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# Implementation of an E-Learning Module To Increase RN Knowledge and Skills of Emergency Preparedness

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ABSTRACT

IMPLEMENTATION OF AN E-LEARNING MODULE TO INCREASE RN  
KNOWLEDGE AND SKILLS OF EMERGENCY PREPAREDNESS

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## ABSTRACT OF GRADUATE STUDENT PROJECT

Scholarly Project

Andrews University

School of Nursing, College of Health & Human Services

Title: IMPLEMENTATION OF AN E-LEARNING MODULE TO INCREASE RN KNOWLEDGE AND SKILLS OF EMERGENCY PREPAREDNESS

Name of DNP student: Kaitlyn Hope Chung

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Date completed: September 23, 2022

### Background

*By failing to prepare, you are preparing to fail.*

—Benjamin Franklin, writer, philosopher, politician

Having education initiatives for mass casualty incidents and disaster preparedness that are concise and organized is of high importance. This issue is pertinent to the midwestern medical center where this project took place because in the event of a true mass casualty or disaster scenario, many lives could be saved if registered nurses (RNs) in the emergency department (ED) were better prepared. For a hospital to provide

adequate and effective care during a crisis, healthcare workers must be effectively trained to do so. However, many studies have found that hospitals across the nation are lacking in this education for hospital staff (Goniewicz et al., 2021a). While guidelines are currently in place within the midwestern medical center for drills, there is no current e-Learning module available to staff which address mass casualty incidents, Sort, Access, Lifesaving Intervention, and Treat or Transport (SALT) triage, and disaster preparedness with information specific to the midwestern medical center's county. It was the Doctor of Nursing Practice (DNP) student's goal to create an online educational module for Registered Nurses in the emergency department of the midwestern medical center where this project took place to bridge this gap.

### Purpose

The United States National Preparedness Goal is to achieve "a secure and resilient nation with the capabilities required across the whole community to prevent, protect against, mitigate, respond to, and recover from the threats and hazards that pose the greatest risk" (Federal Emergency Management Agency [FEMA], 2020a). This project aimed to achieve this at the midwestern medical center where this project took place.

The purpose of this project was to bridge knowledge gaps and improve perceived knowledge and perceived skills regarding mass casualty incidents and disaster preparedness in Berrien County through the creation and implementation of an e-Learning module. The hypothesis of this project was that this intervention would improve ED RN knowledge and perceived knowledge and perceived skills regarding mass casualty incidents and disaster preparedness.

## Methods

After obtaining IRB approvals from Andrews University and the medical institution of interest, 53 registered nurse participants from three emergency departments at a midwestern medical center were surveyed. Consent was obtained prior to completion of the demographic questionnaire, pre- and post-survey, pre- and post-test, and the e-Learning module. Participants were given a 25 question pre-survey to assess their current perceived knowledge and perceived skills regarding disaster preparedness. They also completed 25 multiple choice questions (MCQ's) to assess their base knowledge of mass casualty incidents, SALT triage, and information on mass casualty and disaster preparedness specific to the county of interest. Immediately after the pre-survey and pre-test, participants were presented with the e-Learning module to complete at their own pace. Approximately seven days later, participants were asked to re-take the same test and survey to assess for changes in perceived knowledge, perceived skills, and true knowledge of mass casualty incidents and disaster preparedness.

*Keywords:* Mass casualty incident, disaster preparedness, nursing education, emergency department, SALT, e-Learning, Disaster Preparedness Evaluation Tool (DPET), perceived knowledge, perceived skills.

Andrews University  
College of Health & Human Services

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A Scholarly Project  
Presented in Partial Fulfillment  
of the Requirements for the Degree  
Doctor of Nursing Practice

by

Kaitlyn Hope Chung

Completion Date: September 23, 2022

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Date approved



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## ABBREVIATIONS

BSN	Bachelor of Science in Nursing
CBRN	Chemical, Biological, Radiological, & Nuclear
CDP	Center for Domestic Preparedness
C-MCIREM	Chemical-Mass Casualty Incident Response Education Module
CMS	Centers for Medicare and Medicaid Services
COVID-19	Coronavirus Disease 2019
DNP	Doctor of Nursing Practice
ED	Emergency Department
e-Learning	Electronic Learning
FEMA	Federal Emergency Management Agency
HERT	Hospital Emergency Response Training
MCI	Mass Casualty Incident
PDSA	Plan-Do-Study-Act
PICO	Population, Intervention, Control, & Outcomes
RN	Registered Nurse
SALT	Sort, Access, Lifesaving Intervention, and Treat or Transport
SPSS	Statistical Package for the Social Sciences

## CHAPTER 1

### INTRODUCTION

A mass casualty incident (MCI) or event is when there is such a great number of individuals who have been injured and require treatment that it overwhelms local healthcare systems due to excessive requirements which cannot be met (Ben-Ishay et al., 2016; Perry & Bitan, 2021). Mass casualty incident drills take place once annually in each of the three Emergency Departments (ED) where this project took place. Resources vary depending on the ED. Currently, the extent of MCI training is one annual drill at each location in which participation is encouraged but not mandatory. During initial hire training, ED registered nurses (RNs) are required to complete independent study courses online through the Federal Emergency Management Agency (FEMA, 2022). These courses are:

1. IS-100.c – Introduction to the Incident Command System
2. IS-200.c - Basic Incident Command System for Initial Response
3. IS-700.b - An Introduction to the National Incident Management System

Currently, there is no mandatory annual competency/educational initiative in place regarding MCI's or disaster preparedness for emergency department staff. It is because no current mandatory annual training exists within this midwestern health system where this project implemented educational initiatives for mass casualty incident training and disaster preparedness. The aim of this project was to improve mass casualty/disaster

preparedness education and to improve current perceptions of knowledge and disaster preparedness skills for ED RNs.

## **Background**

Having education initiatives for mass casualty incidents with concise and organized education for emergency department staff is of high importance. This issue is pertinent to this health system because in the event of a true mass casualty scenario, many lives could be saved if RNs in the ED were better prepared. For a hospital to provide adequate and effective care during a crisis, healthcare workers must be effectively trained to do so. However, many studies have found that hospitals across the nation are lacking in this education for hospital staff (Goniewicz et al., 2021a). While guidelines are currently in place for drills, it was the goal of this project to create an online educational module for registered nurses (RNs) in the emergency department regarding mass casualty incidents and disaster preparedness, as there are none currently in place.

Based on this project manager's assessment in multiple previous MCI drills within this organization, as well as post-drill debriefings, it was noted that there was a lack of overall understanding of mass casualty incidents by emergency department staff. As a result, staff have expressed that they feel they are inadequately prepared to treat and care for such patients should a mass casualty occur. Feedback from staff members, including non-nurses, involved in previous drills indicated that there is a gap in education regarding mass casualty incidents. This project planned to use peer-reviewed articles and government resources to develop an electronic education initiative for registered nurses.

The importance of preparing a concise presentation of what a mass casualty incident is and how to properly execute protocols would be of great benefit not only for

future drills, but in the case of an actual event. This presentation was to better prepare colleagues to provide the best care possible during mass casualty incidences. The impact evidence-based mass casualty incident education could have on this facility is critical as mass casualty incidents have been identified as a high risk for human hazard via hazard vulnerability analysis at all three hospitals (Spectrum Health Lakeland, 2020a; Spectrum Health Lakeland, 2020b; Spectrum Health Lakeland, 2021).

### **Rationale**

The midwestern medical center conducts hazard and vulnerability analyses (HVA) annually for each of the three hospitals. This analysis is a systematic approach to identify hazards or risks most likely to impact a healthcare facility and the surrounding community. This is a requirement in the Centers for Medicare and Medicaid Services (CMS) Emergency Preparedness Rule and a requirement for the Joint Commission Emergency Management (Assistant Secretary for Preparedness and Response, 2020). For all hospitals, their HVA's have identified hazards in the categories of natural, technological, human, and hazardous materials. In the category of human-related events, trauma mass casualty incidents hold a 49%, 73%, and a 49% risk in each respective hospital in this midwestern medical system. Medical/infectious surge incidents hold a 53% in all three hospitals in this health system. Traumatic MCI's are the #1, #5, and #4 risk in each respective hospital. Medical/infectious surges are the #5 risk at one and #3 risk at two of the hospitals in this system (Spectrum Health Lakeland, 2020a; Spectrum Health Lakeland, 2020b; Spectrum Health Lakeland, 2021).

The data given indicates the risk of a mass casualty incident is of important concern for these hospitals. Therefore, an intervention which focuses on training in this



area could be of great use to the facilities. Providing such an intervention could be a critical educational resource for RNs in the setting of the emergency departments.

### **Significance of Project**

It was the overall goal of this project that implementation of an e-Learning module about disaster preparedness and mass casualty incidents that measured RN's knowledge and perceived preparedness on such subjects would show improvement. This project holds significance not only to the emergency departments being sampled, but also for the health system and the county. The significance will be addressed under the following subheadings: Emergency Departments, This Midwest Medical Center, and The County Where This Project Took Place.

#### **Emergency Departments**

The importance of this project is that for these units which have infrequent exposure to situations of resource strain and intense patient overflow, staff will be educated on disaster preparedness and mass casualty incidents should such an event occur. Through the means of e-Learning, the module will be readily available to educate staff at their own convenience and/or when mandated by management. For ED RNs, this project may help to improve perceptions of their knowledge and skills regarding mass casualty incidents and disaster preparedness. In doing so, it could make them more able and willing to respond and assist with a disaster in the future (Tichy et al., 2009).

#### **This Midwest Medical Center**

Healthcare facilities and their staff are critical to establishing and maintaining emergency preparedness within a community. It is vital that staff be prepared to respond

in the case of events such as natural disasters, man-made disasters, pandemic outbreaks, and/or acts of terror. The availability and preparation of emergency staff is essential in accommodating surges that will cause increased demand on the healthcare system during a mass casualty incident or disaster. This project will aim to assist in the preparation of emergency department registered nurses should such events occur (Premier, 2021).

### The County Where This Project Took Place

Events that test the resiliency of healthcare are becoming increasingly common. Health systems within this county and the state need to be adequately prepared to handle and respond to crises. This is apparent now more than ever as a result of Covid-19 (Marcozzi et al., 2021). Staff education in disaster preparedness, mass casualty incidents, and/or surge planning can assist in managing the influx of high acuity patients and record number of patients seeking care we are experiencing in our healthcare systems today.

### Project Question

The question for this project was: In the emergency departments of a midwestern medical center, what is the effect of implementing an e-Learning module on disaster preparedness and mass casualty incidents on the knowledge, perceived knowledge, and perceived skills among emergency department registered nurses?

### Purpose

The purpose of this project was to improve mass casualty education and improve current perceptions of knowledge and disaster preparedness skills among RNs in the ED by creating and implementing an e-Learning module. The hypothesis of this project is that this intervention will demonstrate measured improvement in RN knowledge,

perceived knowledge, and perceived skills regarding mass casualty incidents and disaster preparedness.

### **PICO Question**

In the emergency departments of a multi-site midwestern medical center, what is the effect of implementing an e-Learning module on disaster preparedness and mass casualty incidents on the knowledge, perceived knowledge, and perceived skills among registered nurses in the emergency department?

