysis as a valuable teaching and learning tool for novice researchers.

**Summary**

Significant research gaps exist regarding disaster preparedness education at the nursing pre-licensure level. Current research in disaster preparedness nursing education emphasize the challenges in determining the best teaching methods for delivering disaster preparedness content (Jose & Dufrene, 2013). Many competencies, guidelines and recommendations exist (Association of Schools and Programs of Public Health, 2010; Cox & Danford, 2014; ICN & WHO, 2009; INCMCE, 2003; Polivka et al., 2008; Walsh et al., 2012). However, standardized educational programs concerning disaster response and preparedness training are not empirically tested or available.

In 2014 and 2015, the SONHS conducted two disaster preparedness and response exercises. Secondary data analysis was used to explore the relationship between current disaster preparedness education and training, and the associated changes in nursing student knowledge, perceptions and skills acquisition. This analysis was needed to advance the development of standardized disaster nursing competencies and education.
Chapter 3

Methods

Disaster training has not been standardized. Studies conducted in 2014 and 2015 (i.e., Ebola disaster simulation exercise and the Zombie Apocalypse point of distribution exercise) tested knowledge, skills acquisition and confidence gained after each training exercise and provided the data for this secondary analysis. This chapter will discuss 1) secondary data analysis; 2) data sources; 3) validity and reliability concerns for secondary data and procedures to ensure robust results; and 4) data preparation and analysis. Through the proposed analysis, four study aims were addressed: 1) explore nursing student perception of the effectiveness of the Ebola and Zombie Apocalypse disaster exercises in preparing them for real-world disasters; 2) examine nursing student perception of the effectiveness of the Ebola and Zombie Apocalypse disaster exercises in preparing them to safely provide care for patients during a disaster or infectious disease pandemic; 3) explore nursing student perception of their willingness to care for patients during an infectious disease pandemic after receiving training; and 4) develop a preliminary model for training nursing students in emerging infectious disease/disaster preparedness and response that will be tested in a future model.

Secondary Data Analysis

The Primary Investigator (PI) was contacted and permission was obtained to analyze the original data set. Once permission was obtained, parent studies were scrutinized. The parent studies theoretical or conceptual models, variables and operational definitions, hypothesis, measures, data collection strategy, and response rates obtained were examined. Additionally, population, sampling design, sample obtained,
Data coding, entry and analysis, quality control measures, and any external factors that could have affected the study (e.g., current events) were examined.

**Data Sources and Data from the Ebola and Zombie Apocalypse Exercises**

Two training exercises resulted from the call to better educate and train nurses entering the workforce about disaster preparedness and response and resulted in two independent quantitative data sets and one qualitative set. One data set came from the pre-and post- Ebola exercise surveys and the other from the pre-and post- Zombie Apocalypse exercise surveys. The qualitative data set came from the focus groups related to the Ebola exercise.

**Sampling and inclusion criteria.** Students were purposefully sampled for both studies including both accelerated and traditional students. All senior pre-licensure nursing students participated in both the Ebola exercise and the Zombie Apocalypse exercise. Only nursing students who had previously participated in the Ebola exercise participated in the focus group study. All students met the criteria for inclusion.

**Demographic, pre-and post-simulation surveys, and focus group data.**
Because, data was collected at 3 points in time (Ebola exercise, Zombie Apocalypse exercise, and focus group study) and participants may have differed between groups, three sets of demographic data were collected and were analyzed for this study. First, demographic data was collected with the pre-Ebola exercise survey and included age, gender, program of study, and previous healthcare provider experience. Second, Zombie Apocalypse exercise survey demographic data included age, gender, ethnicity, language program of study, previous work experience and number of disaster preparedness related
trainings previously attended. Third, focus group interview demographic data included focus group number, gender, and program of study.

The Ebola pre-and post-surveys measured changes in knowledge, confidence and safety. For the Ebola study, the pre-and post-simulation surveys were not linked, however they did identify the cohort affiliation (i.e., traditional or accelerated). The Zombie pre-and post-simulation surveys measured changes in knowledge, attitude and confidence. Pre-and post-simulation surveys were linked via a student-generated identification code. The focus group sessions were conducted four months after the Ebola exercise and employed open-ended questions to examine the participant’s perceptions regarding the benefits and limitations of the Ebola exercise and any perceived stress response.

**Ethical Considerations and Protection of Human Subjects.** Institutional Review Board (IRB) approval for the Ebola and Zombie studies and the focus groups was obtained through the University of Miami IRB prior to implementation of the research study. Because data collected are already a part of the routine course assignments, a waiver for written consent was obtained. Verbal consent was obtained from all participants in the focus groups. The focus group participants were informed during the consenting process that all information collected would be de-identified.

**Confidentiality.** This study sought to use data that was routinely collected at the SONHS. The Ebola and Zombie exercise data was de-identified prior to analysis. Following the removal of all identifiers, the data was extracted from the surveys and manually entered into a password protected database and stored on the SONHS server. Paper based data was stored in a locked cabinet in the researcher’s office at the SONHS.
The focus group data was extracted from the transcriptions and notes, qualitatively coded, entered into a password-protected database, and stored on the SONHS server. Paper-based data was stored in a locked cabinet in the researcher’s office and then destroyed after transcription. After the focus group information as transcribed, all information, outside of the transcribed and de-identified focus group data, was be destroyed. In order to further protect the individual participant’s confidentiality, the demographic data forms were separated from the transcribed interviews and kept in a locked cabinet in the researcher’s office. There were no breaches in confidentiality, protocol deviations or violations, or other issues related to improper implementation of research to report to the University of Miami IRB. All findings were reported as group data.

**Data Preparation**

Using SPSS (Version22) quantitative was prepared and analyzed. Questions were recoded to ensure directional consistency. Internal consistency reliability was assessed using Cronbach’s α (alpha). Item discrimination was assessed. Preliminary examination of the data included central tendency, mean, median, and normal distribution. Data was cleaned. Minimum and maximum values were examined. Values outside the established range were examined and the original surveys were checked for the correct value. Histograms were examined. Frequency information was used to identify missing data. Outliers were examined for possible exclusion. A significance level of p<.05 was used in analysis procedures to address study aims.
Data Analysis: Ebola Disaster Simulation Exercise Training.

Aim 1: Explore nursing student perception of the effectiveness of the Ebola and Zombie Apocalypse disaster exercises in preparing them for real-world disasters.

Aim 2: Examine nursing student perception of the effectiveness of the Ebola and Zombie Apocalypse disaster exercises in preparing them to safely provide care for patients during a disaster or infectious disease pandemic.

Aim 3: Explore nursing student perception of their willingness to care for patients during an infectious disease pandemic after receiving training.

Pre-and post-tests were not linked but included reporting of program of study. Because of this, analysis of variance between and within subjects was not possible. Therefore, descriptive statistics were used to analyze overall findings before and after training. To supplement descriptive findings, focus group data was analyzed. Descriptive findings and emerging themes were analyzed for similarities and differences and changes over time. These findings were used as a starting point to improve instructional methods for future disaster preparedness nursing education.
Data Analysis: Zombie Apocalypse POD Disaster Exercise.

**Aim 1:** Explore nursing student perception of the effectiveness of the Zombie Apocalypse disaster exercises in preparing them for real-world disasters.

**Aim 2:** Examine nursing student perception of the effectiveness of the Zombie Apocalypse disaster exercises in preparing them to safely provide care for patients during a disaster or infectious disease pandemic.

**Aim 3:** Explore nursing student perception of their willingness to care for patients during an infectious disease pandemic after receiving training.

Pre-and post-tests were linked via participant generated identification codes and demographic data included reporting of program of study. This allowed for mixed analysis of variance (ANOVA) within and between subjects. Findings from this analysis examined changes in perception of the traditional nursing student cohort over time; changes in perception of the accelerated nursing student cohort over time; and any differences between the traditional nursing student and accelerated nursing student cohorts. The findings further illuminated methods to improve instructional designs for future disaster preparedness nursing education.
Content Analysis: Focus Group Study

**Aim 4:** *Develop a preliminary model for training nursing students in emerging infectious disease/disaster preparedness and response that will be tested in a future study.*

Content analysis is a dynamic process in which verbal and non-verbal data is utilized to summarize and form an interpretation of the information received during the research process (Morgan, 1993). Content analysis was used to analyze the collected focus group data and the open-ended questions included in the Ebola and Zombie Apocalypse post-simulation surveys, where contextual meaning was examined. A transcriptionist was used to transcribe the audio tapes. For quality assurance purposes, after transcription of the audio tapes was completed, the researcher reviewed and checked 10% of the total number of transcripts against the actual recorded tapes to verify accuracy. Field notes were not available and could not be used. Content analysis developed by Lincoln and Guba (1985) was used to analyze the focus group sessions. First, data was read word for word and codes were derived from the text that captured key thoughts or concepts. These codes were then sorted into categories based on similar attributes. These emergent categories were used to organize and group codes into meaningful themes. The analysis process was undertaken jointly by the PI and two additional coders. The PI and each coder reviewed the focus group transcripts independently and the results were then compared. In cases where discrepancies were found, resolution was achieved through discussion. Validity of coding was addressed with the implementation of a training protocol that was developed by the PI and used by both secondary coders and PI. Findings from this analysis and quantitative findings were used to develop a preliminary model to train nursing students. Quantitative findings were
compared and contrasted to qualitative findings in order to determine most effective instructional methods. Emerging themes were also used to guide instructional methods including delivery of didactic content and simulated experiences.

**Summary**

The purpose of this study was to explore the relationship between disaster preparedness education and training, and the associated changes in nursing student knowledge, perceptions and skills acquisition. The findings were used to improve instructional methods for future disaster preparedness nursing education. A preliminary model was developed focusing on a step-wise instructional delivery method combining didactic content and hand-on learning to increase self-efficacy. This model will be tested and refined in future studies. The standardized competencies will be the next component to be added to the model and tested. The procedure and operational details of the study were presented and justified in this chapter. Additionally, validity and reliability of secondary data analysis was discussed.
Chapter 4

Results

The dissertation study results are presented in this chapter. The quantitative results of the Ebola Disaster Simulation Exercise Training and the Zombie Apocalypse POD Disaster exercise are presented first, followed by the qualitative results of the Ebola Focus Group Study. Study results include descriptive analysis for each sample (i.e., Ebola Disaster Simulation Exercise and the Zombie Apocalypse POD disaster exercise). The purpose of this study was to explore the relationship between disaster preparedness education and training, and the associated changes in nursing student knowledge, perceptions and skills acquisition through independent samples t-test, mixed analysis of variance (ANOVA), and content analysis.

Ebola Disaster Simulation Exercise Training

Aim 1: Explore nursing student perception of the effectiveness of the Ebola and Zombie Apocalypse disaster exercises in preparing them for real-world disasters.

Aim 2: Examine nursing student perception of the effectiveness of the Ebola and Zombie Apocalypse disaster exercises in preparing them to safely provide care for patients during a disaster or infectious disease pandemic.

Aim 3: Explore nursing student perception of their willingness to care for patients during an infectious disease pandemic after receiving training.
Sample

The Ebola Disaster analysis yielded pre-and post-survey demographic findings of accelerated and traditional nursing students because the surveys were not linked. A possible sample size of the senior class cohort included 160 students with 50 traditional first semester senior nursing students enrolled in NUR411, 56 accelerated first semester nursing students enrolled in NUR308, and 54 accelerated final semester nursing students enrolled in NUR440. Pre-Ebola simulation surveys were completed by 150 participants (94%) with 48 (32%) traditional first semester senior nursing students enrolled in NUR411, 55 (36.7%) accelerated first semester nursing students enrolled in NUR308, and 47 (31.3%) accelerated final semester nursing students enrolled in NUR440. Post-Ebola simulation surveys were filled out by 131 (81.8%) students: 44 (33.6%) traditional nursing students, 48 (36.6%) accelerated nursing students enrolled in NUR308, and 39 (29.8%) accelerated nursing students enrolled in NUR440 (See Tables 1 and 2).

