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An Investigation of the Relationships Between and Among Disaster Preparedness Knowledge, Perceived Use of Intuition, and Triage Decision Making of Emergency Department Registered Nurses in Acute Care Hospitals Using Benner's Novice to Expert Theory

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AN INVESTIGATION OF THE RELATIONSHIPS BETWEEN AND AMONG DISASTER PREPAREDNESS KNOWLEDGE, PERCEIVED USE OF INTUITION, AND TRIAGE DECISION MAKING OF EMERGENCY DEPARTMENT REGISTERED NURSES IN ACUTE CARE HOSPITALS USING BENNER'S NOVICE TO EXPERT THEORY

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Approved by the Dissertation Committee

Submitted in partial fulfillment of the
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DEDICATION

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ABSTRACT

Background: Disasters are man-made or natural events that challenge resources and support in an environment lacking rules and regulations. Nurses represent the largest resource in healthcare and are among the first to encounter victims of disaster, thus having knowledge of disaster preparedness is essential to disaster response. However, there is a lack of empirical evidence concerning the relationships between everyday elements of nursing practice such as intuition and triage decision-making and disaster preparedness knowledge.

Purpose: The purpose of this study is to examine the relationships between and among disaster preparedness knowledge, perceived use of intuition, and triage decision-making in emergency department nurses employed in acute care hospitals.

Methods: This descriptive correlational study of one hundred twenty-three emergency department nurses investigated the relationships between and among disaster preparedness knowledge, perceived use of intuition, and triage decision-making in emergency department nurses employed in acute care hospitals in the New York City combined statistical area. Participants completed the following four measurement instruments: The Emergency Preparedness Information Questionnaire, The Acknowledges Using Intuition in Nursing Scale, the Triage Decision Making Inventory, and a Demographic Data Information Form.

Results: Statistical analysis demonstrated that perceived use of intuition and triage decision-making as a group was not predictive of disaster preparedness knowledge. Triage decision-making was predictive of disaster preparedness knowledge by it-self and significant relationships were found between demographic variables related to experience and disaster preparedness knowledge and triage decision-making. Empirical testing of perceived use of intuition

demonstrated no significant relationships with disaster preparedness knowledge or triage decision-making.

Conclusion: Emergency department registered nurses will be on the front lines of healthcare's response to a disaster event. The relationship between disaster preparedness knowledge and triage decision-making suggests that emergency department registered nurses who posses' higher levels of triage decision-making, have more disaster preparedness knowledge. As such, it is vital that hospital administration, government officials, and professional practice organizations recognize the value of disaster preparedness knowledge and promote innovative methods to educate and train this population of nurses. The empirical evidence of this research study was congruent with Benner's novice to expert theory indicating that knowledge is gained from previous learning and experience.

CHAPTER I

INTRODUCTION

In the event of a major disaster, healthcare professionals are required to respond, manage, and prevent additional harm to victims. When disasters affect a given hospital, nursing staff are called into action, with nurses representing the largest number of health care professionals required to respond (Lavin, 2006). Most registered nurses, both nationally and around the globe, are largely unprepared to respond to and manage major disaster events (Baack & Alfred, 2013; Fung, Loke & Lai, 2008; McKibbin, Sekula, Colbert, & Peltier, 2011). Factors affecting the lack of disaster preparedness include age, lack of disaster preparedness education in hospitals and nursing schools (Garbutt, Peltier, & Fitzpatrick, 2008), lack of knowledge of a formal plan regarding preparedness in the practice setting (Goodhue, Burke, Chamber, Ferrer, & Upperman, 2010), and a lack of understanding of what constitutes disaster preparedness (Fung, Lai, & Loke, 2009).

There are more questions than answers when the disaster preparedness of the nursing profession is considered. One nurse who participated in the Hurricane Katrina disaster response in 2005 reported that individual nurses played a central role in the disaster response (Bulson & Bulson, 2011), yet research conducted revealed that most registered nurses were not confident in their abilities to respond to major disaster events (Baack & Alfred, 2013). The variation in knowledge, education, life and professional experience, and registered nurse's level of expertise all play a role in disaster preparedness (Baack & Alfred, 2013; Yin, He, Arbon, Zhu, Tan, & Zhang, 2011; Yin, Hiyan, Arbon, & Zhu, 2011).

As part of a country's overall plan for disaster preparedness, all registered nurses must have a basic understanding of disaster science. The following are key components of disaster preparedness according to Veneema (2013):

1. The definition and classification system for disasters and major incidents based on common and unique features of a disaster.
2. Disaster epidemiology and measurement of the health consequences of disaster.
3. The five areas of focus in emergency and disaster preparedness: preparedness, mitigation, response, recovery, and evaluation.
4. Methods such as risk assessment, hazard identification, and mapping and vulnerability analysis.
5. Awareness of the role of the nurse in a much larger response system.

(p. 2)

In addition to the above basic understanding of disaster preparedness, Gebbie and Qureshi (2002) suggest that public health workers and registered nurses employed in emergency departments should be aware of the concept of disaster preparedness and knowledge of infection control, contingency planning to prevent further damage, triage, mass immunizations, mass evacuations, and treatment for mass casualties. The reviewed literature encompassed a wide array of nursing functions, roles, education, training, and background; however, no study concluded that registered nurses (RNs) were fully or even adequately prepared with all the necessary knowledge on disaster preparedness; quite the contrary. Given the increased propensity of both man-made and natural disasters, learning more about registered nurses' disaster preparedness will aid in directing training and educational efforts where it would be most effective.

A disaster event challenges the resources and support available to respondents (Reilly & Markenson, 2011). Nursing research has established a positive correlation among intuition and clinical practice, patient outcomes, and clinical judgement (King & Macleod-Clark, 2002; Pretz & Folse, 2011; Robert, 2013). Disasters take place in an environment in which rules and guidelines are lacking, there are inadequate resources, and uncertainty exists (Reilly & Markenson, 2011). Therefore, intuition may play a role in being prepared for disaster and disaster response where instances of uncertainty, inadequate roles and resources, risk taking, and cautiousness exist (Rew, 2000). Additionally, use of intuition may assist the nurse to make multiple decisions including the accurate triage of injured disaster victims and taking measures to ensure the safety of the nurse and others. Triage decision-making (TDM) is among the first clinical decisions when caring for a patient. The purpose of triage is to identify the severity of an injury and mitigate negative outcomes through rapid assessment and decision-making (Cone, 2000). Nursing research suggests that intuition and TDM have a positive influence on patient care outcomes (Cone, 2000; Cork, 2014; Edwards, 2007; Robert, 2013) and thus, may indicate a similar influence on disaster preparedness.

Purpose

The purpose of this study was to explore the relationships between and among disaster preparedness knowledge, perceived use of intuition, and triage decision-making in emergency department nurses.

Definitions

Disaster is conceptually defined by Reilly and Markenson (2011) as a situation that overwhelms local resources or capacity thereby necessitating a call for external assistance. Disasters differ from emergencies in that they require additional resources beyond what local

resources can offer. Disasters can be man-made or natural and there are various levels of disaster response (Adelman & Gray, 2009). A definition for disaster preparedness knowledge could not be found in the literature. The terms disaster preparedness and knowledge are individually defined below. *Disaster preparedness* is the ongoing process of readiness and buildup of capabilities to manage the impact hazards inflict to minimize the negative impact on the health and safety of individuals and systems as well as a state of being prepared for specific risks (Perry & Lindell, 2003; Reilly & Markenson, 2011). *Knowledge* is defined as the fact or condition of knowing something with familiarity gained through experience or association (Merriam-Webster, 2015). Benner, Tanner, and Chesla (1997) describe nursing knowledge as derived from observations of nursing practice and interpretation of narrative accounts fostered by experiences in multiple nursing environments. Therefore**,** *disaster preparedness knowledge* will be defined for the present study as the nurse's familiarity with disaster preparedness. This variable will be operationalized by performance on the disaster knowledge specific Emergency Preparedness Information Questionnaire (Wisniewski, Dennik-Champion, & Peltier, 2004).

Intuition in clinical nursing is a "component of complex judgment, the act of deciding what to do in a perplexing, often ambiguous and uncertain situation" (Rew, 2000, p. 95). It is an immediate sense of knowing, a gestalt experience based on the perception of cues linked together with basic knowledge and past experiences. Intuition is a synthesis rather than an analysis. (Miller & Rew, 1988, p. 85). Perceived use of intuition will be the variable used for this study and is operationalized by performance on the Acknowledges Using Intuition in Nursing Scale (Rew, 2000).

The term triage means "to sort or prioritize" (Cork, 2014, p. 244) and involves a process of clinical decision-making in which an individual's needs for medical care are prioritized

(Gertdz & Bucknall, 2001). *Triage decision-making* (TDM) is the skill of making clinical decisions during the triage stage of assessment, involving the prioritizing care and making decisions on interventions that will follow (Smith & Cone, 2010). Many decisions for nurses during a disaster event will involve triage of patients. TDM is operationalized by performance on the Triage Decision Making Inventory (TDMI) for this study (Cone, 2000).

Delimitations

Recognizing that emergency department registered nurses would be the first nurses to encounter the effects of a disaster event only registered nurses employed in an emergency department were included in this sample. Additionally, an emergency department registered nurse in this study was delimited to residing in the New York City combined statistical area, holding a baccalaureate in nursing (BSN) degree, and have at least one year of experience employed in an emergency department.

Theoretical Rationale

Patricia Benner's *Novice to Expert* theory (1984) was the overarching theory used to guide this research study. Benner based her model on the "Dreyfus Model of Skill Acquisition" (1980) as a foundation for her research work. The Dreyfus model, developed by brothers Stuart and Hubert Dreyfus, was based on the observations of chess players, United States Air Force pilots, army commanders, and tank drivers. The Dreyfus brothers believed learning was experiential (learning through experience) as well as situational (based on situation), and that an individual had to pass through five very distinct stages of learning: novice, advanced beginner, competent, proficient, and expert (Benner, 2004).

Benner found similar parallels in nursing and combined nursing knowledge with the five stages of the Dreyfus model, thus, creating a nursing model. The five stages reflect changes in four general aspects of skill performance and decision-making: 1) a move from reliance on abstract principles and rules to the use of past concrete experience; 2) a shift from reliance on analytical rule based think to intuition; 3) a change in the learner's perception of the situation from viewing it as a compilation of equally relevant bits to viewing it as an increasingly complex whole, in which certain parts stand out as more or less relevant; and 4) passage from a detached observer, standing outside the situation, to one of a position of involvement, fully engaged in the situation (Benner, Tanner, & Chesla, 1992). Each stage is characterized by increased knowledge gained from past experiences. The five stages are novice (first year of education), advanced beginner (new graduate), competent (one to two years' clinical practice), proficient (a transition stage on the way to expertise), and expert (RN achieves practical wisdom) (Benner, 2004).

According to Benner (1984), a *novice* level nurse is a beginner with no experience and who needs to be taught general rules and requires help to perform tasks. The *novice* requires communication as to what to do and clear instructions to follow. In this study, novice nurses will not be included in the sample because of a lack of experience with basic nursing practice. The *advanced beginner* demonstrates a higher level of performance than the novice, having gained prior experience from actual nursing situations. This assists the registered nurse to recognize meaningful practice components and fosters critical thinking which can guide actions. A *competent* nurse generally has two- or three-years' experience on the job and starts to develop a base of experience. These nurses are more aware of long-term goals and can gain perspective from planning individual actions, which helps them to achieve greater efficiency and organization in practice. A nurse at the *proficient* level perceives and understands situations in its

entirety. A *proficient* nurse has an increased holistic understanding of nursing, which fosters improved decision-making. From experience, proficient nurses know what to expect in certain situations and how to modify care plans as needed. Finally, *expert* nurses have a level of experience that promotes a standard of excellence. They are very familiar with policy and practice standards and combines them with their own experience to connect situations and determine actions. *Expert* nurses have a deep background of knowledge and experience, a high level of critical thinking, and an intuitive understanding of clinical situations impacting clinical decision-making (Benner, 1984).

This study examines the relationships between and among disaster preparedness knowledge, perceived use of intuition, and triage decision-making, in emergency department nurses. Benner (1984) suggested that clinical knowledge among nurses develops over time and that each nurse develops specific areas of practice knowledge. The development of knowledge in applied disciplines, such as nursing, is composed of the extension of practical and situational knowledge and is "based on enriched experiential learning spawned by increasing ability to read the current situation in terms of their deep familiarity with similar and dissimilar situations" (Benner, 2004, p. 197). Through this ongoing learning experience, nurses develop situational knowledge, which according to Benner is called "know-how," which permits allowing for a more fluid and rapid performance (Benner, 2004). Benner considers experience to be a proponent of both knowledge acquisition and the foundation for intuition.

Benner's (1984) model provides a useful theoretical guide for this research. Nurses are presented with unfamiliar situations daily and over a period of time and learning experiences, begin to anticipate what function, task, or plan of care is the right course of action to take and apply intuitive clinical decision-making in the care of patients. Benner found there is always

more to any situation than theory predicts, that skilled practice of nursing exceeds the bounds of formal theory. However, after the nurse gains additional knowledge in the form of experience through drills, trials, or actual events, this experience fosters judgment and intuition, and over time, the competent, proficient, and expert nurse no longer needs to refer to charts or protocols or needs to look to others for guidance. In looking at a disaster event and considering the implications of Benner's model, the competent, proficient, or expert registered nurse (RN) would be expected to be able to implement life saving measures quickly, with confidence and precision, and with minimal guidance; and, be able to allocate resources using intuition during disaster situations such as mass triage. Benner considers knowledge and experience paramount when looking at the clinical decision-making process (Benner, 2001; Benner, Tanner, & Chesla, 1992) and believes intuition affects the overall decision-making process of the RN (Benner, 2004). Thus, Benner's theory is appropriate to guide this descriptive correlational research study, which will examine the relationships of disaster preparedness knowledge, nurses perceived use of intuition, and triage decision-making of emergency department nurses. For the purposes of this study, nurse years of experience will be categorized in the following groups established by Benner (novice, advanced beginner, competent, proficient, and expert).

Research Question

RQ: Are there relationships between and among disaster preparedness knowledge, perceived use of intuition, and triage decision-making to manage a disaster, in emergency department nurses employed by acute care hospitals?

Hypotheses

Based on Benner's *Novice to Expert* theory and limited existing empirical research the following hypotheses have been developed.

H1: The perceived use of intuition and triage decision-making in emergency department nurses employed in acute care hospitals as a group are predictive of overall disaster preparedness knowledge.

H2: There is a relationship between disaster preparedness knowledge and years of experience as an emergency department registered nurse employed in acute care hospitals.

H3: There is a relationship between disaster preparedness knowledge and prior disaster preparedness training in emergency department registered nurses employed in acute care hospitals.

H4: There is a relationship between disaster preparedness knowledge and prior disaster patient care in emergency department registered nurses employed in acute care hospitals.

H5: There is a relationship between disaster preparedness knowledge and triage experience among emergency department registered nurses employed in acute care hospitals.

H6: There is a relationship between disaster preparedness knowledge and triage training among emergency department registered nurses employed in acute care hospitals.

H7: There is a relationship between disaster preparedness knowledge and employment at a teaching hospital/university medical center among emergency department registered nurses employed in acute care hospitals.

H8: There is a relationship between disaster preparedness knowledge and the size of hospital in emergency department registered nurses employed in acute care hospitals.

H9: There is a relationship between disaster preparedness knowledge and the level of nursing education among emergency department registered nurses employed in acute care hospitals.

Significance of the Study

The terrorist attacks of September 11th, 2001 catapulted terrorism to the forefront of every American's mind (Adelman & Legg, 2009). Man-made disasters such as terrorism are not the only cause of disaster. Americans and the world were recently shaken by multiple natural disasters such as Hurricanes Katrina and Sandy, the tsunami of Indonesia, and spread of infections like Ebola (Adelman & Legg, 2009). According to Slettebak (2012), the frequency of disasters has risen sharply over the last few decades, and the increase is expected to continue due to climate and demographic changes. Slettebak also claimed the existence of an increased risk for disaster events in areas of large populations as these areas hold more potential victims of natural hazards. Drury and Olson (1998) claimed that a positive relationship exists between disaster severity and the level of political unrest. Given the uprising of terrorism not only in the form of small groups but recently as part of large networks, even to the existence of territory claimed by terrorists, the assertions by Drury and Olson support the notion that disaster events, both natural and man-made, will continue to increase, most notably in areas of large populations. During such events, nurses will be called upon to play the role of first responder (Chan, Chan, & Cheng, 2010).