## CHAPTER 2

### LITERATURE REVIEW

This literature review will define actual and perceived knowledge, perceived skills, preparedness, e-Learning module, and mass casualty incidents. The relevance and importance of nursing education for mass casualty incidents and disaster preparedness will be discussed, particularly during the Covid-19 pandemic. This literature review section will also examine the current status and knowledge of disaster preparedness. The status of nursing education with respect to disaster preparedness will be described.

#### **Conceptual Definitions**

For the purpose of this study, a **mass casualty incident** or event is when there is such a great number of individuals who have been injured and require treatment that it overwhelms local healthcare systems due to excessive resource requirements which cannot be met (Ben-Ishay et al., 2016; Perry & Bitan, 2021).

**Actual and perceived knowledge** will be assessed independently. Knowledge is generally defined as “information, understanding, or skill that you get from experience or education” (“Knowledge”, 2021). As this project will be assessing actual knowledge of disaster preparedness, actual knowledge will be defined as “information or understanding, the sum of what is known” (Michigan State Medical Society, 2021). This will be measured via 25 multiple choice questions provided before and after the intervention. Nurses will be considered as having adequate knowledge by receiving an

overall score of 75% or higher (FEMA, 2014). Perceived knowledge is generally defined as one's self-opinion of the knowledge they possess (Reverso Dictionary, 2021). For this project, the definition used for perceived knowledge will be one's self-assessment or feelings of knowing how to manage disaster preparedness and mass casualty incidences (Park et al., 1988). This will be measured using a portion of the Disaster Preparedness Evaluation Tool (DPET).

A typical definition for **perceived skills** is one's self-assessment of their own abilities (Oxford Reference, 2021). For the purposes of this project, perceived skills will be defined as self-assessment of one's competence and/or capability to organize and "execute courses of actions required to attain designated types of performance" (Kremer et al., 2012).

The general definition of **preparedness** is "the quality or state of being prepared; a state of adequate preparation" ("Preparedness," 2021). For this project, FEMA's definition of preparedness will be used which states "Preparedness within the field of emergency management can best be defined as a state of readiness to respond to a disaster, crisis or any other type of emergency situation" (FEMA, 2020b).

An **e-Learning module** will be defined as an online presentation with several learning concepts which will incorporate teaching methods such as video clips, written content, games and/or social media components (University of Nebraska Medical Center, 2020). In this project the e-Learning module will include education regarding the Sort, Access, Lifesaving Intervention, and Treat or Transport (SALT) method, identification of appropriate potential treatments in patients with varying acuity levels, and reporting any changes in patient condition to the appropriate provider. The desired outcome will be a

perceived benefit to mass casualty education and disaster preparedness by increasing true knowledge and perceived knowledge and skills.

### **Theoretical Framework**

In this project, the e-Learning systems theoretical framework was used. This theory incorporates four e-Learning factors: system stakeholders, teaching models, instructional design, and learning technologies. This particular framework contains three main elements of information systems: people, technologies, and services. The inclusion of these concepts makes for a holistic learning model specific to e-Learning (Aparicio et al., 2016).

People can utilize e-Learning systems and incorporate learned information and principles into educational programs and practice. Technologies specific to e-Learning provide support for staff to assimilate content, promote communication, and contribute collaboration tools. E-learning platforms empower the complex combination of direct and/or indirect communication between different groups of users. Concurrently, e-Learning can also be specified and specialized to distinct strategies or activities (Aparicio et al., 2016; Ayanwale & Oladele, 2021). This framework incorporates specific systems dimensions which have been adapted to the platform of e-Learning for mass casualty incidents, presented in Figure 1.

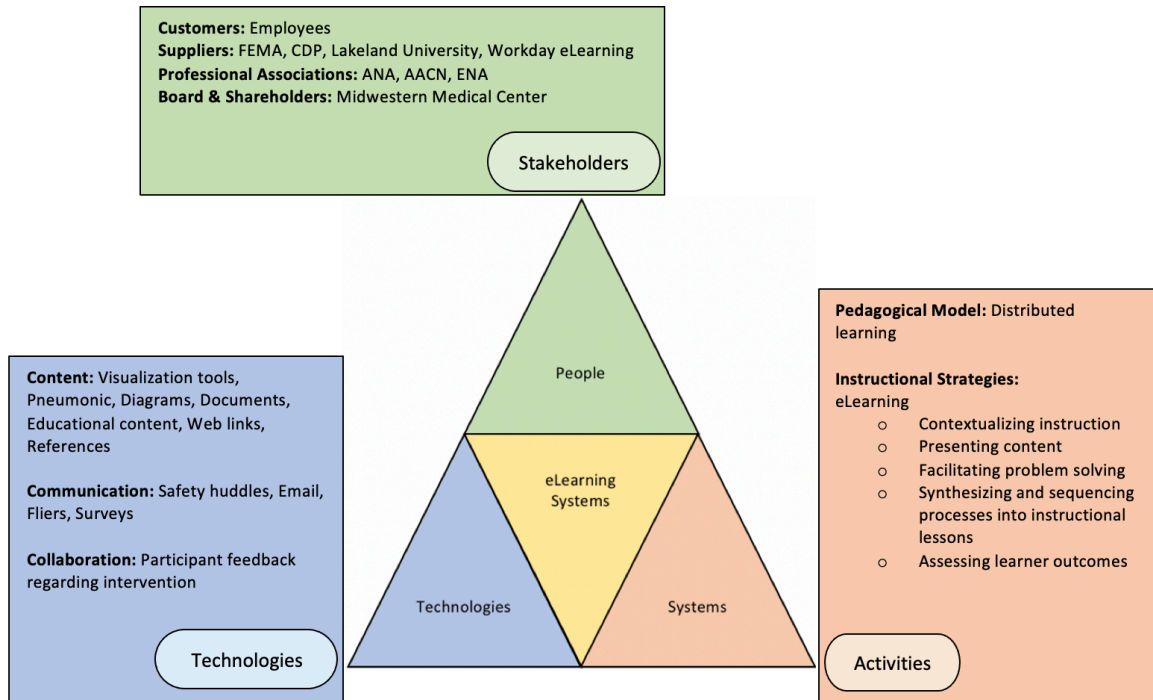


Figure 1. E-Learning systems theoretical framework adapted for disaster preparedness (Aparicio et al., 2016).

**Stakeholders** for the means of this project were comprised of employees and medical centers who will use the platform, suppliers of information regarding mass casualty incidents, professional associations which may utilize and contribute to the module, and shareholders who will provide maintenance services and support for the system. **Technological components** utilized for the means of this e-Learning platform included the content of the module itself, the software used to create the module, communication via emails and during morning huddles for participant recruitment, and surveys before and after use of the module.

The **activity** used to assess learner outcomes after completion of the module were use of a pre- and post-survey. This provided information on if there had been any improvement to true knowledge, perceived knowledge, and perceived skills of the subject(s) (Aggarwal & Ranganathan, 2019).

For this project, Communications (technologies) were used to recruit and inform participants about the project. Employees (stakeholders) used the e-Learning module (activity: distributed learning) to learn about MCI/disaster preparedness. Within the module, pneumonics, diagrams, and other educational content (i.e. technologies) were presented in an aim to increase their knowledge/skills regarding MCI/disaster preparedness which were assessed for using pre- and post-surveys (activity). As a result, the end goal was that the hospital employees (stakeholders) benefited from this intervention and in turn, improved the entire hospital system.

The e-Learning systems theoretical framework was important for use when implementing and evaluating the e-Learning module because it considers all components of module creation and use from start to finish. Stakeholders, technologies, and activities stemming from the module are interconnected and can influence its success in the emergency department. Healthcare employees utilize and interact with e-Learning systems. The activities support integration, communication, and collaboration the content provided (Aparicio et al., 2016). Using this framework, the goal was that all aspects will be considered to allow for successful implementation of the module into emergency department settings for disaster preparedness and mass casualty incident education in the future.

### **Quality Improvement Model**

For this project, the Plan-Do-Study-Act (PDSA) model was used to evaluate for change after implementation of the e-Learning module. Following the steps of this model allowed for project planning, testing for improvement, using the data to study the



result(s), and make improvements to the intervention. The flow of the PDSA model can be seen in Figure 2.

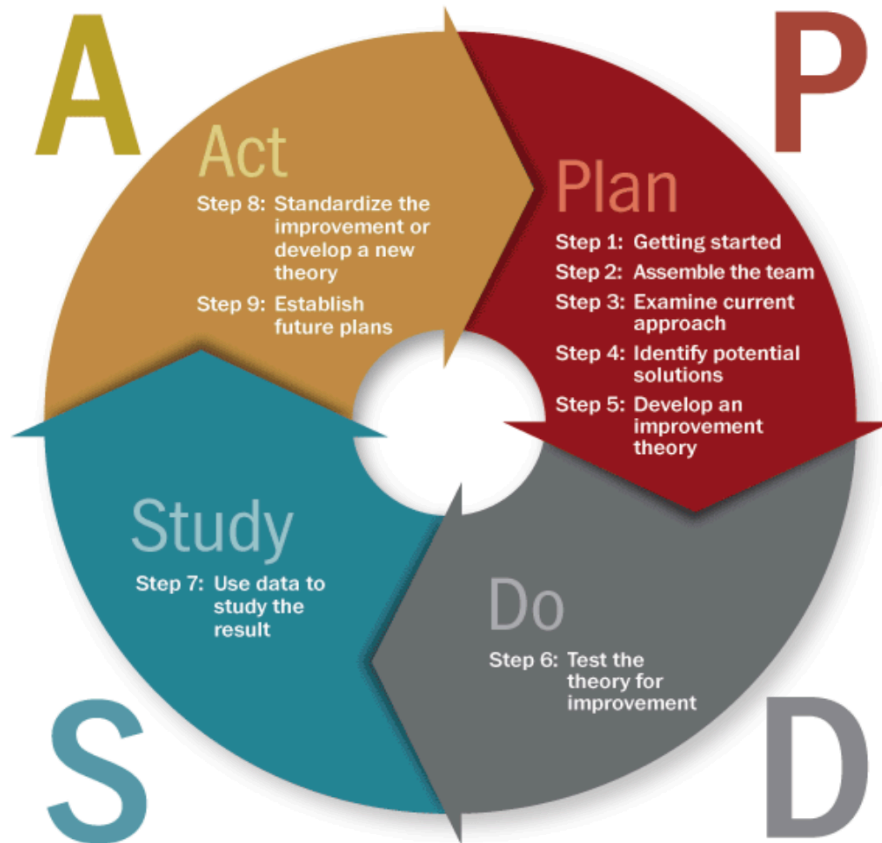


Figure 2. PDSA Model for quality improvement (Tribal Evaluation Institute (TEI), 2016).

### Plan

The planning phase of the PDSA model consists of five steps. In step one, opportunities for improvement were identified. Staff, community members (victim actors/volunteers), and/or partners (emergency medical services) who have current knowledge regarding the topic of interest were identified in step two. Those identified were used as a resource for information acquisition and project organization and dissemination. In the third step, current education initiatives in place were identified so

improvements could be made. Information regarding reasons for current lacks in education were evaluated. Step four included ideas of how the identified issue could be solved and a single potential solution was designed. In step five, a strategy for improvement was theorized. A plan for materials needed and a potential timeframe was addressed (TEI, 2016; Minnesota Department of Health, 2021).

