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Disaster Knowledge and Awareness of Nurses Related to Triage in Mass Casualty Incidents

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DISASTER KNOWLEDGE AND AWARENESS OF NURSES RELATED TO
TRIAGE IN MASS CASUALTY INCIDENTS

by

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Abstract

American life, as we know it, is changing. Disasters are increasing in frequency. Over the past decade, more than two million people has lost their lives. Nationally, nurses are not familiar with concepts of disaster nursing and emergency management. Literature demonstrates that nurses lack the knowledge, skills, and ability to respond adequately in a disaster. This quality improvement project evaluated the effectiveness of an evidence-based disaster awareness program specifically designed for nurses who work in the emergency department. This quality improvement project used David Kolb's Experiential Learning and the Kellogg Foundation's Logic as an organizational framework. With a global goal, the International Council of Nurses (ICN) proposed a framework for disaster nursing competencies for education of "general" nurses, now considered the "gold standard" of disaster nursing competencies. The program focused on the ICN core competencies of disaster nursing. The educational intervention consisted of a variety of educational opportunities, including a self-study packet, an interactive poster, and group discussions. A Retrospective Preevaluation-Postevaluation (RPPE) survey demonstrated that the program was effective in improving nurses' overall disaster awareness. Recommendations for advanced practice nurses revolve around designing and implementing disaster preparedness education that is geared toward nurses.

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Disaster Knowledge and Awareness of Nurses Related to Triage in Mass Casualty Incidents

Background/Statement of the Problem

Globally, healthcare systems have organizational issues that are complex and often related to resource availability. As a media driven country, it's becoming routine to hear ongoing debates about healthcare reform with a common theme: quality, cost and access to healthcare. Regardless of media source and ideological views, it's likely to hear the word "crisis" in the same segment as healthcare. System failures lead to operational failures that place barriers on hospitals and make it difficult to meet the daily needs of patients. Nurses need to be prepared for crisis situations. Disasters, in particular, can overwhelm capacities of healthcare facilities very quickly.

In the United States, Americans often rely on hospitals to provide much of their healthcare. Emergency departments (EDs), in particular, play a key role in treatment. The Centers for Disease Control and Prevention (CDC) reported that there was a record high of 141.4 million visits to hospital EDs in the United States in 2014 (CDC, 2017). In a 10-year span, annual ED visits have increased from 90.3 to million (32% increase). In 2017 article published by the American College of Emergency Physicians (ACEP), it was reported that the increased volumes in emergency departments combined with decreased numbers of open EDs are one of the primary causes for ED overcrowding. Most emergency physicians, when survey, agreed that ED visits were continuing to rise, with a noticeable increase noted from 2014 to 2015 (ACEP, 2017). Reasons for visits vary and include anything from convenience to limited access to primary care. As debates on

policy in healthcare continue to play out in the political arena, it's evident that, with data demonstrating that the number of ED visits per 100 persons being 45.1 (CDC, 2017) access to healthcare is still problematic and people rely on local EDs for reasons other than an emergency. In this report by the CDC, percent of visits that actually resulted in hospital admission was only 7.9%.

This leaves hospitals with enormous challenges on an average day. The threat of terrorism exists at a time when hospitals and EDs in the United States are struggling to manage the current volume of patients who present for care. Overcrowding is now the norm. This situation is thought to be the result of a variety of contributing elements, from reductions in hospitals with emergency departments, regionalization of surgical care, increases in nonemergency patient visits to emergency departments, diversion of emergency medical services, and personnel shortages (ACEP, 2017).

Very simply, overcrowded EDs cause delays in care when there is not enough room available. With most EDs now disclosing wait times routinely and they are at record high numbers and concerns nationwide are starting to focus on preparing our hospitals for crisis events (CDC, 2017). Any surge in volume of patients can result in a crisis event, whether a natural disaster like earthquakes and hurricanes or manmade disasters like terrorism. These may negatively impact healthcare systems that are vulnerable and result in negative outcomes. Logically, healthcare's contribution to disaster response lies in preparation. Gaps in preparedness around the world are well documented (Ben-Ishay, Mitaritunno, Catena, Sartelli, Ansaloni, & Kluger, 2016). They are often not addressed in a comprehensive and systematic way. Solutions for effective

care during increased capacity are maximized with system planning and consistently updated training programs for disaster and mass casualty management (Ben-Ishay et al., 2016).

Emergency medicine is a specialty and is based on the knowledge and skills required for the diagnosis and treatment of unforeseen illness or injury. Emergency medicine is not defined by location and encompasses planning, oversight and medical direction for community emergency medical response, medical control and disaster preparedness (ACEP, 2016). Disaster medicine is unique and also considered a specialty. Yet despite significant federal funding for hospital and public health preparedness efforts to prepare and mobilize providers for disaster preparedness, response have been episodic and difficult to sustain (Veenema et al., 2016).

How prepared are we as a country to respond to respond to crisis situations that involve large number of casualties? Hospital capabilities typically reflect resource availability. The struggle becomes a constant balancing act between supply and demand. The ED is often the point of entry where work flow can be characterized as chaotic, variable and unpredictable. Emergency departments frequently have to manage situations that become unmanageable (Desseyn, 2017). On an average day, most EDs become flooded with patients presenting for a variety of issues, from patients needing a prescription refill, to a fall off a skateboard that resulted in a fractured clavicle. Hospitals have difficulty meeting daily needs of patients. It is necessary for systems to be able to design a structured approach that standardizes emergency triage decisions with best practice approach to preparation and training. When wait times become long and

treatment needs exceed the capacity of an ED, patient triaging becomes necessary to allocate resources and provide effective patient care.

Nationally, with the attention focused on the frequency of “man-made” disasters, there are growing concerns about the availability of health resources to manage such events. Issues range from physical destruction with terrorist attacks to epidemic outbreaks of deadly diseases. The World Health Organization (WHO) defines disasters as a serious event that results in disruption of the functioning of a community or a society causing widespread human, material, economic or environmental losses which exceed the ability of the affected community or society to cope using its own resources (WHO, 2016). Some events, although devastating, are not considered disasters. The actual impact of the event on system resources determines classification of a disaster. For hospitals, the impact of the event directly effects healthcare when the event that causes a sudden and dramatic surge in numbers of patients. When the demand on medical resources and personnel exceed capabilities of medical response, the event is classified as a mass casualty incident (MCI) (WHO). The Centre for Research on the Epidemiology of Disasters (Guha-Sapir, Hoyois, & Wallemacq, 2017) noted that an event that causes unsurmountable damage and human casualties is considered a disaster when the situation overwhelms local capacity, thus necessitating a request to a national or international level for external assistance (Guha-Sapir et al.).

Healthcare systems face enormous challenges during a MCI that is unfamiliar and chaotic. Disasters are often unpredictable and the harm they cause can be mitigated or partly prevented (WHO, 2016). During the period 2011–2015, the global annual average

death rate due to natural disasters was 0.3 deaths per 100,000 population (WHO). With respect to resources, healthcare systems are particularly vulnerable. Crisis outcomes are dependent on preparedness. Universally there are gaps in health system preparedness. Research shows that health care systems commonly do not address disaster preparedness in a comprehensive and systematic way (Ben-Ishay et al., 2016). Internationally, nurses make up the largest group of medical that responds to victims during a disaster and are key direct care providers, yet research suggest that they lack the basic knowledge and skills to respond to disasters (Li, Li, Yang, & Xu, 2016). With the frequency of disasters increasing nationally, basic nursing disaster awareness will facilitate and encourage disaster preparedness for nurses working in hospital emergency departments. The purpose of this project is to develop an emergency room nurse disaster awareness program that provides an evidenced based foundation for disaster mitigation and encourage disaster nursing preparedness.

Next, the literature review will be presented.

Literature Review

An extensive literature review for relevant research on nursing disaster preparedness was conducted through the use of online databases including CINAHL, PubMed, Ovid Nursing, and Cochrane for the last ten years. The key terms included disaster, disaster preparedness and response, nursing education and competency. With a vast number of articles written on disaster nursing, consideration was given to include that were peer-reviewed and published in English language.

The following review of the literature was organized into five themes: disaster definition, scope and management; disaster triage; disaster nursing; nursing disaster preparedness knowledge gaps; and nursing education and training barriers for disaster response.

Disaster Definition, Scope and Management

The WHO defines a disaster as any occurrence that cause damage, ecological disruption, loss of human life, deterioration of health and health services on a scale sufficient to warrant an extraordinary response from the outside community or area (WHO, 2017). A disaster is considered a mass casualty incident (MCI) when emergency medical services resources, such as personnel and equipment, are overwhelmed by the number and severity of casualties (WHO, 2017).

With the steady increase and frequency of disasters over the past few years, healthcare systems worldwide are facing challenges responding to sudden extreme demands for medical care. This increase in the magnitude and frequency of disasters and

public health emergencies has occurred globally. In the last decade alone, there has been an estimated 60% increase in disasters worldwide in which an estimated two million people lost their lives, 4.2 million were injured, 33 million were left homeless and three billion were otherwise affected (Achora & Kamanyire, 2016). The Centre for Research on the Epidemiology of Disasters (CRED) has been actively participating and reporting on research involving disasters and epidemiology for over 40 years (Guha-Sapir et al., 2017). The organization was established as a non-profit institution with concentration on moving disaster management efforts from focus on post-disaster improvisation to pre-disaster preparedness (Lechat, 1975). In 1980, the Centre became what is now known as the World Health Organization (WHO) Collaborating Centre (Guha-Sapir et al., 2017). CRED further maintains and reports on global disaster statistics in “The Emergency Events Database”. In 2016, data indicated that 301 country-level disasters occurred, affecting 102 countries. This sums up to a total of 7,628 deaths, 411 million affected people, and \$97 billion in economic damage (CRED, 2017).

International Federation of Red Cross and Red Crescent Societies classify disasters as natural, biological, geophysical, climatological, hydrological, meteorological and technological (IFRC, 2012). Crises may occur naturally, caused by the environment, or they may be man-made. Some examples of natural events include earthquakes, floods, and hurricanes. Environmental events are typically related to accidents like chemical spills or oil fires, while a man-made disaster is often an act of terror, such as, active shooter and nuclear explosions.