While the concept of disaster preparedness in the healthcare world is not new, the concept is often foreign to healthcare professionals (Reilly & Markenson, 2011). Reilly and Markenson report, "the public has strong expectations of the roles hospitals should play during times of disaster [where] healthcare institutions are expected to provide both emergency care and the continuance of day to day healthcare responsibilities regardless of volume and demand" (p. 5). Fung, Loke, and Lai (2008) thought it was significant to study registered nurses' perception of disaster as they believed nurses' understanding of proper disaster preparedness and management "safeguards the lives of both victims and rescuers" (p. 702) during disaster events. Fung et al. (2008) were correct, as the United States Health Resources and Services Administration (HRSA) reported only eight states in America required hospital employees to be trained in disaster related topics (Reilly & Markenson, 2011).

Given the increasing number of disaster events and the crucial roles nurses are called upon to perform (Chan, Chan, & Cheng, 2010), it is important to understand the factors that influence nurses' ability to deal with disasters. While nursing skills and competency have been researched in relation to disaster preparedness knowledge, the less tangible elements of nursing practice, such as perceived use of intuition and triage decision-making, have yet to be researched in relation to disaster preparedness knowledge. This research study looked beyond the skills of a nurse and examine the relationships between and among nurse's knowledge of disaster preparedness, perceived use of intuition, and triage decision-making. The results of this study can be instrumental in not only assessing the overall state of disaster preparedness knowledge of nurses but also take into account the relationship, if any, between and among disaster preparedness knowledge, perceived use of intuition, and triage decision-making. The study served to further the understanding of intuition and triage decision-making and demonstrate a

link to intuition and triage decision-making ultimately improving the management and response to disaster events.

CHAPTER II

REVIEW OF LITERATURE

An extensive literature review was conducted utilizing Academic Search Premier, Cumulated Index for Nursing and Allied Health (CINAHL), ProQuest, Health and Psychosocial Instruments (HaPI), Lexis Nexus Academic, Science Direct, PubMed, and Google Scholar in order to gather information, articles, dissertations and texts of what is currently known about disaster preparedness knowledge, nursing intuition, and triage decision-making. Keywords used for the search were: registered nurse, physician, emergency first-responders, disaster, emergency management, disaster preparedness, bioterrorism, disaster response, registered nurse disaster training, public health nursing, nursing intuition, nurse intuitiveness, triage, and triage decision-making. Articles were selected based on content, sample size, country of origin, and relation to the topic(s) and nursing. Articles not peer reviewed were excluded.

The ability of healthcare providers to prepare for and have the capacity to manage major disasters has taken on increasing importance since the terrorist attacks of September 11th (2001) and with the incidence of natural disasters such as Hurricane Katrina (2005). While disaster preparedness research has been conducted since these events, the number of studies, regarding healthcare and specifically nursing is limited. A review of the literature on the use of intuition in nursing, clinical decision-making, and triage decision-making (TDM) revealed a greater amount of work overall, however, only a relatively small amount of research focused on intuition and clinical decision-making in emergency settings. Linked to clinical decision-making, a small number of studies involving TDM were found. While the studies involving TDM discussed emergency nursing, as with clinical decision-making none specifically incorporated disaster preparedness. A look at intuition and TDM related to disaster preparedness knowledge combines

what others have researched separately to determine if there is a relationship between these variables and whether each has an effect on the outcome variable of disaster preparedness knowledge. A review of the literature suggests that most registered nurses lack disaster preparedness knowledge and are unprepared to respond to major disaster events (Fung, Loke & Lai, 2008; Gebbie, 2010; Slepski, 2005). The literature suggests that factors affecting the lack of disaster preparedness include age, lack of disaster preparedness education in hospitals and nursing schools (Garbutt, Peltier, & Fitzpatrick, 2008), lack of knowledge of a formal plan regarding preparedness in the practice setting (Goodhue, Burke, Chamber, Ferrer, & Upperman, 2010), and understanding of what constitutes disaster preparedness (Fung, Lai, & Loke, 2009).

Intuition and its relation to decision-making among nurses had been researched since the 1980's in multiple patient care settings (Benner, 1984, 2004; Benner & Tanner, 1987; Pretz & Folse, 2010; Rew, 1988, 2000; Young, 1987). However, these elements have never been studied in relation to disaster preparedness knowledge. While nursing researchers have studied overall disaster preparedness knowledge, disaster preparedness competencies, and disaster preparedness management of nurses (Baack & Alfred, 2013; Fung et al., 2008; Yin, He, & Zu, 2011), few have studied elements of everyday nursing practice, intuition and triage decision-making, and their relation to disaster preparedness knowledge, which according to Cork (2014) and Edwards (2007) is an effective element of decision-making. As purported by Benner (2004), nurses utilize intuition in developing links between seeing and responding to situations. While nursing intuition in relation to disaster preparedness knowledge has not been researched, the literature does reveal that intuition plays a major role in nursing practice at the bedside and during triage in emergency situations (Cork, 2014; Edwards, 2007; Robert 2013); thus, it stands to reason that nurses would utilize intuition during disaster and triage as well.

Triage decision-making (TDM) is a form of clinical decision-making and is a crucial skill for nurses who provide direct patient care or supervise nurses in acute care and community settings (Smith & Cone, 2010). Triage is prioritizing care based on assessment guiding decisions on the next step in the patients care plan. Review of the literature on TDM resulted in both qualitative and quantitative research commonly indicating that intuition, critical thinking, and experience influence TDM. (Gertdz & Bucknall, 2001; Patel, Gutnik, Karlin, & Pusci, 2008; Smith & Cone, 2010). Given the necessity for rapid clinical assessment of patients in the presence of limited resources and support, TDM may be more closely related to and may even influence disaster preparedness knowledge among nurses.

Disaster Preparedness Knowledge

Disasters can be man-made or natural and there are various levels of disaster response (Adelman & Gray, 2009). Disasters are defined by Reilly and Markenson (2011) as situations that overwhelm local resources or capacity, thereby necessitating a call for external assistance. Disasters differ from emergencies in that there is a requirement for additional resources beyond what local resources can offer. Disaster preparedness is the ongoing process of readiness and buildup of capabilities to manage the impact hazards inflict to minimize the negative impact for the health and safety of individuals and systems as well as a state of being prepared for specific risks (Perry & Lindell, 2008; Reilly & Markenson, 2011). Sonnier (2009) suggests that disaster preparedness is the single most important factor in disaster management and involves extensive planning, practice, and evaluation.

Disaster preparedness is multifaceted considering various administrative and clinical operations, outcomes, and stakeholders (Wise & Nader, 2002). Slepski (2005) advised that comprehensive skills, abilities, knowledge, and actions are necessary to respond and prepare for

actual or suspected threats including chemical, radiological, nuclear, biological, or explosive threats whether of natural causes or stemming from a human-induced incident. Disaster preparedness is an essential step toward helping healthcare personnel effectively prepare to mitigate the effects of a major disaster.

Publications describing the concept of disaster preparedness became prevalent in the research literature after the following major catastrophic disasters: New York World Trade Center terrorist attacks of September 11th, 2001, Indian Ocean Tsunami (2004), and Hurricane Katrina (2005). Perry and Lindel (2003) discuss the importance of disaster preparedness and how it leads to a more effective response by all stakeholders when a disaster takes place. The physical factors that influence disaster preparedness are geographical location, nature of disaster, severity of disaster, and resource availability. Characteristics that may affect those involved in disaster are knowledge of disaster preparedness, emotion, competency, and training (Baack & Alfred, 2013; Rogers & Lawhorn, 2007).

Knowledge of disaster preparedness, once considered specialty training for military, public health, and emergency room nurses, has become a basic requirement for the general nurse (Patillo, 2003). Disaster preparedness knowledge is the ability to define a disastrous event, understand the incident command system, triage and assessment, and their role in a disaster event (Miller, 2011). Fung, et al. (2008) emphasized that nurses as clinical leaders are coordinators of care and act as first responders during times of emergency response ensuring the safety of community members and other healthcare team members. Therefore, healthcare professionals should be equipped with the knowledge and skills needed to handle a disaster, and it is crucial for health professionals and related personnel to be ready, as knowledge of disaster preparedness can serve to maintain the stability in an emergent situation. While current literature addresses

disaster preparedness knowledge, most do so without introducing other variables. Very few research studies introduce outside variables that may have an impact on or demonstrate a relationship with disaster preparedness knowledge, and no other studies examine perceived use of intuition and triage decision-making and the possible relationships to disaster preparedness knowledge. In this study, disaster preparedness knowledge will be measured by the Emergency Preparedness Informational Questionnaire (EPIQ). The EPIQ is a knowledge-based survey consisting of forty-five questions. The survey examined the familiarity of different aspects of emergency preparedness, including the detection and response to an event, the incident command system, ethical issues, epidemiology and surveillance, isolation/quarantine, decontamination, communication/connectivity, psychological issues, special populations, and accessing critical resources. The questionnaire was developed in 2003 by Wisniweski, Dennik-Champion, and Peltier, members of the Wisconsin Nurses' Association. Its chief purpose is to assess the knowledge of the nurses in emergency preparedness to develop educational programs to enhance knowledge in the field. (Wisniewski, Dennik-Champion, & Peltier, 2004).

The review of literature found a limited number of studies, which suggests there is little evidence to show that emergency department nurses' knowledge has been studied in relation to disaster preparedness. Studies using the EPIQ to test disaster preparedness knowledge were conducted in 2003 by Wisniweski, Dennik-Champion, and Peltier of the Wisconsin Nurses' Association, in 2008 by Garbutt, Peltier, and Fitzpatrick, in 2011 by McKibbin, Sekula, Colbert, and Peltier, and by Baack and Alfred in 2013.

Wisniweski et al. (2004) of the Wisconsin Nurses' Association used the newly developed Emergency Preparedness Information Questionnaire (EPIQ) to assess the level of knowledge nurses had in emergency preparedness. The results of the study would help develop appropriate

educational programs in the field (Wisniewski, Dennik-Champion, & Peltier, 2004). The instrument was placed on-line in Wisconsin using the Health Alert Network (HAN), which is a communication tool for all Wisconsin's health departments, hospitals, clinics, emergency departments, laboratories, law enforcement, fire services, emergency medical services, and other health agencies (Wisniewski et al., 2004). A total sample of 877 nurses responded to the 44 knowledge-based questions. The researchers analyzed the 44 questions using factor analysis to determine the number of emergency preparedness dimensions. Eight dimensions were established and the preparedness questions grouped into the dimensions as expected by the researchers. An Equimax factor analysis was conducted and the eight factors accounted for a cumulative variance of 73.5%, and coefficient alphas ranged from 0.83 to 0.94, indicating significant internal reliability. The results of this study demonstrated nurses were knowledgeable in basic first aid and triage but demonstrated a low level of self-reported knowledge of disaster preparedness. From the results of this study, the authors of the study worked with the state health department of Wisconsin and developed appropriate educational programs to enhance disaster preparedness knowledge. The researchers believed a major limitation of this study was the on-line forum used to post the instrument. The authors of the study reported the HAN, while useful to facilitate participation in the study, was not an ideal forum to present the questionnaire to assess all Wisconsin's nurses. Further investigation of the online forum by the researchers noted the HAN to have a higher percentage of use by first responders than registered nurses, indicating that the results were more reflective of first responders instead of the targeted nursing population.

In 2008, Garbutt, Peltier, and Fitzpatrick revised the EPIQ instrument used in Wisniewski et al's. study and surveyed 776 nurses regarding their knowledge of disaster preparedness. The

study was conducted to validate the EPIQ instrument as a way to assess a nurse's self-reported knowledge of emergency preparedness. The researchers of this study reported the reliability of the EPIQ as 0.83 to 0.94 for each of the eight dimensions and an overall alpha reliability of the scale at 0.97. Factor analysis, reliability analysis and regression statistics were used to test the scale and supported the reliability and validity of the revised EPIQ used in this study. The revised EPIQ was determined to be a powerful instrument for explaining respondents' self-reported preparedness in the case of large-scale emergency events. Collectively, the results of the factor analysis, reliability analysis, and regression achieved the goal of assessing the reliability and validity of the revised EPIQ (Garbutt et al., 2008). The results demonstrated that more educational programs were needed to address the lack of knowledge about disaster preparedness among nurses, especially nurses most likely to experience disaster events (emergency department, military, and public health nurses).

McKibbin, Sekula, Colbert, and Peltier (2011) conducted a quantitative descriptive correlational research study by studying South Carolina nurses' perceived knowledge of emergency preparedness using the Emergency Preparedness Information Questionnaire (EPIQ) and select demographic variables (nursing specialty, years of experience, highest degree attained, age, region of employment, and emergency preparedness continuing education hours). Prior to examining the relationship, McKibbin et al. conducted a factor analysis among the EPIQ's eight emergency preparedness dimensions which resulted in two dimensions being combined "because of similar structure in the relationships between the variables" (p. 551). The researchers examined the relationships among the resultant seven dimensions including overall familiarity with emergency preparedness, the relationship between perceived knowledge of emergency preparedness, and select demographic variables of nurses (nursing specialty, years of experience,

highest degree attained, age, region of employment, and emergency preparedness continuing education hours). The researchers also included a review of the learning and training preferences of South Carolina nurses in relation to emergency preparedness content. This study had a dual purpose. It was conducted to better understand the learning needs of nurses in South Carolina and then to use the results to guide the prioritization of continuing education and training efforts focused on emergency preparedness and to evaluate the reliability and validity of the EPIQ. McKibbin et al. utilized Boone's programming model concept of planning as the framework for this study, which used a descriptive correlational design and the EPIQ. The researchers collected data from 207 eligible survey participants and analyzed the results. Similar to previous research, the study demonstrated that nurses from South Carolina exhibited an overall low level of self-reported knowledge of emergency preparedness. Participants rated the perceived level of knowledge of emergency preparedness using a five-point Likert scale (1 = not familiar to 5 = very familiar) and reported a mean score of 2.29 (SD = 1.09) for familiarity with overall emergency preparedness; indicating a low level of perceived familiarity with overall perceived knowledge of emergency preparedness. Participants perceived being most familiar with triage, with a mean score of 3.39 (SD = 1.12), and least familiar with clinical decision-making in epidemiology and biological agents, scoring a mean of 2.04 (SD = 1.06) which implies a relationship between triage decision-making and disaster preparedness knowledge. Although the mean values were overall low, the variables with highest positive correlations to emergency preparedness included continuing education conference attendance on the topic of disaster preparedness, employment in community health and ambulatory care settings, and residence in the mountain region of the South Carolina (compared to nurses reporting to live on the coast). From this data, the researchers plan to prioritize learning needs and formulate a planned

approach to educating nurses about emergency preparedness in order to significantly strengthen nurses' ability to respond to disaster events competently and effectively. In addition, this study further tested the reliability and validity of the EPIQ. Cronbach's alpha values were used to calculate the seven dimensions of the EPIQ to assess the internal reliability of the instrument. The coefficient alpha values for each of the seven dimensions of the EPIQ were all greater than 0.92. The alpha value for the entire instrument was 0.98, supporting that the EPIQ is a valid and reliable instrument for assessing familiarity with emergency preparedness and a suitable instrument to assess and identify the learning needs of nurses.

Most recently, Baack and Alfred (2013) conducted a quantitative study focused on registered nurses' preparedness to act and manage disaster situations. The researchers concentrated on man-made disasters (such as terrorist attacks) and made the point that comprehensive skills, abilities, knowledge, and actions are needed to respond and prepare for a threat; actual or suspected. Deci's Self-Determinism Theory (2002) was used as the foundational framework to this study. The theory is based on the belief that individuals are active organisms who seek challenges in the environment. The researchers used this framework to determine what factors may influence a registered nurse's actions. Baack and Alfred examined three variables and the relationship to disaster preparedness competency: individual differences (age, years of experience, and previous disaster experience), self-regulation (intrinsically generated motivation to take an action), and healthcare climate (job satisfaction). A descriptive correlational design was used to measure registered nurse preparedness. Baack and Alfred (2013) sampled N = 620 registered nurses using a simple random sample design. The participants answered a 58-item question disaster readiness survey that was divided into four sections incorporating components of the EPIQ, nurses' assessment readiness scale (NAR), the self-regulation (SR) scale, and a job

satisfaction questionnaire. Perceived competence in disaster preparedness was measured using the EPIQ summed score (n = 618; M = 90.0; SD = 31.7; range = 41 – 205). A median score of 82.5 and a mean of 90.0 indicated an overall low level of perceived familiarity with disasters. The researchers found that traditional demographics had no discernable impact on nurses' perceived disaster preparedness competency. However, two of the individual differences (previous participation in a major disaster event and prior work in a post disaster shelter) significantly correlated with the EPIQ total score. Similar to the EPIQ, the results of the NAR, the additional measure of perceived competence, resulted in a low perception of disaster preparedness competency. The sum scores of the NAR scale (n = 618; M = 4.2; SD = 1.85; range = 2 – 10) indicated that the participants did not feel adequately prepared to respond in a disaster event. The predictive relationship between SR scores and perceived competence in disaster preparedness was determined by examining the questions of SR scale with the outcome variable; the EPIQ summed score. A standard multiple regression resulted in an $R^2 = 0.195$ and adjusted $R^2 = 0.191$ [F (3, 609) = 49.2, $p < .001$]. The results showed that only one SR domain made a significant contribution to the nurses' perceived competence in disaster preparedness as measured by the EPIQ; "willingness to assume risk of involvement in a bioterrorism event" (t = 3.88, $p < .001$).