### Do

The “do” portion of this model includes a single step. Step six tested the improvement theory on a small scale (TEI, 2016; Minnesota Department of Health, 2021). For this project, the theory was tested by means of having participants complete an e-Learning module regarding disaster preparedness and mass casualty incidents for ease of use and understanding of instructions.

### Study

Step seven is the study portion of the PDSA model. In this step, data was collected to measure change pre and post intervention to evaluate results. Standardized tools were used for this evaluation. The data showed which areas of the intervention resulted in an improvement (TEI, 2016; Minnesota Department of Health, 2021).

### Act

After the intervention was completed and results were analyzed, three options emerged for future plans. In step eight, the change/intervention that was completed can (1) be adopted into practice, (2) be tested under different conditions, or (3) be abandoned and a new solution sought. After this, in step nine, any progress made can be built upon

or plans for further/different interventions could be made (TEI, 2016; Minnesota Department of Health, 2021).

### **Mass Casualty Incidents**

The occurrence of mass casualty incidents is a true reality in healthcare today. Events such as the Boston Marathon bombing in 2013 (History.com, 2022), the Orlando night club shooting in 2016 (Ellis et al., 2016), and the Las Vegas shooting in 2017 (Allswede, 2018) are just a few examples of incidents which overwhelmed local hospital resources with large amounts of injured people of varying acuities. Events such as these emphasize the importance of emergency and mass casualty preparedness.

It is critical that the medical community put forth an effort to create and maintain emergency-preparedness programs and practice response through exercises and drills. New literature must be read every year to keep up-to-date on current practices and changing trends for such events. It is important to also learn from hospitals and institutions which have previously experienced mass casualty incidents to evaluate personal current standards and learn from the past experiences of others. Doing this will provide examples of limitations of traditional everyday workflow and educational opportunities of adaptations needed during MCI's (ASPR, 2019).

The Las Vegas shooting on October 1, 2017 is an example of a real-world mass casualty incident. In 11 minutes, over 1,100 rounds of ammunition were fired into a crowd of over 10,000. Over 500 people were injured, with 59 deaths, 35 of which died at the scene and 24 in area hospitals. Sixteen Las Vegas hospitals were involved in the response, significantly sharing resources between them. Sunrise Hospital was the closest trauma center and received the majority of the casualties. This is just a single example of

why MCI training and preparedness is highly important in the world of emergency medicine today (Allswede, 2018).

Planning, training, and practice activities are vital to the success of a mass casualty incident. The ability to respond can be improved if experiences are examined, planning is thorough, and training grows. These practices must involve not only hospital staff, but also emergency medical services, law enforcement, and the community (ASPR, 2019). This project will adopt the FEMA definition of mass casualty incidence which is “an event that produces a volume of ill or injured victims that cannot be handled by the available responders.” (FEMA, 2012).

### **Disaster Preparedness**

Natural disasters are increasing in occurrence around the world. Climate change has led to more extreme weather and an increase in the number of weather-related disasters. According to the World Meteorological Organization (2021), there has been at least one weather-related disaster, climate, or water hazard occurrence every day over the past 50 years. During this time, the number of disasters has increased times five (WMO, 2021).

Within the United States, the worst natural disasters are hurricanes and/or tropical storms of which there were three in the year 2017 alone. One of the most notable natural disasters in U.S. history is hurricane Katrina. This category 3 storm made landfall off the coast of Louisiana on August 29, 2005. Winds reached speeds as high as 120 miles per hour. It is estimated that 1,200 people lost their lives as a result of this storm. It is also the costliest storm on record, costing an estimated \$108 billion in damages (Gibbens, 2019).

Hurricane Katrina brought to light many issues with the federal government's response efforts. It became quickly apparent in the aftermath that the U.S. had been drastically underprepared for a storm of this magnitude. More than a decade later, the affected communities remain significantly scarred (Gibbens, 2019).

With disasters increasing in frequency, it is important that preparedness be established and remain intact. In situations of disaster, nurses are expected to provide medical interventions using their expertise and skills. Therefore, training in disaster preparedness is essential (Goniewicz et al., 2021b). Disaster preparedness training in this project was modeled after the the Plan-Do-Study-Act (PDSA) model for quality improvement. Following the steps of this model allowed for planning the project, testing for improvement, using the data to study the result(s), and make improvements to the intervention. This model will also be particularly useful as ED RNs continue to navigate the COVID-19 pandemic.

### **COVID-19**

The current state of healthcare due to the COVID-19 pandemic is a valid example of the necessity of disaster preparedness and mass casualty training in healthcare. COVID-19 was first detected in China in December, 2019. By March, 2020, the World Health Organization declared COVID-19 a pandemic. It quickly became the worst public health emergency in more than 100 years with more than 120 million cases worldwide and 30.5 million cases in the U.S. confirmed as of April 1, 2021 (National Academies of Sciences, Engineering, and Medicine, et al., 2021).

This public health emergency has highlighted the importance of preparing nurses nationwide with the knowledge, skills, and abilities to respond. COVID-19 has shown

that the U.S. healthcare system is deeply fragmented. This has resulted in excess mortality and morbidity, blatant health inequities, and an inability to contain a swiftly growing pandemic. As natural disasters and public health emergencies increase in occurrence and severity in the future, enunciation of the nursing role in disaster preparedness and emergency response will be critical (National Academies of Sciences, Engineering, and Medicine [NASEM], et al., 2021).

In a disaster situation, nurses provide first aid, clinical care, administer lifesaving medications, assess and triage victims, allocate resources, and monitor ongoing physical health status' of victims. Nurses also activate emergency operations plans, participate in incident command systems, oversee personal protective equipment (PPE) use, and provide crisis communication(s). Often, this is done at great personal risk. Within a hospital setting, preparedness includes understanding hospital/health system capacity to care for patients in an emergency, knowing workforce capacity and capabilities, and determining access to PPE and medical supplies such as ventilators. An action plan should be in place should such an event occur and the institution face such challenges (NASEM, et al., 2021).

Specific to infectious disease outbreaks such as COVID-19, nursing roles can include (a) surveillance and detection, (b) applying prevention and response interventions, (c) screening, testing, and vaccinating, (d) treating patients, (e) providing education, (f) acting as leaders, and (g) counseling. The knowledge of disaster preparedness was vital in coping with the COVID-19 pandemic during the acute phase when the hospitals' capacities were overwhelmed.

## **Knowledge of Disaster Preparedness**

Emergency nurses are the first line of treatment in hospitals when disaster strikes. Therefore, they must be well prepared, educated, and trained to deal with disasters and/or mass casualty incidents. In one study conducted in Saudi Arabia among emergency department nurses, the top three gaps identified regarding disaster preparedness were knowledge of incident command systems, disaster triage, and disaster drills (Brinjee et al., 2021). Specific to the U.S., one study found that barriers facing nurses include (a) lack of disaster experience, (b) poor education and training, (c) hospital disaster policies and procedures, (d) not knowing their role in disaster management, (e) lack of communication and leadership, and (f) lack of personal evacuation experience (Al Harthi et al., 2020). It was also identified that nurses with less than three years of experience had a significantly increased needs to learn about these elements in order to appropriately handle a disaster and/or mass casualty incident (Brinjee et al., 2021).

Furthermore, training in disaster preparedness and mass casualty incidents is especially needed considering current nursing demographics. In the face of the stress of COVID-19, many highly experienced nurses have retired early and left the workforce. Others who have been in emergency medicine are leaving to travel. In their place, most new graduate nurses in the U.S. are entering into acute care environments (Hawkins et al., 2019). New graduate nurses face cognitive, skill-based, and sociocultural challenges as they enter into practice within the ED. Their critical thinking, clinical judgement, and practice-based decision-making capabilities are significantly limited in their early practice (Duchscher & Painter, 2021). As such, it is imperative that nursing educational initiatives be in place to disseminate knowledge to this population of new graduates.

## **Nursing Education**

Nursing is a profession which is constantly changing. Continued education for knowledge maintenance is a necessity. It is the responsibility of nurses to not only educate patients, but also to educate themselves and their colleagues. Healthcare professionals as educators serve as clinical instructors, mentors, preceptors, and in other roles to ensure students and those actively working in healthcare meet expected learning outcomes and stay up-to-date on current practice standards and trends (Bastable et al.,2019).

Education in nursing is paramount to exceptional patient outcomes. Continued education and providing nurses with a means to maintain an updated knowledge base has been shown to improve job satisfaction and competence. Sufficient education in ED RN staff is crucial to safe, holistic, and definitive patient care (Price & Reichert, 2017). Utilizing e-Learning platforms can be a beneficial and accessible way to reach a large number of nurses and to provide them education.

## **e-Learning**

As the growth of medical knowledge continues to increase, it is becoming more difficult for healthcare professionals to keep up. Online education in this field is helping to overcome this difficulty (Schneider & Binder, 2019). As a result, online and electronic technologies within health professional education are increasing (Bastable et al., 2019). Online learning initiatives for registered nurses have been found to adequately deliver continuing skillful advancement and lifetime learning. Online learning is highly beneficial because it allows for increased participation due to flexibility for time of completion, thus providing convenience for nurses involved (Karvinen et al., 2017).



Other advantages include program design flexibility, the ability to accommodate multiple learning styles, and being able to go back to the presented information and revisit concepts (Bramer, 2020). Studies utilizing e-Learning modules for effective management of mass casualty incidents and disaster preparedness are described below.

#### Examples of e-Learning for Mass Casualty Incidents

In a study published by the Society of Trauma Nurses, it was found that implementation of e-Learning modules for trauma, much like that seen during a mass casualty or disaster incident, improved nurses' self-efficacy, knowledge, communication, assessment of patients, and escalation of care. They also found that when attempting to implement new e-Learning modules or a new program, it is essential to maintain regular and ongoing education which focuses on the purpose and benefits of the module (Curtis et al., 2016).

One study involving 22 participants conducted by Stanford University showed that virtual MCI training can be highly beneficial. This study included 10 physicians with an average of four years of experience and 12 nurses with an average of 9.5 years of experience at Stanford University Medical Center and San Mateo County Medical Center. The objective of this study was to determine if a virtual ED populated with 10 chemical and 10 radiological patient victims was an effective clinical environment for training ED staff for MCI's. The conclusion of this study was that online and/or virtual training for MCI's is effective (Heinrichs et al., 2010).

#### Example of e-Learning for Disaster Preparedness

In April, 2021, a prospective cross-sectional study regarding disaster response in medical education was published. This study utilized 168 medical students from

Universiti Kebangsaan Malaysia to determine their knowledge on disaster response medicine (DRM) and their perception regarding the effectiveness of e-learning in teaching emergency disaster response (ELITE-DR). To do this, a pre-test questionnaire was given to establish baseline DRM knowledge. Then, a three-part self-learning video about the principles and medical management of disaster response medicine was used as a training module. After seven days, participants were asked to complete a post-test on knowledge and perception (Saiboon et al., 2021).

The results of this study were that participants overall knowledge showed a significant increase after completion of the video as compared to before the intervention. Recall and simple decision-making knowledge improved. This study also found that visual stimuli helped participants to assimilate greater knowledge compared to audio stimuli. Overall, it concluded that using an e-learning module for teaching disaster response in medical education can be an effective cognitive tool (Saiboon et al., 2021).