A disaster places an extraordinary level of demand for healthcare services. During a disaster, when the demand for care exceeds capacity to respond, hospitals' capability to function properly quickly becomes overwhelmed. This then often prompts hospitals' emergency system response plan (ESRP), which triggers an incident command system (ICS) structure for leadership decision-making (Veenema, Losinski, Newton, & Seal, 2017a). When a crisis occurs, even with organizational preparations to respond, impact can still out way resources. Historically, disasters related to weather and climate cost billions. In a quarterly report, the National Centers for Environmental Information (NCEI) published summary of disaster events in the United States that show cost statistics in excess of billions of dollars between the periods of 1980–2017 (NCEI 2018). According to the NCEI, the U.S. experienced a total of 16 separate billion-dollar disaster events in 2017. Total cost was estimated to exceed \$300 billion.

The Federal Environmental Management Agency (Department of Homeland Security [DHS], 2017) describes four phases of disaster management including mitigation, preparedness, response, and recovery. Mitigation involves limitation of the adverse impacts of hazards and related disasters. Preparedness is a process implemented to reduce the loss & damage to human lives, property. Response includes provision of emergency services and public assistance during or immediately after a disaster. Recovery incorporates the ability to return life to normal levels after a disaster.

Hospitals play an active role in any emergency situation. Planning for disasters is the most important part of disaster response (Assistant Secretary for Preparedness and

Response [ASPR], 2015). Having a clear command structure with defined roles provides a calculated effort to respond to the unknown (Institute of Medicine [IOM], 2012).

Mass casualty incidents happen without warning. An organized response to disaster will positively impact recovery. Disaster management can be specifically defined as the organization and management of resources and responsibilities for dealing with all humanitarian aspects of emergencies, in particular preparedness, response and recovery in order to (Noguchi, Inoue, Shimano, Shibayama, & Shinchi, 2016). The United States National Response Framework (NRF) organizes a guide of basic principles for the nation to respond to disasters and emergencies. The guide suggests that the placement of nursing professionals in leadership roles in management of disaster functions will facilitate coordination of medical service and decision making during disaster events (DHS, 2017).

Regardless of how a disaster occurs, management universally involves training that is geared toward prevention or mitigation (Guha-Sapir et al., 2017). Management actions can be categorized as introspective disaster risk management, corrective disaster risk management and compensatory disaster risk management, also referred to as residual risk management (The United Nations Office for Disaster Risk Reduction [UNISDR], 2017).

Disaster and disaster risk often include descriptive terms that help define the event, including hazard, exposure and vulnerability. An effective disaster risk assessment begins with identifying areas of greatest risk for disaster and focusing attention to allocate resources in anticipation of needs (DHS, 2017). Disaster management is a

process that requires planning, organizing, training, equipping, exercising, evaluating, and taking corrective action with training and exercising plans as the cornerstone. That being said, communities often rely on hospitals and healthcare workers to be available and prepared to respond quickly and efficiently (DHS).

In 2016 (Wolf, 2017) the UNISDR commissioned the development of guidelines on national disaster risk assessment (NDRA) as part of a series of thematic guidelines under its “Words into Action” initiative to support national implementation of the Sendai Framework for Disaster Risk Reduction 2015-2030 (UNISDR, 2017).

The UNISDR established guidelines to facilitate disaster reduction strategies around the world. The Guidelines were intended to motivate and guide countries in disaster risk comprehension. As well as encourage countries to in assessments of disaster risk. These guidelines outline policies and practices for disaster risk management. Some specifics include, but are not limited to, education and training exercises prior to disaster events. Other areas of planning also involve education for medical response, community warning systems, basic structure of operations, search and rescue plans (UNISDR, 2017).

Nationally, with the attention focused on the frequency of “man-made” disasters, there are growing concerns about the availability of health resources to manage such events. The public health concerns range from physical destruction with terrorist attacks to epidemic outbreaks of deadly diseases. Though hospital EDs around the world are identifying shortfalls in emergency response systems, a number of experts and organizations have produced their own lists of competencies and recommendations for clinicians and public health professionals working in disaster (Veenema et al., 2017a).

Attention to development of standards of care with respect to disaster and mass casualty incidents is ongoing (Veenema et al.).

Disaster Triage Definition and Disaster Nursing Role and Training Needs

Triage is the process of collecting pertinent information about patients who are seeking emergency care and initiating a decision-making procedure that uses a valid and reliable triage acuity designation system (Emergency Nurses Association [ENA], 2017). Nurses are trained and develop necessary skills to coordinate and delegate care efficiently. The process of triage is ingrained in a nurse's role regardless of area of discipline. Triage incorporates a nurse's initial assessment with the ability to critically think and prioritize patient care on the basis of appropriate decision making (Smith, & Cone, 2010).

The purpose of triage in the ED is to prioritize incoming patients and to identify those who cannot wait to be seen. The triage nurse performs a brief, focused assessment and assigns the patient a triage acuity level, which is a proxy measure of how long an individual patient can safely wait for a medical screening examination and treatment. In 2008, there were 123.8 million visits to U.S. EDs (CDC, 2009). Of those visits, only 18% of patients were seen within 15 minutes, leaving the majority of patients waiting in the waiting room.

Nursing is the process of collecting pertinent information about patients who are seeking emergency care and initiating a decision-making procedure that uses a valid and reliable triage acuity designation system (ENA, 2017). It is the position of the ENA that:

1. Triage is a critical assessment process performed by a registered nurse or nurse practitioner with a minimum of one- year of emergency nursing experience, as well as appropriate additional credentials and education that may include certification in emergency nursing and continuing education in trauma, pediatrics, and cardiac care, with verification or certification in those subspecialties as appropriate.
2. Emergency nurses complete a comprehensive, evidence-based triage education course and a clinical orientation with an experienced preceptor to enhance triage knowledge and skills.
3. Triage nurses are engaged in an ongoing triage competency validation process that includes observation and chart review, with remediation and further education as appropriate.
4. Emergency department leadership ensures that registered nurses receive appropriate education and demonstrate the knowledge application and situational awareness required to successfully function in the role of triage nurse according to professional and accreditation standards (Wolf, 2017).

The nursing role in the emergency department ED in regard to patient triaging is pivotal for good patient outcomes. Research demonstrates that nurses continue to be unclear about their roles and duties during a disaster event. Internationally, researchers are urgently examining disaster response. In Saudi Arabia, an empirical study was done that examined the role of emergency nurses in mass gathering disaster preparedness (Alzahrani & Kyratsis, 2017). The authors examined disaster preparedness in emergency nurses' levels of awareness, knowledge, skills and perceptions of emergency nurses in Mecca with regard to mass gathering disaster. The findings from this study support previous research that suggested that despite the substantial experience gained through clinical engagement in prior mass casualties, there is a deficit in knowledge of the major incident plans for emergency nurses working in public hospitals (Alzahrani & Kyratsis, 2017). In 2008, The American Association of Colleges of Nursing (AACN, 2008) started

discussion about nurse educators should be including basic knowledge and skills in disaster management at the undergraduate level.

Disaster nursing is a specialty and can be defined as the adaptation of professional nursing skills in recognizing and meeting the nursing physical and emotional needs resulting from a disaster (Veenema et al., 2017b). The overall goal of disaster nursing is to achieve the best possible level of health for the people and the community involved in the disaster (Veenema et al.). Major policy issues continue to be evident that show inadequate integration of nursing into national disaster policy frameworks (IOM, 2014). Nursing ability is often called disaster nursing competency which is directly applied to emergency preparedness capability (Veenema, 2012).

Disaster nursing requires the application of basic nursing knowledge and skills in difficult environments with scarce resources and changing conditions. Nurses must be able to adapt nursing practices to the specific disaster situation while working to minimize health hazards and life-threatening damage caused by the disaster (International Council of Nurses (ICN) , 2009). A disaster nurse is trained to adapt skills while recognizing and meeting the nursing physical and emotional needs resulting from a disaster with the overall goal of achieving the best possible level of health for the people and the community involved in the disaster. (Edmonson, 2017). This places nurses in a critical position respond to global and national health issues in the role in disaster mitigation (Edmonson).

Disaster management universally involves training that is geared toward prevention or (Guha-Sapir et al., 2017). In the US, the Incident Command System, known as the National Incident Management System (NIMS), is responsible to declare a disaster a

mass casualty. During an MCI situation, triage in local hospitals changes to a military model, the START (Simple Triage and Rapid Treatment) (Chemical Hazards Emergency Medical Management [CHEMM], 2017) system. The START system was designed in 1983 and updated in 1994 and is meant for rescuers with basic first aid skills. It can be applied to hospital medical professionals in the ED an incident that produces a hospital surge. Nationally, health care systems need standards for maintaining surge capacity and competencies in order to respond effectively during a disaster. Educating basic awareness of disaster and developing programs for preparedness is crucial for a hospital's effective response to a sudden increase in number of patients or victims of emergencies and disasters (Sheikhbardsiri, 2017).

The START model incorporates the notion of providing care with a utilitarianism approach, the greatest good for the greatest number. Disaster triage operates according to a different ethical approach, the utilitarian ethical theory. An understanding of the ethical basis of disaster triage can help nurses reconcile the personal and professional difficulties, including moral distress, that can result from the decisions that must be made in such a situation (Wagner, 2015).

Much of the disaster literature reviewed shared common themes with other emergency competency preparedness research. Evidence shows that competencies, such as BLS and ACLS, are basic nursing skills. Competencies are defined as the knowledge, skills, abilities, and behaviors needed to carry out a job (Hutton, Veenema, & Gebbie, 2016). Disaster nursing competencies have been identified from evidence-based practice and standard development to minimize risk in disaster nursing practice. Disaster core competencies were first developed by International Nursing Coalition for Mass Casualty

Education (INCMCE) (Hutton et al., 2016) at Vanderbilt University to promote leadership and awareness of the nurse's role in mass- casualty incidents (Hutton). With a global goal, the International Council of Nurses (ICN) proposed a framework for disaster nursing competencies for education of "general" nurses, now considered the "gold standard" of disaster nursing competencies (ICN, 2009).

Some key initiatives around disaster nursing were examined in a process of review. In 2014, the ICN formed a steering committee to examine the existing ICN Framework of Disaster Nursing Competencies. The ICN Framework of Disaster Nursing Competencies was originally developed to provide a common set of competencies in disaster nursing. In a report published in the *Prehospital and Disaster Medicine* journal (Hutton et al., 2016) authors demonstrated that the ICN Framework of Disaster Nursing Competencies was providing a foundation for the education and training of nurses. The framework recommends that competencies should be internationally applicable with content modification, as needed, to be culturally specific for different regions.