Alfred and Baack concluded that registered nurses needed greater preparation for participating in disaster relief efforts. In order to enhance understanding and maintain perceived competence, Alfred and Baack suggested that registered nurses should "seek opportunities to participate in actual disaster events, mock drills, and further educational opportunities specific to disaster preparedness" (p.281) and that educators and administrators must support and encourage disaster preparedness education in order for registered nurses to provide community care in the

event of a disaster. Today, each organization develops training modules for healthcare staff members and the individual community and thus, variations in training and education occur. Additionally, the study found that registered nurses require consistent standardized education and training for human-induced and naturally occurring disaster events. Therefore, hospital organizations and registered nurses would benefit from disaster training to assist the community during disaster events.

Nursing Intuition

It has been well documented in the literature that nurses use a form of intuition in practice and use it to make clinical assumptions and decisions regarding patient care (Benner, 2004; Pretz & Folse, 2010; Rew, 2000). Intuition is "understanding without rationale, without recourse to calculate rationality" (Benner & Tanner, p. 23, 1987). According to Rew (2000), "Intuitive skills are sorely needed in situations where communication is ambiguous or indirect" (p. 105), as was the case at the World Trade Center (New York, New York) and may be the case in future disaster events. Nursing research has described nursing intuition as an important and valid part of a nursing assessment for over 30 years (Riley, 2015). While related, nursing intuition is different from visceral intuition as it relies on previous knowledge and experience (Benner, 1984). Benner and Tanner (1987) define nursing intuition as "judgement without rationale, without recourse to calculate rationality" (p. 208); it is a preconceived notion of what's likely to occur to one's patient, before it happens, relying on one's knowledge and experience to make a decision. Benner (1984), Benner and Tanner (1987), and Rew (1988) were the first in nursing to present intuition as a valid part of the nursing process. These research studies recognized nurses' intuitive experiences and the use of intuition in the clinical decision-making process. The profession of nursing has long recognized that intuition specific to nursing is founded on nursing

experience (Benner, 2004; Benner, Tanner & Chesla, 2009; Pearson, 2013). Experience is defined as “the fact or state of having been affected by or gained knowledge through direct observation or participation” (Merriam-Webster, 2016). Payne (2015) purports that nursing experience is“the summation of all exposure to domain-specific nursing knowledge” (p. 224). Such knowledge is taught in the form of classroom training and continuing education, as well as knowledge gained from clinical work experience, however it is also recognized that experience alone is not sufficient for the development of intuition (Benner, 1984; Pretz & Folse, 2011). According to Benner (1984), pattern recognition and memory play an important role in the development of intuition in all stages of Benner’s model except for the novice stage. Benner explains that in this early stage, the novice nurse lacks experience, which is considered to be a necessary component of actions involving intuition.

McCutcheon and Pincombe (2001) explored intuition with the purpose of evaluating the role of intuition in nursing, examining nurses' understanding of intuition and the perceptions of the use of intuition, and to assess the impact of intuition on nursing practice. The study design utilized both qualitative and quantitative means of analysis. Grounded Theory was used as the overarching theoretical and methodological framework and the Delphi survey was used for the collection of quantitative data. A sample of 262 RNs took part in this research study. The interviews allowed the researchers to develop coding and categories. Constant comparative analyses were done, and categories were used to organize the data. Codes were placed into established category although in some cases category headings were either changed to better reflect the content of a category or categories were merged together to create a wider-arching category thus creating a more concise theory from the data. Quantitatively, two Delphi surveys were used in the study to “add density and richness to the data” (p. 345). The data from the

Delphi surveys were analyzed using both descriptive and inferential statistics. By doing this, the researchers demonstrated the emergence of the categories from the data assisted in category saturation.

McCutcheon and Pincombe's (2001) research findings suggest that "intuition is not something that just happens" but is rather "a result of a complex interaction of attributes, including experience, expertise and knowledge, along with personality, environment, acceptance of intuition as a valid behavior and the presence or absence of a nurse/client relationship" (p. 345). The data also revealed a "theory of intuition" (p. 345) and what the researchers refer to as a synergy of knowledge, expertise, and experience, which while are mutually dependent and have mutual and reciprocal effects, interact to equal an effect greater than their sum. The researchers note this study's main limitation to be the lack of randomization of the sample. The sample of nurses were already interested in intuition, aware of it, or already using it extensively in practice. However, the researchers also cite that:

> Focus group interviews and Delphi surveys, the chosen research methods, require participants who are acquainted in some way with or interested in the area under study. Thus, it would not have been appropriate to select individuals randomly to participate in the study" (McCutcheon & Pincombe, 2001, p. 347).

King and Macleod-Clark (2002) explored nurses' understanding and use of intuition in clinical decision-making in practice in both surgical and intensive care units. The study employed a qualitative design based on the work of Lincoln and Guba. The design was utilized to explore and identify levels of nursing expertise through focused nursing assessments of patients postoperatively. The study used a sample of sixty-one RN's with variations in age, years of clinical experience, and educational background. Thirty RN's worked in four separate

specialty surgical units and thirty-one RN's worked in two separate intensive care units (ICUs) across three hospitals located in England. Only nurses who received and/or were involved in postoperative patient care were part of the sample, however, with the support of the staff responsible for nurse assignments and the long duration of the study all of the sampled nurses were able to participate in the study. Researcher King was the nonparticipant observer and, as such, took field notes of the sixty-one nurses' postoperative assessments of patients. Following the onsite observations and field notes, semi-structured retrospective interviews were done based on the postoperative nursing care. The interviews considered both "the nurses' perceptions of how their expertise had been developed and the nature of the decision-making processes in the current and similar past situations" (p. 324). Lincoln and Guba's (1985) steps of data analysis and Morse's (1991) data filing method for analyzing interactive interviews were utilized to organize and manage the wealth of data gathered in this study. Data analysis provided the emergence of four indicators of expertise as well as four differentiated and incremental levels in the nurses' knowledge and skill: advanced beginners, competent, proficient, and expert. This terminology was used to keep in recognition of levels of expertise previously identified by Benner (1982). Two major processes in the nurses' clinical decision-making during practice were identified. One was analytical thinking, in which the nurses "consciously considered information to reach a decision" (p. 324). The second involved the use of "intuitive awareness of change" [which took place] without any conscious effort and informed decision-making processes during practice" (p. 324). The notion of intuitive awareness, increased feelings, and physiological and/or behavioral responses regularly led to the nurse's use of an analytical model of thinking. The researchers separated the findings into each level of four levels of expertise. Beginner/Advanced Beginner nurses focused upon fulfilling routine tasks, and monitoring of clinical observations required for

postoperative patient care. However, even at this stage, the beginner nurses experienced “vague intuitive feelings of uneasiness or happiness about the patient's status, [but] were unsure of what these feelings meant or how to respond to them” (p. 324) with negative intuitive feelings causing anxiety and nervousness about patient care. Advanced beginners, nurses in the second level of expertise, demonstrated the ability to make simple decisions regarding obvious vital clinical signs outside of nursing intuition, but also explored the nurses use of intuition in clinical decision-making. However, the advanced beginners’ “limited theoretical knowledge and experience provided an insufficient base to identify and interpret the importance of subtle clinical signs to patients' physical or psychological conditions” (p. 325). Like the beginner, the second level of expertise (competent nurses) still followed the routines of postoperative care but with less emphasis on task work completion. In this level, the researchers noted the nurses experienced intuitive feelings and demonstrated the ability to analyze complex relationships between changes in clinical signs and physiological change. King and Macleod-Clark (2002) suggested this to be due to a deeper understanding of theoretical knowledge, knowledge gained from previous postoperative episodes, increasing comprehension of clinical signs, and the development of intuitive feelings. Continuing in Benner’s (1984) model, the researchers described the third level of expertise as the proficient nurse. The authors reported that when these nurses first looked at the person, “an immediacy of intuitive feelings that provided a swift sense of understanding of each patient's overall status, and directed their assessment of further verbal, nonverbal and physiological cues” (p. 325). The proficient nurses perceived that knowledge, observation, and experience influenced intuition however, these same nurses found it difficult to explain how they used or developed their level of intuition. Compared to the prior three levels of expertise, expert nurses were “rapid and confident in their clinical decision-making and

perceived the immediacy of their intuitive responses to be based in unconscious recognition of very subtle changes in the patient" (p. 325). Intuitive feelings provided the motivation for "a rapid analytical search for concrete clinical evidence prior to deterioration in the patient" (p. 325) and in situations of uncertainty, these proficient nurses demonstrated the ability to consider trends in the patient's care. Additionally, expert nurses learned from past experiences that intuitive feelings emerged prior to a patient's deterioration. As such, these nurses responded to these feelings with greater confidence and utilized these feelings when rendering patient care.

The findings of this study demonstrated that intuitive and analytical elements were apparent in nurses' clinical decision-making in four of the levels of expertise established by Benner (1984), advanced beginner to expert level. This also supports previous studies that have demonstrated intuitive and analytical aspects in nurses' decision-making from student to expert level of practice. The study also demonstrated that "intuitive awareness" can be a powerful aspect in some nurses' decision-making, initiating critical thinking and a conscious search to acquire data that would confirm a sense of change in the patient's clinical status. A limitation of this study was that the findings were based on "a snapshot of these nurses' expertise and use of intuition in decision-making within their current field of practice limiting the findings to the time and place in which they [observations] took place" (p. 328) The researchers contend that valuable data might be obtained from future studies' exploration of each nurse's expertise and the use of intuition over time.

Robert (2013) conducted a study involving nurses' use of intuition in direct relationship with clinical decision-making. The purpose of this study was to explore the experiences of staff nurses using phenomenon of nursing intuition in the process of activating Rapid Response Team (RRT) for patients cared for in medical-surgical and telemetry hospital units. Thirty-two full time

registered nurses employed on medical surgical and telemetry units participated in this study. This study was qualitative in design with data collected via face to-face semi-structured and open-ended interviews ranging from 45 to 60 minutes each. Robert utilized Grounded Theory methodology and employed open, axial, and selective coding of 295 units of communication from 32 registered nurses. The findings resulted in the development of a theory grounded in data to "increase understanding of the role of intuition in nurses who activate the RRT for patients in medical-surgical and telemetry units" (p. vii). Per this theory, nursing intuition cannot be defined in terms of a linear process of reasoning, but rather nursing intuition is rooted in the recognition of pattern combinations and subjective inferences collected from the patient during nursing assessment. Robert purported the components of the patterns established by the theory are objective assessment, visual observation, verbal interaction, and subjective assessment. After data analyzation, Robert found that the nurses' decision to activate the RRT was moderated by emotional and physiological reactions, collaboration with others, education, and historical experience. Nurses use these factors to help to augment the ability to trust their feelings and inspire confidence to call the RRT, which led to favorable patient outcomes, as well as the development of the nurse's knowledge. A limitation of this study was the sample size and the use of participants only from medical surgical and telemetry units since nurses from other departments may make use of RRTs. While this study did show that nurses use emotional and physiological reactions, collaboration with others, education, and historical experience as part of their nursing intuition when making clinical decisions toward the care of patients, Robert recommends further research in the field due to a limited understanding of nurse perspectives regarding the use of intuition in activating an RRT.

Studies Utilizing the Acknowledges Using Intuition in Nursing Scale (AUINS)

Rew (2000) researched the characteristics related to intuition by examining the concept of intuition with a panel of experts, psychiatric mental health nurses, and a convenience sample of nurses involved in continuing education. Data were analyzed using factor analysis resulting in Rew identifying the following themes among clinicians: acknowledgement of intuition in clinical practice; willing to take risks; takes risks; acts based on intuition; cautiousness and rigidity, self-awareness; and being creative. These characteristics concurred with previous results of research by Rew (1990; 1991) and the initial 50 item instrument was created. Phase one of instrument development included a panel of five intuition experts completing the instrument. The responses resulted in a decrease from 50 to 28 items with a content validity index of 0.96. Phase two of instrument development included the use of a second sample of 106 participants completing the instrument. Factor analysis resulted in a further reduction of items to 21. Cronbach's alpha coefficient of internal consistency of 0.84. Construct validity was supported through factor analysis and the known-groups technique. The third and final phase of instrument development included completion of the instrument by a convenience sample of 112 nurses attending continuing education programs. Analysis determined only seven of the items explained 40.6% of the variance in scores and were retained as the final unidimensional scale. Rew reported a .91 for Cronbach's alpha coefficient of internal consistency based on the analysis performed during a three-phase review process and demonstrated that the unidimensional Acknowledges Using Intuition in Nursing scale (AUINS) is a reliable and valid tool that can be used to quantify nurses' acknowledgement of intuition as an aspect of clinical decision-making.

In 2013, Meeks-Sjostrom conducted a descriptive, correlational study to investigate nurses' decision-making for patients involved in suspected incidents of elder abuse. The

following four independent variables were examined: nurses' knowledge of elder abuse, intuition use in nursing practice, years of experience working as a nurse, and clinical level of practice status. The dependent variable was clinical decision outcomes (clinical interventions) completed by the nurse regarding elder abuse of an elderly patient. Utilizing a convenience sample of 84 experienced emergency department nurses from two hospitals, the researcher utilized two instruments to quantitatively measure data. The first instrument used was one developed by the researcher to measure nurses' knowledge of elder abuse. The second instrument used was Rew's (2000) 7-item "Acknowledges Using Intuition in Nursing Scale" (AUINS) to measure nursing intuition. Statistical analysis of the results suggested a significant relationship between applied knowledge of elder abuse and clinical decision intervention. The results also demonstrated that applied knowledge of elder abuse and years worked as a nurse significantly predicted clinical decision intervention ($R2 = .341$, $R2\ adjusted = .251$, $F\ (3,22) = 3.79$, $p < .05$) suggesting these two variables are predictors for appropriate nursing interventions to treat suspected elder abuse. The results indicated no significant correlation between nurses' clinical decision-making regarding suspected elder abuse and the use of intuition; however, the researchers admit to a small convenience sample of nurses as a limitation and recommend further research be completed on this topic.

Pretz and Folse (2011) examined nursing intuition by conducting a correlational study to examine the relationship between "domain-specific and domain-general intuition among practicing nurses and student nurses to determine the role of intuition in nurses' decision-making" (p. 2878). While prior research revealed that experienced nurses rely on intuition when making clinical judgements, the various aspects of intuition associated with experience had not been fully explored. Additionally, the researchers took the opportunity to examine the

quantitative instruments used to measure intuition, as they had not yet been compared in either the nursing or physiological literature. The objectives of the study were first to determine whether use of intuition is a factor one applies to all aspects of life or if intuition is more specific to the domain (nursing) one has experience in, and if the results proved to be domain specific, the researchers wanted to learn if the preference for using intuition is greater with increased experience in that domain. The researchers used a correlational design to compare self-reported measures of intuition, as well as the relationship to nurse experience. The following instruments were utilized to compare content and results: "Miller's Intuitive Instrument" (Miller, 1993); the "Acknowledges Using Intuition in Nursing Scale" (Rew, 2000); the "Smith Intuition Instrument" (Smith et al. (2004); the "Types of Intuition Scale" (Pretz & Folse, 2011); the "Rational Experiential Inventory" (Pacini & Epstein, 1999); and the "Myers-Briggs Type Indicator" (Myers et al., 1998). A web-based survey was administered to a sample of 175 clinical nurses and student nurses using the above instruments and quantitative analysis to determine descriptive and inferential statistics. The researchers tested preference for intuition by examining the relationships among the measures of nursing intuition and the measures of general intuition. The researchers found almost all aspects of nursing intuition were correlated with one another. The same was found for all aspects of general intuition and almost all inter-correlations were significant. To examine further, all nursing intuition scores and all general intuition scores were subjected to a principal components factor analysis with Varimax rotation. The three-factor solution explained 60.24% of the variance and showed that preference for intuition in nursing is not the same as preference for intuition in general. The factor analysis also showed that general intuition was independent of all measures of nursing intuition and that nursing intuition has two dimensions: (1) a sense of being skilled, being able to read patients' cues and a sense of affinity

for innovation in practice and (2) a reliance on physical awareness of signs and energies and spiritual connections with patients. The second research question involved the influence of experience on intuition. The researchers surmised that experience would be positively related to nursing intuition, since they expected nurses gained more experience with more opportunities to care for patients, resulting in an increase in confidence in their intuitive judgement. To examine this, the researchers coded experience as number of self-reported years of experience as a practicing RN. The results showed that experience was related to preference for intuition in the domain of nursing, but not all aspects of nursing intuition. The effect of experience on preference for intuition was also examined and results showed that preference for intuition differed according to level of RN experience, Wilks' λ =0.789, F (20, 432.111) = 1.598, p =0.049. Univariate analyses revealed no main effect of experience on any individual measure of general trust in intuition. The findings supported Benner's (1984) premise that intuitive clinical decision-making develops with experience. Additionally, the researchers confirmed the reliability and factor structure of the instruments used. Although Pretz and Folse recognized the self-reporting nature of the survey as a limitation, the results of the study strengthened the knowledge base of decision-making in clinical practice by examining differences in preference for use of intuition among nurses.