Table 1.

Demographic characteristics pre-Ebola by program type

<table>
<thead>
<tr>
<th></th>
<th>Traditional</th>
<th>Percent</th>
<th>Accelerated</th>
<th>Percent</th>
</tr>
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<tbody>
<tr>
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<td></td>
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<td></td>
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<tr>
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<tr>
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Table 2.

Demographic characteristics post-Ebola by program type

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<td>Accelerated</td>
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<tr>
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<tr>
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<td></td>
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<td>2</td>
<td>30</td>
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<tr>
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<tr>
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<td>38</td>
<td>86</td>
<td>76</td>
</tr>
</tbody>
</table>

**Traditional students.** Traditional students that completed the pre-Ebola simulation surveys ranged from 19 to 48 years of age (M= 22.52, SD 4.46). This included 41 females (85.4%) and 7 males (14.6%). Eight students (16.7%) had previous healthcare experience and 40 students (83.3%) did not. Healthcare experience of these study participants varied and included: Student Nurse Extern (12.5%), Certified Nursing Assistant (12.5%), Fire Captain (12.5%), Hospital Corpsman (12.5%), Licensed Practical Nurse (12.5%), Nurse Technician (12.5%), State Emergency Response Team (12.5%), and a Patient Safety Attendant (12.5%).

Traditional students that completed the post-Ebola simulation surveys ranged from 19 to 48 years of age (M=22.68 years, SD 4.63). This included 36 females (81.8%) and 8 males (18.2%). Six students (13.6%) had previous healthcare experience and 38 students (86.4%) did not. Healthcare experience included Student Nurse Extern (16.7%), Certified
Nursing Assistant (33.3%), Fire Captain (16.7%), Hospital Corpsman (16.7%), and Licensed Practical Nurse (16.7%).

**Accelerated Option Students.** Accelerated students that completed the pre-Ebola simulation surveys ranged from 20 to 53 years (M=26.39 years, SD 4.19). One student did not report age. This included 91 females (88.3%) and 11 males (10.7%). One participant did not report gender. Thirteen students (12.6%) had previous healthcare experience and 89 students (87.4%) did not. The majority of the participants reported Certified Nursing Assistant (38.5%) as their previous healthcare experience. The rest of the participants’ healthcare experience included Athletic Trainer (7.7%), Nurse Technician (7.7%), Wilderness First Responder (7.7%), Massage Therapist (7.7%), Emergency Medicine Technician (7.7%), Medical Officer (7.7%), Medical Assistant (7.7%), and Lifeguard (7.7%).

Accelerated students that completed the post-Ebola simulation surveys ranged from 22 to 53 years of age (M=26.62 years, SD 4.37). Five participants (5.7%) did not report age. This included 74 females (85.1%) and 10 males (11.5%). Three participants (3.4%) did not report gender. Eleven students (12.6%) had previous healthcare experience and 76 students (87.4%) did not. The participants’ previous healthcare experience was varied and included Certified Nursing Assistant (18.2%), Athletic Trainer (9.1%), Nurse Technician (9.1%), Wilderness First Responder (9.1%), Massage Therapist (9.1%), Emergency Medicine Technician (9.1%), Medical Officer (9.1%), Medical Assistant (9.1%), and Lifeguard (9.1%). Three participants (27.3%) did not identify their previous healthcare experience.
Aim 1

The results of the independent samples \( t \)-tests examine the change in pre-and post-test scores of the traditional and accelerated option student cohort. Aim 1 explored nursing student perception of the effectiveness of the Ebola disaster exercise in preparing them for real-world disasters. Three pre-and-post survey questions (i.e., items) were combined to address Aim 1: (a) “How knowledgeable are you about the potential public health impact of Ebola?” (b) “How well do you think you could address the Ebola related questions of a concerned member of the public?” and (c) “How important is pre-Ebola outbreak preparation and training?” Cronbach’s alpha for these 3 items was .57. Item discrimination was assessed and deleting “How important is pre-Ebola outbreak and training” would increase Cronbach’s alpha (\( \alpha = .754 \)). The item was deleted. “How knowledgeable are you about the potential public health impact of Ebola?” was scored in a positive direction (i.e., 1-5), with higher response scores indicating increased knowledge and lower scores decreased knowledge. The item responses were worded and coded as follows: “not at all knowledgeable” was coded 1 and “very knowledgeable” was coded 5. “How well do you think you could address the Ebola related questions of a concerned member of the public?” was scored in a positive direction (i.e., 1-5), with higher response scores indicating increased ability and lower scores indicating decreased ability. The item responses were worded and coded as follows: “not at all” was coded 1 and “very well” was coded 5. These two items were summed to calculate a total training effectiveness score with possible values ranging from two to 10.

To test the hypothesis that pre-and post-tests on the effectiveness of training scores were statistically significantly different, an independent samples \( t \)-test was
performed. When examining Aim 1 pre- and post-distributions for skewness and kurtosis there was mild to moderate departure from normality. It was decided to continue with the analysis due to sample size. There was a statistically significant difference in the pre (M = 6.70, SD = 1.5) and post scores (M = 8.40, SD = 1.5) for the traditional cohort; t (90) = -5.43, p < 0.001. Prior to the exercise, the traditional cohort was neutral regarding the effectiveness of training. After the exercise, training was perceived as an effective method of preparing them for real-world disasters (see Table 3).

Table 3.

Effectiveness of the Ebola disaster exercise in preparing students for real-world disasters

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean</th>
<th>Mean</th>
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<td>Traditional</td>
<td>48</td>
<td>44</td>
<td>6.70</td>
<td>8.40</td>
<td>-5.432</td>
<td>90</td>
</tr>
<tr>
<td>Accelerated</td>
<td>102</td>
<td>87</td>
<td>6.43</td>
<td>7.50</td>
<td>-5.106</td>
<td>187</td>
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</table>

There was also a statistically significant difference in the pre (M=6.43, SD=1.5) and post scores (M=7.50, SD=1.4) for the accelerated option cohort; t (187) = -5.11, p < 0.001. The accelerated cohort was also neutral regarding the effectiveness of training perceived training as effective in preparing them to deal with real-world disasters prior to the exercise and there was an increase in the perceived effectiveness of the training after participating in the exercise (see Table 3).
Aim 2

Aim 2 examined nursing student perception of the effectiveness of the Ebola disaster exercise in preparing them to safely provide care for patients during a disaster or infectious disease pandemic. To explore student perception of effectiveness to safely provide care, Aim 2 was addressed using the pre-and-post survey question “How confident are you about being safe in your nursing role when caring for an Ebola patient?” This item was scored in a positive direction (i.e., 1-5), with higher response scores indicating increased confidence and lower scores decreased confidence. The item responses were worded and coded as follows: “not at all confident “was coded 1; and “very confident” was coded 5.

To test the hypothesis that pre-and post-tests on the effectiveness of training to safely provide care scores were statistically significantly different, an independent samples t-test was performed. The pre-and post-test distributions were sufficiently normal for the purposes of conducting a t-test with the skew -.080 (SE = .146) and kurtosis -.665 (SE = .290). There was a statistically significant difference in the pre (M =2.79, SD = 1.0) and post scores (M =3.70, SD =1.0) for the traditional cohort; t (90) = -4.13, p <0.001. Prior to the exercise, the traditional student cohort was neutral regarding the ability to safely provide care. At the conclusion of the exercise, the traditional student cohort was more confident in their ability to safely provide care (see Table 4). There was also a statistically significant difference in the pre (M = 2.85, SD = 1.1) and post scores (M = 3.26, SD = 1.0) for the accelerated option cohort; t (188) = -2.63, p =0.009. Similar to the traditional student cohort, the accelerated cohort was neutral regarding the ability
to safely provide care. However, at the conclusion of the exercise, the traditional option cohort was more confident in their ability (see Table 4).

Table 4.

*Effectiveness of the Ebola disaster exercise in preparing students to safely provide care to patients during a disaster or infectious disease pandemic*

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean</th>
<th>Mean</th>
<th>t</th>
<th>df</th>
<th>p</th>
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<tr>
<td>Traditional</td>
<td>48</td>
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<td>&lt;0.001</td>
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<tr>
<td>Accelerated</td>
<td>103</td>
<td>2.85</td>
<td>3.26</td>
<td>-2.628</td>
<td>188</td>
<td>0.009</td>
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</table>

**Aim 3**

Aim 3 explored nursing student perception of their willingness to care for patients during an infectious disease pandemic after receiving training. To explore student willingness to respond, Aim 3 was addressed using the pre-and-post survey question “Once you are graduated and working as a nurse, how significant a role do you think you would play in your agency’s overall response to an Ebola outbreak?” The item was scored in a positive direction (i.e., 1-5), with higher response scores indicating increased significance and lower scores decreased significance. The item responses were worded and coded as follows: “not at all significant “were coded 1; and “very significant” were coded 5.

Prior to running the statistical analysis, examination of the distribution of scores was undertaken to determine whether the data was sufficiently normally distributed. The pre-and post-test distributions were not normal. While values for skewness and kurtosis
did not appear problematic, skew -.417 (SE = .146) and kurtosis -.284 (SE = .290), visual examination of the histogram revealed significant violations of this assumption. As a result, the Mann-Whitney U Test was used to determine whether there was a significant difference between pre and post tests on willingness to respond. A non-significant effect was noted, $U = 919.00, p = .266$. After participating in the Ebola Disaster Simulation Exercise Training, both the traditional and accelerated cohort felt more prepared to deal with a real-world disaster and safely provide care for patients during a disaster or infectious disease pandemic. However, there was no change in the traditional and accelerated option cohorts’ willingness to respond to a disaster.

Zombie Apocalypse POD Disaster Exercise

**Aim 1:** Explore nursing student perception of the effectiveness of the Ebola and Zombie Apocalypse disaster exercises in preparing them for real-world disasters.

**Aim 2:** Examine nursing student perception of the effectiveness of the Ebola and Zombie Apocalypse disaster exercises in preparing them to safely provide care for patients during a disaster or infectious disease pandemic.

**Aim 3:** Explore nursing student perception of their willingness to care for patients during an infectious disease pandemic after receiving training.

Sample

The Zombie Apocalypse pre-and post-surveys were linked via participant generated identification codes. A possible sample size of the senior class cohort included 106 students with 50 traditional final semester senior nursing and 56 accelerated final
semester nursing students. Fifty-six participants (53%) had linked surveys: 28 (50%) traditional students and 27 (49%) accelerated option students. One student did not identify program of study (See Table 5).

Table 5.

Demographic characteristics Zombie Apocalypse by program type

<table>
<thead>
<tr>
<th></th>
<th>Traditional</th>
<th></th>
<th>Accelerated</th>
<th></th>
</tr>
</thead>
<tbody>
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<td>Gender</td>
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<td>5</td>
<td>19</td>
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<tr>
<td>Female</td>
<td>23</td>
<td>82</td>
<td>22</td>
<td>81</td>
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<td>Age</td>
<td></td>
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<td></td>
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<td>21 &amp; under</td>
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<td>22-25</td>
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<td>26-30</td>
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<td>21</td>
<td>20</td>
</tr>
<tr>
<td>31 &amp; over</td>
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<td>20</td>
<td>20</td>
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<tr>
<td>Healthcare</td>
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<tr>
<td></td>
<td>no</td>
<td>25</td>
<td>89</td>
<td>23</td>
</tr>
</tbody>
</table>

Traditional students. Traditional students that completed the Zombie Apocalypse simulation surveys ranged from 19 to 24 years of age (M = 21.58 years, SD = 1.44). Sixteen students did not report age. This included 23 females (82.1%) and 5 males (17.9%). Three students (10.7%) had previous healthcare experience and 25 students (89.3%) did not. Healthcare experience included Certified Nursing Assistant (66.7%) and Paramedic (33.3%).