Concerns were subsequently identified that there was not a systematic process in place that reviewed individual country variations in disaster educational needs. The ICN designated Steering Committee was charged with reviewing the global nursing workforce and providing clarification of nurses' role in disasters (Hutton et al., 2016). The committee members consisted of a panel of experts in emergency/disaster nursing and competency-based education. The committee concluded their report with recommendations that a wider network of nurses and nursing groups be organized to participate in the official ICN planned review in 2017. The committee also suggested that the review be structured to help differentiate between competencies core to all

nursing practices and those that are needed for advanced or specialized disaster-related practice. Finally, the authors recommended that future research explore how the ICN Framework of Disaster Nursing Competencies does or does not assist in maintaining best practices in the field and also improve outcomes for victims of disaster.

In 2012, a task force was gathered that consisted of a task force of physicians, registered nurses (RNs) and emergency medical technician (EMTs). Using a modified Delphi technique, the authors were able to identify 19 content domains, 19 core competencies and 93 performance objectives relevant to acute care medical professions. These addressed specific levels of knowledge, skills and attitudes that must be mastered to meet the training goal (Schultz, 2012). The authors specifically addressed the need for triaging based on standardized competencies in order to maintain the knowledge and skills required for effective response to disaster-related emergencies (Schultz).

A modified Delphi approach was used to perform an extensive review of the literature examining the triage nurses' role in the ED with the expectations of developing a role description of triage nurse (Ebrahimi, 2016). The authors reported that although experts agree that comprehensive educational programs and developmental research are needed to support nurses in this role, there is inconsistency in nurses' perceptions of the role. A purposeful sample of 38 emergency medicine experts was used to evaluate triage related interventions. The study showed that the role of triage nursing is variable when comparing agreement on prioritizing and related interventions. The authors concluded with related research demonstrating that comprehensive educational programs and developmental research are required to support diagnostic and therapeutic interventions

in triage practice by nurses (Ebrahimi). Ultimately, triage related interventions still need extensive development to be reliable enough to practice by triage nurses.

Nursing Disaster Preparedness Knowledge Gaps

Disaster response requires planning to be effective. Research demonstrates that healthcare workers receive little to no training to perform adequately during a disaster or mass casualty incident. Concerns continue to face nurses regarding the nation's gap related to disaster preparedness and response systems. The American Nurses Association is vocal with voicing concerns about identifying and addressing the gap in our nation's disaster preparedness and response system. In a brief on disasters published in 2017, the ANA asked the question: "Who will be there?" The report not only highlights some of the unresolved issues that relate to what a registered nurse's (RNs) duty to respond is. It suggests that planning for situations that place nurses in situations that result in unfamiliar role expectations would improve involvement in response to disasters. A mass casualty incident often presents nurses with unique situations that have physical, emotional and legal implications. The ANA actively lobbies for developing policies and laws that enable the registered nurse and other providers to respond confidently and to ensure that the needs of the American public will be met during a disaster (ANA, 2017b).

In 2009, the Institute of Medicine (IOM) voiced concerns related to continuing education of nurses and proposed solutions to development of systems that promote professional development, education and training (Harding, Walker-Cillo, Duke, Campos, & Stapleton, 2013). Ultimately, there is a need to provide standards of care to ensure safe delivery of care that results in positive outcomes. Competency in nursing is vast and can be difficult to define. The ANA defines disaster competencies as "an

expected and measurable level of nursing performance that integrates knowledge, skills, abilities, and judgment, based on established scientific knowledge and expectations for nursing practice” (ANA, 2015). The ENA has built on the ANA standards and created the Emergency Nursing: Scope and Standards of Practice document that is specific to demonstrate competence of emergency nursing as a specialty (Harding et al., 2013).

The IOM identified knowledge gaps in public health systems preparedness and emergency response and recommended priority research areas (Leinhos, Qari, & Williams-Johnson, 2014). Looking back at the Pandemic and All-Hazards Preparedness Act (PAHPA) of 2006, the IOM identified gaps in knowledge about public health systems preparedness and emergency response that included needs for research, training, preparedness, and criteria for evaluating public health emergency preparedness, response, and recovery, and metrics to measure their effectiveness and efficiency (Leinhos et al.). The IOM further emphasized the need for workforce development in emergency response.

Health care standards of care often become a balancing act during a disastrous event. Nurses often find themselves participating in an unfamiliar role with multiple victims. A typical role for a nurse can quickly turn into a situation that is dependent upon a nurse to be prepared to rapidly triage, critically think and adapt without notice. In an extensive review of multiple literature databases, researchers examined the role of nurses in disaster preparedness, management, and emergency response (Grochtdreis, de Jong, Harenberg, Görres, & Schröder-Bäck, 2016). The literature reviewed in this study was global and had common themes related to disaster nursing education and a lack of curricula exists in many countries around the world. The authors had a specific aim to

provide an overview of nurses' roles, knowledge and experience in national disaster preparedness and emergency response. After careful screening of 432 references, information from 68 articles were reviewed in depth. Research demonstrated that although there is an international consensus that nurses are key players in emergency response (Leinhos et al., 2014), demographically, countries vary in perceptions of nursing qualifications for disaster response. The literature examined in this study identified the need for nurses to not only prepare for, but train for disaster response.

The role of a nurse in the setting of a disaster often relies on a nurses' ability to utilize critical thinking and problem-solving skills that may vary depending on uniqueness of the situation. With the increased frequency of disasters worldwide, attention is beginning to focus on healthcare response. Nursing roles, in particular, are becoming more defined with identification of training needs. The WHO and the ICN developed the Framework of Disaster Nursing Competencies (ICN, 2009). These competences will serve as a sufficient complement to the knowledge and skills of nurses already acquired through basic nursing curricula. During and after a disaster, attention should be applied to the work environment, feelings and stressors of nurses, not only to raise the willingness to respond to a (Hutton et al., 2016). Where non-existent, national directives and concepts for disaster nursing should be developed and nurses should be aware of their duties. Nursing educators should prepare nurses for disasters, by adjusting the curricula and by meeting the increased need for education and training in disaster nursing for all groups of nurses. The appropriateness of theoretical and practical preparation of disaster nursing competencies in undergraduate nursing courses and continuing education programs should be evaluated (Hutton et al., 2016).

Emergency room nurses lack the knowledge and skills required to respond effectively in a MCI. Despite the use of varying scales to measure disaster preparedness in nurses, a common finding among the reviewed literature is that nurses are inadequately prepared for disaster response. In a more recent study, a systematic review of literature was done on disaster preparedness among nurses (Labrague et al., 2017). The literature included peer-reviewed publications over a 10-year span from 2006 to 2016 that specifically looked at nurses' preparedness for disasters on an international spectrum. Using a cross-sectional research design and a survey approach with questionnaires, the authors concluded that nurses widely reported that nurses are insufficiently prepared and do not feel confident responding effectively to disasters. All the studies reviewed in this report indicated that nurses had a low to moderate level of preparedness. Final findings in this study support previous literature that nurses report widely that they are insufficiently prepared and do not feel confident to effectively respond to disasters. The author also noted that factors that increase a nurse's preparedness include previous disaster response experience and disaster-related training. Hospitals need to implement policies to address lack of preparedness amongst healthcare workers. The study further demonstrated that the current literature is favorable in demonstrating initiatives to educate nurses on disaster, but evidence continues to demonstrate that nurses remain under prepared for disaster response (Labrague).

Nursing Education and Training Barriers for Disaster Response

The ANA (2017b) reported that nurses have concerns regarding the nation's gap in our nation's disaster preparedness and response systems. Questions remain unanswered as to what the RN's duty to respond is, especially if called upon to serve in a nontraditional

role and what expectations the RN should have for physical, emotional and legal protections (ANA). National associations like the ANA are lobbying for plugging gaps by developing policies and laws that enable RNs and other providers to respond confidently and to ensure that the needs of the American public will be met during a disaster (Forino, 2014).

With the fundamental point of triage involving decisions that are more difficult when a condition is life-threatening and the scarce resource potentially life-saving, it's easy to see ethical concerns when the question becomes: "Who shall live when not everyone can live?" (Aacharya, Gastmans, & Denier, 2011). An interesting study published in the BMC Emergency Medicine journal looked at several ethical questions related to triage systems. The authors used the four principles of biomedical ethics, respect for autonomy, beneficence, no maleficence and justice, to provide the starting point and help to identify the ethical challenges of ED triage (Aacharya et al.). The authors identified that integrating basic ethical dimensions with clinical assessments provides a strategy of triage that incorporates a care-oriented approach.

Patient care is typically guided by desire to do the right thing and have positive patient outcomes. The Code of Ethics for nurses was developed by the ANA to provide guidance for nurses in carrying out nursing responsibilities in a manner consistent with quality in nursing care and the ethical obligations of the profession (ANA, 2015). Provision 5 of the Code states that the nurse owes the same duty to self as to others. In a routine ANA brief (2017b) the position of conflict of obligation is discussed. The ANA contends that during times of disaster, nurses and other health care providers, must decide

how much high-quality care they can provide to others while also taking care of themselves (ANA, 2017b).

While there is a great deal of literature written about disasters and disaster response, little has been written from the emergency nursing perspective. A literature review was conducted examining the literature related to nursing in the ED during a disaster (Hammad, Arbon, Gebbie, & Hutton, 2012). The authors specifically explored literature that spoke to experiences and perceptions of nurses who have worked in the ED during a disaster. The review demonstrated that there continues to be a significant gap in the current body of knowledge on this topic. More specific, the study concluded that nurses feel unprepared for disasters secondary to lack of disaster education and training. This review was not conclusive in determining what type of disaster education and training would be most appropriate. Authors concluded her research review with demonstrating implication to nursing education. The research that was reviewed in this study places nurse educator in the front of disaster response. Data demonstrates that nursing curricula has a limited amount of disaster related content and programs need to be developed for nurses that include disaster into both undergraduate and postgraduate curriculums. Ultimately, the authors stated that further research is needed to accurately assess preparedness needs of nurses for disaster response in the ED. Findings from this study have significant implications for need into how to best prepare nurses for working in the ED during a disaster.

In this same study, the authors also examined the existing literature related to emergency department (ED) nursing using a mixture of qualitative, quantitative and mixed method approaches in data collection from a number of countries around the world

from 2000 and 2011. This literature review specifically examined the role ED nurses play caring for patients following a disaster. The authors demonstrated a pattern that showed five themes arising from the articles: (1) What nurses do during a disaster response; (2) How nurses feel during a disaster response; (3) Preparedness of nurses for disaster response in the ED; (4) Barriers to working in the ED during a disaster; and (5) Changes that occur during a disaster. Of the five themes, two key findings focused concern on disaster preparedness of ED nurses. These findings included changes from a 'normal' working day to a disaster and the preparedness of nurses working in the ED during a disaster (Hammad et al., 2012). This theme focuses on nurses' actions and behaviors when working in the ED during a disaster. While many skills and roles remain unchanged from a normal day a nurse in the ED, there was evidence that a disaster created additional roles and tasks.