## CHAPTER 3

### METHODOLOGY

#### **Project Design**

This project followed a nonrandomized, single group, pre-post quasi-experimental design. This design was used to evaluate any difference as a result of the intervention (Harris et al., 2006).

#### **Population**

##### Setting

The first hospital within this midwestern health system is a 49-bed hospital with 11 patient rooms in the emergency department (Spectrum Health Lakeland, 2022a). It is designated as a level IV trauma center (Michigan Department of Health and Human Services [MDHHS], 2021). The second hospital is an 89-bed hospital with 21 patient rooms in the emergency department (Spectrum Health Lakeland, 2022b). It is also designated as a level IV trauma center (MDHHS, 2021). Finally, the third hospital is a 196-bed hospital with approximately 40 patient rooms in the emergency department (Spectrum Health Lakeland, 2022c). It is designated as a level III trauma center (MDHHS, 2021).

To be considered a level IV trauma center, the hospital must possess (a) an emergency department that can provide advanced trauma life support; (b) 24-hour laboratory coverage; (c) trauma nurses and physicians; (d) transfer agreements with Level

I and/or II trauma centers; (e) comprehensive quality assessment; and (f) an outreach program for the community (American Trauma Society [ATS], 2022). To be classified as a level III trauma center, the hospital must have (a) 24-hour coverage by emergency medicine physicians, (b) prompt availability of general surgeons and anesthesiologists, (c) a comprehensive quality assessment program, (d) transfer agreements with level I/II trauma centers, (e) provide back-up care for rural/community hospitals, (f) offer continued education for staff, and maintain (g) prevention efforts with an outreach program for the communities it serves (ATS, 2022).

The most recent mass casualty event experienced by the first hospital was on February 7, 2003 after a 72-car accident on the expressway nearby during a snowstorm. Twenty-two people were transported to this ED (Prichard, 2003). The only person still working within the ED who was present during this incident is their current RN manager. During this incident 17 years ago, she was an ED staff RN. She recounts the event as a stressful one in which she feels they were most definitely not prepared for.

In March, 2017, the second hospital experienced what can be considered their most recent mass casualty event. A carbon monoxide leak occurred at a local hotel. This led to 11 people seeking emergent care for carbon monoxide poisoning. Of those 11 people, six were children (NBC Universal, 2017).

According to the ED nurse manager of the third hospital, the Covid-19 epidemic of the last few years was seen as a mass casualty disaster event. According to the Berrien County Health Department (2022), since the start of the pandemic there have been a total of 35,843 confirmed cases in the county. Of those, 862 have/had been hospitalized with

430 deaths. In addition, there were 4,425 probable cases of which 79 were hospitalized and 46 died.

Each emergency department attempts to participate in an annual mass casualty incident drill consisting of registered nurses, support staff, and local EMS. However, this has become difficult to do. The COVID-19 pandemic has led to drastic changes in clinical staffing throughout hospitals in the United States. RNs across the nation are experiencing high chronic fatigue, lower work satisfaction, and are leaving in droves to transition into travel nursing for the increased pay and flexibility (Lavoie-Tremblay et al., 2021). As a result, there are more new graduate nurses than ever working in the emergency departments of this midwestern medical center. There are also many traveling nurses and nurses who have transferred from other settings into the ED. Thus, many RNs currently working in the EDs have not been exposed to real-life disaster response or mass casualty incidents. To bridge this gap in experience and knowledge, the intended setting for this project was the emergency departments specifically within this health system.

### Recruitment

Emergency department nurses were invited to take part in this project by means of emergency department organizational employee email (Appendix D), informational flyers posted in the staff bathrooms and break/locker rooms (Appendix E), and a brief announcement of the project relayed in morning safety huddles on the weekdays by unit managers in these emergency departments. Email content included a description of who the project administrator was, the topic of interest, participation requirements for completion of the project, the project design, and an approximate timeline. This project

was implemented solely in three emergency departments within a midwestern health system.

With the help of midwestern health systems manager of education, the intervention was automatically assigned to all ED RNs via ‘Workday learning’. This is an electronic learning platform integrated into Workday, the enterprise management cloud system used. This platform grants employees access to educational content on demand which they can complete at their own pace (Workday, Inc., 2022).

#### Inclusion and Exclusion Criteria

The sample for this project included emergency department registered nurses who currently work in the emergency departments at three hospitals within this midwestern health system. Inclusion criteria consisted of employment by this health system, active RN licensure in the state of MI, and participants must work in the emergency department. This project strived to include ED RNs, RN managers in these departments, RNs who float to the ED regularly, and RN house supervisors who routinely help in the ED.

Exclusion criteria included any RNs who do not work in the ED, ED personnel who are not a registered nurse, and any travel/agency RNs working in these units at the time of the project. Travel/agency RNs will not be used as their time-limited employment contracts make them unreliable pre and post participants.

#### Sample Size

The first hospital employs approximately 14 RNs in their emergency department. The second hospital employs approximately 35 RNs in their ED. The third hospital currently employs 67 RNs in their ED. The pool of participants included RNs working in

these units (116), clinical nurse supervisors (2), the ED managers (2), and qualifying RN house supervisors (9). The overall projected pool for participation was 129.

This project aimed for a  $\geq 95\%$  confidence interval, a  $\leq 5\%$  margin of error, a medium effect size of 0.5, and a power of 0.8. Using the G Power Software and paired sample *t*-test as the main reference test, the minimum required sample size to ensure validity of this project was calculated to be 34.

### Sampling Strategy

Convenience sampling was utilized which consisted of appropriate RNs in the ED (McLeod, 2019). The module was disseminated to RNs of all shifts of the emergency room in these locations as it was automatically assigned to them via Workday Learning in agreement with this health system. The module itself was titled “Emergency Preparedness Focus Part 1”. From there, RNs participated at their discretion.

### Ethics

Recruitment, ED RN participation, and data collection occurred once approval was received from both Andrews University and this midwestern health system’s internal review boards. A consent (Appendix F) was present within the initial survey which participants were required to read and agree to before continuing to the next step.

### Incentives

Compensation and/or incentives can improve participation in research (University of Alberta, 2021). As such, there was a raffle for three \$50 Amazon gift cards using emails provided by participants. These emails were entered into an electronic name wheel

online and chosen at random. Winners were notified via their listed email after the completion of data collection.

## **Tools and Measurement**

### **Variables**

The independent variable for this project was the e-Learning module. Dependent variables were perceived knowledge, perceived skills, and measured knowledge. Perceived knowledge and skills were measured using the initial portion of the Disaster Preparedness Evaluation Tool (Appendix B). Measured knowledge was evaluated through completion of 25 multiple choice questions (Appendix C).

### **Tools**

#### **Participant Demographics**

Participating nurses were asked to complete a demographic questionnaire (Appendix A). This allowed the student to develop an understanding of the composition of the project population (French, 2014). Continuous variables included age, years of ED experience, years of experience as an RN in general, and years of experience in the medical field overall. Categorical variables included highest nursing degree obtained, which shift the participant primarily works, and their employment status.

#### **DPET**

Originally, the disaster preparedness evaluation tool (DPET) was created to assess nurse practitioner's perceptions regarding preparation for and knowledge of disasters. For the purpose of this project, this tool was used to evaluate emergency department registered nurses. The actual questions and answer choices were not changed. The tool in



its entirety is comprised of 67 items and three subscales: (a) level of preparedness; (b) level of preparedness for response; and (c) level of preparedness for disaster recovery (Tichy et al., 2009). To assess perceptions of knowledge and skills in the chosen population, only the initial portion of the DPET titled “level of preparedness” was used in this project (Appendix B). Permission for use of the DPET for this project was granted by the original author.

Part A of the DPET contains three domains which assess disaster knowledge, disaster skills, and preparedness for a disaster. It was presented in the form of a six-point Likert scale where participants were asked to rate each statement from strongly disagree to strongly agree. Examples of questions in the perception of knowledge include: (a) I know the limits of my knowledge, skills, and authority as an RN to act in disaster situations; and (b) I read journal articles related to disaster preparedness. Examples of questions measuring perception of disaster skills include: (a) I am familiar with accepted triage principles used in disaster situations; and (b) I consider myself prepared for the management of disasters. The preparedness for disaster section of the DPET contains the questions: (a) I have personal/family emergency plans in place for disaster situations; and (b) I have an agreement with loved ones and family members on how to execute our personal/family emergency plans (Tichy et al., 2009).

### **Scoring and Interpretation.**

All questions within the DPET are scored using a Likert scale ranging from 1 to 6 (1 = strongly disagree, 2 = disagree, 3 = somewhat disagree, 4 = somewhat agree, 5 = agree, and 6 = strongly agree), with higher scores indicating greater perceived preparedness (Han & Chun, 2021). Measures of central tendency (mean and standard

deviation) were used to describe each question, the three subsections, and the subscale as a whole. Means between 1.00 and 2.99 were perceived as weak, means between 3.00 and 4.99 as moderate, and means between 5.00 and 6.00 as strong agreement (King et al., 2019).

### **Reliability and Validity.**

The “Level of preparedness” subscale of the original DPET was found to have a Cronbach alpha of 0.93 (Tichy et al., 2009; King et al., 2019). The closer the score is to one, the greater the internal consistency of the items in the DPET tool. An alpha of .70 or above is considered acceptable, but an alpha above .90 may be due to redundant items in a tool (Tavakol & Dennick, 2011).

### **MCQ's**

Participants completed 25 multiple choice questions to assess their base knowledge of mass casualty incidents, SALT triage, and information on mass casualty and disaster preparedness specific to the county where the medical centers are located (Appendix C). They completed the same questionnaire approximately seven days after completing the e-Learning modules. Participants were considered as having passed with a score of at least 75%, following FEMA standards (FEMA, 2014). As this intervention is a combination of reading and lecture, it is expected to see an increase in pre-post knowledge by approximately five percent (Masters, 2019).

Face validity was acquired by having these questions reviewed by two panels: (a) two physician experts in the field of emergency medicine and (b) two masters-level RNs currently working in managerial roles in the emergency department(s).

## **Implementation**

This e-Learning module was developed with the help of the ED manager at the second hospital, the Emergency Preparedness Specialist, and nursing faculty at Andrews University. The manager for the medical center's clinical education and simulation department agreed to work on integration of the module into the Workday learning platform as well as pre-assigning the module to all ED nurses. The module was shown to current ED registered nurses under the advisement of ED management.

The project consisted of an initial pre-survey. After completion, participants were given the opportunity to immediately move on to complete the educational module, consisting of six sections, at their own pace. Seven days later, participants were sent an email with a hyperlink asking them to complete the post-survey. The timeframe of seven days was chosen as literature supports this ideal time frame between learning and evaluation (Latimier et al., 2019).

The first hospital gives access to six computers for use at their ED nurses station. The second hospital affords access to nine computers at the ED nurses station. The third hospital has approximately 14 computers exclusively for ED staff with an additional four resident computers available when not in use. These were available for RNs to complete the e-Learning module while at work. As this was uploaded to their Workday learning profile, it was also available for them to complete at home had they wished to do so.

## **Intervention**

The e-Learning module was designed with the aim of being concise and relevant in information. Examples of disaster/mass casualty events, realistic patient scenarios, and questions tailored to this medical center population of emergency RNs were included.