Most recently, Hughes (2016) conducted a study to investigate the relationships among the use of instructional simulation, the use of intuition in clinical decision-making, and the influence of age on those relationships among associate degree nursing students. An explanatory, correlational design was utilized to examine the relationship between simulation, as measured by the Creighton Simulation Evaluation Instrument (C-SEI; Todd et al., 2008) and the use of intuition in clinical decision-making, as measured by Rew's (2000) Acknowledges Use of

Intuition in Nursing Scale (AUINS). The results from this study demonstrated a slight (r = .233) but statistically significant (p = .049) relationship between simulation and the use of intuition, however, no relationship between age and the use of intuition. Limitations for this research included the self-reported nature of the instruments and prompted the researcher to recommend future research and analysis on the concept of intuition and its role in clinical decision-making.

Nursing research has already established a relationship between intuition and its enhancement to clinical practice, patient outcomes, and clinical judgement (King & Macleod-Clark, 2002; Pretz & Folse, 2011; Robert, 2013). This study will explore the possible relationship between intuition and disaster preparedness knowledge. Disasters take place in an environment in which rules are lacking, there are inadequate resources, and uncertainty exists (Reilly & Markenson, 2011). Therefore, intuition may play a role since it is in instances of uncertainty and inadequate roles and resources that intuition may impact one's willingness to take risks, act, exude cautiousness, self-awareness; and creativity (Rew, 2000), all needed during disaster response. Not only is a nurse's intuition concerning the overall welfare of the patient during a disaster important, but the use of intuition helps the nurse to make multiple decisions which can involve the accurate triage of injured disaster victims, as well as taking measures that can insure the safety of the nurse and others.

Triage Decision-Making

Triage decision-making (TDM) is the skill of making clinical decisions during the triage stage of assessment, involving the prioritizing care and making decisions on interventions that will follow (Smith & Cone, 2010). TDM includes the ability to receive information, process and understand the information, deliberate on the information, and make and defend the resulting choices (Larkin, Marco, & Abott, 2001). TDM is a form of clinical decision-making, which is a

process that nurses perform when they make clinical judgements involving patient care and management (Banning, 2007). In 1964, New York Hospital was the first to institute a nursing triage system. The hospital reported that processing time for emergency department clients was decreased by 50%, fewer complaints were noted from clients, and movement to the treatment area was quicker than when a physician performed triage duties (Mezza, 1992). TDM has historically been linked to and defined in civilian emergency medicine, military medicine, and disaster management, the focus being on who will survive and be allocated resources, and who will not (Smith & Cone, 2010). Given the gravity of such decisions, the nurse must have astute assessment skills to categorize patients and to prioritize care (Mezza, 1992). Triage decision-making is based on the concepts of critical thinking, cognitive skills, intuition, and experience (Cone, 2000) and a review of the triage decision-making research emphasizes those concepts.

Gertdz and Bucknall (2001) conducted a quantitative study by observing the data triage nurses collect from patients in order to allocate a triage priority. Using the Australasian Triage Scale (ATS), the researchers explored the impact of patient and nurse variables on the duration of the triage nurses' decision-making in the clinical setting. The sample included 26 nurses employed in one emergency department located in metropolitan Melbourne, Australia and 404 instances of triage were observed. Gertdz and Bucknall found that there was limited use of objective physiological data (i.e. vital signs) collected by the nurses' when making decisions regarding patient acuity, and differences among the sample regarding the duration of time to make triage decisions. Instead, the study noted triage decision-making being strongly influenced by subjective factors. To test the factors that influence triage duration, an analysis of variance was conducted and indicated a significant increase in triage duration when the nurse collected vital signs, performed a neurological assessment, administered first aid, when the triage process

was interrupted, when the patient did not have an injury, if the patient did not speak English, or if the patient had a letter of referral. Significant decreases in triage duration were found to occur when the patient was an expected arrival to the emergency department (i.e. receiving notification about a patient being sent to the emergency room from physician's office). Individual nurse differences (speed of response to patient, documentation speed) had a strong influence on triage duration. The variables not found to impact on triage duration included limb assessment and observation ($F = 0.89$, $p = 0.346$), patient mode of arrival ($F = 0.006$, $p = 0.936$) or whether a patient history assessment was obtained from the patient or an accompanying adult. ($F = 0.011$, $p = 0.918$). When factoring nurse experience, the researchers noted that nurses with five or less years of emergency experience took longer to assess patients with an increased mean triage duration than nurses with more than five years of emergency experience (3.86 minutes vs 3.55 minutes). Independent samples *t*-test however, indicated the difference was not statistically significant ($t = 0.67$, $p = 0.23$). The findings raised implications for the development of practice standards and triage education and argued that practice standards should include routine measurement of physiological parameters for all patients except for the obvious critically ill patient. Additionally, the researchers concluded that the inclusion of standard time frames for triage are not an appropriate method of evaluating triage decision-making in the real world, as variables such as language barriers and interruption of triage prolonged triage duration.

In 2005, Chung qualitatively explored emergency department nurses' experiences of triage decision-making. Chung interviewed seven nurses utilizing unstructured interviews and noted the following three themes: experience of triage decision-making, use of information in triage decision-making process and factors affect the triage decision-making. Chung discovered that the experience of triage decision-making included frustration, feelings of uncertainty,

autonomy, and satisfaction and that nurses based decisions on past experiences, triage protocol, and intuition. Chung also noted external factors that influenced triage decision-making as interruptions, time constraints, and lack of formal training.

In 2007, Edwards conducted a study which explored how emergency department nurses undertake the process of initial assessment at triage, specifically the process of "initial visualization" (p. 73). Fourteen accident and emergency (A&E) nurses from two demographically different A&E departments were video-recorded during 38 triage encounters. The recordings were replayed to the nurses, who were asked to report what they were thinking during triaging patients. The research findings suggested that prior to the beginning of the triage encounter, nurses could sense the degree of urgency to the presenting patient. The degree of urgency was based on an "immediate intuitive evaluation of 'the look of the patient,' which comprised an assessment of "obvious" physiological signs coupled with an appraisal of the degree of distress expressed" (p. 73). Edwards reported that nurses did this by "dimensionalizing client attributes and comparing those features considered salient to any given problem against an extensive repertoire of previous cases" (p. 73), thus, concluding that a nurse's previous experience plays a role in their intuitive decision-making during the triaging of patients presenting to the ED.

Triage decision-making (TDM) and the thought processes of the nurse during triage were examined using qualitative analysis by Goransson, Ehnfors, Ponteyn, and Ehnerberg (2008) and Patel et al. (2008). Goransson et al. (2008) sampled a total of sixteen nurses, divided into two groups based upon their scores. The nurses for this study represented thirteen different emergency departments in Sweden and included nurses who were designated triage nurses and those who were not. The researchers used "think aloud" (p. 163) methods and content analysis to

depict the cognitive processes of emergency department nurses during triage events with patients of varied acuity. The researchers found that nurses used an assortment of thinking strategies while reasoning, triaging, and organizing information in multiple ways to make triage decisions. This demonstrated the complexity of triage decision-making and the researchers recommending further research to identify the essential skills necessary for this decision-making during triage. The researchers also concluded that experience is not an accurate measure of which nurse is best to triage patients.

Patel et al. (2008) researched the triage process, guidelines, and factors effecting triage decision-making. Patel et al. sampled five triage nurses employed at a large pediatric Canadian emergency department. Utilizing semi structured interviews the sample were asked nineteen questions divided into three categories. about how triage decisions are made. The categories were the following: factors directly affecting the process of triage, the role of guidelines, and additional characteristics of the emergency department (ED) that affect triage. The results of the interviews were coded using thematic coding. For factors directly affecting the process of triage, nurses reported using experience, intuition, and physiologic measurements. For the second category, use of guidelines, nurses reported varying use of guidelines based on experience. Nurses with greater experience based clinical judgements on experience, intuition, and knowledge and if any doubt came between their intuitions and the guideline, then the nurses preferred to “go with their gut” instead of relying on the guideline. Contrariwise , the less experienced nurses reported that they carefully followed the guidelines most of the time and relied on intuition only when they were confident in their clinical judgment, or under abnormal circumstances. For the final category, additional characteristics of the ED that affect triage,

nurses reported technology, language barriers, and full ED waiting rooms as factors that affect triage.

The researchers concluded that experience is the most critical determinant of the nature of the use of guidelines which affect the triage process. More experienced nurses have already internalized the guideline as part of their intuition and utilize prior experiences to gauge the acuity level for this patient. A problem for experienced nurses emerges when guidelines change, and inaccurate decision-making can result in patients being under-triaged or over-triaged. The researchers suggest additional naturalistic studies of triage decision-making in other health care settings to gather additional understanding of the triage decision-making process.

Cork's (2014) study explored the relationship between emergency department (ED) charge nurses' use of intuition during triage and in enacting a trauma code in the ED; and comparing its efficacy to the patient's final injury severity scores. Cork conducted a descriptive, quantitative, cross- sectional record review and cohort analysis to explore the validity of nurses' use of intuition to predict the severity of patient injuries, and whether it impacts their choice to institute a trauma code at a rural Trauma Level III ED. A retrospective review of 393 eligible medical files during the specified period was conducted. Confounding was addressed and controlled by reviewing all eligible data, placing a record in the "gut instinct" category if that was the only criterion indicated in the document, and excluding all records without sufficient documentation. Thirty-three records were excluded, with 30 that did not meet any standby trauma criteria, and 3 lacking sufficient documentation. A total of 360 medical files were included in this phase, with 109 in the "gut instinct" and 251 in an "other" category. A third quartile boxplot analysis was performed on both sets of data and showed 9 "gut" and 5 "other" records as potential outliers. These documents were closely examined and determined that all

were legitimate eligible records for inclusion. Results indicated a very strong positive correlation between the sets of data ($r = 0.992$; $p < .001$) indicating nursing intuition as a valid approach for predicting severity of injury in trauma patients. This study validated the acceptance of the use of intuition in general nursing practice which may enhance patient care and outcomes. However, a major limitation was the RN sample size being only 6 individual RNs as well as the less then required number of cases (393) to review per Cohens power analysis (419).

Research Studies using the Triage Decision Making Inventory

In 2010, Smith and Cone published the results of a pilot study conducted in 2000 using the newly developed "Triage Decision Making Inventory" (TDMI). The TDMI is an instrument that measures the identification of critical thinking, cognitive characteristics, intuition, and experience when making decisions related to patient triage (Smith & Cone, 2010). Although initially developed to evaluate the decision-making skills of emergency room nurses, the researchers' objective was to test the reliability and validity of the instrument. They did so by administering to a sample of 583 experienced registered nurses with various backgrounds and specialties enrolled at a southeastern university's baccalaureate and graduate nursing programs. The results from this pilot study demonstrated the TDMI to be a reliable and valid instrument that could be utilized for a sample both inside and outside of the emergency room, although the researcher acknowledges a main limitation to be the self-reported nature of the instrument. Smith and Cone suggested that the results of the subscales on the TDMI identify areas that the nurse needs further education and training to improve competency and decision-making. For example, if the nurse scored low on the cognitive characteristics subscale, this may indicate that the nurse needs additional support regarding clinical skills. Similarly, if the nurse scored low on the experience and intuition subscales, the nurse may need further educational support or further

orientation. Smith and Cone purported that the results from the TDMI may assist clinical educators in developing programs for those nurses with similar issues/needs. Internal consistency for the instrument was measured through Cronbach's alpha, which measured .95 for the entire instrument. The Cronbach's alpha for each subscale ranged from .84 to .89. indicating that the TDMI's items were related and measure the same concept (Frank-Stromberg & Olsen, 2004; Mishel, 1998). Additionally, a test-retest was completed with 23 participants with a score of .77 indicating stability over time in the ability to measure decision-making (Polit, 1996). This research demonstrated the TDMI to be a reliable and valid measure of decision-making during triage and an instrument to assess training needs and facilitate further education of nursing staff.

In 2012, Smith further evaluated the TDMI using a sample of 190 military and civilian nurses of diverse backgrounds and experience employed at a large military health facility. The results proved to be consistent with the first pilot study conducted by Smith and Cone (2010), with statistical findings supporting the reliability and validity of the TDMI. Statistical analysis also allowed for the instrument to combine two of the instruments subscales, "Critical Thinking" and "Cognitive Characteristics", resulting in a decrease of questions on the instrument, from 37 to 27 questions. Principal component analysis with Varimax rotation resulted in three factors, which accounted for 53.2 % of the concept of triage decision-making. The factors were labeled as Cognitive Abilities (41.7%), Experience (7%), and Intuition (4.5%). Eigenvalues ranged from 1.69 to 15.5, factor loading ranged from .501 to .802, and Cronbach's alpha for each factor ranged from .858 - .922. Although limitations of this study included sample size, data collection method, and the generalizability of findings, the results are significant and further support the reliability and validity of the TDMI. Smith identifies the TDMI as a valuable instrument to assess nurses working in other "high demanding patient situations" (p. 136) such as a

"metropolitan ED, during natural disaster, in a combat/war setting, or on a busy medical surgical unit" (p. 136).

Most recently, Smith et al. (2013) used the TDMI to determine if additional education and simulation would improve confidence in decision-making related to triage. The researchers utilized an experimental design with a sample of 14 nursing students. The interventions in this study were additional education via the completion of an advanced cardiac life support (ACLS) training course and participation in human patient simulation by the nursing students. Four groups were established for the study. The first group was provided only simulation as the intervention. The second group, only ACLS. The third group was provided with both simulation and ACLS and the fourth group was the control group. The TDMI was given to the sample groups prior to the interventions and after the interventions. Although the scores on the TDMI were above the midpoint prior to intervention, the post intervention scores increased significantly in all intervention groups. The group with the highest post intervention score was the group who received both simulation and ACLS indicating that various forms of education are more beneficial to learning, than only one form. Smith et al.'s study concluded that multiple methods of education can positively impact results on the TDMI.

Triage decision-making (TDM) is among the first clinical decisions when a patient needs care. Within the hospital setting, triage encompasses a clinical assessment and decision in order to classify a large number of patients arriving to the emergency department (ED) and prioritize patient care based on the acuity level of the patient's illness or injury. The purpose of triage is to identify the severity of an injury and mitigate negative outcomes through rapid assessment and decision-making (Cone, 2000).

Nursing research suggests that intuition and TDM have a positive influence on patient care outcomes (Cone, 2000; Cork, 2014; Edwards, 2007; Robert, 2013), and may indicate a similar influence on disaster preparedness knowledge. However, a study specifically looking at these variables in relation to disaster preparedness knowledge has not yet been done. Edwards (2007) discussed how triage nurses have been shown to use "intuitive appraisal" (p. 74) when they first look at the patient to determine the level of care needed. Similarly, King and Clark's (2002) research noted how nurses use intuition to detect clinical changes in the patient and found nurses did so "without any conscious effort" (p. 324).

While intuition and its impact on clinical decision-making has been studied among nurses at the bedside, there is a gap in the literature researching its relation to disaster preparedness knowledge. In response to this literature gap, this study will explore the relationship between and among disaster preparedness knowledge, perceived use of intuition, and triage decision-making. A positive correlation among all variables will indicate that nurses with high intuitive capabilities and triage decision-making skills have stronger knowledge of disaster preparedness and therefore are better prepared for disaster. Nursing research has already established a relationship between triage decision-making and nursing intuition (Cork, 2014), however, both intuition and triage decision-making and the possible relationship with disaster preparedness knowledge has yet to be examined. This study explored those possible relationships.

CHAPTER III

THE METHOD

Design of the Study

In this descriptive correlational study, the relationships between and among perceived disaster preparedness knowledge, perceived use of intuition, and triage decision-making in emergency department nurses working in acute care hospitals were examined. Statistical analysis examined the relationship between and among the variables. Exploratory analyses were conducted with selected demographic characteristics to determine the relationships to disaster preparedness knowledge, perceived use of intuition, and triage decision-making and examined correlations between and among these variables. Demographic characteristics included the following: whether the participant had greater than one year experience working as an emergency department registered nurse, length of time as an emergency department registered nurse in current hospital, overall length of time as an emergency department registered nurse, length of time as a nurse in current hospital, category of hospital at which the participant is employed, if the hospital the participant is employed is a trauma center and the trauma center level, the size of the hospital at which the participant is employed, length of time as an registered nurse overall, if the participant has ever had disaster preparedness training, if disaster preparedness training or education is offered by the hospital, if the participant had disaster preparedness training or education in the last five years, if the participant had ever taken care of patients during a disaster event, if the participant had ever worked during a disaster event, if the participant triages patients, if the participant had ever received triage training or education, if triage training is offered by the hospital, has the participant received triage training or education in the last 5 years, the participants highest achieved educational level in nursing, whether the

participant is of a full or part time employee status, the participant's state of residence, the participants county of residence, and the participants age and gender.