Accelerated Option Students. Accelerated option students that completed the Zombie Apocalypse simulation surveys ranged from 23 to 33 years of age (M = 26.60 years, SD = 3.66). Eighteen students did not report age. This included 22 females
(81.5%) and 5 males (18.5%). Four students (14.3%) had previous healthcare experience and 24 students (85.7%) did not. Healthcare experience included Certified Nursing Assistant (75%) and Athletic Trainer (25%).

Aim 1

The process and results of the mixed analysis of variance (ANOVA) are described in the section below. Findings from this analysis examined changes in perception of the traditional nursing student cohort over time; changes in perception of the accelerated option nursing student cohort over time; and any differences between the traditional nursing student and accelerated option nursing student cohorts. Aim 1 explored nursing student perception of the effectiveness of the Zombie Apocalypse exercise in preparing them for real-world disasters. To explore student perception of effectiveness, the following pre-and-post survey questions:

- “How would you assess your current knowledge of a point-of-distribution (POD)?”
- “How would you assess your current knowledge of the staffing roles for dispensing medication in a POD setting?”
- “How would you assess your current knowledge of the Miami-Dade County Health Department protocols for dispensing medications in a POD setting?”
- “How would you assess your current knowledge of the reporting procedures for adverse events that occur during a POD setting?”
• “How would you assess your current knowledge of the principles of
griage in a closed POD?”
• “How would you assess your current knowledge of the principles of
triage in a closed POD?”
• “Disaster simulation is pertinent to my learning in a pre-licensure
baccalaureate nursing program.”
• “I feel confident in my ability to apply my knowledge of a POD layout in
a disaster setting.”
• “I feel confident in my ability to apply the principles of the nurse staffing
role for dispensing medication in a POD setting.”
• and “I feel confident in my ability to give accurate health education to
simulated person(s) in a POD setting.”, were combined to create Aim 1.

Cronbach’s alpha for the ten items was .88. The first six item responses were scored in a
positive direction (i.e., 1-5), with higher response scores indicating increased knowledge
and lower scores indicating decreased knowledge. The item responses were worded and
coded as follows: “not at all knowledgeable” was coded 1 and “very knowledgeable” was
coded 5. The remaining item responses were scored in a positive direction, with higher
response scores indicating increased confidence and lower scores indicating decreased
confidence. These item responses were worded and coded from 1-5 with “strongly
disagree” coded as 1 and “strongly agree” coded as 5. These ten items were summed to
calculate a total training effectiveness score with possible values ranging from 10 to 50.

The data were analyzed using 2 x 2 ANOVA for mixed designs, with change over
time (pre-and post-test scores) as the within subjects variable and program of study
(traditional and accelerated) as the between subjects variable. When examining Aim 1 pre- and post-distributions for skewness and kurtosis there was mild to moderate departure from normality. It was decided to continue with the analysis due to the large sample. There was a statistically significant change over time $F(1, 53) = 21.39, p < .001$, $\eta^2 = .288$. The traditional students change from pre ($M=25.86, SD=5.9$) to post ($M=37.25, SD= 6.5$) scores was significant ($p < .001$). There was also a significant change ($p < .001$) in the accelerated option student scores pre ($M=19.11, SD= 5.1$) and post ($M=38.37, SD=4.4$). Prior to participating in the exercise, both groups of students reported less knowledge. Compared to the traditional students, the accelerated option students had less knowledge. However, there was an increase in knowledge in both groups. The students perceived that the Zombie Apocalypse exercise was effective in preparing them for real world disasters.

**Aim 2**

Aim 2 examined nursing student perception of the effectiveness of the Zombie Apocalypse exercise in preparing them to safely provide care for patients during a disaster or infectious disease pandemic. To explore student perception of effectiveness to safely provide care, and address Aim 2, pre-and-post survey questions:

- “I feel confident in my ability to correctly identify symptomology consistent with a specified communicable disease in a disaster event.”
- “I feel confident in my ability to adhere to accurate infection control measures for an identified communicable disease agent in a disaster event.”
• I feel confident in my ability to correctly identify patients who are experiencing psychological distress during a disaster event.”
• “I feel confident in my ability to refer patients to the appropriate resources in the event they are experiencing psychological distress during a disaster event.”
• “I feel confident in my ability to use therapeutic communication to diffuse psychological distress experienced by person(s) during a disaster event.”
• “I feel confident in my ability to correctly conduct “griage” of patients during a disaster event.”
• “I feel confident in my ability to correctly triage patients during a disaster event.”
• “I feel confident in my ability to make clinical decisions in the event of a disaster.”
• I feel confident in my ability to communicate effectively with key personnel in the POD setting.”
• and “ I feel confident that I can complete my nursing duties under the pressures of a disaster event.”, were used to create Aim 2.

Cronbach’s alpha for Aim 2 was found to be highly reliable (10 items; α = .93). These items were scored in a positive direction (i.e., 1-5) with higher response scores indicating increased confidence and lower scores decreased confidence. The item responses were worded and coded as follows: “not at all confident” coded as 1 and “very confident” coded as 5. These ten items were summed to calculate a total training effectiveness to safely provide care to patients score with possible values ranging from 10 to 50.

When examining Aim 2 pre- and post-distributions for skewness and kurtosis there was mild to moderate departure from normality. Once again, it was decided to
continue with the analysis due to the large sample. There was a statistically significant change over time $F(1, 52) = 6.85, p = .012, \eta^2 = .116$. In the traditional student cohort change from pre (M=33.33, SD=8.2) to post (M=38.52, SD= 6.4) scores was significant ($p < .001$). There was also a significant change ($p < .001$) in the accelerated option cohort pre (M=28.22, SD= 6.0) and post (M=38.41, SD=4.1). Prior to participating in the exercise, both groups reported less confidence. Compared to the traditional group, the accelerated option students were less confident. However, there was an increase in confidence in both groups. The students perceived that the Zombie Apocalypse exercise was effective in preparing them to safely provide care for patients during a disaster or infectious disease pandemic.

**Aim 3**

Aim 3 explored nursing student perception of their willingness to care for patients during an infectious disease pandemic after receiving training. To explore student willingness to respond and address Aim 3, pre-and-post survey questions were used: “In the event of a disaster resulting from an infectious disease, I would be willing to provide care.” The item was scored in a positive direction (i.e., 1-5) with higher response scores indicating increased significance and lower scores decreased significance. The item responses were worded and coded as follows: “strongly disagree” coded as 1 and “strongly agree “coded as 5.

Aim 3 was created using only one item. Because of this all normality tests were violated. As a result, the Wilcoxon Signed Ranks Test was used to determine whether there was a significant difference from pre-to post-tests on willingness to respond in the traditional
group and the accelerated group. In the traditional group, a non-significant effect was noted, $Z = -1.70, p = .089$. A significant effect ($Z = -2.35, p = .019$) was noted in the accelerated option group.

Although the traditional option students felt more prepared to deal with a real-world disaster and safely provide care to patients, there was no change in their willingness to respond. The accelerated option students felt less prepared than the traditional students to deal with a real-world disaster and safely provide care to patients prior to the exercise. At the conclusion of the exercise, this group had a greater increase between mean pre- and post-scores than the traditional students and were more willing to respond to a disaster.

**Ebola Focus Group Study**

**Aim 4:** *Develop a preliminary model for training nursing students in emerging infectious disease/disaster preparedness and response that will be tested in a future study.*

This section describes the results of the data obtained from transcribed focus group sessions. The focus group sessions were used to examine the participant’s perceptions regarding the benefits and limitations of the Ebola exercise and any perceived stress response. The themes that emerged from this analysis will assist in developing a preliminary model for training nursing students in emerging infectious disease/disaster preparedness and response. The major themes included: “Purpose”, “Realism”, “Incentive/Motivation”, and “Vulnerability/Empowerment.” Three categories were shared by the major themes. These categories were: “Confusion”, “Frustration”, and “Stress.”
Sample

Only nursing students who had previously participated in the Ebola exercise participated in the focus group sessions. Twelve sessions were held; seven (58%) accelerated option sessions and five (36%) traditional option sessions (See Table 6). Traditional option focus groups were comprised of 21 females (72%) and eight males (28%). Accelerated option focus groups were comprised of 28 females (88%) and four males (12%). One focus group session (focus group 4) was not included due to only one student participating (See table 7).

Table 6.

**Focus group demographic data**

<table>
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<th>Variable</th>
<th>Characteristic</th>
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</tr>
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<tr>
<td></td>
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</tr>
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</tr>
<tr>
<td></td>
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<td>49</td>
<td>80</td>
</tr>
</tbody>
</table>

Table 7.

**Focus group demographic data by program of study**

<table>
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<tr>
<th>Variable</th>
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<th>N</th>
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<tbody>
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</tr>
<tr>
<td></td>
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<td>72</td>
</tr>
<tr>
<td>Accelerated Students</td>
<td>Male</td>
<td>4</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>28</td>
<td>88</td>
</tr>
</tbody>
</table>
Themes and Categories

Content analysis revealed four major themes and three categories that were shared by all four themes. The major themes included “Purpose”, “Realism”, “Incentive/Motivation”, and “Vulnerability/Empowerment”. Three categories were shared by the major themes. These categories were “Confusion”, “Frustration”, and “Stress”. All the themes and categories originated from the data and represent the students’ impressions of the benefits and limitations of Ebola exercise. The themes and categories are described within the sections that follow. Direct quotations from the focus group session transcripts appear as excerpts (indented paragraphs), in which square brackets ([ ]) indicate information added by the researcher and ellipses (…) signify items omitted for conciseness.

Purpose. In their comments, the accelerated and traditional option students expressed confusion, frustration and stress regarding the purpose of the exercise. Many felt going into the exercise that the purpose would be to don and doff but were confused when not everyone had a chance to don and doff, they were assigned other roles, or the donning and doffing was not taken seriously. They were frustrated by what they perceived was a lack of instructions or conflicting instructions. The students also the felt lack of adequate preparation and unclear expectations as to the purpose of the exercise were very stressful.

Confusion. The students voiced confusion over spending time learning how to don and doff then being assigned a different role that was never discussed and not having
an opportunity to don and doff. There was also confusion when instructors did not emphasize the proper procedure for doffing.

And I feel like we all just focused on donning and doffing … So the other stuff—donning and doffing I knew how to do—but everything else was kind of just lost a little bit.

… I donned, went in and then it was over…I really didn’t do anything. So for me, being in the second group, really what was the purpose…?

It lost gravity at the end when I had taken all this time to don all the PPE because I was in the dirty—…And then at the end of the exercise they were like, “Oh, just take it off.” And we were like “Oh well, I thought we were supposed to take it off properly so we could see if we’d been contaminated” (…) and so for me, I was like, “well what was the point in taking the time to put it all on?”

Yeah, and then like the assignments for simulation, like we were all assigned one area but some people didn’t even have to put on the gear that they spent so much time teaching us about. People were just outside like welcoming people, essentially. It’s like how are they going to learn anything from that?

Other students were confused and frustrated by an exercise focusing on Ebola.

I think that as the semester went on, Ebola became less of an issue in the media; we heard less about it. And by the time we had this Ebola training, it was like a lesser issue. And a lot of us just figured that it would sort of fade out as being like a big issue… it was not really necessary to solely focus on Ebola specifically for this type of training.

I also think the Ebola crisis ended very soon after it began. And it was small scale. People thought, “Why do I need to know this? This is gone, and it’s not nearly as big.”