This allowed for critical thinking and utilization of knowledge (Curtis et al., 2016; Sand, 2019). Lesson plans for each section of the module can be seen in Appendix G.

Content within the module was evidence-based using relevant peer-reviewed sources from within the last five years. However, sentinel sources were also used. A second source of content for this e-Learning module came from FEMA's Hospital Emergency Response Training (HERT) for Mass Casualty Incidents that was completed by the project manager. This program took place in Anniston, AL from June 25-June 30, 2018. HERT is an educational program through the Center for Domestic Preparedness (CDP) for hospital staff members to gain knowledge and training in emergency response. This particular course prepares healthcare responders to integrate emergency response while operating an Emergency Treatment Area during a mass casualty incident involving potential patient chemical, biological, radiological, or nuclear (CBRN) contamination (CDP, 2021).

Participants in this project learned about the incident command system, how to triage using the SALT method, and how to appropriately don and doff protective equipment in cases of CBRN disasters (CDP, 2021). In addition, links to websites, continuing education, and other study materials were provided at the conclusion of the module to allow for nurses to obtain additional information if desired. Content was presented as pictures, text, diagrams, and video to accommodate different learning styles (Curtis et al., 2016; Shirazi & Heidari, 2019).

This e-Learning module served as a pilot study for potential future use. In the event this health system decides to implement the module as part of annual competencies for nurses, it will be transposed into a module for this medical center's online education

platform via Workday. This will allow ED RNs and other staff members constant and consistent access to learning initiatives for disaster preparedness and mass casualty incidents.

## **Evaluation**

Before and after completion of the e-Learning module, participants were asked to complete identical quantitative questionnaires on disaster preparedness via ‘Class Climate.’ This is an online evaluation software which was used to deliver the questionnaires used in this project. This software allowed the DNP student to customize the questionnaires, obtain raw data, measure learning outcomes, and export data into statistical software for analysis (Scantron, 2022). The “level of preparedness” subscale of the Disaster Preparedness Evaluation Tool (DPET- see Appendix B) (Tichy et al., 2009) consisting of 25 Likert-scale questions and also 25 multiple choice questions created for this project and reviewed by experts prior to use (Appendix C) were used for the pre- and post-surveys.

## **Procedure**

### **Data Collection**

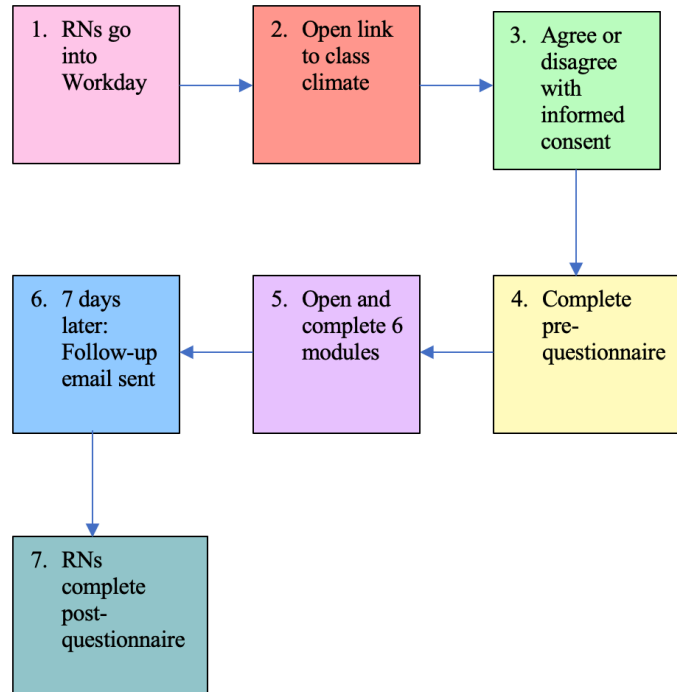
Data was collected electronically via class climate over a period of approximately 10 weeks at the first and second hospitals. The third hospital was added after several weeks to increase the data pool. Data was collected in the third hospital for approximately six weeks. The project manager and statistician had access to participant data for analysis. The step-by-step process for data collection is illustrated in figure 3.

Links to the questionnaires are as follows:

1. Pre-Survey – <https://www.andrews.edu/classclimate/online.php?p=Presurvey2022>

## 2. Post-Survey –

<https://www.andrews.edu/classclimate/online.php?p=Postsurvey2022>



*Figure 3.* Data collection process.

### Statistical analysis

Class Climate was used to acquire data. Demographic elements were calculated into percentages for analysis. The multiple-choice questions were evaluated by calculating the percentage of participants who scored correctly. Quantitative data analysis of the 25 Likert-scale questions was completed using the computer software Statistical Package for Social Sciences (SPSS) version 27.

For this project, the hypotheses tested are as follows:

$$H_0: \mu_1 - \mu_2 = 0 \text{ (there is no change)}$$

$$H_1: \mu_1 - \mu_2 \neq 0 \text{ (change exists)}$$

For demographic data, means and standard deviations were calculated for the continuous variables. Frequencies were calculated for categorical variables.

The paired sample t-test is a parametric test that compares the means of two measurements taken from the same individual at two different times. For this project, the two measurements represented are pre- and post-data. Thus, the paired sample t-test was used to compare the pre- and post-DPET and MCQ's scores to determine if there was any statistically significant difference between the pre- and post-values (University Libraries, 2021). Additionally, independent t-test or analysis of variance (ANOVA) test was used to compare the DPET and MCQ scores between various demographic groups.

## CHAPTER 4

### RESULTS

The purpose of this project was to bridge knowledge gaps and improve knowledge and perceived skills regarding mass casualty incidents and disaster preparedness among emergency department registered nurses through the creation and implementation of an e-Learning module. This chapter presents the results of this project including demographics and the pre- and post-scores for the multiple choice questions and the disaster preparedness evaluation tool subscale.

#### **Participant Demographics**

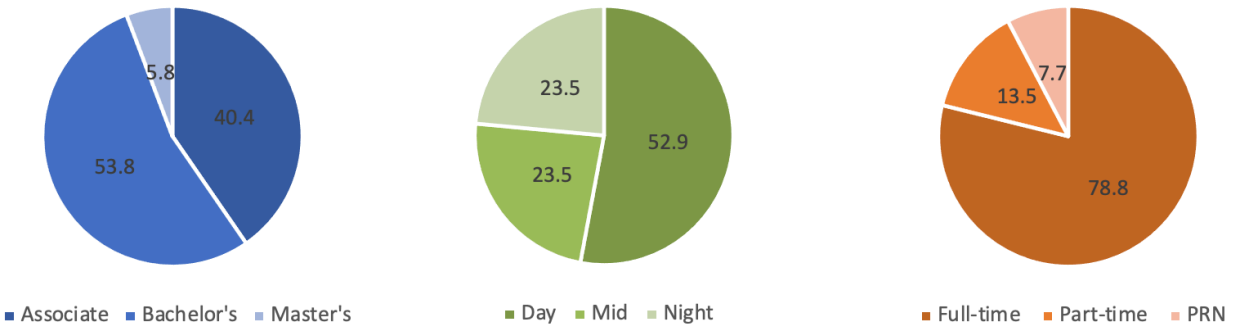
A total of 52 participants answered the demographic questionnaire. The average age of participants was 41.4 years old (SD=13.558). Participants averaged 10.19 years as a nurse, 7.36 years as a nurse in the ED, and 14.56 years working in medicine overall (Table 1). Fifty-nine and 6/10 (59.6%) of participants hold a bachelor's degree or higher in nursing. Fifty-two and 9/10 (52.9%) of those surveyed primarily work day-shift, with 23.5% working mid-shift and 23.5% working night shift. Of the 52 participants, 78.8% are employed full-time with 13.5% employed part-time and 7.7% employed PRN. Seventy-eight and 8/10 (78.8%) of participants have completed previous training or education in the areas of mass casualty incidents and/or disaster preparedness. However, only 23.1% have provided medical care in a real-life disaster event. This data is presented in Table 1 and Figure 4.



Table 1

*Participant Demographics*

Characteristics	<i>n</i>	%	<i>M ± SD</i>
Age	52		41.40 ± 13.558
Years as RN	52		10.19 ± 10.774
Years as RN in Emergency Department	52		7.36 ± 8.382
Overall medical professional experience	52		14.56 ± 10.948
Highest nursing degree			
Associate	21	40.4	
Bachelors	28	53.8	
Masters	3	5.8	
Primary shift			
Day	27	52.9	
Mid	12	23.5	
Night	12	23.5	
Employment status			
Full-time	41	78.8	
Part-time	7	13.5	
PRN	4	7.7	
Previously completed education/training in disaster preparedness and/or mass casualty incidents?			
Yes	41	78.8	
No	11	21.2	
Provided medical care in a real-life incident?			
Yes	12	23.1	
No	40	76.9	



*Figure 4.* Percentage of participants regarding highest degree held, primary shift, and employment status.

### Statistical Analysis

The question for this project was: In the three emergency departments in a midwestern medical system, what is the effect of implementing an e-Learning module on disaster preparedness and mass casualty incidents on the knowledge, perceived knowledge, and perceived skills among registered nurses working in the emergency department?

#### Knowledge

Table 2 provides the mean pre- and post-scores for the multiple choice questionnaire. A paired sample t-test was used to compare pre- and post-scores. Overall, there was a mean increase between pre- and post-scores of 0.98. While there was a slight increase between pre- and post-scores, the p-value is 0.094, which is not statistically significant. However, the number of participants who scored at least 75% increased from 11.3% to 28.6%, which shows at least some knowledge improvement after completion of the e-Learning module.

Table 2

*Pre- and post-scores for multiple choice questions*

	<i>n</i>	Scores <i>M ± SD</i>	Scored $\geq 75\%$	Test Statistics
Pre-test	35	15.51 ± 2.994	11.3%	$t = -1.343$ $df = 34$ $p = 0.094$
Post-test	35	16.49 ± 4.402	28.6%	

### Perceived knowledge

Table 3 shows participant results for the “disaster knowledge” portion of the “level of preparedness” subscale of the Disaster Preparedness Evaluation Tool.

Participants were asked to rate themselves on a Likert scale from 1 to 6 (1 = strongly disagree, 2 = disagree, 3 = somewhat disagree, 4 = somewhat agree, 5 = agree, and 6 = strongly agree) (Han & Chun, 2021). Means between 1.00 and 2.99 were perceived as weak, means between 3.00 and 4.99 as moderate, and means between 5.00 and 6.00 as strong agreeance (King et al., 2019).

Overall, there was an increase in all areas pre and post except for “interested in classes”. The mean for this decreased by 0.4. No areas measured as having strong agreeance pre or post. Weak agreeance pre-scores include reading journals and participating in the creation of current guidelines. Journal reading increased to moderate while guideline participation remained weak. Statistically significant increases were noted on items (a) Have a list of community contacts, (b) Know where to find research information, (c) Research is easily accessible, (d) Sufficient local support, (e) Know chain of command, and (f) Aware of classes.