The study adds a nursing perspective to the area of disaster response and highlights the need for further research. Nurse educators are instrumental in a disaster response and focus needs to be concentrated on developing a nursing curriculum that includes disaster programs for both undergraduate and postgraduate curriculums regular disaster with drills and exercises which include multiple disciplines (Hammad et al., 2012). While nurses felt empowered with hands on experience, barriers do exist. The review demonstrated that nurses expressed barriers that ranged from organizational policies that address disaster preparedness, to personal and family safety concerns. Other barriers reported involved the type of disaster, significance of infrastructure damage, and lack of disaster training with unfamiliarity of organizational plan (Hammad et al.).

While investigating barriers, the authors highlighted factors that involved the much broader concepts of not only the willingness to respond, but the ability. The study supported that nurses feel under-prepared for disaster response and don't feel that education and training readily exist. The authors concluded that the literature reviewed did not reach a consensus on what type of disaster education and training would be most appropriate. What is agreed upon, is, that the response to disasters needs to begin with preparation (Hammad et al.).

The willingness of health care workers to report for duty in the event of a disaster varies considerably depending on the nature of the disaster (Ogedegbe, Nyirenda, DelMoro, Yamin, & Feldman, 2012). Personal safety and family obligations prove to be areas of particular concern for staff. This research was published in the *International Journal of Emergency Medicine* (2012) and looked specifically at perceptions of clinical and non-clinical staff with regard to personal needs, willingness to report (WTR) to work and level of confidence in the hospital's ability to protect safety and provide personal protective equipment (PPE) in the event of a disaster. The objectives in this study were to compare, among a large sample of health care personnel from a community hospital, the responses of clinical and non-clinical staff with regard to their: (1) personal needs, (2) willingness to report to work in the event of a disaster, and (3) level of confidence in their hospital's ability to provide protective gear and take precautions to protect their safety in the event of a disaster. Ogedegbe studied hospital employees using an anonymous online survey. Results identified specific barriers, including family obligations and concerns for personal safety, which were the most important predictor for staff not being willing to respond during a disaster. The authors concluded clinical and non-clinical staff differed

in the types of barriers to responding to a disaster and their confidence in the hospital's ability to guarantee their safety (Ogedegbe et al.).

Of note, the authors mention that their study is actually one of few to report a large number of participants with knowledge of their responsibilities in the event of a disaster. This finding was thought to be largely related to the fact that a large majority of respondents (93 %) considered it their responsibility to report to work in the event of a disaster was probably based on the fact that our hospital employees had had frequent exposure to disaster preparedness training.

Researchers (Whetzel, Walker-Cillo, Chan, & Trivett, 2013) also examined nurses' perception of their role in a disaster and their perceived susceptibility to a disaster. In addition, basic knowledge and role preparation were examined. The results in this study highlighted that many emergency nurses admit that they have not taken basic actions, neither personally or professionally, to prepare themselves for a disaster. The author suggested future research needs to involve specific personal needs of emergency nurses. How do nurses prepare themselves to go to work during a disaster? In disaster setting, it's no surprise that nurses will struggle morally and not completely comprehend potential ethical dilemmas that result from a catastrophic public health event. Little is known about nurses' direct experiences of ethical preparedness for dealing with catastrophic public health emergencies and healthcare disasters or the ethical quandaries that may arise during such events (Johnstone & Turale, 2014). In a recent systematic literature review, researchers explored and synthesized qualitative data reporting nurses' direct experiences of being prepared for and managing the ethical challenges posed by catastrophic public health emergencies and healthcare disasters. The study was done to

investigate the literature on nurses' experiences of ethical preparedness for managing public health emergencies and healthcare disasters. The authors wanted more focused attention directed toward emergency planning, preparedness, and response for nurses. The authors critically appraised 12 studies published between 1973 and 2011.

In this review, the authors were able to confirm that there is a significant gap in the literature on nurses' experiences of ethical preparedness for managing public health emergencies and healthcare disasters, and the ethical quandaries they encounter during such events. There was common theme found in system planning oversights that was related failures to directly address the issue of ethical considerations in planning, preparedness, and response to public health emergencies and disasters by nurses. This finding alone, highlights the need for ethical considerations in emergency planning, preparedness, and response (Johnstone & Turale).

Next, the theoretical frameworks that guided this project will be presented.

Theoretical Framework

This quality improvement project used David Kolb's Experiential Learning Theory (Kolb, 1984) and the Kellogg Foundation's Logic Model (Kellogg Foundation, 2004) as an organizational framework. David Kolb's Experiential Learning Theory will be used to design a brief educational program that incorporate a didactic component of disaster awareness and nurse competencies with a short simulation of a realistic MCI.

Kolb's learning theory suggests that learners construct new knowledge by adding what is learned from new experiences to what is already known (Billings, 2016). Using Kolb's theory, the program will be diverse and address suggested styles of learning. Kolb has identified four different learnings styles that will be applied to the educational program. The four learning styles described in his theory include: (a) diverging: the learning abilities of concrete experience and reflective observation, (b) assimilating: the learning abilities of reflective observation and abstracted conceptualization, (c) converging: the learner abilities of abstracted conceptualization and active experimentation, and (d) accommodating: the learner abilities of active experimentation and concrete experience (Billings, 2016). Using this theory as a framework of program development will provide a flexible platform of presentation of information.

Kolb (1984) described learning as the method in which knowledge is structured through the transformation of experiences. The main assumption is that learning stems from what the learner perceives as well as how the information is processed (Kolb). In his learning theory, Kolb further highlighted the progression through the learning modes and by default, the learning styles. He accounts for the human tendency to form habits

and preferences that stem from experience, skill and attitude. It can be concluded, therefore, that an effective learning program first acknowledges a learner's preference, but then purposefully addresses the remaining gaps to complete the cycle of experiential learning.

Kolb's theory acknowledges that by knowing the learning styles of nurses, information presented will be more relatable to practice and experience (Turesky & Gallagher, 2011). As learning is a process what allows ideas and concepts to form and reform with experience, the combination of a didactic component with a simulated scenario will provide a stepping stone that will take nurses from disaster awareness level to interest in preparedness level (Billings, 2016).

The Kellogg Foundation Logic Model (2004) was used as a framework to guide for project planning. The model has the capacity to accurately depict the proposed project both visually and narratively. The model design includes inputs, activities, outputs and outcomes.

The Logic Model framework is illustrated in Figure 1 on the next page.

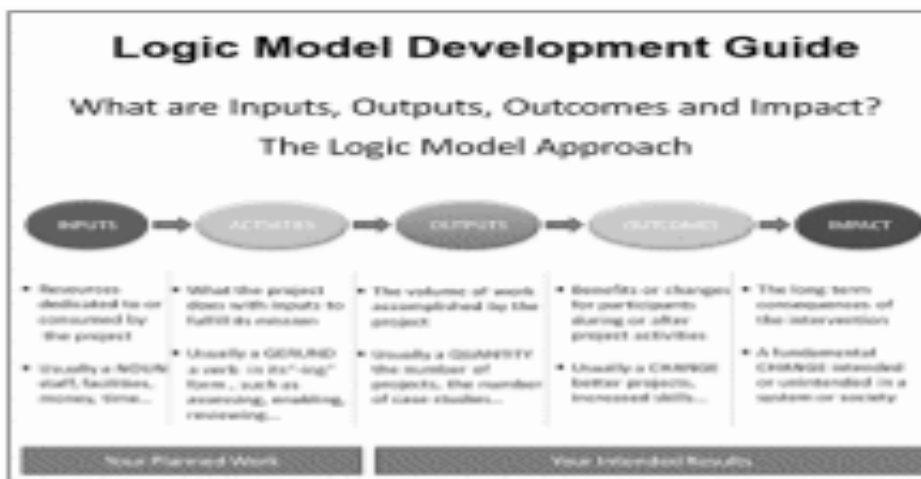


Figure 1. Logic model

The Logic Model guided the planning process because it demanded careful definitions of the resources and inputs that would potentially impact the project. Also identified were the activities that were project interventions, the outputs or the immediate result of the project activities, the outcomes that would measure the results of the project and finally the impacts which will serve to identify the impact of the project on practice. Utilizing a logic model to guide the assessment of a project helps to ensure that the evaluation meets the expectations of the stakeholders. Linking questions to each of the elements in the logic model and cross-checking to assure that the goals and objectives are being met increases its utility. It also helps to ensure that the evaluation will be focused, and questions addressed in a way that yields the maximum amount of valuable, pertinent information on the program or project assessed (Torghele, Buyum, Dubruiel, Augustine, Houlihan, Alperin, & Miner, 2007).

Next, the methods will be presented.

Method

Purpose

The purpose of this quality improvement project was to develop an emergency department nurse disaster awareness program that provides an evidence-based foundation for disaster mitigation and encourages disaster nursing preparedness.

Design

The project was a quality improvement design that included an educational intervention and utilized a Retrospective Preevaluation-Postevaluation (RPPE) design survey to evaluate program effectiveness. A retrospective pretest evaluation is often used after a professional development course and is a method been shown to be effective with accurate responses that reflect the degree of change in knowledge, skills, and/or attitudes (Malagon-Maldonado, 2016). The survey was made available for participants who attended program.

Sample/Participants

The sample for this project was purposeful and was intended to include all RNs presently employed at Kent hospital working in the emergency room. A total of 84 RNs (n=84), ranging from fulltime to part-time and per-diem, were invited to participate. Inclusion criteria included nurses working in the emergency room at Kent Hospital. Exclusion criteria consisted of nurses who did not work in the emergency room.

Site

This project was conducted at Kent Hospital in the emergency department. Kent Hospital is a 359-bed, nonprofit, acute care hospital. As for the emergency department, Kent is the second busiest in the state of Rhode Island, with an average of 70,000 annual visits (Care New England, 2017).

Approval

Approval for educational program was obtained from Darcy Abott, the Director of the ED Kent Hospital (Appendix A). This program was reviewed by hospital administration and it was determined that submission to the Kent Hospital Institutional Review Board (IRB) was not required. The proposal was submitted to Rhode Island College's IRB and a quality improvement determination was given.