It was overblown… Ebola is just not that easy to catch. Yes it can kill you if you get it, but [it’s] just not that easy to catch… It seemed we just bought into the hype.

I felt like the Ebola- I did not feel like it was a crisis. I feel like we have a poverty, people not eating, homelessness crisis more than we have an Ebola crisis.

**Frustration.** Students were frustrated by the lack instructions and preparation and the inability to practice the skill (i.e., donning and doffing) that they had spent so much time learning.
Well, I was in triage, so I feel like all of our preparation was for donning and doffing, and then I didn’t even have to do that. So, it was like, okay, well, I never had any triage training. We never have had that, in any sim, or anything like that. So I didn’t really know what to do. And then the only thing I did know how to do, I didn’t really do. So, I feel like I didn’t get to practice the donning and doffing thing...

It just made it seem like we were getting kind of tested like, “oh you need to know exactly how to don and doff” And then, honestly, it was a joke because half of them didn’t even take it off, right? And half of us—it wasn’t consistent at all.

My role was a nurse in the non-contaminated ER so I didn’t don or doff safety equipment and I wasn’t even exposed to nurses who were donning.

Stress. Students were stressed by what they perceived was a lack of preparation and guidance. They felt that they were purposely left to flounder and wondered if that was the purpose of the exercise.

[I] kind of feel like we’re kind of just put into it and we’ve never been part of it. We never learned about it. So then we’re just expected to do roles that we weren’t really prepared for.

We were in a role that we didn’t even know was going to exist prior to going into the whole training.

We kind of were thrown in there. We didn’t know what we were doing.

I think we didn’t have adequate preparation for it. These simulations that we have in class, it’s all stuff we’ve learned. We should know how to put it into practice. Whereas the disaster simulations have been, “Alright, let’s go.” Kind of I feel like we’re kind of just put into it and we’ve never been a part of it. We never learned about it. So, then we’re just expected to kind of do roles that we weren’t really prepared for.

It was just, “Go ahead and do it. Do your thing, people.”

Because if we’re in the hospital setting in isolation, they would tell us what to do. You know what I mean? We’re with a nurse. So, we’re not by ourselves. Or if we get a job somewhere, we’re gonna have a policy to follow. You know what I mean? But in that situation, we had nothing…

…we kind of were thrown in there. We didn’t know what we were doing.

We still don’t have a good grasp of what we were supposed to do. What was the point of it? Was it to really see if we knew what we were doing without guidance?
If we could figure it out with a little guidance? I really don’t understand what was the purpose of it.

So, I feel like if we had more knowledge and more training at the outline of how it was going to go down where we could actually feel comfortable to apply stuff, we would have felt better about it… We were kind of confused of the purpose afterwards.

what was the purpose of it? Was it to see how we would do without assistance or was it to help us? Because if it was to learn through the process we should have had more guidance through it.

Realism. Traditional and accelerated option students struggled with understanding what was real and what was simulated in the scenario and how they should respond. They were confused, frustrated, and stressed by working in an environment that was unfamiliar to them, without guidance, and not knowing when to “pretend” or function in a real capacity.

Confusion. Not understanding what was real or simulated was a source of confusion for the students. Other sources of confusion included not being familiar with the environment and the paperwork.

So I was seeing all these labels around the school being like, “This is triage. This is dirty waiting.” And I was like “I have no idea how this actually applies in real life because I’ve never seen it.”

Once we admit them to the hospital from the ED triage…we had to then get them there. We didn’t know how to get them there…because it’s not a real hospital. It’s pretend.

The way we were walking them through, we were totally contaminating everything because we didn’t know we were supposed to walk them through a faculty lounge.

I had a questionnaire in the ED triage. But the confusing part was, so, we were supposed to call the Health Department if we checked off things that would indicate Ebola. But they gave us the real form that’s currently used. But the scenario was a pretend scenario where there was already an Ebola outbreak. So, these people who had symptoms, who had Ebola in the scenario, were using a
form that’s asking about travel history; have you been to West Africa. So then, we
didn’t call the Health Department for anyone. People weren’t having the actual –
because the form was for real life right now and the scenario was in the
hypothetical future where… so we just gave up.

It also would have been beneficial if we had more of a heads up on how the layout
was going to be, like what the pods were doing Saturday at least we’d gotten the
map and everything. But for Ebola, it was kind of like we got there that day and
they kind of ran through it really quickly, which in a disaster simulation yes, we
wouldn’t really have much of a heads up. But as new nurses it was kind of
confusing.

_Frustration_. Students were frustrated by what was perceived as the unrealistic
staffing of the emergency department and the lack of available assistance.

I don’t want you to think that we’re thinking it’s gonna be structured in real life
and it’s not gonna be like this. We know it’s chaos if it is an emergency situation.
We understand it all. It’s just like she said, you need to have some sort of
guidance. We were only in our second semester. We’ve never dealt with
something like this. And I feel like in real life, you have people there you could
ask questions about.

It’s somewhat unrealistic because we’ll always be with people that have more
experience. It’s like throwing in a bunch of nursing students that we’re not even
licensed yet. We’re all very inexperienced. But I think the situation if we were
part of a pod or something, there will always be people there that have some
experience, whereas all of us are kind of looking at each other like, “What are we
supposed to do?” Nobody knows what to do.

They also expressed frustration regarding the realism of the behavior and
responses provided by the “patients”, other actors, and available resources including PPE.

[When discussing the “patients” providing temperatures and signs and symptoms]
Yeah, exactly. Is this a trick?

I couldn’t figure out how to use the phone because it was an intercom phone. I
couldn’t figure out how to use it. But I couldn’t even get help with that. To me,
that doesn’t interrupt the simulation, how [un]realistic is it, to have someone help
you? I feel like in real life, you have people there you could ask questions about.
Because someone might know how to use the phone and-

And that’s another thing, we have people sitting in the waiting room and,
technically, those chairs were contaminated. So actually they should have been
disposed of because there were a lot of people that were sitting out in the waiting room area who were contaminated. And the people just sat there…

Well, for me, personally, there were a couple of things I thought were unrealistic, or not as they were supposed to be. So, I was a screener, and people were coming up to me, and they were saying, “Oh, I think that you…” Trying to – they were touching me on my face and my neck, trying to contaminate me. And in a real life situation, most people don't just come up to you, and start touching your face, and trying to get something on you.

**Stress.** Many students were stressed by the amount of patients needing to be seen.

They felt that this was unrealistic and that in the real-world more help would have been available.

It became stressful as more patients came in and we didn’t have any spaces or what to do with them. We just didn’t know anything.

I think more people, more staff; more simulated staff. If we have, say, doctors. So then the people in the ER, you guys were like, “What do we do?” It’s like if there’s a doctor there then there’s an actual more collaborative care and it’s more realistic for a hospital setting.

And that was what I was saying before, about when they [the patients] started coming, because it was a bunch of them, and they all kind of started coming for us. And we didn't have security, so we had to try to say, you know, back up, back up, we're trying to get this. But, it got to a point where people were just...coming.

Although they were frustrated and stressed, some students believed the simulation was realistic. They believed the stress they experienced mimicked the stress experienced in a real event. They also felt the confusion, frustration, and stress experienced in the simulation helped prepare them for a real event.

It kind of felt like a real crisis, in the front.

Actually having to screen the patients, and do a quick assessment. That's more realistic. We're not gonna have time to go through everything. So, you have to do the focused assessment, and then just figure out that, and then, I guess putting on and off the PPE –

No, I did like the checklist better than the videos. I thought the checklist was really helpful when we were doing the simulation; to have that and to have them post it on the walls and stuff, which I think would actually be what you would
have in a hospital setting or whatever care setting, whether it be out in an emergency or whatever, to have that and to go through with a partner with the checklist. I thought that was really helpful to do that.

[Discussing running out of equipment during simulation and comparing it to a clinical experience] I actually had a scenario in the ER last week… and they [the nurses] were talking about how scary it would be because the ER is not stocked with absolutely any PPE that would be necessary if there was a crisis or an outbreak.

[Discussing simulation mirroring reality] I think it's kind of crazy that a major medical center like that doesn't have any kind of training on proper PPE. And, in any situation. And to me, that's – I was really surprised that a center like that, in Dallas, didn't have – the nurses weren't trained on that. And, I was just surprised by that.

[Discussing the changes with the donning and doffing guidelines used leading up to the exercise]. That’s really realistic, though, because that happens.

I feel like that was a strong plan of the simulation though; infection control kind of. Because I feel like especially in the hospital, the nurse is like, “Oh, you have to wear this but I’m not going to wear it. You just wear it,” a lot of times. So, that actually really helped and made you think about keeping yourself safe in real practice; not disaster situations but even day to day. Because I didn’t really realize, I guess, how serious some of the stuff they have can be and to make sure you protect yourself.

…So I think those were all good things, like you couldn’t hear each other or that there was some lack of preparation in gear and whatnot. Because in reality, that’s how it’s going to be if we had a new virus. So in that sense, I do think it was very effective…

I think that the importance of PPE is at the very front of my mind. And I think that, with the original outbreak, it – that probably wasn't at the front of their mind, because it's not something that they're used to, or something they've ever dealt with. But for us, they put such a big emphasis on it, and donning and doffing in particular, that I think it would be in the front of my mind. So, if there was a situation, I think I would say, with me, to make sure I review how to don and doff properly. Because now I know how important that part is.

**Incentive/Motivation.** Both groups of students were frustrated and stressed with the scheduling of the simulation (i.e., on the weekend) and that personal time had not been taken into account when scheduling the exercise. The majority of the accelerated option students were stressed by the added work that would not be graded and the
traditional students were frustrated that the exercise had taken place on a weekend when another important school event was being held.

Confusion and Frustration. Students were confused and frustrated as to the scheduling of the exercises. They did not understand why the Ebola exercise was planned on a weekend, was not included as part of any course syllabi, and was not announced at the beginning of the semester. However, the overwhelming response was frustration. Requiring the students to come in on a Saturday was viewed as inconsiderate. Students were frustrated by having to participate in the exercise outside of regular class time.

It’s the aggravation of having to come on a Saturday. I guarantee that’s what it was, or that we were put in a very high stress environment without any direction.

Of course we had to come in on a Saturday; we’re already busy students. Come in on a Saturday. Sort of short notice.

And also if it was something that was integrated – like if it was integrated ahead of time and to our curriculum, we’d be more receptive to doing it. So like this semester it was already integrated from the beginning so we knew we had to do it.

To have something on the weekends on a Saturday morning that’s mandatory and 8 to 1 doesn’t really make you happy about it.

You don’t want to be there so you don’t participate the way you could and you don’t have the same – like you're not going to get what you could out of it. Like I know I'm not going to walk out of there and be like, “Wow, I learned so much.” I'm gonna walk out of there and be like, “Wow, I have two exams to study for, now.”

If somebody doesn't wanna volunteer then what's the point of doing it? Like I don't wanna volunteer so why am I here? So I guess that's something that maybe like any, they can ask students do you wanna be involved here, do you wanna get a certification and as soon as they say yes then they come do this stuff but as soon as they say no, they shouldn't have to be here.

If they want students to be more involved, they should probably like think about their lives outside of the simulation and then we'd probably be more willing, happy about being there.
I don't know that it’s going to change anybody’s attitude when all of a sudden you’ve got a life besides school, and nursing students already have one of the hardest schedules on the campus. And then all of a sudden you're telling us we have to be here for this, and you can’t make it up. You have to do it or it’s – I don't think it was handled well as far as the scheduling.

…because nobody's gonna walk in there on Saturday morning at 8 a.m. and be really happy about being there when we have so much work to do. And Ebola was after Florida State University, remember?

It was already on a date that was very iffy for a lot of people. It was a day after a big University of Miami [University of Miami vs Florida State University football game] event.