Table 3

*Participant self-ranked responses to the Disaster Preparedness Evaluation Tool Subscale for disaster knowledge.*

Items	<i>n</i>	Pre-scores <i>M ± SD</i>	Post-scores <i>M ± SD</i>	Test Statistics
	35			
Interested in classes		4.34 ± 1.349	3.94 ± 1.552	<i>t</i> = 1.377 <i>df</i> = 34 <i>p</i> = 0.089
I know my limits		4.37 ± 1.190	4.43 ± 1.267	<i>t</i> = -0.239 <i>df</i> = 34 <i>p</i> = 0.406
Aware of community vulnerabilities		4.23 ± 1.165	4.40 ± 1.117	<i>t</i> = -0.828 <i>df</i> = 34 <i>p</i> = 0.207
Research literature is understandable		4.11 ± 1.132	4.31 ± 1.568	<i>t</i> = -0.729 <i>df</i> = 34 <i>p</i> = 0.236
Have a list of community contacts		3.60 ± 1.265	4.17 ± 1.403	<i>t</i> = -2.006 <i>df</i> = 34 <i>p</i> = 0.026 <i>d</i> = -0.339
Read journals		2.74 ± 1.314	3.17 ± 1.505	<i>t</i> = -1.369 <i>df</i> = 34 <i>p</i> = 0.090
Know where to find research information		3.60 ± 1.168	4.17 ± 1.200	<i>t</i> = -2.576 <i>df</i> = 34 <i>p</i> = 0.007 <i>d</i> = -0.435
Research is easily accessible		3.57 ± 0.948	4.23 ± 1.031	<i>t</i> = -2.980 <i>df</i> = 34 <i>p</i> = 0.003 <i>d</i> = -0.504
Sufficient local support		3.80 ± 0.933	4.34 ± 0.998	<i>t</i> = -2.936 <i>df</i> = 34

				$p = 0.003$ $d = -0.496$
Familiar with emergency response system	$4.11 \pm 1.659$	$4.43 \pm 1.065$	$t = -1.300$ $df = 34$ $p = 0.101$	
Finding information is an obstacle	$3.20 \pm 1.023$	$3.51 \pm 1.401$	$t = -1.087$ $df = 34$ $p = 0.142$	
Know chain of command	$3.63 \pm 1.395$	$4.26 \pm 1.442$	$t = -2.484$ $df = 34$ $p = 0.009$ $d = -0.420$	
Aware of classes	$3.51 \pm 1.380$	$4.17 \pm 1.317$	$t = -2.793$ $df = 34$ $p = 0.004$ $d = -0.472$	
Participate in activities	$3.66 \pm 1.187$	$4.06 \pm 1.494$	$t = -1.405$ $df = 34$ $p = 0.084$	
Have participated in planning	$3.71 \pm 1.601$	$3.94 \pm 1.589$	$t = -0.773$ $df = 34$ $p = 0.223$	
Have created guidelines	$2.26 \pm 1.197$	$2.91 \pm 1.652$	$t = -2.124$ $df = 34$ $p = 0.021$	

#### Perceived skill

Table 4 shows participant results for the “disaster skills” portion of the “level of preparedness” subscale of the Disaster Preparedness Evaluation Tool. Participants continued to rate themselves via a Likert scale from 1-6.

No items in the area of disaster skills ranked as strong. The single weak area occurred pre-test when participants were asked if they considered themselves a leader.

However, this area increased to moderate strength post-test. All other areas both pre and post ranked as moderate. Statistically significant increases were noted on items (a) Can perform isolation procedures, (b) Participate in drills, (c) Consider myself prepared, and (d) Consider myself a leader.

Table 4

*Participant self-ranked responses to the Disaster Preparedness Evaluation Tool Subscale for disaster skills.*

Items	<i>n</i>	Pre-scores <i>M ± SD</i>	Post-scores <i>M ± SD</i>	Test Statistics
	35			
Know how to use personal protective equipment		4.86 ± 1.033	4.94 ± 1.187	<i>t</i> = -0.367 <i>df</i> = 34 <i>p</i> = 0.358
Familiar with disaster triage		4.71 ± 0.893	4.80 ± 1.052	<i>t</i> = -0.407 <i>df</i> = 34 <i>p</i> = 0.343
Can perform isolation procedures		4.34 ± 1.136	4.69 ± 0.963	<i>t</i> = -1.785 <i>df</i> = 34 <i>p</i> = 0.042 <i>d</i> = -0.302
Participate in drills		3.83 ± 1.150	4.23 ± 1.239	<i>t</i> = -2.171 <i>df</i> = 34 <i>p</i> = 0.019 <i>d</i> = -0.367
Can execute decontamination procedures		4.31 ± 0.993	4.40 ± 1.168	<i>t</i> = -0.475 <i>df</i> = 34 <i>p</i> = 0.319
Consider myself prepared		3.66 ± 0.873	4.06 ± 1.282	<i>t</i> = -1.983 <i>df</i> = 34 <i>p</i> = 0.028 <i>d</i> = -0.335

Consider myself a leader	2.83 ± 1.424	3.31 ± 1.568	$t = -1.740$ $df = 34$ $p = 0.045$ $d = -0.294$
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Perceived family preparedness

Table 5 shows participant results for the “family preparedness for disaster” portion of the “level of preparedness” subscale of the Disaster Preparedness Evaluation Tool. Participants continued to rate themselves via a Likert scale from 1-6.

Both pre and post-scores for the two items in this portion of the DPET ranked as moderate. There was an increase in both areas. However, only the item concerning a family agreement on execution of a disaster plan showed a statistically significant increase.

Table 5

*Participant self-ranked responses to the Disaster Preparedness Evaluation Tool Subscale for family preparedness for disaster.*

Items	<i>n</i>	Pre-scores <i>M ± SD</i>	Post-scores <i>M ± SD</i>	Test Statistics
Family plan in place	35	3.51 ± 1.522	3.77 ± 1.750	$t = -0.867$ $df = 34$ $p = 0.196$
Family agreement on execution		3.26 ± 1.559	3.77 ± 1.832	$t = -2.172$ $df = 34$ $p = 0.018$ $d = -0.367$

## CHAPTER 5

### DISCUSSION

Having education initiatives for mass casualty incidents with concise and organized education for staff is of high importance. This issue is pertinent to this midwestern medical center in this community because in the event of a true mass casualty scenario, many lives could be saved if RNs in the ED were better prepared. For a hospital to provide adequate and effective care during a crisis, healthcare workers must be effectively trained to do so. However, many studies have found that hospitals across the nation are lacking in this education for hospital staff (Goniewicz et al., 2021a). Feedback from staff members, including non-nurses, involved in previous drills indicated that there is a gap in education regarding mass casualty incidents.

Planning, training, and practice activities are vital to the success of a mass casualty incident (Assistant Secretary for Preparedness and Response, 2019). Natural disasters are increasing in occurrence around the world. Climate change has led to more extreme weather and an increase in the number of weather-related disasters. According to the World Meteorological Organization (2021), there has been at least one weather-related disaster, climate, or water hazard occurrence every day over the past 50 years (WMO, 2021). In situations of disaster, nurses are expected to provide medical interventions using their expertise and skills. Therefore, training in disaster preparedness is essential (Goniewicz et al., 2021b).



The current state of healthcare because of the COVID-19 pandemic is a valid example of the necessity of disaster preparedness and mass casualty training in healthcare. This public health emergency has highlighted the importance of preparing nurses nationwide with the knowledge, skills, and abilities to respond. COVID-19 has shown that the U.S. healthcare system is deeply fragmented. As natural disasters and public health emergencies increase in occurrence and severity in the future, enunciation of the nursing role in disaster preparedness and emergency response will be critical (National Academies of Sciences, Engineering, and Medicine [NASEM], et al., 2021).

### **Summary of Findings**

The hypothesis of this project was that this intervention would improve RN knowledge, perceived knowledge, and perceived skills regarding mass casualty incidents and disaster preparedness. Overall, there was a mean increase of knowledge between pre- and post-multiple choice question (MCQ) scores of 0.98. Although this was not a statistically significant increase, participants who scored at least 75% increased from 11.3% to 28.6%, indicating some knowledge improvement after completion of the module. Of the 25 items asked from the Disaster Preparedness Evaluation Tool (DPET), 24 showed increases in self-ranking between the pre- and post-survey, 11 of which were statistically significant. Increases in almost all post-scores from the DPET indicate positive change regarding perceptions of disaster knowledge, disaster skills, and family preparedness after module completion.

## **Project Analysis and Commentary**

### **Strengths**

This is the first time a project of this type has been completed within these three emergency departments in this midwestern health system. By gathering and analyzing data via an educational competency in the areas of mass casualty incidents and disaster preparedness, it identified a need for continued education on these topics.

### **Limitations**

This project was done by means of Workday Learning, the educational platform used by this health system. To be accessed from home requires personal device permissions be given to the institution. Unfortunately, many staff members have not set this up as they do not wish to give the institution access to their personal devices. As such, they were limited to completing the initial questionnaire and module while at work. This was an issue as the emergency department is notoriously busy and many RNs stated they could not find the time to complete it. Data from participants who successfully completed the pre-test and survey but were unable to complete the module and/or the post-test and survey was not reported.

There were also several participants who stated they completed the initial questionnaire, however, there was no data for them in Class Climate. After communicating with Andrews University liaison for Class Climate, alterations to the initial questionnaire were made and further lost data was prevented. However, there was no way to access the reported completed questionnaires of those participants.

## Implications

Although pre- and post-results of the MCQ were not statistically significant, there was an increase in scores before and after completion of the module. With the DPET subscale, only one area had a decrease in self-ranking before and after the module. The other 24 items showed increases before and after the module, with 11 of them being statistically significant increases. In conclusion, the results of this project show that annual training in the areas of mass casualty incidents and disaster preparedness could positively benefit staff. This could be further supported if completed in conjunction with participant attendance of a live, in-person, disaster or mass casualty incident drill as are done annually at all three health system facilities.

## Dissemination plan

The results of this project were made available to Andrews University and this midwestern health system. Specifically, results were provided directly to the three ED managers, two ED clinical resource nurses, and a midwestern medical system's emergency preparedness specialist. The findings of this project were transposed into poster format for presentation at Andrews University. This poster was also provided to the aforementioned members of this healthcare system to be presented to staff if they desired.

## Recommendations

It is recommended that the findings of this project serve as evidence for the need of continued education on mass casualty incidents and disaster preparedness. Education in these areas should be made available not only to ED RNs, but also other essential staff members such as emergency department technicians and emergency medicine residents.

This information would not only familiarize them with MCI and disaster preparedness procedures, but also with the protocols specific to the healthcare institution for which they work. Implementing annual educational competencies on these subjects would positively impact the success of staff members if ever faced with a real-life experience in the future.

### Sustainability

This project was an attempt at creating an online e-Learning module which could be used at these three hospitals for education in the areas of mass casualty incidents and disaster preparedness. This e-Learning module is only the beginning. It is a good starting point in building a relevant and sustainable means of providing education not only to RNs but all who are interested in these areas. By way of this health systems education department, this module can serve as the foundation for building an annual compliance training e-Learning module.