Program Development

The intervention was an educational program on disaster nursing awareness entitled: *Disaster Nurse Awareness: As an Emergency Department Nurse, What Do I Need to Know to Respond?* Development of the educational program in this study was guided by the Logic Model. The components of the logic model related to the planned program development are illustrated next. Basic components of the Logic Model include inputs, activities, outputs, outcomes and impact (Appendix B)

Inputs. Inputs can be defined as the resources that are invested into the program. A needs assessment was conducted to validate the need for the program. Necessary resources include educational materials for the planned program, staff members to participate in program and the researcher to provide the program. Organizational support

and staff willingness are key components to the project success. The content of this program was designed based on the literature review and disaster nursing knowledge gaps identified in the needs assessment.

A successful disaster response is dependent on disaster preparedness. Nurses, in particular, play key roles during a disaster that require a certain level of knowledge, skills, and training in order to be effective. The educational program designed for this quality improvement project was focused on gaps found in the literature and the feedback from the ED nurses and leadership at Kent Hospital. The needs assessment looked at emergency department nurses' gaps awareness of disaster knowledge related to nursing skills and practice.

With the November 15th, 2017 deadline for healthcare organizations to address their compliance with the revised Centers for Medicare and Medicaid (CMS) emergency preparedness requirements (CMS, 2018), Kent Hospital took steps for readiness and participated in an emergency preparedness exercise. The hospital is known for focusing on teamwork and best practices. On September 14, 2016, the Rhode Island Airport Corporation (RIAC), working together with the Rhode Island Emergency Management (RIEMA) and its emergency response partners, held a Disaster Preparedness Exercise at T.F. Green Airport. Kent Hospital joined several other local hospitals in a collaborative mock disaster exercise that was intended to review procedures and protocols in the event of an actual disaster. Although the disaster was just a drill, nurses voiced concerns about adequate training in the prevention and management of disasters and mass casualty incidents. Conversations focused on procedural aspects of emergency operations and the

hospital plan, training and personal safety. Identifying nurses' practice gaps is a key component to development of learning objectives and the instructional design to provide disaster awareness. The ED nurses collectively demonstrated a lack of knowledge about disaster risk and the hospital emergency plan. Confusion was obvious with respect to nurses comprehending their role in the exercise and identifying key facility leaders.

The gaps, however, were transferable to the multidisciplinary team working within the Kent Hospital. The practice drill demonstrated that there were some common barriers that needed to be addressed in preparing the emergency department for a mass casualty incident. The emergency department leadership acknowledged that gaps in knowledge existed in disaster awareness throughout all disciplines of the organization.

Activities. Activities are what the project planner does with the inputs to fulfill objectives. Such activities include the actual processes, tools, events and actions that are used to produce the program and intended outcomes. This quality improvement program intervention focused on the basic disaster awareness of the nurses and took place over a three-week period. The program intervention was developed from current evidence-based research and was planned to use a Logic Model design (Appendix B). Primary components of the program are illustrated next.

Interactive poster. The primary program intervention was an educational interactive poster (Appendix C) illustrating basic disaster nurse awareness components. It was designed on a 48 inch by 36-inch layout. Along with providing an overview of basic disaster nursing awareness, competencies and the nursing role, the poster board contained an interactive element. Two-word puzzles (Appendix D) were designed and

included on the poster. The puzzles represented the interactive component of the poster board reviewing incident command and START triage. The activities were added to engage participants. An educational self-study packet was organized to include an 8 ½ by 11-inch copy of the poster display, a familiar disaster case study, and some disaster nursing resources. Copies of the word puzzles were also made available and placed next to the poster display and in each of the study packets.

Self-study packet. The educational self-study packet that was emailed to all participants also included an 8 ½ by 11-inch copy of the poster display, a familiar disaster case study, and some disaster nursing resources. The self-study packets were organized in labeled folders and placed in a bin next to poster display. The familiar case study that was included in the packet was represented as an academic article reporting on the challenges Hurricane Katrina presented to healthcare (Darsey, Carlton, & Wilson, 2013). Although there are many disaster events nationally, this particular disaster represents the literal definition of mass casualty incident. Katrina was the largest and one of the strongest hurricanes in US history (Darsey et al.).

Group discussions. The group discussions were brief and only lasted 15-minutes. The discussions were informal and planned at different times around unit shift huddles. The variable times allowed nurses opportunity to participate on off shifts. The group discussions agenda involved reviewing specific key points addressed in the poster and the study packets. The groups were all small and allowed staff to engage in face to face conversations with the researcher.

The content and objectives for the educational intervention overall are illustrated in Appendix E.

Procedures. Before the poster was displayed, a program flyer (Appendix F) was emailed to the to all nurses eligible to participate one-week prior beginning of the project. The program intervention included either viewing of the interactive poster board posted in nurses' break room or a self-study packet that was emailed to each eligible participant.

Once the flyer was distributed, an informational letter (Appendix G) was emailed to all the nurses employed in the emergency department at Kent Hospital via their work emails. The informational letter introduced the developer and the quality improvement program content, purpose, and timeline. This informational letter invited all emergency department nurses to participate and further informed staff that participation was anonymous and strictly voluntary. The program intervention included either viewing of the interactive poster board or self-study packet that was emailed to each eligible participant.

In order to provide a visual reminder, the poster was displayed in the nursing break room for a total of three weeks. Participants signed in on an attendance sheet as they viewed the poster. Participants signed their initials on an attendance sheet as they viewed the poster. The attendance sheet clearly stated that their initials were only used to verify number of participants and that participation in the program was anonymous and voluntary.

Once the poster was on display for two weeks, the four scheduled group discussions were held. A schedule was posted adjacent to the poster to inform staff on times researcher will be present. No pre-registration or registration was required to participate in program or program group discussions.

Outputs. Outputs are the direct activities and participation of the participants. The program effectiveness was measured with a Retrospective Preevaluation-Postevaluation (RPPE) questionnaire (Appendix H). The questionnaire was designed to measure the effectiveness of the project. The tool was an adaption of *the Emergency Preparedness Information Retrospective (EPIQ)*, a reliable and valid tool to evaluate nurses' perceived familiarity of emergency preparedness and disaster response core competencies (Georgino, Kress, Alexander, & Beach, 2015). The original EPIQ questionnaire was abbreviated to 8 questions from the original 44 questions. Due time constraints, questions that mainly focused on the eight core disaster nursing competencies were selected, representing questions one through eight. The questionnaire utilizes a five-point Likert scale showing participants disaster nursing knowledge from very familiar = 1 to not familiar = 5: the lower the score of familiarity; the higher the awareness level. Content validity of the questionnaire was evaluated a brief pilot study with three ED nurses. Question nine addressed participants' satisfaction with course and question 10 provided the opportunity for open feedback.

The questionnaire was emailed to all eligible participants in the third^t week of the program. Participants were instructed to consider completing the questionnaires if they had viewed the poster board or the self-study packet. Instructions were also provided

about placing the completed questionnaires in a in clearly marked locked box placed in the nurses' break room. Table 1, on the next page, illustrates the questions and the associated program learning objectives.

Table 1

Program Evaluation Questions and Learning Objectives

QUESTION	LEARNING OBJECTIVE
1. I Understand the principles and challenges of disaster triage.	Develop a basic understanding of types disasters and phases of disasters.
2. I can identify types of disasters.	Develop a basic understanding of types disasters and phases of disasters.
3. I can identify critical resources for disaster response in my organization.	Demonstrate awareness elements of disaster plan and understand basic roles of hospitals and government agencies in emergency management.
4. I am familiar with the terms and concepts of Incident Command System (ICS).	Understand basic roles of hospitals and government agencies in emergency management.
5. I understand disaster preparedness and management.	Identify basic nursing role during a disaster and need to develop personal preparedness plans.
6. I am familiar with the needs of special populations during a disaster.	Identify needs of special populations.
7. I am familiar with the medical management of mass casualties.	Identify difference in nursing role for triage during a MCI.
8. I am familiar with treatment principles related to blast injury, chemical attacks, and radiological dispersal devices.	Develop a basic understanding of types disasters and phases of disasters.

Outcomes. Outcomes represent the expected changes resulting from program activities. Some immediate anticipated program outcomes included improved increase knowledge, skills, and confidence in disaster awareness. Medium outcomes involved nurses developing an evidenced based foundation of disaster awareness that would result in increased willingness to train and prepare for future disasters. Only short-term outcomes were the focus of this project, as reflected in the project purpose.

Next, the results will be presented.

Results

The intervention for this project consisted of several educational opportunities, including self-study packet, an interactive poster and group discussions. Next, each will be briefly described.

Self-study packet

All 84 eligible participants in this quality improvement program received a self-study packet by work email. There was no attempt to determine how many participants reviewed the self-study materials.

Interactive poster

Forty-seven nurses out of a possible of 84 (56%) indicated that they had viewed the interactive poster board. Several nurses made anecdotal comments to the program developer after reviewing the poster about the need for formal disaster training in the emergency department.

Group discussions

Fourteen nurses (17%) participated in the brief group discussions. Participants had dialogue with the program developer and each other about disaster nursing. Conversations revolved around personal preparedness and level of nursing skills. The poster board material represented a focal point and guided the discussions. Participants were able to easily reflect on the poster board with cues. The face-to-face dialogue not only engaged the nurses in discussion about disasters, but ideas for improvement as well.

The interactive component of the poster board included two-word puzzles for the nurses to complete. This activity was specifically designed to encourage peer-to-peer conversation. Although attendance was low, the nurses who participated were engaged and had many questions and ideas.

The case study was depicted on the poster as well as included in the self-learning packet. This encouraged nurses to learn from past experiences and events during their reflection. Several participants commented on the case study about Katrina and current disaster events. Participants shared that the poster board enlightened them on the potential conditions communities face during a disaster and the need for preparedness. When asked, all participants could not accurately describe what “crisis standards of care were and what it actually takes to be “considered” a disaster. Concerns were also voiced about the hospital’s ability to respond to a mass casualty and organizational plans for training. Participants shared that they have never been formally trained on disaster. Several commented that “many of the points on the educational poster board were familiar, but, they felt a need to have opportunity to formally train”. All of the participants stated that they do not have a “personal disaster plan” and did not know if they would be “willing to respond” during a disaster. Before the sessions ended, the word puzzles were also reviewed.