Description of Population and Sample

The sample for this study included full and part time registered staff nurses employed by acute care hospitals as emergency department registered nurses for one year or greater residing in the combined statistical area of New York City, New York, United States of America; New York, New Jersey, Pennsylvania, and Connecticut (Office of Management and Budget, 2015). The United States Census Bureau (2018) defines Combined Statistical Area (CSA) as an area that "consist of two or more adjacent metropolitan and micropolitan statistical areas that have substantial employment interchange". The sample included emergency department registered nurse who achieved a BSN degree or higher, who can read and speak the English language, and who are members of the Emergency Nurses Association (ENA). The ENA is a professional organization exclusively for emergency department nurses. As such, it was primarily utilized to secure a sample of emergency nurses only, limiting any cross over from non-emergency department nurses. Emergency Department (ED) nurses were selected for this study as the American College of Surgeons (1999) described ED staff a major strength in the medical management of disaster. The survey link was posted on the ENA External Research Opportunity website. Participation was voluntary.

According to Gray, Grove, and Sutherland (2017), the following must be specified to determine a sample size: (1) the level of significance α, (2) the population effect size and (3) the β level which is the probability of obtaining a significant result. The size needed was based on the following criteria to conduct correlational and regression analyses: level of significance set at

.05, a moderate effect size of .35 and a power of .80. The effect size was obtained from prior disaster preparedness knowledge research (Baack & Alfred, 2013; McKibbin et al., 2011).

A sample size of 130 participants was determined based on power analysis for a correlational descriptive study design examining the effect of intuition and decision-making on disaster preparedness knowledge. Gray, Grove, and Sutherland (2017) note that power analysis reduces the risk of Type II errors, and/or estimating occurrences. Power analysis helps the investigator eliminate the possibility of wrongly accepting a false null hypothesis. The goal is to correctly reject the null hypothesis which states the independent variables have no effect on the dependent variable, or there is no relationship between the variables studied.

Inclusion Criteria

This study was limited to emergency department registered nurses employed in acute care hospitals residing in the combined statistical area (CSA) of New York City, located in the United States of America. The CSA of New York City is comprised of multiple counties in four states: New York, New Jersey, Pennsylvania, and Connecticut. Employment as a registered nurse (RN) in an emergency department for one year or greater, achievement of a Bachelor of Science in Nursing (BSN), and membership of the Emergency Nurses Association (ENA) was required for participation. Evidence supports hospitals that employ registered nurses with BSN degrees demonstrate improved patient outcomes, higher quality metrics, lower mortality, and decreased patient length of stay (Blegen, Goode, Park, Vaughn, & Spetz, 2013). In addition, nurses from both the states of New York and New Jersey are required to obtain a baccalaureate degree in nursing within ten years of initial licensure and according to the American Association of College of Nursing (2012), nurses holding a BSN are described as being well prepared to make appropriate clinical decisions, using analytic processes to apply patient care, and contribute to

positive patient outcomes. RNs with employment of less than one year, RNs holding degrees less than a BSN, and those not holding a membership with the ENA were excluded from this study. Participants were required to read and speak the English language. Although, Benner (1984) established categories based on experience Benner (novice, advanced beginner, competent, proficient, and expert), the amount of years in each category is not exact. Therefore, for the purposes of this study, nurse years of experience were categorized by the researcher as follows: novice nurses are nurses with 0 - 1 year of experience; advanced beginner nurses are nurses with 1 - 2 years of experience; competent nurses are nurses with 2 - 3 years of experience, proficient nurses are nurses with 4 - 7 years of experience; expert nurses with 7 years of experience or more.

Setting

The setting for the study was emergency department nurses working in acute care hospitals in the combined statistical area (CSA) of New York City, United States of America (USA). The CSA of New York City was chosen due to its large population and its proximity to previous disaster events (World Trade Center attack, 1993, 2001; Hurricane Sandy, 2012; trash can bombings in Seaside Park NJ, Elizabeth NJ, and New York City, 2016). According to Nemeth and Hollander (2010) “New York City is a populous, high-profile global city that offers large ‘payoffs’ for urban terrorists in terms of lives, resources and media attention and thus, has the highest degree of target proneness of any city in the USA” (p. 24). The vulnerability of the New York City area to disaster, especially terrorism, makes knowledge of disaster preparedness important for first responders and healthcare providers, including registered nurses living and working in this area.

Instruments and Measurement Methods

The following four research instruments were utilized to collect and measure data from the study participants: The "Emergency Preparedness Information Questionnaire" (EPIQ), the "Acknowledges Using Intuition in Nursing Scale" (AUINS), the "Triage Decision Making Inventory" (TDMI), and a Demographic Data Information Form designed by the researcher.

Emergency Preparedness Information Questionnaire (EPIQ)

After the terrorist attacks in 2001, the Wisconsin Nurses Association (WNA) recognized the need for an assessment of the educational needs of registered nurses in responding to disasters such as bioterrorism and emergencies effecting public health. The WNA took a leadership role in by holding a three-day summit with the intent of developing a questionnaire to identify critical competency dimensions and to determine the education and training needs of RNs. The resulting competency measurement instrument was called the Emergency Preparedness Information Questionnaire (EPIQ; see Appendix B). The summit provided initial insight into the competencies and capabilities needed by nurses and first responders when responding to a large-scale emergency event. The EPIQ consists of nine subscales. The summed total of the EPIQ subscales measures a nurse's self-reported familiarity with aspects of emergency preparedness. The questionnaire includes eight dimensions of emergency preparedness measured on a Likert scale of 1 = very familiar to 5 = not familiar. The subscale dimensions include familiarity with the incident command system; ethical issues in triage; epidemiology and surveillance; familiarity with decontamination; familiarity with communication and connectivity; familiarity with psychological issues; familiarity with special populations; and familiarity with accessing vital resources. The total summed score of the EPIQ was used as a measure of nurses' perceived knowledge in disaster preparedness. This instrument

was selected over other instruments for its content, it's utilization in multiple research studies, and its high validity and reliability.

Validity and Reliability

Initial testing for validity and reliability was completed by the creators of the EPIQ. The researchers conducted a factor analysis on the 44 questions involving familiarity to determine the number of emergency preparedness dimensions. The preparedness questions grouped as expected and had high internal reliability. The cumulative variance explained from the Equimax factor analysis was 73.5% and the resulting coefficient alphas ranged from 0.83 to 0.94, indicating high levels of internal reliability. In a later study, Garbutt, Peltier, and Fitzpatrick (2008) evaluated the EPIQ and reported Cronbach's alphas for the subscales ranged from 0.83 - 0.94 and 0.97 for the total instrument. Garbutt, Peltier, and Fitzpatrick also reported strong internal consistency reliability with Cronbach's alphas for the subscales ranging from 0.84 - 0.95 and 0.98 for the EPIQ total instrument.

Acknowledges Using Intuition in Nursing Scale (AUINS)

The AUINS (Rew, 2000) was selected to evaluate perceived use of intuition for this research study. The AUINS was selected for its use in the nursing literature, its easily understandable content, and it's focus on investigating the use of intuition for decision-making (see Appendix C). The researcher received permission to use the AUINS from the author.

Validity and Reliability

The AUINS (2000) is a seven-item self-reporting instrument developed by Rew that measures the self-reported use of intuition in clinical decision-making. Participants have the choice to respond "agree," "disagree," or "don't know" to each item. A higher number of "agree" responses indicate acknowledgment of greater use of intuition when making clinical decisions.

Rew developed the AUINS by conducting studies in three phases. During phase one, the instrument was constructed by Rew based on a review of the published nursing and management literature. Content validity was established by a review of two panels consisting of experts on the concept of intuition in nursing. The expert panel review resulted a content validity index of 0.96 and a reduction in the number of items from 50 to 28. Phase two consisted of Rew mailing the revised 28-item instrument to a sample of 250 randomly selected clinically active psychiatric-mental health nurses obtained from a list by the state board of nurse examiners in a southern state. A final sample of 106 participants reviewed the instrument resulting in a Cronbach's alpha coefficient of internal consistency of 0.84. Through factor analysis, the instrument was further reduced to 21 items, with eigenvalues ranging from 1.01 to 5.78 and explaining 64.5% of the scores. Construct validity was supported through factor analysis and the known-groups technique.

In the third and final phase of development, the revised 21 item scale was presented to a convenience sample of 112 nurses from multiple clinical backgrounds who attended continuing education courses at a major university. Factor analysis was conducted on AUNIS providing evidence of construct validity and the known groups technique was repeated to support construct validity of a unidimensional form of the scale. The data from this evaluation, underwent unidimensional statistical analyzation where any items reporting a factor analysis of less than 0.72 were removed. This resulted in a seven-item version of the unidimensional Acknowledges Using Intuition in Nursing Scale (AUINS). Rew reported a 0.91 for Cronbach's alpha coefficient of internal consistency based on the analysis performed during phase three.

Triage Decision Making Inventory (TDMI)

Cone's Triage Decision Making Inventory (TDMI; 2000) was developed to quantitatively evaluate the self-perceived confidence level of emergency department nurses in making triage decisions (see Appendix D). The TDMI is a 27-item instrument utilized to measure the decision-making abilities of triage nurses with a total summative score is 162 for the 27 items. Influences on triage decision-making include cognitive abilities, clinical experience, and intuition (Cioffi, 1998, 2001; Smith & Cone, 2010) which are the three subscales of the TDMI. The first subsection measures cognitive abilities, the second subsection measures experience, and the third and final subsection measures intuition. The instrument utilizes a Likert scale that has six choices ranging from strongly agree to strongly disagree. This instrument was selected over other instruments for its content, it's utilization in research studies involving emergency department nurses, and its high validity and reliability. The researcher received permission to use the AUINS from the author.

Validity & Reliability

The TDMI originated as a 37-item Likert-type scale that had six choices ranging from strongly agree to strongly disagree. In the development of the instrument, ten expert emergency room nurses were utilized to describe the characteristics, insights, and decision-making of nurses working in triage (Cone & Murray, 2002). The items developed for the instrument were based on experience, perceived use of intuition, assessment skills, critical thinking skills, and communication, which were identified as characteristics of experienced triage nurses (Cone & Smith, 2010). As a 37-item instrument, the TDMI was initially evaluated in a sample of 208 emergency department nurses by Cone (2000). The instrument was used again by Smith and Cone in 2010 and by Smith in 2012.

In the TDMIs initial evaluation by Cone (2000) internal consistency was measured through Cronbach's alpha, which was .95 for the entire instrument. The Cronbach's alpha for each subscale ranged from 0.84 to 0.89. indicating that the TDMI's items were related and measured the same concept (Frank-Stromberg & Olsen, 2004; Mishel, 1998). Additionally, a test-retest was completed with 23 participants with a score of 0.77 indicating stability over time in the ability to measure decision-making (Polit, 1996). The subscale of cognitive abilities incorporates prioritization skills, organization skills, judgment, critical thinking, and knowledge. The subscale of experience includes the skills necessary to make a decision and perceived use of intuition items focus on gut feelings, sixth sense, or inner feelings. In 2000, the TDMI was tested with a sample of 583 experienced nurses of multiple clinical specialties and demonstrated acceptable reliability and validity data (Smith & Cone, 2010). The following four factors emerged from this evaluation through factor analysis: critical thinking, cognitive characteristics, perceived use of intuition, and experience. These four factors reflected the same dimensions identified in the sample of emergency nurses from the earlier study. A fifth factor emerged, which represented two negatively worded items created for the factor of experience. The reliabilities for each factor were acceptable (Smith & Cone, 2010). No items were dropped in this pilot evaluation using a sample of nurses with diverse clinical specialties. All factor loadings for each factor were greater than .30. The alpha coefficients were as follows: 0.95 for the entire inventory, 0.92 for Factor 1 (cognitive characteristics), 0.94 for Factor 2 (experience), 0.87 for Factor 3 (critical thinking), 0.87 for Factor 4 (intuition), and 0.38 for Factor 5 (negatively worded items for experience).

The TDMI was most recently evaluated in 2012 study by Smith in a sample of 190 military and civilian nurses employed at a military health facility. The results were found to be

consistent with the first pilot study conducted by Smith and Cone (2010) and statistical findings proved reliability and validity of the TDMI. Statistical analysis also allowed for the instrument to combine two of the instruments subscales, “Critical Thinking” and “Cognitive Characteristics” reducing the number of questions on the instrument, from 37 to 27 items and resulting in the TDMI having three subscales instead of the original four. Principal component analysis with Varimax rotation resulted in three factors which accounted for 53.2 % of the concept of triage decision-making. The factors were labeled as Cognitive Abilities (41.7%), Experience (7%), and Intuition (4.5%). Eigenvalues ranged from 1.69 to 15.5, factor loading ranged from .50 to .80, and Cronbach's alpha for each factor ranged from 0.86 - 0.92. Using factor loadings and conceptual consistency, 10 items were dropped resulting in a 27-item inventory. Factor analysis was used to establish construct validity. The statistical findings from this study suggest a valid and reliable instrument in a sample of nurses with diverse nursing specialties and the three factors reflected the original conceptualization of triage decision-making by Cone (2000). The statistical analysis of Smith’s study reflected the results from two prior psychometric evaluations (Cone, 2000; Smith & Cone, 2010) and helped reduce the number of items in the inventory from 37 to 27. The remaining 27 items are applicable to nurses working in all types of clinical settings as the findings of this study provide the psychometric data on the inventory for a new sample of nurses thus, narrowing a research gap and providing an inventory for all nurses.

Although limitations of this study included sample size, data collection method, and the generalizability of findings, the results were significant and further demonstrated the reliability and validity of the TDMI. Smith also identified the TDMI as a valuable instrument to assess nurses working in other “high demanding patient situations” (p. 136) such as a “metropolitan

ED, during natural disaster, in a combat/war setting, or on a busty medical surgical unit" (p. 136).

Demographic Data Information Form

The Demographic Data Information Form (see Appendix E), constructed by the researcher, is a 25-item questionnaire which elicited data on a variety of demographic characteristics of research study participants. Each participant was asked to respond to the questions including those pertaining to employment as an ED nurse: whether the participant had greater than one year experience working as an ED nurse, length of time as an ED nurse in current hospital, overall length of time as a ED nurse, length of time as a nurse in current hospital, category of hospital at which the participant is employed, if the hospital the participant is employed is a trauma center and the trauma center level, the size of the hospital at which the participant is employed, length of time as an registered nurse overall, if the participant had ever had disaster preparedness training, if disaster preparedness training or education was offered by their hospital, if the participant has had disaster preparedness training or education in the last five years, if the participant had ever taken care of patients during a disaster event, if the participant had ever worked during a disaster event, if the participant triages patients, if the participant had ever received triage training or education, if triage training was offered by their hospital, had the participant received triage training or education in the last five years, the participant's highest achieved educational level in nursing, whether the participant was a full or part time employee, the participants state of residence, the participants county of residence, and the participant's age and gender.

Data Collection Procedures

Volunteer participants were recruited via the Emergency Nurses Association (ENA) External Research Opportunity webpage. Following the study approval by Seton Hall University's (SHU) Institutional Review Board (IRB), the study proposal, proof of SHU IRB approval, research instruments, and process for consent were submitted to the ENA leadership for review. Once approved, the ENA posted the study survey via a link on the ENA External Research Opportunity webpage where potential participants were able to complete the research study. Once the participant selected the link on the ENA External Research Opportunity webpage, they were directed to the Qualtrics website that included the title of the university affiliated with the researcher (SHU) and the Letter of Solicitation (see Appendix A). The Letter of Solicitation contained a general explanation of the study in which the researcher explained the general reason for requesting the invitation to participate in the study, presented an overview of the study, the ethical issues related to participation in the study, the eligibility of the participants for the study, and a formal request for volunteer participants. The letter provided specific information about the following: the researchers academic affiliation, data collection procedures, a description of all questionnaires, the suggested process for completing the research instrument, and submission of the survey. The letter also included information about the nature of voluntary and anonymous participation in the study, the risks and benefits for participation, and contact information to use if the participant had questions about the study or his or her rights as a participant in research. There was a clear statement in the letter that informed the participant that submission of completed surveys implied consent to voluntarily participating in the research study and thus, no formal consent form was used, and no signature was requested or required. Additionally, the letter included a statement pertaining to the use of caution when submitting any

information via the internet and to only submit their information to the site specifically for this study.