### Evaluation

The purpose of this project was to bridge knowledge gaps and improve perceived knowledge and perceived skills regarding mass casualty incidents and disaster preparedness in the county of interest through the creation and implementation of an e-Learning module. The hypothesis of this project was that this intervention would improve RN knowledge and perceived knowledge and perceived skills regarding mass casualty incidents and disaster preparedness. The e-Learning module created was evaluated by ED management and the emergency preparedness specialist for this midwestern medical system. Suggestions for changes were implemented in the module prior to its use. Based on feedback from staff, management, and the emergency preparedness specialist, the

module is sufficient for education regarding mass casualty incidents and disaster preparedness.

### Self-scholarly analysis

This project was guided by The Essentials for Doctoral Education for Advanced Nursing Practice. Specifically, essentials I, II, III, IV, and VI were applied to this project.

**Essential I** (Scientific Underpinnings for Practice) led the DNP student to utilize evidence-based theories and concepts in the creation and implementation of this project (American Association of Colleges of Nursing [AACN], 2006). The e-Learning systems theoretical framework was adapted for disaster preparedness for use in this project. The Plan-Do-Study-Act (PDSA) model was used to evaluate for change after implementation of the e-Learning module.

**Essential II** (Organizational and Systems Leadership for Quality Improvement and Systems Thinking) drove the DNP student to develop and evaluate the delivery of an educational initiative based on scientific findings to meet current and future needs of emergency department Registered Nurses. Through this essential, advanced communication skills and processes such as email, Workday Learning, and Class Climate were used to ensure quality improvement of educational initiatives regarding mass casualty incidents and disaster preparedness within the health system (AACN, 2006).

**Essential III** (Clinical Scholarship and Analytical Methods for Evidence-Based Practice) guided the literature review by ensuring the DNP student critically appraised “existing literature and evidence to determine and implement the best evidence for practice” (AACN, 2006). The tools and processes used to evaluate this project and apply its findings to improve nursing practice were also guided by this essential. These include

use of the Disaster Preparedness Evaluation Tool (a proven reliable and valid tool), use of multiple-choice questions created by the investigator and determined valid via face validity, creation by the investigator of an e-Learning module which was also scrutinized and given face validity, and statistical analysis of the results using version 27 of SPSS.

Overall, this essential helped the DNP student to design an evidence-based intervention, create hypotheses and predict outcomes, collect and analyze pre- and post-data, and disseminate the findings of this project to improve educational initiatives and potential healthcare outcomes for patients in the future (AACN, 2006).

**Essential IV** (Information Systems/Technology and Patient Care Technology for the Improvement and Transformation of Health Care) guided the DNP student in the creation of an e-Learning module for this project. Information systems (ie. PowerPoint and Workday Learning) were used to design, select, and evaluate this quality improvement project in a healthcare setting. Through the creation of the module and its evaluation, the DNP student demonstrated the ability and skill to develop and execute a project plan using evidence-based information obtained from information systems and databases (AACN, 2006).

**Essential VI** (Interprofessional Collaboration for Improving Patient and Population Health Outcomes) was a key component in the creation and implementation of this project. Via this essential, the DNP student was able to effectively communicate and collaborate with other members of the healthcare team in the creation of the e-Learning module (AACN, 2006). Such people include ED managers, clinical resource RNs, physicians, and an emergency preparedness specialist. These interpersonal relationships enabled the DNP student to create a project which would aim to impact the

role of nursing and healthcare in the areas of mass casualty incidents and disaster preparedness.

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APPENDICES

**Appendix A.** Demographic Questionnaire.

<b>Demographic Questionnaire. Please write or circle answer.</b>	
What is your age?	
How many years have you been an RN?	
How many years of experience do you have as an RN in the ED?	
How many years of professional experience do you have in the medical field overall?	
What is the highest nursing degree you have obtained?	ADN BSN MSN DNP/PhD
Which shift do you primarily work?	Days Mids Nights
What is your current employment status with Lakeland?	Full-time Part-time PRN
Have you previously completed education/training in disaster preparedness and/or mass casualty incidents?	Yes No
If you have completed previous education/training, when was this?	
Have you ever provided medical care in a real-life disaster or mass casualty incident?	Yes No

**Appendix B.** DPET Disaster Preparedness Subscale. Adapted for RNs (Tichy et al., 2009).

<b>Criteria</b>	1 Strongly Disagree	2	3	4	5	6 Strongly Agree
<b>Disaster Knowledge</b>						
1. I would be interested in educational classes on disaster preparedness that relate specifically to my community situation.						
2. I know the limits of my knowledge, skills, and authority as an RN to act in disaster situations.						
3. I am aware of potential vulnerabilities in my community.						
4. I find that the research literature on disaster preparedness is understandable.						
5. I have a list of contacts in the medical or health community in which I practice. I know referral contacts in case of a disaster situation.						
6. I read journal articles related to disaster preparedness.						
7. I know where to find relevant research or information related to disaster preparedness and management to fill in gaps in my knowledge.						
8. I find that research literature on disaster preparedness and management is easily accessible.						



9. In case of a disaster situation, I think there is sufficient support from local officials on the county or state level.						
10. I am familiar with the local emergency response system for disasters.						
11. Finding relevant information about disaster preparedness related to my community needs is an obstacle to my level of preparedness.						
12. I know whom to contact (chain of command) in disaster situations in my community.						
13. I am aware of classes about disaster preparedness and management that are offered in my workplace, university, or community.						
14. I participate in one of the following educational activities on a regular basis: continuing education classes, seminars, or conferences dealing with disaster preparedness.						
15. I have participated in emergency planning for disaster situations in my community.						
16. I participate/have participated in creating new guidelines or emergency plans or in lobbying for improvements on the local or national level.						
<b>Disaster Skills</b>						
1. In case of a bioterrorism/biological attack, I know how to use personal protective equipment.						
2. I am familiar with accepted triage principles used in disaster situations.						

3. In case of a bioterrorism/biological attack, I know how to perform isolation procedures so that I minimize risks for community exposure.						
4. I participate in disaster drills or exercises at my workplace on a regular basis.						
5. In case of a bioterrorism/biological attack, I know how to execute decontamination procedures.						
6. I consider myself prepared for the management of disasters.						
7. I would be considered a leadership figure in my community in a disaster situation.						
<b>Family Preparedness for Disaster</b>						
1. I have personal/family emergency plans in place for disaster situations.						
2. I have an agreement with loved ones and family members on how to execute our personal/family emergency plans.						

**Appendix C.** Multiple choice questions for evaluation of knowledge. Correct answers are highlighted in green.

Questions	A	B	C	D
1. Which victim should be triaged first?	The youngest	Whoever is closest to you	Someone who is not breathing	Someone with a superficial wound
2. All walking wounded should be sorted into which category?	Minimal	Delayed	Immediate	Expectant
3. Which label represents those who have the highest priority of being treated first?	Minimal	Delayed	Immediate	Expectant
4. Which statement is false regarding those tagged as “delayed”?	These victims should be seen after those tagged as “minimal”.	This patient’s care can be delayed for up to one hour.	A patient tagged as “delayed” has injuries which could eventually lead to compromise of breathing, circulation, or mental status.	This patient has the second highest priority for treatment.
5. Victims tagged as “expectant” mean the patient:	Can have treatment delayed	Are expected to inevitably expire	Should be closely observed for changes in status	Require immediate medical intervention
6. A question(s) to assess mental status is:	Can you squeeze my hand/finger?	Can you count backwards from 100?	Have you been drinking alcohol?	What is your name? Where are you? What

				month is it?
7. You find a victim that is not moving. You lightly shake them and ask them if they are okay; they do not respond. What do you do next?	Move on to the next victim	Open their airway	Shout more loudly	Tag them as immediate
8. You find that a victim has a cap refill of 4 seconds. What is your next step?	Open their airway	Check cap refill again	Tag as “immediate” and treat for shock	Tag as “delayed” and treat for shock
9. What is the first phase of emergency management?	Preparedness	Response	Recovery	Mitigation
10. Pharmacy falls under which category in the incident command system?	Admin/Finance	Security & Planning	Operations	Logistics
11. What does IAP stand for?	International Association of Preparedness	Incident Action Plan	Identity-Aware Participation	Independent Activities Period
12. What is the purpose of the operations section of incident command?	Develops tactical organization and directs all resources to carry out the IAP.	Develops the IAP to accomplish the objectives.	Provides resources and services needed to support the incident.	Monitors incident-related costs.
13. If a radial pulse is absent, or cap refill is >2 seconds, the patient should be tagged as:	Minimal	Delayed	Immediate	Expectant

14. Once a patient is tagged, they do not need to be monitored for any changes in status.	True	False		
15. Once a patient is tagged as “delayed” you do not need to reassess the patient after that.	True	False		
16. A 29-year-old female has a foreign body in her leg. She is able to walk with assistance. A tourniquet is in place, but she is still bleeding. Her capillary refill is <2 seconds. Her RR is 18/min. What is her triage designation?	Minimal	Delayed	Immediate	Expectant
17. A 30-year old presents with burns all over his body. He has large, white-appearing areas. He is complaining of moderate pain. There is soot in his oropharynx and nares with a RR of 40. What is their triage designation?	Minimal	Delayed	Immediate	Expectant
18. A 72-year-old is breathing, has their eyes closed, is not responding to	Minimal	Delayed	Immediate	Expectant

commands, and is nonverbal. There appears to be a large parietal hematoma. What is their triage designation?				
19. A 43-year-old is non-ambulatory and is bleeding from their proximal right thigh. There is a tourniquet in place which, when removed, produces pulsatile bleeding. What is their triage designation?	Minimal	Delayed	Immediate	Expectant
20. What is SALT an acronym for in relation to this module?	Speech and Language Therapy	Serum Alanine Aminotransferase	Skin-Associated Lymphoid Tissue	Sort, Access, Lifesaving Intervention, and Treat or Transport
21. A mass casualty incident is in the top 10 threats for both SHL Watervliet and Niles Hospitals.	True	False		
22. Which emergency response system is used in Berrien County?	National Incident Command System (NIMS)	Personal Emergency Response System (PERS)	Patient Safety Network (PSNet)	National Disaster Response System (NDRS)
23. Who is part of the incident command staff?	Planning sections chief	Logistics section chief	Safety officer	Operations section chief
24. What is an example of a chemical agent	Anthrax	Cyanide	Uranium	Radiation

that could be used to induce a disaster/mass casualty incident?				
25. What kind of tape is used when donning a Class C PPE suit?	Scotch tape	Duct tape	Gorilla tape	Chem tape

## **Appendix D.** Verbal/Electronic Information for Recruitment.

Fellow ED RNs,

As some of you may know, I am in the Doctor of Nursing Practice (DNP) program at Andrews University. Completing a DNP project is a requirement of the program. For my project, I have chosen to create an e-Learning module for disaster preparedness and mass casualty incidents (MCI's) for RNs specific to Berrien County. The goal is to assess participating RN's pre- and post-knowledge and perceptions of knowledge and skills in disaster and MCI preparedness. To do this, I created a power point module (similar to a Workday learning module) for information on disaster preparedness and mass casualty incidents.

My project requires a total of 40 RNs to participate between Niles and Watervliet ED's.

Participation will include:

- Completion of a demographic questionnaire
- 25 multiple choice questions (pre and post)
- 25 Likert-scale questions on perceptions of knowledge and skills regarding disaster preparedness (pre and post)
- Completion of the e-Learning module consisting of six sections. Content includes videos, graphs, tables, and written content (will be uploaded to your Workday learning)

Participation will be completely voluntary. I will need you to list an email of your choice so I can identify and correlate pre and post-data. You will receive a follow-up email with a link to complete the post-survey and post-test after approximately 7 days.