In all honesty, I went into it with an attitude of this is sort of a joke. So when it was all happening, I wasn’t stressed because it didn’t feel real. I knew it wasn’t obviously real. And I wasn’t taking it seriously because of the things we’ve discussed earlier. It’s taking up our time on a weekend.

**Stress.** Lack of a grade, perceived extra work and the time taken away from studying were voiced as being stressful.

So, there was a lot of pressure besides all the pressure that we already have as the accelerated program.

If it was five percent of my grade, I think it would have given some incentive. You could have gotten a grade.

Or at the very least if within a class instead of being all- random- extra work. Just being in the accelerated program [is] very, very stressful.

it was lack of effort from our parts, too… they were so inconsiderate, so inconsiderate. It’s not being considerate of our time. We had so much work to do that my first thought, honestly, was: “oh, my God, I have something [inaudible] [00:10:13] how fast is this gonna go?” Like I want to get it done, I want to get it done, you know? So like the quicker I got it done was what I was worried about, rather than I really could have gotten a good – like the Saturday, I really could get a good experience if it wasn’t on a Saturday when I had a test to study for.

The most stressful thing was like we’re giving up our Saturday mornings to be here. I mean I know it doesn’t matter if there was a school activity event the night before [University of Miami vs Florida State University football game], like everyone was at. So we gave up our Saturday mornings to really put in the time that we have to put in the time that day. And then we get here and it’s like all over the place. If it was like really successful and it was so beneficial to us that – and
then I would walk out of there that Saturday and be like: okay, I gave up my Saturday but you know what, I learned so much and it wasn’t that big of a deal.

For both groups, the frustration and stress of being made to come on the weekend led to unwillingness to participate and was seen as a limitation of the training.

**Vulnerability.** Students were also confused, frustrated, and stressed by what they viewed as lack of guidance, communication, and instructions. Changing and unclear instructions also confused, frustrated and stressed them. For many students this increased their feelings of helplessness both during the simulation and when potentially encountering a similar situation during clinicals or upon graduation.

**Confusion.** Like, the main thing, where all the problems started, it was in the screening. Like, I don't think we were prepared enough to separate patients. So, it was like, at the first step, it was already – everything else was messed up. So, I think there needs to be more focus on the specific -The first line-Symptoms. Like, okay, do you have a fever? Like, you need to train the people to ask specific questions, not – because we're trained to go through the whole assessment. Like, oh, what's your blood pressure? Take the blood pressure. You just need to ask, like, do you have a fever? Is it, are you vomiting? Okay, over here. Minimal questions to separate people, because it gets too crazy.

Students were selected and assigned roles. But some students didn’t feel comfortable in their role. Some students had to do triage and they didn’t really feel comfortable in that assertive – it’s chaotic outside. Let me maintain order and then also control the environment. So, it was kind of – some people were displaced.

So, what was the point of it? What were they trying to teach us?

I don’t know if it was really… like, they wanted to see how we would do, because there wasn’t a lot of explanation, and I know she wanted us to kind of learn from it…we were all kinda lost on what to do.

It was just very much we didn’t know what was going on, what happened, and we didn’t know how good of a job we did, or anything.

**Frustration.** …we didn’t get any feedback about what we did right and what we did wrong and so everybody at the end, a lot of people were saying well, why did we do this?
The miscommunications as far as like what is the correct way to don, mostly on like how to don the gear like affected our perception of how to put that suit on now and I think if we're ever given another suit like that, we're all gonna be like are you sure this is the right way to do it? We were told so many different ways to do it before.

[When discussing filling out the unfamiliar forms] and the form was, if I recall, so many sheets to fill out… So, we just gave up.

…It’s frustrating that there was no protocol for chain of command

[We needed guidance] a chain of command type thing that we’ve been taught about. And we were literally left to, “You just have to figure it out on your own.”

There was no incident command system…and that’s what we’re taught now. So, it’s kind of just again, we were just thrown in there with the resources that we had which were limited and then kind of like, “Good luck.”

When questions aren’t answered then it makes it hard to make the rest of it because you’re missing a key piece of doing it right

**Stress.** It’s overwhelming to me because if at the school level, an institute of academic learning, I’m still having trouble doing it then when you get out into the real world and you’re expected to do it. And then beyond that, whatever that may be, it’s kind of how exponentially – if I don’t know, do the people in the hospital know it? And if they don’t know it, do they know where to figure out how to do it? Or is everybody walking around like, “Yeah, I can do this”??

So, I don't know if – I don't know how it works, do they have continued trainings on this [PPE]? Or is it you come out of nursing school, and you go out and, you got your training, and just go, you know?

I’m definitely more self-aware of – I guess not scared but if something were to really happen, I’d be seriously concerned if I was a nurse working with people with it. Because there’s so many things that you don’t even think about that could go wrong. And then you’re on the other side of that. So, now I’m consciously incompetent versus being unconsciously incompetent.

I think it makes me more afraid…Because now I know how many ways I can screw up putting on the PPE… Yeah, and taking it off. Taking it off is what scares me.

The students also felt the situation was chaotic and disorganized and the chaos increased their frustration, stress, and feelings of helplessness.

I wouldn’t say that it was kind of chaotic, it was fucking chaotic.
Also, that a lot of people – there was different types of experiences, for each group that was there. Some people only stayed for five minutes, and like, someone got contaminated, and that was the end of the whole situation. So, I don't think everyone got the same experience, or exposure to what the simulation was supposed to be.

Because it was so confusing when we were going through the simulation that we were flustered. So, that hindered our judgement about if it was helpful or not because we were just frustrated.

And it seemed like since it was so chaotic, you couldn’t really communicate with other people. It’s like whatever you had to do you had to do it yourself. Because just trying to communicate with the person next to you became impossible.

And, just with two triage people, with the amount of people coming in from outside that didn't go the right way, it was really hard to separate them. And then, there was people that just had kinda minor things going on, so we kind of had to sort. But it was so chaotic, so it was hard.

**Empowerment.** Many developed a plan to deal with what they were encountering, regardless of the confusion, frustration, and stress.

We were doing the clean ER I think it was. And we were just kind of like, “So, do we just look at them? Oh, don’t use the real blood pressure,” – I’m like, “So, what am I doing?” I’m like, “Just figure it out.” I’m like, “Just place these people here then.” We kind of just went on the fly and did our own thing. I’m not sure if it was right or wrong.

I was in the screening. So, I was interviewing the people and screening them right in the beginning. And they told me, “Oh, look for these symptoms.” But that’s all they said. And some had some of the symptoms but some didn’t. So, it’s do I take the chance and put them in the clean or do I send them to the dirty and then they possibly get sick? You know what I mean? So, I didn’t feel confident. So, if they had any type of symptom that was related to it, even if it was one or two, I sent them to the dirty. Because I didn’t want to take that chance of contaminating.

Well, he necessarily didn’t have to show symptoms this early. So, I was like, He’s a mystery patient.” I was also like, “Have you traveled outside of the country? Have you been around any of the patients?” And I would ask a million questions because of that. I didn’t want to – but I feel like some people didn’t know to ask that question or didn’t think of it. And that probably is why they got contaminated.

There was no way that we could fill out the whole form. So, I kind of did a name, fever. I skipped around to kind of see what…needs to be filled out.
So, everybody was asking different questions, and everybody – I just felt like we didn't have the time to get a unified front and say, you need to ask these few questions, this and this. It was kind of like, okay, now go. So, everybody just sort of asked their certain questions that they thought needed to be asked.

Well, when that happened [contamination of the ED], not everyone was wearing masks, so we ended up giving everyone masks, and then trying to move them – there was nowhere we could take the people to, so we kinda just moved them against a wall…

Looking back at the experience, many students felt they had a better understanding of what they would do in a real disaster.

I think what you said; advocating for your nursing role and asking for those trainings or resources. Or if this happens, not going in blind. You know that stuff can go down. It goes down quick and you’re just more aware, which is scary. But I’d rather know what can happen than just be hit with it; blindsided.

I think it was putting on the equipment. I felt, not super stressed, but I was trying to do it the right way, and I couldn't really remember the right way. So, that was reading instructions. I just that was more important, because that's what we probably can bring with – we can probably bring the way to put the equipment on – that comes with us. Like, with any kind of disaster that we may need that kind of equipment.

And now thinking about if that was actually me, if that was me actually with the real people and they were telling me, “Figure it out,” I’d be really mad. I’d be like, “No, you figure it out. I’m getting out of here. I don’t know what to do. You need to give me some guidance.” Which I hope that that’s what’s actually going on with people that were dealing with the real thing.

I’m being realistic. There was only one scenario and we were only one position. So, of course one time is better than no time but I can’t say that this one experience in one area of the chaos or the situation makes me feel more confident to handle this [a real disaster].

I wouldn’t take on that role [caring for a patient with Ebola] if I didn’t feel like I was trained and confident.

[Multiple responses when asked if they would respond to an infectious disease pandemic after participating the training] probably not…moreso than before… No, maybe if I was trained more, I would be more comfortable…I would…I would consider it. I don’t think I would for sure…It depends on the thing and how organized people are…I would definitely go…
Summary.

The major themes “Purpose”, “Realism”, “Incentive/Motivation”, and “Vulnerability/Empowerment” were determined to impact the students’ perceptions of the benefits and limitations of the Ebola exercise. These themes emerged from the data as students described their confusion, frustration and stress responses. Combined with the results from the Ebola Disaster Simulation Exercise Training and the Zombie Apocalypse POD Disaster Exercise, these themes and sub-themes will be used to guide the development of a preliminary model for training nursing students in emerging infectious disease/disaster preparedness and response that will be aimed at increasing knowledge, confidence and willingness to respond.
Chapter 5

Discussion

The specific aims tested in this study were to: 1) explore nursing student perception of the effectiveness of the Ebola and Zombie Apocalypse disaster exercises in preparing them for real-world disasters; 2) examine nursing student perception of the effectiveness of the Ebola and Zombie Apocalypse disaster exercises in preparing them to safely provide care for patients during a disaster or infectious disease pandemic; 3) explore nursing student perception of their of their willingness to care for patients during a disaster or infectious disease pandemic after receiving training; and 4) develop a preliminary model for training nursing students in emerging infectious disease/disaster preparedness and response that will be tested in a future study.

This final chapter will discuss the study findings within the context of the Extended Parallel Process Model (Witte, 1992). Included in this chapter is also an examination of the study strengths and limitations, nursing implications, and future research directions.

Discussion of Findings

In the present sample, accelerated option students were older than traditional students with an average age of 27 years. This mirrors the national trends with the average age of nursing students at graduation being 31 and with 56% of new nurses entering the workforce between the ages of 24 to 32 (U.S. Department of Health and Human Services Health Resources and Services Administration [HRSA], 2010). The study sample also reflects the new nurse population that consists of traditional students (i.e. high school graduates) and a growing number (37%) of nursing students who enter
nursing after obtaining a baccalaureate or master’s degree in another field or as a second career (HRSA, 2010). In the Ebola study, 78% of the sample was comprised of accelerated option students. This is due to the fact that one traditional student cohort and two accelerated option cohorts participated in the exercise. One accelerated option cohort graduated and did not participate in the Ebola focus groups or the Zombie Apocalypse exercise. The sample for the Zombie Apocalypse was evenly distributed between traditional and accelerated option students.

Aim 1: Explore Nursing Student Perception of the Effectiveness of the Ebola and Zombie Apocalypse Disaster Exercises in Preparing Them for Real-World Disasters.