Analysis of Data

The data collected within the Qualtrics software was reviewed for accuracy by the primary researcher and subsequently transferred to a Statistical Package for the Social Sciences (SPSS) file. Utilizing assistance from a statistician, the appropriate descriptive statistics were run on each of the variables, to provide a mean, median, mode, range of scores, and/or standard deviation to describe central tendencies. Linear regression analyses was used to determine the relationships of the independent variables of perceived use of intuition and triage decision-making and potential influence on perceived disaster preparedness knowledge. Pearson Product Correlation was used to determine if significant relationships and an ANOVA was used to determine if hospital category and size differences influenced perceived disaster preparedness.

Graphics were used to communicate the distribution of the major concepts of concern [EPIQ, AUINS, & TDMI], and certain demographic variables. Where appropriate, inferential analyses were run to understand patterns and relationships among the variables. Bivariate correlations were run on the major concepts of concern and select demographic variables to determine the strength and direction of the relationships between variables. Inferential statistics was completed on the variables that are related to the major concepts of concern to determine predictive values.

Ethical Considerations

The protection of human rights of the participants of this research study were maintained throughout the course of the study. The researcher submitted an application to the Seton Hall University (SHU) Institutional Review Board (IRB). A letter of participation (see Appendix A)

was included as part of the survey prior to the survey questions for potential participants. The letter provided an explanation of the research and discussed the rights of the participants, including the right to independently volunteer in the study. The letter assured participants that whether they choose to participate or not, their decision would remain anonymous, since all data collected as part of the research was done anonymously. Withdrawal from the study was discussed, as the participants had the right to withdraw from participation in the study without reprisal. The letter provided specific information about the following: the researcher's academic affiliation, data collection procedures, a description of all questionnaires, the suggested process for completing the research study forms and for submission of the survey via Qualtrics. The letter also included information about the nature of voluntary and anonymous participation in the study, the risks and benefits for participation, and contact information to use if the participant had questions about the study or rights as a participant in research. There was a clear statement in the letter of participation that submission of completed surveys implied consent to having voluntarily participated in the research study and thus, no formal consent form was used, and no signature was requested or required. Additionally, the letter stated the approximate duration of the survey and demographic form (20 minutes).

CHAPTER IV

RESULTS

Data Analysis Procedures

This research study investigated the relationships between and among disaster preparedness knowledge, perceived use of intuition, and triage decision-making of emergency department registered nurses in acute care hospitals using Benner's *Novice to Expert* theory. The study was conducted via electronic survey made available by a link on the Emergency Nurses Association (ENA) External Research Opportunity webpage, where participants were able to click on a link to complete the research study. Once participants selected the link on the ENA External Research Opportunity webpage, they were directed to the Qualtrics website that included the title of the university affiliated with the researcher (Seton Hall University) and the letter of solicitation. One hundred and forty-two people responded to the survey. One hundred and twenty-three respondents met the criteria for inclusion in the study.

Participants completed the Emergency Preparedness Information Questionnaire, the Acknowledges Use of Intuition Scale, the Triage Decision Making Inventory, and a Demographic Data Information Form. Analysis of data was conducted using the Statistical Package for the Social Sciences (SPSS 24.0 for Windows) utilizing Pearson Product-Moment Correlation and Linear Regression. Descriptive analysis provided information about characteristics of the sample as well as study variables.

Research Participants

Inclusion criteria to participate in this study were employment as an emergency department registered nurse for one year or greater, residency in the New York combined

statistical area, and have a BSN degree or higher. Review of data demonstrated 75% (n = 123) of all participants (N = 142) met inclusion criteria. Of the those eligible for inclusion, one hundred percent (n = 123) of the research study participants were emergency department nurses who worked in the emergency department for one year or greater, resided in the New York City combined statistical area and reported having a BSN degree or higher [BSN 73.2%, (n = 90), Masters degree 24.4%, (n = 30), Doctorate 2.4%, (n = 3)] as shown in Table 1. More than half, 67.5% (n = 83) of the study participants were employed at a teaching hospital or university medical center, however less than half 37.4% (n = 46), reported employment at a hospital designated a trauma center and employment at a level 1 trauma center, 30.1% (n = 37) as outlined in Table 1. According to the hospital size by bed count, participants appeared to be evenly distributed [50-250 beds 29.3%, (n = 36), 251-500 beds 33.3%, (n = 41), 501 beds or more 31.7%, (n = 39)]. Approximately 89.4% (n = 110) reported having disaster preparedness training, 68.3% (n = 84) reported that training or education was offered by the hospital where they work, and 81.3% (n = 100) of the study participants reported having disaster preparedness training or education in the previous 5 years. More than half 66.7% (n = 82) of the participants reported never being involved in caring for patients during a disaster event or being on duty during a disaster event, 66.4%, (n = 81). About 91.1% (n = 112) of participants reported to work in triage and about 94.3% (n = 116) and 95.9% (n = 118) reported receiving triage training or education and it being offered by their hospital, respectively. Slightly more than three quarters, 75.6% (n= 93), of participants reported having received triage training or education in the last 5 years. The majority of participants reported being employed full time [87%, (n = 107)] and 58.5% (n = 72) participants resided in the state of New Jersey, 41.5% (n = 51) in the state of

New York. Approximately 85.4% (n = 105) of the participants were female, 13.0% (n = 16) were male, and 1.6% (n = 2) identified as other than male or female.

The age of research participants ranged from 23 to 67 years of age. Non-categorical data, depicted in Table 1, showed the average age of participants was 40 years old (M = 40.4, SD = 11.76). Participants' years of experience as an Emergency Department RN ranged from 1 to 40 years (M = 10.57, SD = 8.78), and the length of time as a registered nurse in overall career ranged from 1 to 45 years (M = 14.20, SD = 11.65).

Table 1. Descriptive Statistics – Demographic Variable Responses

Variables	**N**	**Mean**	**SD**
Age	122	40.40	11.76
Years as ED RN	122	10.57	8.78
Years as RN	122	14.20	11.65
Gender	123	**Number**	**Percent**
Females		105	85.4
Males		16	13
Other		2	1.6
Location	123		
New Jersey		72	58.5
New York		51	41.5
Level of Education	123		
Bachelor's Degree		90	73.2
Master's Degree		30	24.4
Doctorate Degree		3	2.4
Training	123		
DP training		110	89.4
Triage training		118	95.9
Category of Hospital	123		
Teaching Hospital		83	67.5
Trauma Center (any level)		46	37.4
Level 1 Trauma Center		37	30.1

Descriptive Statistics of the Main Variables

The descriptive statistics for the main variables include the mean, standard deviation, median, possible and actual ranges, and the skewness of the three main variables of this research study: disaster preparedness knowledge, perceived use of intuition, and triage decision-making.

Figure 1. Disaster Preparedness Knowledge

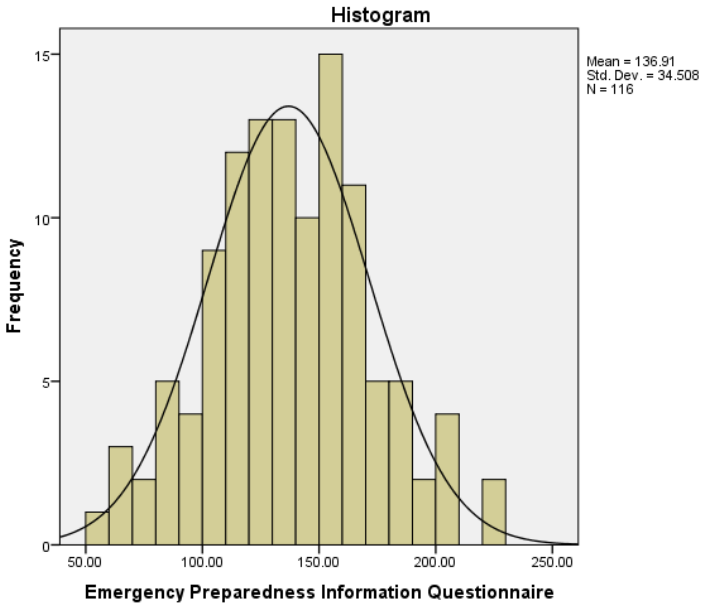


Figure 2. Perceived Use of Intuition

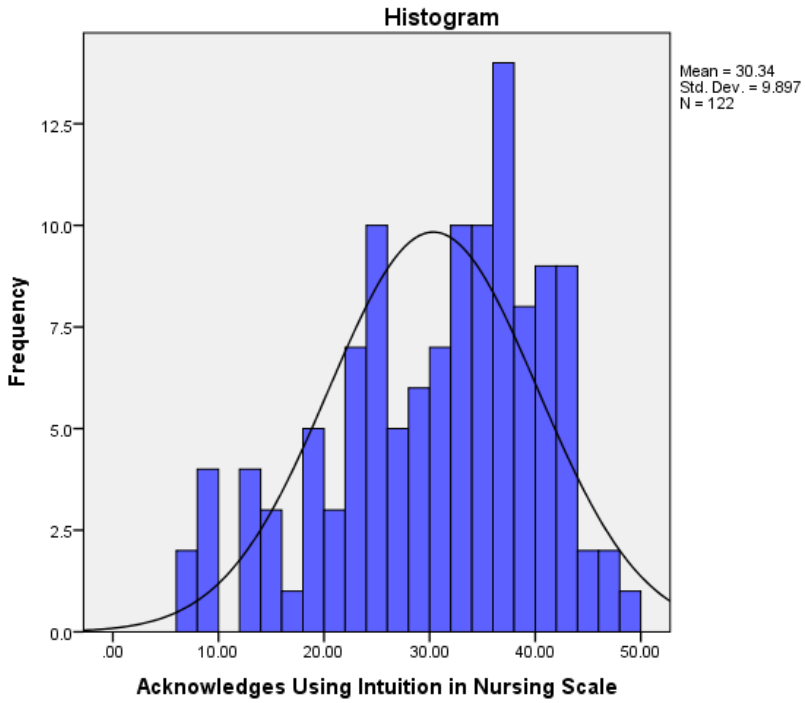
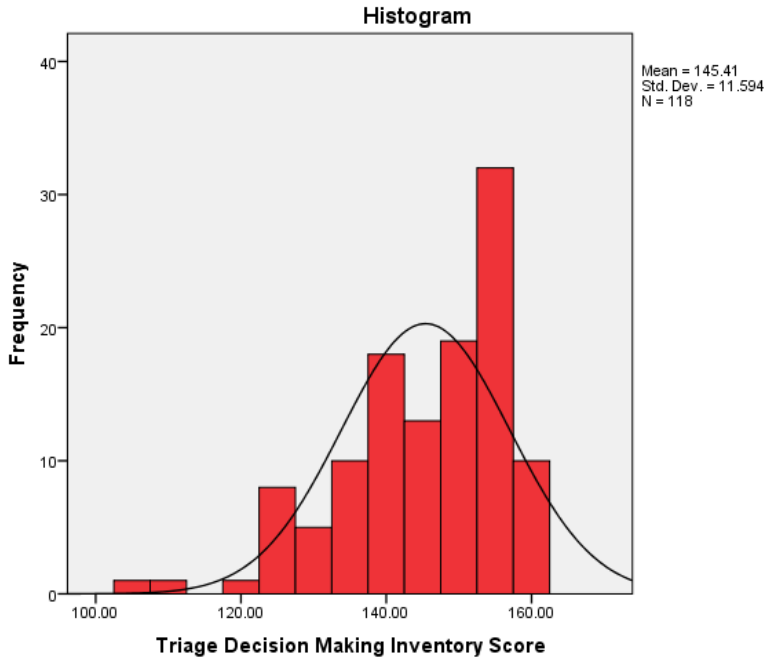


Figure 3. Triage Decision-Making



Scoring for the Emergency Preparedness Information Questionnaire (EPIQ) which measured disaster preparedness knowledge can range from 45 – 225. For the purposes of this study the EPIQ's Likert scale was reversed to maintain uniformity among the instruments. Scores from the participants ranged from 57 to 224. Scoring for the Acknowledges Using Intuition in Nursing Scale (AUINS) which measured perceived use of intuition ranges from 7 to 49. Research participant scores ranged from 7 to 48. The scoring for the Triage Decision Making Inventory (TDMI) can range from 27 – 162; scores from the participants ranged from 105 to 162 since one outlier with a score of 27 was removed to meet the assumption of normal distribution. The midpoints for disaster preparedness knowledge, perceived use of intuition, and triage decision-making were 135, 24.5, and 94.5 respectively and each were exceeded by the mean scores of each instrument by the participants (M = 136.91, SD = 34.51; 30.34, SD = 9.90; 145.41, SD = 11.59) as shown in Figures 1 - 3.

Presentation of Results

Research Question

The principal question of this research study examines whether there are relationships between and among disaster preparedness knowledge, perceived use of intuition, and triage decision-making to manage a disaster, in Emergency Department nurses employed by acute care hospitals. Pearson Correlation statistical analysis of the data is presented in Table 2. Analysis proved a significant relationship between disaster preparedness knowledge and triage decision-making (r = .22, p = .02) however, the relationship between disaster preparedness knowledge and perceived use of intuition was not statistically significant (r = .02, p = .84). The relationship between perceived use of intuition and triage decision-making was also not significant (r = .12, p = .18) demonstrating no relationship. Since nearly half of the participants never cared for a

patient during a disaster, an independent *t*-test was run to determine whether there was a statistically significant difference in the participants' scores on disaster preparedness knowledge. The participants who cared for a patient during a disaster had a mean score of 155.65 (*SD* = 36.32) and the participants who had not cared for a patient during a disaster had a mean score of 128.12 (*SD* = 30.03) $t(114) = 4.29$, $p \leq .001$. Likewise, an independent *t*-test was run to determine whether participants who had not worked in triage had statistically significant different scores on disaster preparedness knowledge when compared to participants who had worked in triage. The test showed there was no significant difference in the participants' scores; participants who worked in triage had a mean score of 137.73 (*SD* = 35.10) and participants who did not work in triage had a mean score of 129.00 (*SD* = 28.25) $t(114) = .79$, $p = .43$. A one-way ANOVA was run to determine whether there were statistically significant different scores on disaster preparedness knowledge by hospital size. The results from the ANOVA demonstrated a significant difference $F(3, 115) = 7.04$, $p \leq .001$. Post hoc results showed significant different scores between participants employed at hospitals with 501 beds or more and participants employed at hospitals with 50-250 beds ($p \leq 001$). Additionally, there were significantly different scores between participants employed at hospitals with 501 beds or more and participants who did not know how many beds their hospital had ($p = 003$).

Hierarchical regression was run to explain which variables were the strongest predictors of disaster preparedness knowledge. The linear combination of 'Caring for Patients During a Disaster' and 'Years as an ED RN' explained a significant 15% variance in disaster preparedness knowledge [$R^2 = .15$, $F(2,111) = 10.26$, $p \leq .001$]. The variables 'Hospital Bed Size', 'Disaster Preparedness Training Offered', and 'Teaching vs Non-Teaching Hospital' explained an

additional 19% [R^2 change = .19 $F(3,108) = 10.62$, $p \leq .001$] above and beyond 'Caring for Patients During a Disaster' and 'Years as an ED RN'.

Hypotheses Testing

Central tendency was computed for each participant score for the measures of between the major study variables (EPIQ, AUINS, and TDMI). Pearson Correlation and multiple linear regression statistics were utilized to determine relationships between variables.

H1. Hypothesis 1 stated that perceived use of intuition and triage decision-making in emergency department nurses employed in acute care hospitals as a group are predictive of overall disaster preparedness knowledge. Multiple linear regression analysis demonstrated perceived use of intuition and triage decision-making together did not predict a statistically significant portion of the participants' disaster preparedness knowledge, [$R = .22$, $R^2 = .05$, $F(2,108) = 2.86$, $p = .06$]. This hypothesis was not supported. Separately however, triage decision-making did predict disaster preparedness knowledge ($\beta = .48$, $p = .02$).

H2. Hypothesis 2 stated there is a relationship between disaster preparedness knowledge and years of experience as an emergency department (ED) registered nurse (RN) employed in acute care hospitals. The Pearson correlation coefficient between disaster preparedness knowledge and years of experience as an ED RN demonstrated a positive statistically significant relationship ($r = .27$, $p = .00$). This hypothesis was supported. However, the regression equation which contained 'Caring for Patients During a Disaster' and 'Years as an ED RN' showed that 'Years as an ED RN' did not explain a significant portion of disaster preparedness knowledge ($\beta = .76$, $p = .06$).

H3. Hypothesis 3 stated there is a relationship between disaster preparedness knowledge and prior disaster preparedness training in emergency department registered nurses employed in acute care hospitals. The Pearson correlation coefficient between disaster preparedness knowledge and prior disaster preparedness training demonstrated a slight but statistically significant relationship (r = .23, p = .01). This hypothesis was supported. An independent t-test was run to determine whether there was a statistically significant difference in the participants' scores on disaster preparedness knowledge. The participants who reported disaster preparedness training had a mean score of 139.66 (SD = 34.41) and the participants who did not have disaster preparedness training had a mean score of 115.00 (SD = 27.52) $t(114) = -2.48$, p = .01.