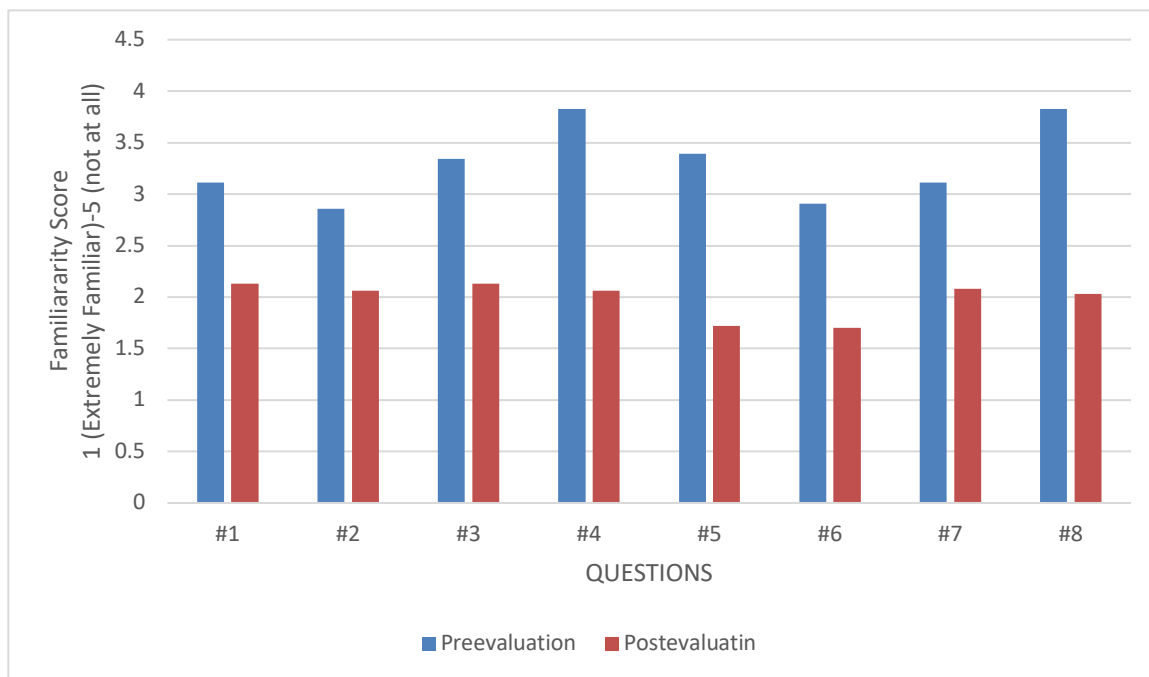
Preparedness Information Retrospective (EPIQ)

Finally, 38 nurses out of a possible 84 (45%) completed the retrospective preevaluation-postevaluation questionnaire. Participants rated their current level of familiarity of the basic concepts of disaster nursing awareness before and after the

intervention. Table 2 on the next page illustrates the comparison of the participants average pre and post scores.

Table 2

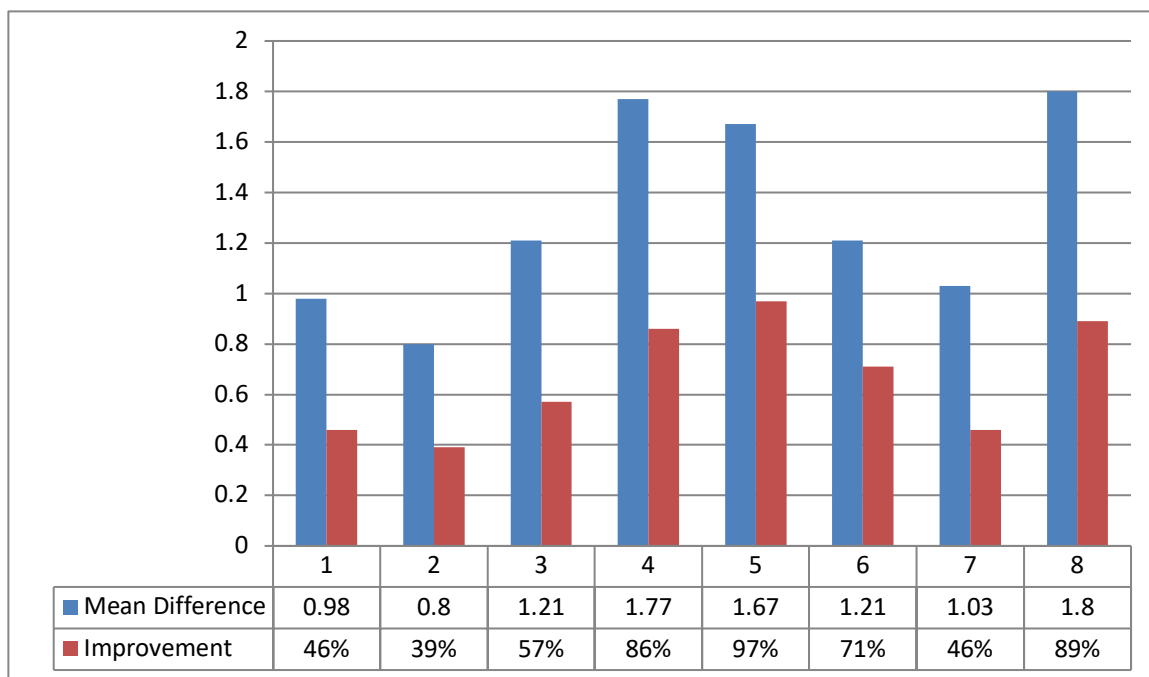
Average Pre and Post Intervention Scores



All 38 participants reported increased familiarity with the basic concepts of disaster nursing awareness. For all eight items, the pre-assessment mean scores were higher (indicating less familiarity) than the post-assessment scores. It was noted that one of the participants rated themselves very knowledgeable (1 on the rating scale) of the topic prior to the program courses. Response demonstrated that nurses felt that they were generally unfamiliar with disaster types, management and resources, and challenges of triage. The post program scores indicated an improvement in scores on all eight of the questions (indicating higher familiarity). Table 3 on the next page illustrates the mean difference of the preevaluation postevaluation scores and percent improvement.

Table 3

Mean Difference of Preevaluation Postevaluation Scores and Percent Improvement



The mean difference in familiarity scores was 1.31. All mean scores improved (range = 0.8-1.77) in postevaluation responses. The terms and concepts of basic principles of disaster nursing (89%), Incident Command System (86%), the understanding of disaster preparedness and management (97%), and the ability to identify needs of special populations (71%) and demonstrated the most improvement.

Participants were asked if the program improved knowledge regarding emergency preparedness and disaster response on a Likert scale that ranged from strongly disagree to agree. Participants' responses to this question are illustrated in Figure 2 on the next page.

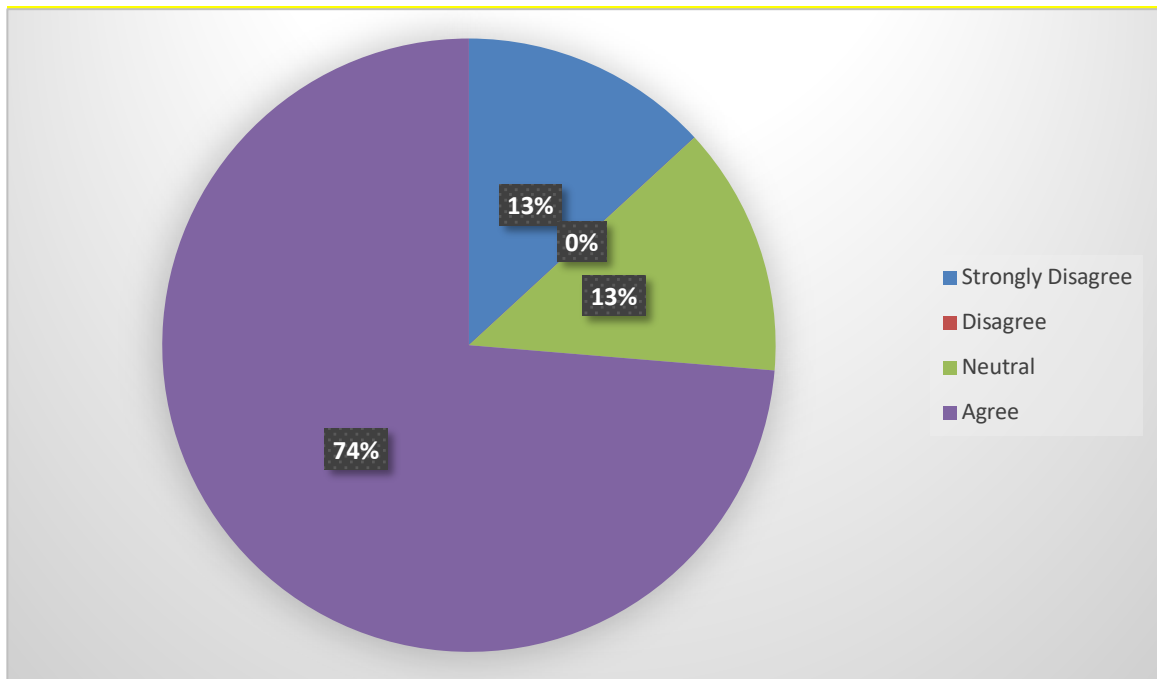


Figure 2. Knowledge of emergency preparedness and disaster response

Approximately three-quarters of the nurses (74%) who participated in the program agreed that their knowledge of emergency preparedness and disaster response improved.

Next, the summary and conclusions will be presented.

Summary and Conclusions

A disaster occurs when normal conditions of existence are disrupted, and the level of suffering exceeds the capacity of the hazard-affected community to respond to it (World Health Organization (WHO), 2017). A disaster is event that increases the demand for health care to the point that the demand exceeds the available resources. Disasters, natural or man-made, were once thought of as low frequency events, but with heavy consequences. Such events include hurricanes, earthquakes, riots, terrorist attacks, nuclear meltdowns, infectious diseases, and environmental catastrophes.

With the incidence of disastrous events increasing in frequency, disaster preparedness and surge capacity is becoming an identified concern for hospitals. Historically, Americans viewed disasters as only happening every few years. American life as we know is changing; we can't turn on the news without hearing about a catastrophic event. Mass shootings now occupying the headlines. The Gun Violence Archive reports more than 14,000 people were killed and over 29,000 injured in 2017 (Gun Violence Archive [GVA], 2018). Disaster preparedness is cyclic. Hospital emergency management regulators are focusing on disaster response plans. Surge capacity plans for response need to be ready for extreme situations that can vary from acts of terrorism to a pandemic disease outbreak. With nurses on the frontline, a general lack of basic disaster awareness can be a limiting factor in surge capacity.