**Ebola disaster simulation exercise training.** Aim 1 was created by combining the items *How knowledgeable are you about the potential public health impact of Ebola*, *How well do you think you could address the Ebola related questions of a concerned member of the public*, and *How important is pre-Ebola outbreak preparation and training*. These items do not directly measure the effectiveness of training. However, an increase in knowledge could be interpreted as an increase in effectiveness in preparation for a real-world disaster. In this study, both the traditional and accelerated option cohorts’ perceived training as effective in preparing them to deal with real-world disasters prior to the exercise and there was an increase in the perceived effectiveness of the training after participating in the exercise. An increase in the perception of the importance of Pre-Ebola preparation and training was also viewed as an increase in effectiveness of training. Kaplan et al. (2012) reported similar results with an increase in knowledge base and an
increase in the ability to handle emergency preparedness situations and to work more effectively in hospital or clinic being reported by students.

**Zombie apocalypse POD disaster exercise.** Similar to the Ebola exercise, Aim 1 was created by combining all the knowledge items and interpreting an increase in knowledge as an increase in effectiveness in preparation for a real-world disaster.

*Disaster simulation is pertinent to my learning in a pre-licensure baccalaureate nursing program, I feel confident in my ability to apply my knowledge of a POD layout in a disaster setting, I feel confident in my ability to apply the principles of the nurse staffing role for dispensing medication in a POD setting, and I feel confident in my ability to give accurate health education to simulated person(s) in a POD setting* were also used to create Aim 1. These items were also thought to indirectly reflect the effectiveness of training in preparing students for a real-world emergency. If upon completion of the exercise the students felt they had a better understanding and were more confident about the environment (i.e., layout), their role in a POD setting, and their ability to educate “patients”, then it could be inferred that the exercise was effective in preparing them for a real-world emergency. Other studies have supported the use of an increase in knowledge and confidence to measure effectiveness of training (Pang et al., 2009).

The findings of this study suggest that prior to participating in the exercise, both traditional and accelerated option students reported less knowledge. Both cohorts received the same training prior to the exercise. However, when compared to the traditional students, the accelerated option students had less knowledge prior to the exercise. At the completion of the exercise there was an increase in knowledge in both
groups. It is unclear why the accelerated cohort felt less knowledgeable. A study examining the most effective teaching modalities for each cohort would be of merit.

**Aim 2: Examine Nursing Student Perception of the Effectiveness of the Ebola and Zombie Apocalypse Disaster Exercises in Preparing Them to Safely Provide Care For Patients During A Disaster or Infectious Disease Pandemic.**

**Ebola disaster simulation exercise training.** To explore student perception of effectiveness to safely provide care, item *How confident are you about being safe in your nursing role when caring for an Ebola patient* was used to create Aim 2. An increase in confidence was viewed as an increase in the ability to safely provide care to patients during a disaster or infectious disease pandemic. Study findings suggest that prior to training both cohorts were neutral regarding the ability to safely provide care. At the conclusion of the exercise, both groups were more confident in their ability to safely provide care. However, the traditional option cohort was more confident in their ability. This finding is inconsistent with the Ebola focus group findings. During the focus groups traditional students voiced they were unhappy attending the exercise on the morning after a football game with a rival university. They expressed a lack of desire to don and doff PPE and participate in the exercise. The accelerated option students attended the exercise the morning of the football game and voiced they were more concerned about the impact of the exercise on their study time, but were still willing to participate. After participating in the exercise, all the groups were scanned with a black light to assess for possible contamination with a simulated Ebola virus (i.e., an odorless powder that glowed brightly under ultraviolet light). Perhaps more accelerated option students became contaminated and this affected the response.
**Zombie apocalypse POD disaster exercise.** For this study, Aim 2 was created by combining all the confidence items and interpreting an increase in confidence as an increase in the ability to safely provide care to patients during a disaster or infectious disease pandemic. Similar to the Ebola exercise findings, prior to participating in the zombie apocalypse exercise, both traditional and accelerated option students reported less confidence. Prior to the exercise, the accelerated option students were less confident than the traditional students. However, both groups were more confident after participating in the exercise. It is unclear why the accelerated option students were less confident prior to participating in the exercise. Both groups received the same didactic content and participated in the role-play exercise. As mentioned previously, a study examining the most effective teaching modalities for each cohort would be of merit.

The literature supports that students’ perceptions of increased knowledge and confidence have increased their perceived ability to safely provide care (Chan et al., 2010; Kaplan et al., 2012; Morrison & Catanzaro 2010; Pang et al., 2009). Students who participated in a multidisciplinary disaster education project felt comfortable in their assigned roles and understood the nursing skills utilized in the various roles (Hutchinson et al., 2011). Landry et al. (2008) found that students reported increased knowledge in handling infectious waste and hazardous materials and controlling the spread of infection.
Aim 3: Explore Nursing Student Perception of Their Willingness to Care for Patients During an Infectious Disease Pandemic After Receiving Training.

**Ebola disaster simulation exercise training.** Once you are graduated and working as a nurse, how significant a role do you think you would play in your agency’s overall response to an Ebola outbreak was the item used to create Aim 3. This item does not directly assess willingness to respond. However, in a pilot study of local Maryland public health personnel (Balicer, Omer, Barnett, & Everly, 2006) researchers illustrated that perceived importance of a participant’s role in an agency response can markedly affect willingness-to-respond rates. Although there was an increase in knowledge and confidence in both groups, there was no change in willingness to respond with either cohort after the Ebola exercise. Balicer et al. (2010) found that during a pandemic influenza emergency, nurses were less likely than physicians to respond. The belief statements that impacted nurses’ willingness to respond included level of perceived knowledge regarding pandemic events; perceived importance of role in overall response; and perceived personal safety at work (Balicer et al., 2010). Perhaps students felt unsure transitioning from students to new nurses and what their role would be as new nurses during a disaster/infectious disease pandemic.

**Zombie apocalypse POD disaster exercise.** In the event of a disaster resulting from an infectious disease, I would be willing to provide care was the item used to create Aim 3. This item directly measured willingness to respond. There was an increase in knowledge and confidence in both groups. Unlike the Ebola disaster exercise, there was a change in willingness to respond with the accelerated cohort after the zombie apocalypse exercise. Although knowledge and confidence increased, the traditional students may
have still been fearful or unwilling to respond to an infectious disease pandemic. The unwillingness of some health workers to place themselves at risk of exposure to emerging infectious diseases was observed during the 2003 SARS epidemic and the early years of the HIV/AIDS epidemic (Stein et al., 2004). Similarly, although educational materials and information regarding AIDS has become more readily accessible, nursing students and nurses continue to fear and may be reluctant to care for patients with HIV/AIDS (Chen, & Han, 2010; Mullins, 2009). The findings with the accelerated option students supports previous findings. Barnett et al. (2010) found that increased efficacy played a bigger role than perceived threat in willingness to respond. Nurses who felt prepared, understood their role during a disaster, and felt their role was important were more willing to respond.

**Aim 4: Develop a Preliminary Model for Training Nursing Students in Emerging Infectious Disease/Disaster Preparedness and Response That Will be tested in a Future Study.**

*Ebola focus groups.* During the Ebola focus groups, students voiced that they were confused, frustrated and stressed. Many felt the exercises were not worthwhile realistic, or relevant. These feelings may account for the results seen in Aim 3. Framing these findings within the EPPM model (Witte, 1992) may help clarify the findings. According to the EPPM model, people who fall into two categories (low threat/high efficacy and high threat/high efficacy) are more likely to view the training as effective (accept the message) and be more willing to respond to a disaster (adopt the recommended response). People who view the severity of the threat as high and their ability to respond to the threat as low (high threat/low efficacy) or view the severity of
the threat as low and their ability to respond to the threat as low (low threat/low efficacy) are more likely to view the training as ineffective (deny the message) and be less willing or unwilling to respond to a disaster (adopt the recommended change).

In this study, some students felt unprepared during the exercise and unable to perform their roles (low efficacy). Many “gave up” and felt that whatever action they took did not matter and did not make a difference. Many compared the experience during the exercise with possible real-world experiences and felt unprepared and unwilling to respond to a real-world disaster. These findings echo other study findings (Landry et. al., 2008; Pang et. al., 2009). Other students felt that being unprepared mimicked a real-world disaster and sought ways to perform their roles safely. These students felt they had “figured it out” and were proud of what they had accomplished (high efficacy).

The preliminary training model will focus on increasing efficacy (self and response).
Preliminary Model

![Diagram of external stimuli, message processing, outcomes, and process]

Figure 2. Preliminary model for training

Message processing: increasing perceived efficacy.

- Students will be taught how to perform a rapid assessment during their first semester of nursing school. Prior to receiving the didactic content, a pre-test will be administered. After receiving the didactic content, they will role-play and perform rapid assessments on each other. On their assigned simulation day, they will also participate in a simulation scenario where they will perform rapid assessments on their simulated patients. At the end of their simulation day, the students will be given a post-test and will evaluate the simulation scenario.
• During their second adult-medical surgical course, the students focus on the care of patients with chronic illnesses. Didactic content will introduce the concept of caring for patients with chronic illnesses during a disaster. Prior to receiving the didactic content, a pre-test will be administered. Students will participate in a table-top or role-playing exercise. On their assigned simulation day, they will participate in a scenario where they will care for patients with chronic illnesses during or immediately after a disaster. The scenario will build upon previously learned material (i.e., rapid assessment). At the end of their simulation day, the students will be given a post-test and will evaluate the simulation scenario.

• During their third adult-medical surgical course, the students focus on the care of patients with acute illnesses. Didactic content will introduce the concept of caring for patients with acute illnesses during a disaster. Prior to receiving the didactic content, a pre-test will be administered. Students will participate in a table-top exercise. On their assigned simulation day, they will participate in a scenario where they will care for patients with acute and chronic illnesses during and/or immediately after a disaster. Scenarios will continue to build upon previously learned material. At the end of their simulation day, the students will be given a post-test and will evaluate the simulation scenario.

• During their final medical-surgical course and their role synthesis course, the students will receive the remaining disaster preparedness and response content. Prior to receiving the didactic content, students a pre-test will be
administered. Students will participate in a table-top exercise. On an assigned day, students in these courses will participate in a large-scale disaster exercise. The exercise will incorporate all previously covered disaster preparedness material. At the end of the exercise, the students will be given a post-test and will evaluate the disaster exercise. This large-scale disaster exercise will take place during regularly scheduled class or clinical time and will not take place on a weekend.

Message processing: perceived threat. It will be difficult to control the threat component. However, Balicer et al. (2006) posit that perceived efficacy outweighs perceived threat when responding to a threat.

The goal of this preliminary model is to weave disaster preparedness principles throughout the entire curriculum and provide the students with multiple opportunities in multiple settings to acquire skills and increase knowledge and confidence. As students progress through the program, they will build upon previously taught disaster preparedness principles. The simulations will become more complex and the students will have to incorporate disaster preparedness principles into the care of adult medical-surgical patients. At a later date, disaster preparedness content will also be incorporated into the pediatric and maternal-child courses. This will allow the students to become familiar with caring for patients across the life-span in a disaster setting.

Study Limitations

The investigator acknowledges several limitations of this study. The present study may have been limited because of the use of secondary data analysis. Data was not
collected by the investigator and there was an inability to raise questions or probe emerging themes. Another limitation was the timing of the exercises. Both simulations were held on weekends. During the focus groups, both cohorts expressed frustration that a mandatory activity was being held on a weekend. Students may have under-responded to all survey items out of frustration and a decreased desire to participate. Finally, focus groups were held four months after the Ebola exercise. Time may have changed student perceptions of the events.