H4. Hypothesis 4 stated there is a relationship between disaster preparedness knowledge and prior disaster patient care in emergency department registered nurses employed in acute care hospitals. The Pearson correlation coefficients between disaster preparedness knowledge and prior disaster patient care demonstrated a positive statistically significant relationship (r = .37, $p \leq$ = .001). This hypothesis was supported.

The regression equation which contained 'Caring for Patients During a Disaster', 'Years as an ED RN', 'Hospital Bed Size', 'Disaster Preparedness Training Offered', and 'Teaching vs Non-Teaching Hospital' showed that 'Caring for Patients During a Disaster' explained the largest significant portion of disaster preparedness knowledge (β = 17.14, p = .00).

H5. Hypothesis 5 stated there is a relationship between disaster preparedness knowledge and triage experience among emergency department registered nurses employed in acute care hospitals. The Pearson correlation coefficients between disaster preparedness knowledge and

triage experience yielded a weak and not statistically significant relationship (r = .07, p = .43). Therefore, this hypothesis is not supported.

H6. Hypothesis 6 stated there is a relationship between disaster preparedness knowledge and triage training among emergency department registered nurses employed in acute care hospitals. The Pearson correlation coefficients between disaster preparedness knowledge and triage training experience yielded a weak and not statistically significant relationship (r = .11, p = .26). Therefore, this hypothesis is not supported.

H7. Hypothesis 7 stated there is a relationship between disaster preparedness knowledge and employment at a teaching hospital/university medical center among emergency department registered nurses employed in acute care hospitals. The Pearson correlation coefficients between disaster preparedness knowledge and employment at a teaching hospital/university medical center demonstrated a positive and statistically significant relationship (r = .25, p = .007). This hypothesis was supported. An independent *t*-test was run to determine whether there was a statistically significant difference in the participants' scores on disaster preparedness knowledge. The participants who reported working at a teaching hospital had a mean score of 142.89 (SD = 34.53) and the participants who reported working at a non-teaching hospital had a mean score of 124.60 (SD = 31.43) $t(114) = -2.75$, p = .00.

H8. Hypothesis 8 stated there is a relationship between disaster preparedness knowledge and the size of hospital in emergency department registered nurses employed in acute care hospitals. The Pearson correlation coefficients between disaster preparedness knowledge and the size of hospital demonstrated a positive and statistically significant relationship (r = .40, p < .001). This hypothesis was supported. In fact, the regression equation which contained 'Caring for Patients During a Disaster', 'Years as an ED RN', 'Hospital Bed Size', 'Disaster

Preparedness Training Offered', and 'Teaching vs Non-Teaching Hospital' showed that 'Hospital Bed Size' explained the largest significant portion of disaster preparedness knowledge ($\beta = 11.15$, $p \leq .001$).

H9. Hypothesis 9 stated there is a relationship between disaster preparedness knowledge and the level of nursing education among emergency department registered nurses employed in acute care hospitals. The Pearson correlation coefficient between disaster preparedness knowledge and level of nursing education demonstrated a slight but statistically significant relationship ($r = .20$, $p = .04$). This hypothesis was supported. However, a one-way ANOVA was run to determine whether there were statistically significant different scores on disaster preparedness knowledge by the participant education levels. The results from the ANOVA demonstrated there was not a significant difference $F(5, 110) = 2.05$, $p = .07$.

Table 2. Correlations among Variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1. Yrs. as E.D. RN	1	-.02	.06	.09	.09	.86**	.02	.14	-0.1	.26**	.30**	.23*	.02	.04	-.17	.07	.78**	.27**	-.22**	.26**
2. Hospital category		1	.48**	.41**	.47**	-.03	.21*	.12	.29**	.09	.05	-.10	.13	.30**	.13	.08	.02	.25**	-.13	.06
3. Trauma Center			1	.41**	.52**	-.01	0.15	.13	.23*	.17	.10	.00	0.11	.15	.15	0.1	0.03	.28**	0.01	-0.01
4. Trauma Center level				1	.20*	0.11	.20*	.21*	.16	.18*	.12	.02	.15	.16	-.01	.17	.19*	.23*	.11	-.04
5. Number of beds					1	.02	-.01	.18*	.11	.09	.10	-.09	.05	.21*	-.01	.01	.02	.40**	-.07	0
6. Yrs. as RN						1	.07	.20*	-.15	.28**	.32**	.17	.07	.06	-.24**	.12	.86**	.29**	-.17	.20*
7. DP training or education							1	.36**	.45**	.19*	.19*	.08	.26**	.06	.05	-.08	.07	.23*	-.06	.05
8. DP training or education offered or required								1	.36**	.23*	.22*	.17	.11	.19*	-.09	.11	.26**	.38**	.02	.09
9. DP training or education last 5 years									1	.12	.08	0	.15	.01	.07	-.02	-.11	.23*	0	.02
10. Caring during a disaster										1	.85**	.10	.10	.15	0	.25**	.22*	.37**	-.06	.21*
11. Worked/on duty during a disaster											1	.04	.10	.15	-.04	.16	.26**	.33**	-.08	.23*
12. Work in Triage												1	.17	.08	.22*	.08	.19*	.07	-.02	.22*
13. Triage training or education													1	.31**	.43**	.06	.09	.11	.10	.07
14. Triage training or education offered or required														1	.17	.03	.09	.15	-.05	.11
15. Triage training or education last 5 years															1	-.18	-.16	.05	0	.02
16. Highest level of education completed																1	.05	.20*	.15	.15
17. Age																	1	.29**	-.23*	.21*
18. DP Score																		1	.02	.22*
19. Intuit Score																			1	.12
20. TDMI Score																				1

* Correlation is significant at the 0.05 level.
** Correlation is significant at the 0.01 level.
a. Cannot be computed because at least one of the variables is constant.

Reliability of Measures

To test the reliability of the EPIQ, the AUINS, and the TDMI instruments, Cronbach's alpha coefficients were calculated to test internal consistency. According to Polit and Beck (2010), internal consistency is the best approach to assess a source of measurement error in psychosocial instruments and the sampling of items. Internal consistency calculations ensure items on a scale measure one uniform attribute.

The EPIQ (Wisniewski, Dennik-Champion & Peltier, 2004) was used to measure disaster preparedness knowledge. To determine reliability of the EPIQ, the Cronbach's alpha was calculated. In this research study's sample of emergency department (ED) registered nurses, the alpha was .98 for the total EPIQ. The AUINS (Rew, 2000) used to measure perceived use of intuition had a Cronbach's alpha of .91 and the Cronbach alpha for the TDMI (Cone, 2000), used to measure triage decision-making, was .96.

Ancillary Analysis

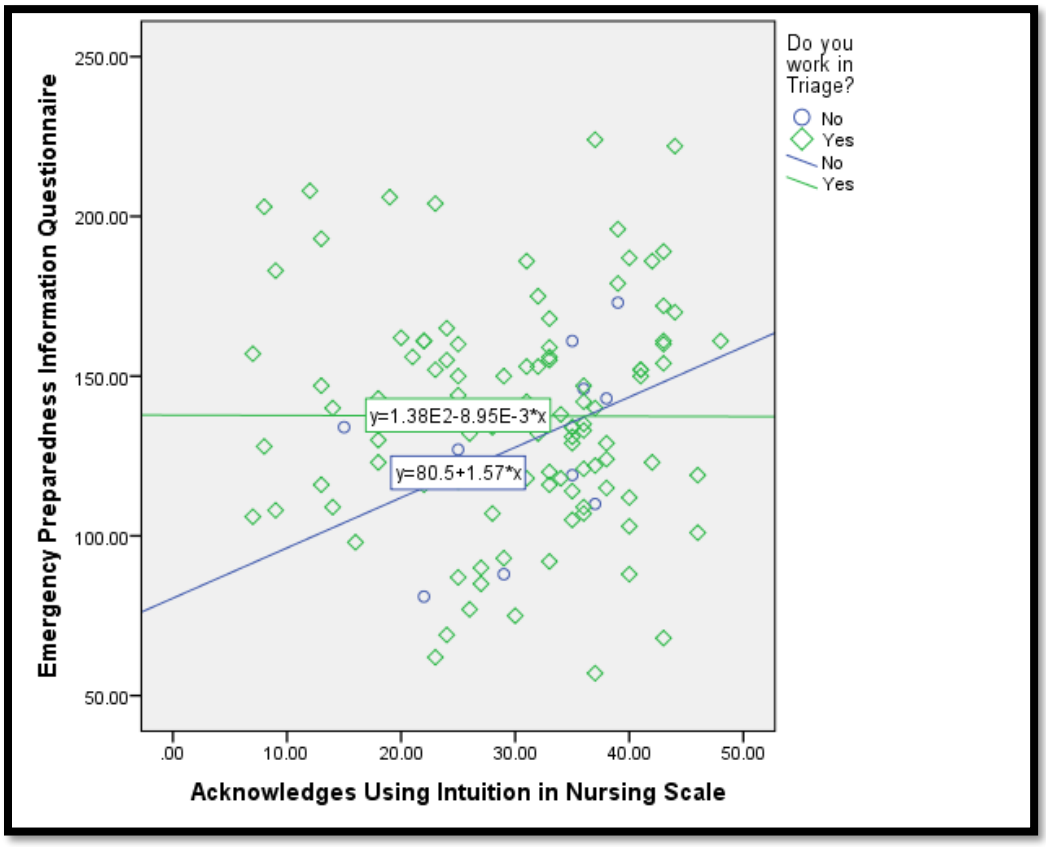
Further analysis of the data utilizing Pearson Correlation statistical analysis (see Table 2) revealed a positive significant correlation between triage decision-making and the number of years as an ED RN (r = .26, p = .01). A significant inverse relationship was noted for the number of years as an ED nurse and perceived use of intuition (r = -.22, p = .02). In this case, this sample of ED nurses reported using less intuition in their practice as their years as an ED nurse increased.

Disaster preparedness knowledge and triage decision-making were found to have a positive and significant correlation with age (r = .29, p = .00), (r = .21, p = .02). Conversely, perceived use of intuition had an inverse significant relationship with age (r = -.23, p = .01).

Triage decision-making demonstrated positive significant relationships with triage experience (r = .22, p = .01) and working during a disaster event (r = .23, p = .01). Moreover, a positive and statistically significant relationship was noted between disaster preparedness knowledge and employment at a hospital designated as a level 1 trauma center (r = .23, p = .013).

Further statistical testing of sample subsets related to previous experience were completed to determine if participants without previous experiences resulted in different statistical outcomes. Pearson correlation statistics were run among the 11 participants who did not have triage experience. Contrary to initial findings, results now demonstrated that perceived use of intuition had a significant positive relationship with triage decision-making (r = .68, p = .02). In addition, the scatterplot below demonstrates an interactive effect of whether the participants worked in triage. Specifically, there was a positive relationship (R^2 = .18) between disaster preparedness knowledge and perceived use of intuition among participants with no triage experience and no relationship between disaster preparedness knowledge and perceived use of intuition among participants who worked in triage (see Figure 4), suggesting that people who have experience in triage use less intuition. Pearson correlation statistics were also completed to compare whether previous experience caring for patients during a disaster impacted the variables. Results showed no interaction among the participants regardless of whether they had previous experience caring for patients during a disaster or not.

Figure 4. Interactive Effect of Triage Experience on the relation between Perceived Use of Intuition and Disaster Preparedness Knowledge



Summary

Pearson Correlation statistical analysis of the data gathered from this sample of emergency department registered nurses employed at acute care hospitals and residing in the New York City combined statistical area, found a positive significant relationship between disaster preparedness knowledge and triage decision-making (r = .22, p = .02) but no significant relationship between disaster preparedness knowledge and perceived use of intuition (r = .02, p = .84) nor significant relationship between perceived use of intuition and triage decision-making (r = .12, p = .18). Further statistical analysis by linear regression revealed that perceived use of intuition and triage decision-making do not predict overall disaster preparedness knowledge. Additionally, the mean average score on the EPIQ (M = 136.91, SD = 34.51) was just above the

instrument's midpoint (135), indicating this samples perception of their disaster preparedness knowledge was moderate since the highest possible score was 225.

CHAPTER V

DISSCUSSION OF FINDINGS

This research study investigated the relationships between and among disaster preparedness knowledge, perceived use of intuition, and triage decision-making of emergency department registered nurses in acute care hospitals using Benner's *Novice to Expert* theory. A sample of 123 participants completed the Emergency Preparedness Information Questionnaire (EPIQ), the Acknowledges Using Intuition in Nursing Scale (AUINS), the Triage Decision Making Inventory (TDMI), and a Demographic Information Form. Although Pearson Correlation analysis reported a statistically significant relationship between disaster preparedness knowledge and triage decision-making ($r = .22$, $p = .02$), further analysis utilizing linear regression demonstrated that perceived use of intuition, and triage decision-making as a group were not predicative of disaster preparedness knowledge [$R = .22$, $R^2 = .05$, $F(2,108) = 2.86$, $p = .06$].

Disaster preparedness is multifaceted considering various administrative and clinical operations, outcomes, and stakeholders (Wise & Nader, 2002). Once considered specialty training for military, public health, and emergency room nurses, disaster preparedness is now a basic requirement for the general nurse according to Patillo (2003). Disaster preparedness knowledge is the ability to define a disastrous event, understand the incident command system, triage and assessment, and their role in a disaster event (Miller, 2011). Fung et al. (2008) emphasized that nurses as clinical leaders are coordinators of care and act as first responders during times of emergency response ensuring the safety of community members and other healthcare team members. Therefore, healthcare professionals should be equipped with the knowledge and skills needed to handle a disaster, and it is crucial for health professionals and

related personnel to be ready, as knowledge of disaster preparedness can serve to maintain the stability in an emergent situation.

Intuition, in this research study, was defined as a "component of complex judgment, the act of deciding what to do in a perplexing, often ambiguous and uncertain situation" (Rew, 2000, p. 95). It is an immediate sense of knowing, a gestalt experience based on the perception of cues linked together with basic knowledge and past experiences. Intuition is a synthesis rather than an analysis. (Miller & Rew, 1988, p. 85). For this study and in addition to the research question, the researcher hypothesized that a relationship would be found between perceived use of intuition and triage decision-making.

Triage decision-making was presented as the skill of making clinical decisions during the triage stage of assessment, involving the prioritizing care and making decisions on interventions that will follow (Smith & Cone, 2010). Triage decision-making is among the first clinical decisions used when caring for a patient. The purpose of triage is to identify the severity of an injury and mitigate negative outcomes through rapid assessment and decision-making (Cone, 2000). Nursing research suggests proper triage decision-making has a positive influence on patient care outcomes (Cone, 2000; Cork, 2014; Edwards, 2007; Robert, 2013).

The Sample

This sample of 123 participants were predominantly female (85.4%) and consisted of emergency department registered nurses residing in the New York City combined statistical area employed in acute care hospitals who achieved a BSN degree or higher and had at least 1-year of experience as an emergency department registered nurse.

The Instruments

Each instrument utilized in the research study demonstrated excellent psychometric properties. In this study of emergency department registered nurses, the alpha reliability for the total score on the EPIQ was .98, the AUINS was .91, and the TDMI was .96. The alpha reliability found in this study was consistent with previous study findings for each instrument: .97 for the EPIQ (Wisniewski, Dennik-Champion, Peltier, 2004), .91 for the AUINS (Rew, 2000), and .95 for the TDMI (Cone, 2000).

Discussion of Results

Research Question

This study examined the relationships between and among disaster preparedness knowledge, perceived use of intuition, and triage decision-making in disaster management in emergency department nurses employed by acute care hospitals. Pearson correlation statistical analysis of the data from this sample of emergency department registered nurses reported a significant relationship between disaster preparedness knowledge and triage decision-making ($r = .22$, $p = .02$), but no significant relationship was reported between disaster preparedness knowledge and perceived use of intuition ($r = .02$, $p = .84$), nor was a significant relationship found between perceived use of intuition and triage decision-making ($r = .12$, $p = .18$).

Results from this study revealed that the sample had higher scores on the EPIQ compared to previous research by Baack and Alfred (2013) and McKibbin, Sekula, Colbert, and Peltier (2011). Scores for the TDMI in this study were high comparable to previous research by Smith et al. (2013) with average scoring above the midpoint. Statistical analysis did demonstrate a significant relationship with scores on the EPIQ and TDMI. Scores for the AUINS in this study

were also reported higher than the midpoint, however**,** statistical analysis did not show any significant relationship between the AUINS and EPIQ or the AUINS and TDMI.