This quality improvement project used three different strategies to provide nurses with basic disaster nursing awareness. Development of the program was guided by the Logic Model (Kellogg Foundation, 2004). In the interest of providing a program that was

“user friendly” in a busy emergency department, the program included an interactive poster board, a self-study packet, and group discussions. A retrospective preevaluation postevaluation questionnaire was conducted to measure participants’ familiarity with core concepts pre and post.

The interactive poster board and the self-learning packet addressed core disaster nursing concepts and review of hospital’s role in disaster preparedness. Key findings from this project identified that there was a general lack of basic disaster awareness amongst nurses in the emergency department. Participants indicated that not only were they unfamiliar with disasters and crisis standards of care, but knowledge was limited related to mass casualty triage and incident command. Because events come with their own individual prescribed resources and dangers, it is almost impossible to predict what the needed resources will be. A successful response to a disaster, however, is directly dependent on the community’s disaster preparedness and response. The fact that none of the participants rated themselves very knowledgeable prior to the program demonstrated that the program content was not already well known to them.

The program design, in itself, was feasible and inexpensive. The program demonstrated that all participants gained a significant level of improvement in awareness of key concepts of disaster. With the program spread over a three-week time span, it was difficult to evaluate individual participants immediately after the interventions and to provide immediate feedback. With the goal of this program geared toward the participants’ perceptions of their own level of awareness of disaster, the use of an

interactive poster board combined with a self-study packet and group discussions proved to be an effective method of exposing nurses to disaster awareness.

Like most studies this study was presented with some limitations did exist in conducting this project. First, the sample size was relatively small, with the total number of participants being less than half of the nurses who were eligible. This number reflected the participants who completed the questionnaire, not necessarily the number of nurses who participated in the viewing of the poster board and completing the self-study packet. The poster board was on display in the nursing breakroom. This location was not central and limited staff exposure. Many of the nurses who do not enter the breakroom would not have had immediate access to the poster. Participation in group discussions was low, many nurses stated the time and locations made it difficult to attend.

Understanding the plan for crisis is key to maintaining structure in chaos. Disasters are unpredictable, but training and education can be scheduled. It's crucial that nurse be informed in order to have a pre-established flow of command. By promoting disaster nursing awareness at an organizational level, nurses will improve disaster preparedness and readiness to respond.

Research findings also showed that personal preparedness is the number one reason why nurses don't respond to a disaster. Participants in this study mirrored research findings. Many nurses reported that they "haven't really given thought" to their own persona disaster plans. Organizing personal commitments, even if simply thought out, will increase the level of participation in disaster training. Understanding the importance of having your own personal plan during an event is critical.

Next, the recommendations and implications for advanced nursing practice will be presented.

Recommendations and Implications for Advanced Nursing Practice

Disaster response demands a large workforce with diverse professional disciplines, subspecialty categories, and levels of professional experience and cultural expertise (Gallardo, 2015). It is essential that community hospitals, emergency services in particular, understand the basic principles of disaster and have the ability to participate in disaster preparedness, response, recovery, and mitigation. As new regulations emerge from the Centers for Medicare & Medicaid Services' (CMS) final rule on emergency preparedness, hospitals are reevaluating and revising emergency plans (CMS, 2018). The CMS Emergency Management Final Rule is structured to address key areas of disaster preparedness and response that include policies, communication, and education with training. The ultimate goals of the rule are to increase patient safety. For hospitals, the rule aims to establish national emergency preparedness requirements that are designed to guide in emergency disaster preparedness and recovery (JACHO, 2018).

Advanced practice nurses can help address emerging healthcare needs that come with disasters. An important component is to examine educational standards addressing disparities in training by initiating programs that are evidence-based, relevant, and transferable to multidiscipline. Disaster nursing is at the present time not generally taught in nursing school. This is not an area nurses choose to work or gain experience on the job. The US needs a national nursing workforce of nurses that are familiar with concepts of disaster nursing and emergency management that will provide communities with the ability to respond to any disaster or public health emergency in a timely and

appropriate manner (Veenema et al., 2017b). Serious consideration needs to be given to building core disaster concepts into undergraduate and graduate level nursing programs.

The APRN can be instrumental in having a significant impact on quality of care, clinical outcomes, patient satisfaction, and cost during a disaster. The APRN can also be the motivational factor in taking the action that is needed to expand awareness of this issue and to propose recommendations directly related to disaster nursing practice, education, policy, and research. Routine exercises and drills allow for evaluation and revision of plans before the disaster occurs (Chartoff, 2017). In practice, the APRN can improve disaster care by leading teams in delivering care related to triage, resuscitation, and leadership. As educator, the APRN can serve in teaching disaster preparedness to multidisciplinary teams. On a political level, APRNs can for developing policies and laws that enable RNs and other providers to respond confidently and to ensure that the needs of the American public will be met during a disaster (Forino, 2014). Through research, the APRN can explore initiatives to improve surge capacity in hospitals.

Disasters disrupt communities without warning. The healthcare systems need to be prepared to respond in all the phases of disaster. The APRN can be vital in educating healthcare professionals understand the basic elements of mitigation and preprimaries. Ultimate outcomes involve victim's survival and minimizing organizational economic losses. Preplanning extends to the community population. As the APRN, assessing the community to identify vulnerable populations and specific risks will allow corrective measures to be addressed before an event occurs.

The preparedness phase of disaster is vital. The APRN functions as a leader by becoming familiar with the organizational preparedness plans and becoming actively involved in training and education procedures. The APRN can be effective in designing and implementing disaster preparedness education that is geared toward nurses. Disaster nursing participation has separate skill sets and expectations depending on which disaster phase a nurse participates in. As a facilitator, the APRN can communicate and collaborate on basic instructions and expectations of roles.

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Appendix A
Approval Letter



February 23, 2018

RE: Quality Improvement Project/Rhode Island College IRB

Dear Kathleen Natareno,

Thank you for submitting your Quality Improvement Project for my review. I wholeheartedly approve your project to be conducted at Kent with our emergency department nursing staff at their voluntary consent and time dedication. I look forward to seeing your results related to staff understanding of disasters and measured success of your education.

I appreciate your efforts toward expanding the knowledge of emergency nursing, and support your project without reservation.

Most Sincerely,


Darcy Abbott, RN, BSN, MS, CEN
ACNO, Kent Hospital

DA/edf

A CARF NEW ENGLAND HOSPITAL

455 TOLL GATE ROAD * WARRICK, RHODE ISLAND 02886 * 401-737-7000 * www.kenthospital.org

Appendix B

Logic Model

Program Logic Model: Disaster Nurse Awareness: As an Emergency Department Nurse, What Do I Need to Know to Respond?

Situation: Emergency Department nurses should be adequately equipped with the knowledge and skills to respond to disasters.

Inputs What we will invest	Outputs		Outcomes - Impact		
	Activities - What we will do	Participation - Who we will reach	Short Term Results	Medium Term Results	Long Term Results
Needs assessment to develop program. Organization collaborate and support: ED manager and educator Program development: Evidence Based Research: (ICN) framework of disaster nursing competencies Educational materials: flyer, poster board, study guide, and survey. Location to present program Researcher time Staff participation and time	Distribute informational flyers. Display educational poster. Distribute study guide Participate and facilitate in-service huddles. Educational sessions: in-service huddles Assess program effectiveness	ED nurses ED leadership Kent hospital organization	Learning Increase disaster awareness and disaster preparation knowledge. Change nurse's attitudes towards disaster preparedness Motivate disaster training	Behavioral Action Nurses initiate disaster planning training into practice	Ultimate Impact Improve organizational motivation for disaster preparedness. Facility develops standard disaster training process National disaster training standards for nurses
Assumptions Emergency department nurses receive little disaster training. Organization needs financial and legislative support to begin process.			External Factors Funding for preparedness activities. Availability of staff to train. Resources for education.		

Evaluation Plan: To determine if the active educational approach of interactive poster to transfer knowledge is appropriate, a pre-test/post-test evaluation tool will be used to assess understanding.

The tool will be administered before delivering the education to assess any prior knowledge the nurses may have (pre-test), immediately after the lecture is delivered and posters

Evaluation Tool: Emergency Preparedness Information Questionnaire (EPIQ)

Appendix C

Interactive Poster Board

The Greatest Good For The Greatest Number

Kathleen Nalareno RN BSN

AMERICAN LIFE, AS WE KNOW IT IS CHANGING

National news reports that mass shootings in the US have totaled 1,024 in the last 1870 days.

DISASTERS

The World Health Organization (WHO) defines disasters as a serious event that results in displacement of the functioning of a community or a society causing widespread human, material, economic or environmental losses which exceed the ability of the affected community or society to cope using its own resources (2017).

KNOW YOUR DISASTER

Disasters can take many shapes and forms. They can occur naturally or man-made, and can be accidental or acts of terrorism.

Hurricane Katrina

Category: Hurricane with subcategory: Tropical Storm
Estimated the largest and most tropical hurricane's ever killed
Over 1,000 people died
40% of the population by housing
40% of the population over 10 years
One of the largest evacuation in history of 10 million people
Total damage cost estimated at \$160 billion
Any other disaster response should start with disaster preparedness, then, emergency medical disaster response, and then, disaster relief.

TRiage

> A process by which patients classified according to the type and urgency of their conditions to get the right patient to the right place at the right time with the right care/procedure.

DISASTER TRIAGE
 - The initial triage priority

DISASTER Triage II
 - Those with Respected Assured secondary priority

START TRIAGE

> Simple triage and rapid treatment (START) is a triage method used by first responders to quickly classify victims during a mass casualty incident (MCI) based on the severity of their injury.

MASS CASUALTY INCIDENT

Mass Casualty Incident (MCI) is an incident which generates more patients at one time than locally available resources can manage using routine procedures.

DISASTER PREPAREDNESS

Preparedness
 > Efforts to put in place before an emergency or disaster strikes.

Response
 > Coordination of emergency response and critical resources to find and remove casualties and protect property and the environment.

Recovery
 > Efforts that take place immediately following the response phase of a disaster.

Mitigation
 > Actions to reduce the effects of a disaster in the community.

DISASTER NURSING

> Disaster nursing can be defined as the adaptation of professional nursing skills in recognizing and meeting the nursing, physical and emotional needs resulting from a disaster.

> The International Council of Nurses (ICN) developed a framework of competencies for nurses working in disasters.

> These competencies provide guidelines for the education of nurses in knowledge, skills, abilities, and behaviors required to successfully prepare for, respond to, and recover from disasters.