**Implications for Nursing Education**

Existing research in disaster preparedness nursing education point out the challenges in determining the best teaching methods for delivering disaster preparedness content (Jose & Dufrene, 2013). The results of this study have important implications for the education of future and current nurses. Disaster preparedness education should begin in nursing school. As outlined by the ANA and the AACN, nurses need to respond in a disaster. Education on disaster preparedness principles must begin early in the curriculum, be woven throughout the curriculum, and include a basic knowledge of common disasters and types of injuries/disease presentations, rapid assessment of injuries (including griage and triage), and a basic understanding of communication during a disaster and the function of an incident command center. The care of vulnerable populations and patients with chronic diseases during a disaster should also be incorporated. Instruction must include an understanding of interprofessional roles and the need for communication and collaboration with different disaster responders.
Disaster education should begin in nursing school but not be limited to pre-licensure education. Disaster response education should also be woven throughout the graduate curriculum. The role of the nurse and the importance of the nurse as a member of the disaster response team must be stressed. This education cannot merely exist in a didactic format in one course or at one level. In order to be effective, disaster preparedness must be looked at as a step-wise, multi-modality thread woven throughout the entire undergraduate and graduate curriculum.

**Implications for Nursing Practice**

Nurses comprise the largest percentage of healthcare providers and are early disaster responders, yet nurses may not respond during a disaster. This unwillingness to respond directly impacts a healthcare facility’s surge capacity and affects patient outcomes. Understanding the underlying cause- fear of exposure, lack of education or skills, perceived unimportance of role or not understanding the role- can help healthcare administrators educate and support nurses prior to a disaster. For example, administrators should incorporate disaster preparedness content as part of the new-hire onboarding process. During orientation, the healthcare facility’s disaster plan and hospital ICS should be reviewed. The different roles should be discussed and the importance of each role should be stressed. New hires should then participate in small group table-top exercises and share their experiences. Also as part of the orientation process, new-hires with direct patient contact should also review correct donning and doffing of PPE and appropriate disposal of hazardous waste.
Semi-annually, healthcare facilities should collaborate with local health departments, police, and fire rescue and conduct large scale exercises. These exercises should not be limited to common natural disasters (i.e., hurricanes in Florida and tornadoes in the Midwest) biological and bioterrorist attacks should also be exercised. During these exercises hospital response should not be limited to only emergency department physicians and nurses. All personnel should participate. Allowing nurses and other healthcare providers to practice disaster preparedness and response principles multiple times and in multiple settings will increase knowledge and confidence and alleviate fears. Nurses will better understand their roles and the importance of their roles and be more willing to respond.

**Implications for Future Research**

Based on these findings, a preliminary model will be refined focusing on a step-wise instructional delivery method combining didactic content and hands-on learning. Future studies could build upon this model by examining where in the curriculum disaster training takes place, the length and amount of training, and expanding exercise participants to include other healthcare providers. Additional variables to include in future exploration consist of any of the following: use of online training modules; virtual reality simulations; different disaster preparedness competencies, such as INCMCE or ICN competencies or CDC guidelines; and influence of socialization on willingness to respond.

This study was limited to nursing student changes in knowledge, perceptions and skills acquisition. Another area needed for further exploration is psychological safety and
support for healthcare providers during and immediately after a disaster. Future research needs to extend to other healthcare providers such as nurses, nurse practitioners, physicians, public health department employees, police officers, firefighters, and any other disaster responders.

Conclusions

Disasters, infectious disease pandemics, and terrorist attacks (National Consortium for the Study of Terrorism and Responses to Terrorism, 2016) are increasing in frequency and severity. As of the writing of this dissertation, Sierra Leone marked the end of the largest Ebola outbreak in history after 42 days had passed since the last person confirmed to have Ebola tested negative for the second time. This brings the total number of Ebola cases in West Africa (from March 2014 to March 2016) to 28,639, with 11,316 total deaths (WHO, 2016). The Zika virus has re-emerged, with 39 countries reporting active transmission of the virus and over 100 cases reported in the U.S. (CDC, 2016). The purpose of this study was to explore the relationship between current disaster preparedness education and training, and the associated changes in nursing student knowledge, perceptions, and skills acquisition through quantitative and qualitative analysis. This unique perspective was used to address the ambiguities in the literature and to fill in the gaps in our understanding of disaster preparedness education and willingness to respond. There are several important findings that add to the scientific literature.

First, the results demonstrated that a step-wise, multi-modality approach to disaster-preparedness education involving local health departments and using federal guidelines was beneficial. Students reported feeling more prepared to deal with a real-
world disaster and to safely provide care during a disaster or infectious disease pandemic. These findings provide a springboard for the development of an educational model for disaster preparedness education.

Second, the results demonstrated that nursing students need an understanding of their roles as nurses responding to a disaster and the importance of said roles. Students viewed disaster response as a voluntary action that was separate from their nursing role. Students would benefit from an educational model that discusses and builds upon disaster preparedness principles early and throughout the curriculum and not just in one course.

Nurse educators are uniquely positioned to address the problems of disaster preparedness and response. The same barriers Weiner, Irwin, Trangenstein, & Gordon (2005) identified—demanding curricula with little opportunity to add new content, insufficient disaster course content, and inadequately prepared nursing faculty—still exist today. However, as disasters increase in frequency and severity, it is no longer a matter of “if” a disaster strikes but “when.” In fact, a recent survey demonstrates that nurses still are not prepared to respond. More than half of working nurses (53.8%) surveyed indicated that they neither received nor provided emergency training in the previous year. Of those nurses who had received or provided emergency preparedness training, only 10.5% felt very prepared, while 44.1% felt somewhat or not at all prepared (HRSA, 2010). As nurse researchers, faculty members, and patient and community advocates, we are called upon to educate our future nurses in disaster preparedness and response. Increasing efficacy through increasing the knowledge and confidence of future nurses regarding their roles and the importance of those roles during a disaster will increase the number of nurses willing to respond and ultimately save lives.
References


Snowden, L. (1997). An investigation into whether nursing students alter their attitudes and knowledge levels regarding HIV infection and AIDS following a 3-year program leading to registration as a qualified nurse. *Journal of Advanced Nursing*, 25(6), 1167-1174. doi: 10.1046/j.1365-2648.1997.19970251167.x


APPENDIX A

CHARACTERISTICS OF ACCELERATED OPTION AND TRADITIONAL OPTION STUDENTS

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Accelerated students</th>
<th>Traditional Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum GPA</td>
<td>Overall transfer and pre-requisite GPA of 3.0</td>
<td>UM students: minimum cumulative GPA of 3.0 and a UM prerequisite GPA of 2.75.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Transfer students: minimum cumulative GPA of 3.5 and a prerequisite GPA of 3.3.</td>
</tr>
<tr>
<td>Requirements</td>
<td>Minimum undergraduate degree in a field other than nursing</td>
<td>Incoming Freshman: Minimum High School GPA of 3.7</td>
</tr>
<tr>
<td>Length of Program</td>
<td>Fast-track 12 month (three semester) program</td>
<td>Two year (4 semester) program with summers off</td>
</tr>
</tbody>
</table>

*Note. Adapted from: https://umshare.miami.edu/web/wda/nursing/EE_Pictures/Brochures/2014/BSN_Accelerated_092214.pdf and https://umshare.miami.edu/web/wda/nursing/EE_Pictures/Brochures/2014/BSN_Traditional_092214.pdf*
<table>
<thead>
<tr>
<th>Nursing Course</th>
<th>Course Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NUR308: Adult Health II</td>
<td>This course focuses on the nursing management of the adult/geriatric client who experiences alterations and/or adaptations in physiologic defense mechanisms.</td>
</tr>
<tr>
<td>NUR411: Adult Health III</td>
<td>This course focuses on the adult experiencing complex multi-organ and/or multi-system alterations/adaptations in functions. Emphasis is on the use of the nursing process to assist adult clients to adapt to the related changes.</td>
</tr>
<tr>
<td>NUR440: Population Focused Nursing</td>
<td>The focus of this course shifts from individual nursing care to population-focused nursing and community-oriented approaches to understanding and addressing major public health concerns across the lifespan.</td>
</tr>
<tr>
<td>NUR453: Role Transition</td>
<td>This course integrates theoretical and applied concepts of transition to the nursing role within the healthcare setting. The focus is on synthesizing previously learned knowledge and incorporating physiological, psychological, and developmental concerns into the care of the clients.</td>
</tr>
</tbody>
</table>

*Note. Adapted from the University of Miami School of Nursing and Health Studies course catalog. Available at: https://umshare.miami.edu/web/wda/admission/courselisting/NURUndergradCourses1213.pdf.*
APPENDIX C

EBOLA PRE-SIMULATION EVALUATION

Please complete the following information:

Age: ____________

Gender: ____________

Did you work as a healthcare provider or first responder before attending nursing school? Y / N

If yes, what was your profession?
__________________________________________________

Remember when answering the Ebola outbreak questions, that because there is no prevalence of Ebola in the United States, an Ebola outbreak can consist of 2 or more cases.

Please answer the following questions on a scale of 1 to 5, with 5 being “very knowledgeable” and 1 being “not at all knowledgeable”.

1. How knowledgeable are you about the potential public health impact of Ebola?

   Very knowledgeable   5  4  3  2  1       Not at all knowledgeable

Please answer the following questions on a scale of 1 to 5, with 5 being “very confident” and 1 being “not at all confident”.

2. How confident are you about being safe in your nursing role when caring for an Ebola patient?

   Very confident       5  4  3  2  1       Not at all confident

Please answer the following questions on a scale of 1 to 5, with 5 being “very likely” and 1 being “not at all likely”.

3. How likely do you feel that the health department will provide you with timely updates on the information needed to care for an Ebola patient?

   Very likely          5  4  3  2  1       Not at all likely
Please answer the following questions on a scale of 1 to 5, with 5 being “very well” and 1 being “not at all”.

4. How well do you think you could address the Ebola related questions of a concerned member of the public?

Very well  5  4  3  2  1  Not at all

Please answer the following questions on a scale of 1 to 5, with 5 being “very significant” and 1 being “not at all significant”.

5. Once you are graduated and working as a nurse, how significant of a role do you think you would play in your agency's overall response to an Ebola outbreak?

Very significant  5  4  3  2  1  Not at all significant

Please answer the following questions on a scale of 1 to 5, with 5 being “very important” and 1 being “not at all important”.

6. How important is pre-Ebola outbreak preparation and training?

Very important  5  4  3  2  1  Not at all important

Please answer the following questions on a scale of 1 to 5, with 5 being “very important” and 1 being “not at all important”.

7. How important would it be for you to have psychological support available during a response to an Ebola outbreak?

Very important  5  4  3  2  1  Not at all important

Please answer the following questions on a scale of 1 to 5, with 5 being “very important” and 1 being “not at all important”.

8. How important would it be for you to have psychological support available after a response to an Ebola outbreak?

Very important  5  4  3  2  1  Not at all important
APPENDIX D

EBOLA POST-SIMULATION EVALUATION

Please complete the following information:

Age: ____________

Gender: ____________

Did you work as a healthcare provider or first responder before attending nursing school? Y / N

If yes, what was your profession?
__________________________________________________________

*Remember when answering the Ebola outbreak questions, that because there is no prevalence of Ebola in the United States, an Ebola outbreak can consist of 2 or more cases.*

Please answer the following questions on a scale of 1 to 5, with 5 being “very knowledgeable” and 1 being “not at all knowledgeable”.

1. How knowledgeable are you about the potential public health impact of Ebola?

Very knowledgeable  5  4  3  2  1  Not at all knowledgeable

Please answer the following questions on a scale of 1 to 5, with 5 being “very confident” and 1 being “not at all confident”.

2. How confident are you about being safe in your nursing role when caring for an Ebola patient?

Very confident  5  4  3  2  1  Not at all confident

Please answer the following questions on a scale of 1 to 5, with 5 being “very likely” and 1 being “not at all likely”.

3. How likely do you feel that the health department will provide you with timely updates on the information needed to care for an Ebola patient?

Very likely  5  4  3  2  1  Not at all likely
Please answer the following questions on a scale of 1 to 5, with 5 being “very well” and 1 being “not at all”.