★ There will be a drawing for three \$50 Amazon gift cards for those who participate.

Winners will be chosen at random and will be notified via email. ★

If you are interested and/or have any questions, please contact me via email or text. Also, please feel free to approach me in person with any questions or concerns.

Thank you!

Kaitlyn Chung, BSN, RN  
(703) 376-7076  
Kaitlyn.Chung@spectrumhealth.org



# DISASTER PREPAREDNESS & MCI EDUCATION

ATTENTION EMERGENCY RN'S

Participants needed  
for my DNP project!

Open to all shifts

Information has been sent to your  
Lakeland email

- eLearning module
- 25 question pre and post-survey
- 25 question pre and post-quiz

Kaitlyn Chung, BSN, RN  
[Kaitlyn.Chung@spectrumhealth.org](mailto:Kaitlyn.Chung@spectrumhealth.org)

1234 Napier Ave.  
St. Joseph, MI 49085



**Appendix F.** Electronic Informed consent to be imbedded into module.

### **Electronic Informed Consent**

Project name: **Implementation of an e-Learning Module to Increase RN Knowledge and Skills of Emergency Preparedness**

Principal Investigator: Kaitlyn Chung, BSN, RN, DNP(c)

Advisor: Dr. Jochebed Ade-Oshifogun

You are being invited to participate in a research study titled “Implementation of an e-Learning Module to Increase RN Knowledge and Skills of Emergency Preparedness”. This study is being done by Kaitlyn Chung from Andrews University. You were selected to participate in this study because you are a Registered Nurse working in the Emergency Department.

#### **Purpose of Project**

The purpose of this project is to bridge knowledge gaps and improve your perception of knowledge and skills regarding mass casualty incidents and disaster preparedness in the Emergency Department.

#### **Inclusion and Exclusion Criteria**

The sample for this project will include registered nurses who currently work in the emergency department at this Midwest medical center. Inclusion criteria will consist of employment by this Midwest medical center, active RN licensure in the state of MI, and participants must work in the emergency department.

Exclusion criteria includes any RNs who do not work in the ED, ED personnel who are not a registered nurse, and any travel/agency RNs working in these units at the time of the project.

### **Intervention**

If you agree to participate in this project, you will be asked to complete a 25 question pre-survey on your perceptions of knowledge and skills regarding disaster preparedness. You will also be asked to answer 25 multiple choice questions to determine your baseline knowledge. Then, you will be asked to complete the module which will take approximately 90 minutes.

Approximately seven days after your module completion, you will receive an e-mail to complete a follow-up survey containing the same questions. This will assess for any change in your knowledge, perceived knowledge, or perceived skills.

### **Voluntary Participation**

Your participation in this project is entirely voluntary. You are free to choose whether or not to participate, and you can withdraw at any time. If you choose not to participate, this will not affect your standing or employment with Spectrum Health Lakeland. However, your participation will help improve the emergency preparedness at SHL.

### **Duration**

This project will require two electronic contacts with the DNP student. The first contact to complete the initial survey and e-Learning module and the second contact to complete a follow-up survey within 1-2 weeks.

**Risks**

There are no physical risks to participants in this project. You may feel a little anxious while taking the test after completing the module. However, you are at liberty to take your time in completing the test and this will reduce your anxiety.

**Confidentiality**

You will be asked to provide an email of your choice to match your pre- and post-answers. Your email and any personal information collected during your participation will be known only to the DNP student and the advisor. This will not be shared with anyone else. Your responses to questions would be aggregated for dissemination and will not be linked to your personal information.

**Incentive**

To thank you for your participation in this project, you will have the option to provide an email to be used in a drawing for a \$50 Amazon gift card. There will be three winners. You will receive an email notifying you if you have won.

**Questions**

If at any time you have questions regarding this project or participation, please do not hesitate to reach out to the DNP student using the contact information listed below. If you do not feel comfortable reaching out to the student directly you may contact the project chair at Andrews University who may be able to answer questions. If you have any questions concerning your rights or welfare as a project participant, you may contact the Andrews University IRB Office at (269) 471-6361 or [irb@andrews.edu](mailto:irb@andrews.edu).

Principal Investigator

Kaitlyn Chung

(703)376-7076

Kaitlyn.Chung@SpectrumHealth.org

Academic Project Chair

Dr. Ade-Oshifogun

(708)769-4259

Jochebed@andrews.edu

By clicking “I agree” below you are indicating that you are at least 18 years old, have read and understood this consent form, and give your electronic consent to participate in this project. Please print a copy of this page for your records.



Agree



Disagree

**Appendix G.** Lesson plans for each section of the e-Learning module: MCI and Disaster Preparedness RN Education.

<b>Lesson 1</b>	<b>Introduction</b>
<b>Objectives</b>	<p>At the end of this module, learners should be able to:</p> <ol style="list-style-type: none"> <li>1. Define mass casualty incident, preparedness, and SALT</li> <li>2. Identify the main hazards/vulnerabilities for Spectrum Health Lakeland in Niles and Watervliet</li> <li>3. Understand the Berrien County emergency response system</li> <li>4. Recall contacts if needed for MCI/Disaster scenarios</li> <li>5. Identify references for continued education</li> </ol>
<b>Content Outline</b>	<p>9 slides</p> <ol style="list-style-type: none"> <li>1. Title slide</li> <li>2. Objectives</li> <li>3. Spectrum Health emergency preparedness education requirements</li> <li>4. Definitions</li> <li>5. 2020 Hazard vulnerability analysis (HVA): Top threats</li> <li>6. Emergency Response System: Berrien County</li> <li>7. Important Contacts</li> <li>8. Resources &amp; Continuing Education</li> <li>9. References</li> </ol>
<b>Assessment Plan</b>	Pre- and Post-test
<b>Method of Instruction</b>	PowerPoint
<b>Estimated Time</b>	4 minutes
<b>Technology/Resources</b>	Computer, PowerPoint, Class Climate

<b>Lesson 2</b>	<b>Content Overview</b>
<b>Objectives</b>	<p>At the end of this module, learners should be able to:</p> <ol style="list-style-type: none"> <li>1. Recall what a mass casualty incident is</li> <li>2. Recall what a disaster incident/scenario is</li> <li>3. Understand the hospital's role in managing and participating in mass casualty and disaster incidents</li> <li>4. Realize the importance of annual exercises for practice</li> </ol>
<b>Content Outline</b>	<p>5 slides</p> <ol style="list-style-type: none"> <li>1. Title slide</li> <li>2. Objectives</li> <li>3. Natural Disasters &amp; MCI's: Hospital FEMA YouTube Video [49 mins]</li> <li>4. Drills &amp; Education</li> <li>5. References</li> </ol>
<b>Assessment Plan</b>	Pre- and Post-test
<b>Method of Instruction</b>	PowerPoint, YouTube
<b>Estimated Time</b>	55 minutes
<b>Technology/Resources</b>	Computer, PowerPoint, Class Climate

<b>Lesson 3</b>	<b>NIMS</b>
<b>Objectives</b>	At the end of this module, learners should be able to: <ol style="list-style-type: none"> <li>1. Understand the National Incident Management System (NIMS)</li> </ol>
<b>Content Outline</b>	9 slides <ol style="list-style-type: none"> <li>1. Title slide</li> <li>2. Objectives</li> <li>3. Five Major Components</li> <li>4. Preparedness</li> <li>5. Communication &amp; Information Management</li> <li>6. Resource Management</li> <li>7. Command &amp; Management</li> <li>8. Ongoing Management &amp; Maintenance</li> <li>9. References</li> </ol>
<b>Assessment Plan</b>	Pre- and Post-test
<b>Method of Instruction</b>	PowerPoint
<b>Estimated Time</b>	5 minutes
<b>Technology/Resources</b>	Computer, PowerPoint, Class Climate



<b>Lesson 4</b>	<b>Incident Command System</b>
<b>Objectives</b>	At the end of this module, learners should be able to: <ol style="list-style-type: none"> <li>1. Understand incident command</li> <li>2. Understand the hospital incident command system</li> <li>3. Understand the hospital incident management team</li> <li>4. Understand SHL’s Emergency Activation Plan</li> </ol>
<b>Content Outline</b>	7 slides <ol style="list-style-type: none"> <li>1. Title slide</li> <li>2. Objectives</li> <li>3. Five Major ICS Functional Areas</li> <li>4. Hospital Incident Command System (HICS)</li> <li>5. Standard HICS Structure</li> <li>6. SHL Emergency Activation/Notification</li> <li>7. References</li> </ol>
<b>Assessment Plan</b>	Pre- and Post-test
<b>Method of Instruction</b>	PowerPoint
<b>Estimated Time</b>	6 minutes
<b>Technology/Resources</b>	Computer, PowerPoint, Class Climate

<b>Lesson 5</b>	<b>SALT Triage</b>
<b>Objectives</b>	<p>At the end of this module, learners should be able to:</p> <ol style="list-style-type: none"> <li>1. Understand the difference between SALT and daily triage</li> <li>2. Explain SALT triage process and utilization</li> </ol>
<b>Content Outline</b>	<p>8 slides</p> <ol style="list-style-type: none"> <li>1. Title slide</li> <li>2. Objectives</li> <li>3. Daily triage vs. SALT</li> <li>4. Why SALT?</li> <li>5. SALT Triage: Step 1 Sort</li> <li>6. SALT Triage: Step 2 Assess</li> <li>7. SALT Triage: Step 2 Categories</li> <li>8. References</li> </ol>
<b>Assessment Plan</b>	Pre- and Post-test
<b>Method of Instruction</b>	PowerPoint
<b>Estimated Time</b>	15 minutes
<b>Technology/Resources</b>	Computer, PowerPoint, Class Climate

<b>Lesson 6</b>	<b>Chemical, Biological, Radiological, and Nuclear Considerations</b>
<b>Objectives</b>	At the end of this module, learners should be able to: <ol style="list-style-type: none"> <li>1. Identify the importance of PPE and appropriate use</li> <li>2. Learn chemical, biological, radiological, and nuclear considerations</li> <li>3. Learn coordinating decontamination protocol(s)</li> </ol>
<b>Content Outline</b>	13 slides <ol style="list-style-type: none"> <li>1. Title slide</li> <li>2. Objectives</li> <li>3. Decontamination Principles</li> <li>4. Required Equipment</li> <li>5. Personal protective Equipment (PPE) - Level C</li> <li>6. Level C Equipment</li> <li>7. Donning &amp; Doffing PPE – Level C</li> </ol> Videos [17 mins] <ol style="list-style-type: none"> <li>8. Roles &amp; Responsibilities</li> <li>9. Facility Response to Contaminated Patient</li> <li>10. Facility Response to Mass Casualty with Contaminated Patient</li> <li>11. Niles Decontamination Tent Location</li> <li>12. Watervliet Decontamination Tent Location</li> <li>13. References</li> </ol>
<b>Assessment Plan</b>	Pre- and Post-test
<b>Method of Instruction</b>	PowerPoint, YouTube
<b>Estimated Time</b>	20 minutes
<b>Technology/Resources</b>	Computer, PowerPoint, Class Climate