CRISIS STANDARD OF CARE

> Patients are greater than the resources.
 > Health care standards are altered and population focused.
 > Routine operations of healthcare in ED could be in use of resources on those who may be too sick to survive.

RESOURCES

> Hospitals are now the major resource for the intake, evaluation & treatment of patients affected by disaster.

SURGE

> 50 patients in 15 minutes.
 > When a sudden increase in demand for health services presents as patient volume disrupts the normal course of emergency services.

SURGE CAPACITY

> A hospital's ability to expand beyond normal capacity to meet a large increase in demand for care.

STATION HOUSING FIRE

> New York (Florida) land, February 26, 2003, the fourth deadliest night club fire in American history.

> Declared a Mass Casualty Incident with 100 people killed and 210 injured.

> 100 critical burns.

> 100 Firefighters from 15 communities responded and transported to area hospitals within 1 hour 45 minutes.

> Total of 100 victims were treated at regional hospitals with 100 victims arriving in West Hospital emergency department.

INCIDENT COMMAND SYSTEM

> The Incident Command System (ICS) is the structure developed that allows for flexibility while delineating roles and functions to help navigate through a tough situation.

> Hospital Incident Command System (HICS) 1

> A flexible organizational chart that can be scaled to fit the nature and size of the emergency.

ICD Checklist **Call Response Team Brief** **Incident Command Center Checklist**

ICN Framework of Disaster Nursing Competencies

KEYPOINTS

> Globally disasters are increasing frequency.

> Nurses continue to be the largest health care workforce in the United States.

> Literature demonstrates that most nurses are not adequately prepared for disaster management.

> Personal preparedness is the most common barrier that is reported by nurses for mitigation efforts during a disaster.

Appendix D

Word Puzzles

START TRIAGE

```

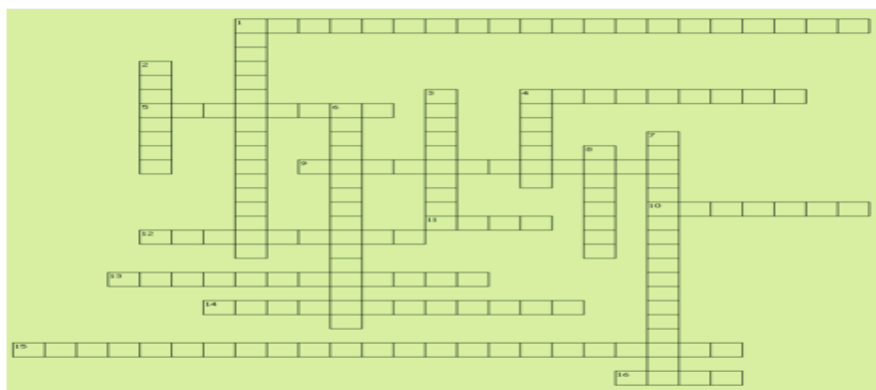
T I E M Q U L I F E G R R D J
J H F S R N K X V B A X E I F
C H R G L D U T G C T D S C H
D G E E A U N R I R N D P A O
P N A E A E P M E U E Z I U P
T T D T D T M V O D E O R N M
M P W I K E E W E M R Q A X C
X E C G D C G N V M G V T T T
J C T I V N A P I I Z P I R R
A M A W I J W L O N C I O A I
F T Y K W H A N B H G T N T A
E W L G A T W O L L E Y I S G
F A S H O O T I N G T K A M E
W R O N I M F R J Y S V P O S
I N T E R V E N T I O N R I X
    
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ACCIDENT
GREEN TAG
LIFE
RED
START
URGENT
YELLOW TAG

BLACK TAG
IMMEDIATE
MINOR
RESPIRATION
THREATENING
VICTIMS

DEAD
INTERVENTION
PULSE
SHOOTING
TRIAGE
WALKING WOUNDED

Disaster Awareness



- Down**
1. Disasters caused by people or technology.
 2. Responding safely to an emergency.
 3. Preventing future emergencies or minimizing their effects.
 4. Events or situations with the potential to harm people, property, and the natural environment.
 6. Any event inside a healthcare facility or campus that could endanger the safety of patients or staff.
 7. Method of rapidly sorting ill or injured patients into categories based on their acuity and survival potential.
 8. Recovering from an emergency

- Across**
1. Number of victims significantly overwhelms ED.
 4. Example of natural
 5. Infection that spreads rapidly around the world.
 9. Preparing to handle an emergency.
 10. An example of a biological weapon
 11. Set up by federal government to send medical teams, equipment, and supplies to a disaster area.
 12. Unlawful use of or threatened use of force or violence.
 13. Sudden patient increase in volume.
 14. Man-made disaster intended to make people ill.
 15. Administrator who assumes overall leadership for implemented emergency plan.
 16. The lead Federal agency in a disaster response

Appendix E

Program content and objectives

OBJECTIVES	CONTENT	INTERVENTION	TIME	EVAL
Develop a basic understanding of types disasters and phases of disasters.	Disaster and Disaster Phases: Prevention, Mitigation, Preparedness, Response and Recovery.	1. Interactive poster board 2. Self-Learning Packets 3. Group Discussion	Wk. 1 & 2	Q #1 & #2
Understand basic roles of hospitals and government agencies in emergency management.	Key components of the ICS and Hospital Command Center Management	1. Interactive poster board 2. Self-Learning Packets 3. Group Discussion	Wk. 1 & 2	Q #3 & #4
Demonstrate awareness elements of disaster plan.	Disaster education and training.	1. Interactive poster board 2. Self-Learning Packets 3. Group Discussion	Wk. 1 & 2	Q #5
Identify needs of special populations.	Disaster education and training.	1. Interactive poster board 2. Self-Learning Packets 3. Group Discussion	Wk. 1 & 2	Q #6
Identify difference in nursing role for triage during a MCI.	START Mass Casualty Triage Algorithm	1. Interactive poster board 2. Self-Learning Packets 3. Group Discussion	Wk. 1 & 2	Q #7
Identify basic nursing role during a disaster.	ICN Framework of Disaster Nursing Competencies.	1. Interactive poster board 2. Self-Learning Packets 3. Group Discussion	Wk. 1 & 2	Q #8

Appendix F

Flyer



DISASTER KNOWLEDGE AND AWARENESS OF NURSES RELATED TO TRIAGE IN MASS CASUALTY INCIDENTS

You're invited to participate in a Quality Improvement Project for Disaster Nursing Awareness.

Where:

· Nursing Break Room

When:

· April 15 and 16

Time:

· 3pm-4pm, 5pm-6pm

What is the role of a nurse during a disaster that involves a mass casualty incident?

The demand for disaster nursing and emergency preparedness is growing. Nurses play a major role in responding to disasters

When is a disaster a Mass Casualty Incident?

When emergency medical services resources are overwhelmed by the number and severity

Nurses need to be aware of basic disaster nursing competency and age during a mass

by: Kathleen Natcheno RN, BSN

Appendix G

Informationa Letter

INFORMATIONAL LETTER Rhode Island College
DISASTER KNOWLEDGE AND AWARENESS OF NURSES RELATED TO TRIAGE IN
MASS CASUALTY INCIDENTS: A QUALITY IMPROVEMENT PROJECT

Dear Nursing Staff:

My name is Kathleen Natareno I am a Clinical Nurse Specialist student in the Master of Science in Nursing program at Rhode Island College. I am currently conducting a quality improvement project in the emergency department at Kent Hospital.

The purpose of this project is to improve nurses' knowledge of disaster awareness. In order to complete this quality improvement program, I am asking for all emergency department nursing staff to participate.

The project will take place over a three-week period. Staff participation is anonymous and will be strictly voluntary. The program will include viewing of an interactive poster board, attendance at a 10-15-minute group discussion, and completion of an anonymous questionnaire. A self-study packets will also be emailed directly to all participants. During the third week, there will be four brief group discussions scheduled to review specific key points in disaster awareness and provide answers to the word puzzles.

The questionnaire will be available to all participants during the third week of the program. Blank questionnaires will be placed in a labeled manila envelope next to the poster. There will also be a clearly marked locked box to place the completed questionnaires.

Participation will remain voluntary and anonymous. If you have any questions, please contact me at knatareno_0724@email.ric.edu.

Thank you in advance for your participation,

Kathleen Natareno RN, BSN

Appendix H

Questionnaire

Ten-Question Adapted Emergency Preparedness Information Retrospective Preevaluation-Postevaluation (RPPE) Questionnaire (EPIQ)

Circle the number of your level of familiarity with the following topics after AND/OR before educational program and self-learning packet.											
Key:											
1. Extremely Familiar											
2. Very Familiar											
3. Somewhat Familiar											
4. Not so Familiar											
5. Not familiar at all											
Before: Disaster Nurse Awareness Program: "As an Emergency Department Nurse, What Do I Need to Know to Respond?"						After: Disaster Nurse Awareness Program: "As an Emergency Department Nurse, What Do I Need to Know to Respond?"					
(1) I understand the principles and challenges of disaster triage.	1	2	3	4	5	(1) I understand the principles and challenges of disaster triage.	1	2	3	4	5
2) I can identify types of disasters.	1	2	3	4	5	2) I can identify types of disasters.	1	2	3	4	5
(3) I can identify critical resources for disaster response in my organization.	1	2	3	4	5	(3) I can identify critical resources for disaster response in my organization.	1	2	3	4	5
(4) I am familiar with the terms and concepts of Incident Command System (ICS).	1	2	3	4	5	(4) I am familiar with the terms and concepts of Incident Command System (ICS).	1	2	3	4	5
(5) I understand disaster preparedness and management.	1	2	3	4	5	(5) I understand disaster preparedness and management.	1	2	3	4	5
(6) I am familiar with the needs of special populations during a disaster.	1	2	3	4	5	(6) I am familiar with the needs of special populations during a disaster.	1	2	3	4	5
(7) I am familiar with the medical management of mass casualties.	1	2	3	4	5	(7) I am familiar with the medical management of mass casualties.	1	2	3	4	5
(8) I am familiar with treatment principles disaster nursing	1	2	3	4	5	(8) I am familiar with treatment principles disaster nursing	1	2	3	4	5
Please answer the following additional questions:											
9. This course improved my knowledge regarding emergency preparedness and disaster response:											
Strongly disagree			Disagree			Neutral			Agree		
10. Please provide feedback for how this education session could be improved the following space:											

Abbreviation: EPIQ, Emergency Preparedness Information Questionnaire.