4. How well do you think you could address the Ebola related questions of a concerned member of the public?

Very well 5 4 3 2 1 Not at all

Please answer the following questions on a scale of 1 to 5, with 5 being “very significant” and 1 being “not at all significant”.

5. Once you are graduated and working as a nurse, how significant of a role do you think you would play in your agency's overall response to an Ebola outbreak?

Very significant 5 4 3 2 1 Not at all significant

Please answer the following questions on a scale of 1 to 5, with 5 being “very important” and 1 being “not at all important”.

6. How important is pre-Ebola outbreak preparation and training?

Very important 5 4 3 2 1 Not at all important

Please answer the following questions on a scale of 1 to 5, with 5 being “very important” and 1 being “not at all important”.

7. How important would it be for you to have psychological support available during a response to an Ebola outbreak?

Very important 5 4 3 2 1 Not at all important

Please answer the following questions on a scale of 1 to 5, with 5 being “very important” and 1 being “not at all important”.

8. How important would it be for you to have psychological support available after a response to an Ebola outbreak?

Very important 5 4 3 2 1 Not at all important

What did you like most about the simulation?

What did you like least about the simulation?

Any other feedback?
APPENDIX E

FOCUS GROUP DEMOGRAPHIC DATA

Focus Group Information

Focus Group Number: ____________________________________________________________

Gender of participants:

Number of Females:

Number of Males:

Nursing program: Traditional O Accelerated O
APPENDIX F

FOCUS GROUP QUESTIONS

1. The majority of nursing students reported that Ebola preparation was less important after the simulation than compared to before. What do you think the reasons were for this decrease?

2. Did you feel your class trainings prepared you for the disaster simulation? Why? Why not? What could we have changed or added to make you feel more prepared?

3. Which activities of the disaster simulation helped you to practice the concepts you learned in class the most? Which helped you the least?

4. What activities of the disaster simulation made you feel the most stressed? What role did stress play in your disaster experience?

5. Should mental health support be available to healthcare providers during an infectious disease outbreak of this magnitude? Why? Why not? In what capacity?

6. Which activities of the program increased your confidence about being safe in your nursing role when caring for an Ebola patient? Which did not?

7. How confident do you feel with using personal protective equipment, patients in isolation and maintaining your safety and the safety of the patient, regardless of the infectious agent? What aspects of the simulation increased or decreased your levels of confidence?

8. In the event of an infectious disease pandemic/disaster, how do you feel your future actions will be affected by this training?
APPENDIX G

ZOMBIE APOCALYPSE POD PRE-SIMULATION EVALUATION

Student-Generated ID: __________ (In order to link your pre and post evaluation of the POD disaster simulation exercise, please generate an ID code for this form consisting of the first two letters of your Mother’s middle or maiden name followed by the last four digits of your telephone number.)

Student Information:

<table>
<thead>
<tr>
<th>Gender:</th>
<th>Male □</th>
<th>Female □</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age:</td>
<td></td>
<td>----------</td>
</tr>
<tr>
<td>Ethnicity:</td>
<td>White □</td>
<td>Black/African American □</td>
</tr>
<tr>
<td>English as First Language:</td>
<td>Yes □</td>
<td>No □</td>
</tr>
<tr>
<td>Program of Study:</td>
<td>Traditional □</td>
<td>Accelerated □</td>
</tr>
</tbody>
</table>

Did you work as a healthcare provider or first responder before attending nursing school?

- [ ] Yes
- [ ] No

If yes, what was your profession?

Number of previous public health courses taken:

Prior to this course, what is the number of previous disaster preparedness related trainings you have attended?

Please circle the number that best reflects your answer to the following questions on a scale of 1-5, with 5 being “expert knowledge” and 1 being “no knowledge”:

1. How would you assess your current knowledge of a point-of-distribution (POD)?

   No knowledge 1 2 3 4 5 Expert knowledge

2. How would you assess your current knowledge of the staffing roles for dispensing medication in a POD setting?
3. How would you assess your current knowledge of the Miami-Dade County Health Department protocols for dispensing medications in a POD setting?

No knowledge 1 2 3 4 5 Expert knowledge

4. How would you assess your current knowledge of the reporting procedures for adverse events that occur during a POD setting?

No knowledge 1 2 3 4 5 Expert knowledge

5. How would you assess your current knowledge of the principles of griage in a closed POD?

No knowledge 1 2 3 4 5 Expert knowledge

6. How would you assess your current knowledge of the principles of triage in a closed POD?

No knowledge 1 2 3 4 5 Expert knowledge

Please circle the number that best reflects your level of agreement with the following statements on a scale of 1-5, with 5 being “strongly agree” and 1 being “strongly disagree”:

7. Disaster simulation is pertinent to my learning in a pre-licensure baccalaureate nursing program.

Strongly Disagree 1 2 3 4 5 Strongly Agree

8. In the event of a disaster resulting from an infectious disease, I would be willing to provide nursing care.

Strongly Disagree 1 2 3 4 5 Strongly Agree

9. Disaster simulation is applicable to my future clinical work as a nurse.

Strongly Disagree 1 2 3 4 5 Strongly Agree

10. It is important that psychological support is available to you during a POD event.

Strongly Disagree 1 2 3 4 5 Strongly Agree
11. It is important for psychological support to be available to patients during a POD event.

Strongly Disagree 1 2 3 4 5 Strongly Agree

12. I do not need to know about a POD.

Strongly Disagree 1 2 3 4 5 Strongly Agree

Please circle the number that best reflects your level of agreement with the following statements on a scale of 1-5, with 5 being “strongly agree” and 1 being “strongly disagree”:

13. I feel confident in my ability to correctly identify symptomatology consistent with a specified communicable disease in a disaster event.

Strongly Disagree 1 2 3 4 5 Strongly Agree

14. I feel confident in my ability to adhere to accurate infection control measures for an identified communicable disease agent in a disaster event.

Strongly Disagree 1 2 3 4 5 Strongly Agree

15. I feel confident in my ability to correctly identify patients who are experiencing psychological distress during a disaster event.

Strongly Disagree 1 2 3 4 5 Strongly Agree

16. I feel confident in my ability to refer patients to the appropriate resources in the event they are experiencing psychological distress during a disaster event.

Strongly Disagree 1 2 3 4 5 Strongly Agree

17. I feel confident in my ability to use therapeutic communication to diffuse psychological distress experienced by person(s) during a disaster event.

Strongly Disagree 1 2 3 4 5 Strongly Agree

18. I feel confident in my ability to apply my knowledge of a POD layout in a disaster setting.

Strongly Disagree 1 2 3 4 5 Strongly Agree

19. I feel confident in my ability to apply the principles of the nurse staffing role for dispensing medication in a POD setting.
20. I feel confident in my ability to give accurate health education to simulated person(s) in a POD setting.

21. I feel confident in my ability to correctly conduct “griage” of patients during a disaster event.

22. I feel confident in my ability to correctly triage patients during a disaster event.

23. I feel confident in my ability to make clinical decisions in the event of a disaster.

24. I feel confident in my ability to communicate effectively with key personnel in the POD setting.

25. I feel confident that I can complete my nursing duties under the pressures of a disaster event.
APPENDIX H

ZOMBIE APOCALYPSE POD PRE-SIMULATION EVALUATION

Student-Generated ID: __________ (In order to link your pre and post evaluation of the POD disaster simulation exercise, please generate an ID code for this form consisting of the first two letters of your Mother’s middle or maiden name followed by the last four digits of your telephone number.

Please circle the number that best reflects your answer to the following questions on a scale of 1-5, with 5 being “expert knowledge” and 1 being “no knowledge”:

1. How would you assess your current knowledge of a point-of-distribution (POD)?

No knowledge 1 2 3 4 5 Expert knowledge

2. How would you assess your current knowledge of the staffing roles for dispensing medication in a POD setting?

No knowledge 1 2 3 4 5 Expert knowledge

3. How would you assess your current knowledge of the Miami-Dade County Health Department protocols for dispensing medications in a POD setting?

No knowledge 1 2 3 4 5 Expert knowledge

4. How would you assess your current knowledge of the reporting procedures for adverse events that occur during a POD setting?

No knowledge 1 2 3 4 5 Expert knowledge

5. How would you assess your current knowledge of the principles of griage in a closed POD?

No knowledge 1 2 3 4 5 Expert knowledge

6. How would you assess your current knowledge of the principles of triage in a closed POD?

No knowledge 1 2 3 4 5 Expert knowledge

Please circle the number that best reflects your level of agreement with the following statements on a scale of 1-5, with 5 being “strongly agree” and 1 being “strongly disagree”:

125
7. Disaster simulation is pertinent to my learning in a pre-licensure baccalaureate nursing program.
    Strongly Disagree 1 2 3 4 5 Strongly Agree

8. In the event of a disaster resulting from an infectious disease, I would be willing to provide nursing care.
    Strongly Disagree 1 2 3 4 5 Strongly Agree

9. Disaster simulation is applicable to my future clinical work as a nurse.
    Strongly Disagree 1 2 3 4 5 Strongly Agree

10. It is important that psychological support is available to you during a POD event.
    Strongly Disagree 1 2 3 4 5 Strongly Agree

11. It is important for psychological support to be available to patients during a POD event.
    Strongly Disagree 1 2 3 4 5 Strongly Agree

12. I do not need to know about a POD.
    Strongly Disagree 1 2 3 4 5 Strongly Agree

Please circle the number that best reflects your level of agreement with the following statements on a scale of 1-5, with 5 being “strongly agree” and 1 being “strongly disagree”:

13. I feel confident in my ability to correctly identify symptomatology consistent with a specified communicable disease in a disaster event.
    Strongly Disagree 1 2 3 4 5 Strongly Agree

14. I feel confident in my ability to adhere to accurate infection control measures for an identified communicable disease agent in a disaster event.
    Strongly Disagree 1 2 3 4 5 Strongly Agree

15. I feel confident in my ability to correctly identify patients who are experiencing psychological distress during a disaster event.
    Strongly Disagree 1 2 3 4 5 Strongly Agree
16. I feel confident in my ability to refer patients to the appropriate resources in the event they are experiencing psychological distress during a disaster event.

Strongly Disagree  1  2  3  4  5  Strongly Agree

17. I feel confident in my ability to use therapeutic communication to diffuse psychological distress experienced by person(s) during a disaster event.

Strongly Disagree  1  2  3  4  5  Strongly Agree

18. I feel confident in my ability to apply my knowledge of a POD layout in a disaster setting.

Strongly Disagree  1  2  3  4  5  Strongly Agree

19. I feel confident in my ability to apply the principles of the nurse staffing role for dispensing medication in a POD setting.

Strongly Disagree  1  2  3  4  5  Strongly Agree

20. I feel confident in my ability to give accurate health education to simulated person(s) in a POD setting.

Strongly Disagree  1  2  3  4  5  Strongly Agree

21. I feel confident in my ability to correctly conduct “griage” of patients during a disaster event.

Strongly Disagree  1  2  3  4  5  Strongly Agree

22. I feel confident in my ability to correctly triage patients during a disaster event.

Strongly Disagree  1  2  3  4  5  Strongly Agree

23. I feel confident in my ability to make clinical decisions in the event of a disaster.

Strongly Disagree  1  2  3  4  5  Strongly Agree

24. I feel confident in my ability to communicate effectively with key personnel in the POD setting.

Strongly Disagree  1  2  3  4  5  Strongly Agree

25. I feel confident that I can complete my nursing duties under the pressures of a disaster event.
Strongly Disagree  1  2  3  4  5  Strongly Agree

26. What is your overall reaction to this exercise?

27. Do you have any suggestions for future improvements to this exercise?

28. What are the strengths of this exercise?

29. What are the weaknesses of this exercise?