Although previous nursing researchers had not studied relationships between and among disaster preparedness knowledge, perceived use of intuition, and triage decision-making, **s**tudies by Cork (2014), Edwards (2007), Hughes (2016) and Robert (2013) all suggested that nurses use intuition when making clinical decisions. However, contrary to the majority of nursing research that suggested a relationship between use of intuition and clinical decision-making, this study found there was not a significant relationship between intuition and triage decision-making. These findings are similar to the findings by Meeks-Sjostrom (2013) who found no significant correlation between nurses' clinical decision-making and use of intuition when studying suspected elder abuse.

Perhaps an explanation for the similarities with Meeks-Sjostrom's study is the sample used in the studies. The sample for this study and the study by Meeks-Sjostrom (2013) were comprised of a robust sample of all emergency department nurses. Although, the studies by Cork (2014) and Edwards (2007) used a sample of emergency department nurses, small sample sizes were limitations; only 6 and 14 respectively. Small sample sizes may lead to a failure to detect a relationship between the concepts. A post hoc test to determine the power achieved with this research study sample of 111, along with a p value < .05 and an effect size of .23 was computed utilizing G*Power and found to have a power of .69 with 108 degrees of freedom. Of note, the beta coefficient for perceived use of intuition was -.07, p =.82 while the beta coefficient for triage decision-making was .48, p = .01.

The studies by Hughes (2016) and Robert (2013) did not sample emergency department nurses. Hughes studied a sample of nursing students and Robert studied a sample of inpatient

medical-surgical nurses. Emergency department nurses work in a fast paced, sometimes hectic environment that non-emergency department nurses may not regularly face. As Chung (2005) pointed out, emergency department nurses are challenged with external factors such as time constraints and interruptions which can influence their decision-making. Finally, emergency department nurses care for a variety of patients, which may not support development of intuition compared to registered nurses that work in specialty care areas who care only for specific patient diagnosis related to a body system (i.e. cardiac nurses, neuroscience nurses).

Hypotheses

Data were further analyzed to test this study's hypotheses. The first hypothesis was not supported. Linear regression analysis demonstrated that perceived use of intuition and triage decision-making as a group did not predict a significant portion of the variance in disaster preparedness knowledge [$R = .22$, $R^2 = .05$, $F(2,108) = 2.86$, $p = .06$]. This finding is consistent with the finding by Meeks-Sjostrom (2013) who also found no significant predictive relationship between the perceived use of intuition, clinical decision-making, and elder abuse knowledge in sample of 84 emergency department nurses. Findings from Meeks-Sjostrom's and this study support the premise that having a gut feeling does not predict decision-making. Utilization of all emergency department nurses in both studies may explain this finding as well give the assortment of patient diagnoses that emergency department nurses experience and the inability to develop an intuitiveness due to the variety of diagnoses encountered by the emergency department nurse.

Statistical testing of hypotheses 2 through 4 found support for Benner's *Novice to Expert* theory. According to Benner (2004), there are five stages of experiential learning (novice, advanced beginner, competent, proficient, and expert) and each stage is characterized by

increased knowledge gained from previous experiences. Findings for hypothesis 2 were similar to findings by Baack and Alfred (2013), who found that years of experience was related to disaster preparedness knowledge, and Meeks-Sjostrom (2013) who found that years of experience was related to elder abuse knowledge. As in this study, both Baack and Alfred and Meeks-Sjostrom used a sample of emergency department nurses. Results for hypothesis 3 were comparable to those found by McKibbin et al. (2011). Although, McKibbin et al. noted overall low disaster preparedness knowledge scores, they found a positive significant relationship with disaster preparedness knowledge and previous disaster preparedness education. Lastly, support was found for Hypothesis 4. Similar to the findings by Baack and Alfred (2013), a positive significant relationship was found between disaster preparedness knowledge and previous experience caring for patients during a disaster event.

The findings of this study did not support hypotheses 5 or 6, neither of which were researched prior to this study. Hypothesis 5 suggested a relationship between disaster preparedness knowledge and triage experience, and hypothesis 6 suggested a relationship between disaster preparedness knowledge and triage training in emergency department registered nurses employed in acute care hospitals. The results of this study suggest that neither triage experience or triage training are indicative of disaster preparedness knowledge. Thus, disaster preparedness knowledge is not related to triage experience and triage training.

Hypothesis 7 and 8 were not researched prior to this study. Hypothesis 7 suggested a relationship between disaster preparedness knowledge and employment at a teaching hospital/university medical center and hypothesis 8 suggested a relationship between disaster preparedness knowledge and the size of hospital in emergency department registered nurses employed in acute care hospitals. Both hypotheses were supported by the findings in this study (*r*

= .25, p = .01); (r = .40, p < .001). Teaching hospitals/university medical centers are traditionally affiliated with colleges and universities and tend to have greater resources available to staff to promote education and learning. Teaching hospitals/university medical centers often have dedicated education departments that offer training and education courses. Additionally, teaching hospitals/university medical centers are generally large which may explain why this study's findings supported both hypothesis 7 and 8.

Lastly, this study did find support for hypothesis 9. Hypothesis 9 suggested a relationship between disaster preparedness knowledge and the level of nursing education among emergency department registered nurses employed in acute care hospitals. This finding is contrary to the finding by Baack and Alfred (2013) who found that education level did not have a significant relationship with disaster preparedness knowledge.

Ancillary Findings

Demographic variables were analyzed for correlations with disaster preparedness knowledge, perceived use of intuition, and triage decision-making. The following significant relationships were discovered with this research study sample:

1. Disaster preparedness knowledge and employment at a hospital designated as a level 1 trauma center demonstrated a positive significant relationship (r = .23, p = .01).
2. Disaster preparedness knowledge demonstrated a positive and significant correlation with age (r = .29, p = .00).
3. Triage decision-making was found to have a positive and significant correlation with years as an ED RN (r = .26, p = .05).
4. Triage decision-making demonstrated a positive significant relationship with triage experience (r = .22, p = .01).

5. Triage decision-making demonstrated a positive significant relationship with working during a disaster event (r = .23, p = .01).
6. Perceived use of intuition was found to have an inverse significant relationship with the number of years as an ED RN (r = -.22, p = .02).
7. Perceived use of intuition was found to have an inverse significant relationship with age (r = -.23, p = .01).

As noted above in ancillary finding #1, disaster preparedness knowledge had a positive significant relationship with hospital designation as a level 1 trauma center. Perhaps resources at level 1 trauma centers are more robust compared to non-level 1 trauma centers. Hospitals designated as level 1 trauma centers may require emergency department nurses to take educational courses related to trauma to maintain trauma designation. Such courses may incorporate elements of disaster preparedness into the curriculum, as critically injured patients from a disaster event would likely be transported to level 1 trauma centers for care. Additionally, emergency department nurses employed at level 1 trauma centers may have a greater propensity to have actual experience caring for patients during a disaster given the severity of patients they care for; therefore, they may have greater disaster preparedness knowledge. Although the correlation is weak, this notion is supported by the positive significant relationship between employment at a level 1 trauma center and experience caring for a patient during a disaster (r = .18, p = .05).

Disaster preparedness knowledge was also found to have a significant positive relationship with age (ancillary finding 2). The average age of the participants in this study was approximately 40 years old. It is possible the relationship between these two variables is related to experience as older participants would certainly be exposed to a greater number of disaster

related events. Both Baack and Alfred (2013) and Meeks-Sjostrom (2013) found that years of experience was related to increased knowledge. Similar to this study, the average age of participants in Baack and Alfred and Meeks-Sjostrom's studies were 42 and 41 respectively.

Ancillary findings three, four, and five support Benner's *Novice to Expert* theory as each demonstrates a positive significant relationship between triage decision-making and a variable related to experience (years as ED RN, triage experience, experience working during a disaster event respectively). These findings are congruent with those from Patel, Gutnik, Karlin, and Pusci (2008) who found that triage nurses often utilize previous experience when making decisions related to triage.

Contrary to previous nursing research and Benner's theory (Benner,1984; Hughes, 2016; and Pretz & Folse, 2011), significant inverse relationships were found between perceived use of intuition and years of experience as an ED RN and participant age (ancillary findings 6 and 7). These findings indicate that as the emergency department nurse gains greater experience and ages, intuition is less utilized. Perhaps, this is due to the more experienced older ED nurse not needing to utilize or rely on intuition because of the increased knowledge gained from previous experiences. This result may be related to the sample (ED nurses). Although ED nurses are specialized in emergency care, ED nurses encounter all forms of illness and may not have an opportunity to develop intuitiveness for diagnoses compared to nurses in specialized fields. Comparatively, Meeks-Sjostrom (2013) also used a sample of ED nurses, and found no relationships with perceived use of intuition.

An alternative explanation for the lack of relationship between disaster preparedness knowledge and perceived use of intuition may be due to the findings that years of ED experience was not a significant predictor of disaster preparedness knowledge. In fact, a beta weight of less

than 1% indicated that years of ED experience (β = .76, p = .06) does not explain disaster preparedness knowledge. The question could be raised as to what role intuition plays in today's nursing practice as the profession of nursing moves toward evidence-based practice and performance improvement which relies on data compared to intuition based on previous experiences.

Summary

This research study was the first to examine and empirically test the relationships between and among the concepts of disaster preparedness knowledge, perceived use of intuition, and triage decision-making in emergency department registered nurses utilizing Benner's (1984) *Novice to Expert* theory as a foundation. Disaster preparedness knowledge was not found to have a significant relationship with perceived use of intuition, however**,** disaster preparedness knowledge did have a positive significant relationship with triage decision-making. As a group, perceived use of intuition and triage decision-making was not predictive of disaster preparedness knowledge, although**,** by itself, triage decision-making was predictive of disaster preparedness knowledge. Significant relationships were found between demographic variables related to experience and disaster preparedness knowledge and triage decision-making supporting Benner's *Novice to Expert* theory. Significant relationships between disaster preparedness knowledge and; 1) years of experience as an ED nurse, 2) prior disaster preparedness training, and 3) prior experience caring for patients during a disaster among ED nurses employed in acute care hospitals. Ancillary findings also supported Benner's theory demonstrating positive significant relationships between triage decision-making and; 1) years of experience as an ED nurse, and 2) experience working in triage among ED nurses employed in acute care hospitals. The empirical

evidence was congruent with Benner's *Novice to Expert* theory indicating that knowledge is gained from experience.

Empirical testing of perceived use of intuition demonstrated no significant relationships with disaster preparedness knowledge or triage decision-making. Additional testing of perceived use of intuition with demographic variables yielded significant inverse relationships with years of experience as an ED nurse employed in acute care hospitals and the age of participants. This finding indicates that as ED nurses gain experience, intuition is utilized less in clinical practice. Thus, the findings from this are contrary to previous nursing research by Benner (1984), Hughes (2016), King and Macleod-Clark (2002), and Pretz and Folse (2011) who purport that nurses utilize intuition as they gain experience.

Given the unexpected statistical results for the relationships between perceived use of intuition and previous experiences, further statistical testing of sample subsets related to previous experience were completed to determine if participants without previous experiences resulted in different statistical outcomes. Among the participants who did not have triage experience, results now demonstrated that perceived use of intuition had a significant positive relationship with triage decision-making ($r = .68$, $p = .02$). In addition, statistical analysis demonstrated a positive interactive relationship ($R^2 = .18$) between disaster preparedness knowledge and perceived use of intuition among participants without triage experience and no relationship between disaster preparedness knowledge and perceived use of intuition among participants who worked in triage. The results suggest that people who have experience in triage use less intuition. Pearson correlation statistics were also completed to compare whether previous experience caring for patients during a disaster impacted the variables. However, results showed no interaction among

the participants regardless of whether they had previous experience caring for patients during a disaster or did not.

CHAPTER VI

SUMMARY, CONCLUSIONS, RECOMMENDATIONS, AND IMPLICATIONS

Summary

This descriptive correlational research study was the first to examine the relationships between and among disaster preparedness knowledge, perceived use of intuition, and triage decision-making in emergency department registered nurses working in acute care hospitals. Research participants completed the Emergency Preparedness Information Questionnaire (EPIQ) for measurement of disaster preparedness knowledge (Wisniewski, Dennik-Champion, & Peltier, 2004), the Acknowledges Using Intuition in Nursing Scale (AUINS) to measure perceived use of intuition (Rew, 2000), the Triage Decision Making Inventory (TDMI) to measure triage decision-making (Cone, 2000), and a Demographic Data Information Form.

This research study aimed to examine disaster preparedness knowledge. Benner's *Novice to Expert* nursing theory was the overarching theory used to guide this research study. This theory asserts that there are five stages of experiential learning for the nurse (novice, advanced beginner, competent, proficient, and expert) and each stage is characterized by increased knowledge gained from previous experiences.

The volunteer sample for this research study consisted of 123 participants that met criteria for inclusion in the study. The sample was predominantly female (85.4%) and consisted of emergency department registered nurses from the New York City combined statistical area employed in acute care hospitals with a BSN degree or higher and at least 1 year of experience as an emergency department registered nurse. The study was conducted via electronic survey made available by a link on the Emergency Nurses Association (ENA) External Research Opportunity

webpage. Participants were directed to the Qualtrics website that included the title of the university affiliated with the researcher (Seton Hall University) and the letter of solicitation.

Conclusions

Results of this research study yielded a positive significant correlation between disaster preparedness knowledge and triage decision-making. Regression analysis showed that triage decision-making had a statistically significant influence on disaster preparedness knowledge (β = .48, p = .02). Therefore, an emergency department registered nurse skilled in triage decision-making would be expected to have higher disaster preparedness knowledge than emergency department nurses not skilled in triage decision-making. Proficiency in triage decision-making is important during disaster events to prioritize care and preserve resources.

Significant relationships were found between the demographic variables about participants' previous disaster training and experience and both disaster preparedness knowledge and triage decision-making, supporting Benner's *Novice to Expert* theory. The empirical evidence of this study was congruent with Benner's theory indicating that knowledge is gained from previous experience. Since actual disasters are not common, experiential learning, in the form of mock scenarios and drills, can fill the void, allowing nurses to gain experience, thus, increasing nurse's knowledge of disaster preparedness.

Contrary to disaster preparedness knowledge and triage decision-making, empirical testing of perceived use of intuition yielded no positive significant relationships with the main concepts nor with the demographic variables. Instead, perceived use of intuition had inverse significant relationships with years of experience as an emergency department registered nurse employed in acute care hospitals and participant age. However, statistical testing of participants without triage experience demonstrated a significant positive relationship between perceived use

of intuition and triage decision-making (r = .68, p = .02). Furthermore, statistical analysis demonstrated a positive interactive relationship (R^2 = .18) between disaster preparedness knowledge and perceived use of intuition among participants without triage experience and no relationship between disaster preparedness knowledge and perceived use of intuition among participants who worked in triage, suggesting that ED nurses with triage experience use less intuition.

Limitations

Limitations related to design, sample, and instrumentation may exist in research studies and should be considered when interpreting data. Inclusion criteria limited participation in this study to emergency department registered nurses from the New York City combined statistical area. As this study limited participation to emergency department nurses from a particular combined statistical area employed in acute care hospitals, the sample may not be reflective of registered nurses employed in other hospital departments from areas outside of the New York City combined statistical area, thus may not be homogenous. Additionally, participants were required to have at least one year of experience and a BSN degree, further limiting eligibility for participation in the study and enhancing probability of not being homogenous.

A second limitation of this study was the use of self-report instruments. Self-report instruments are based on participant perception of their knowledge and understanding of the instruments content, directions, and questions. A participant's perception of knowledge may not reflect actual knowledge and misunderstanding of directions and questions by participants could result in incorrect responses or incomplete surveys leading to inaccurate results. Additionally, the sample of this study was accessed via the Emergency Nurses Association, a professional organization. Participants belonging to a professional organization may have been hesitant to

report use of intuition in practice due to the promotion of scientific reasoning, such as evidence-based practice, rather than intrinsic approaches to care such as use of intuition. Given the focus on the use of evidence-based practice and data driven initiatives in hospitals, the sample may not desire to report the use of intuition in practice on a scholarly survey.

A third limitation of this study was that greater than half of the sample reported not having any previous experience being on duty during a disaster event. Using a sample with previous disaster experience or who have experience being employed at a level 1 trauma center may have yielded different results.

Finally, the integrity of the results of subsamples that reported mixed previous experiences with triage and disaster has limitations. Post hoc analysis utilizing G*Power revealed a power of .69 among the research study subsample with triage experience of 112, which suggests that there was a 31% chance of inadequate results. Statistical analysis of sample subsets demonstrated different relationships between variables for those who reported having previous experience and those who did not. Further research utilizing a sample of only ED nurses with previous triage experience may enhance the body of knowledge on this topic.

Recommendations for Future Research

Continued research on the disaster preparedness knowledge of registered nurses is recommended. This study found a positive significant relationship and a predictive relationship between disaster preparedness knowledge and triage decision-making. However, there was not a relationship found with perceived use of intuition. Future research should explore the relationships between disaster preparedness knowledge and other concepts related to nursing to garner a better understand of both the relationships and how to further improve disaster preparedness knowledge in nurses.

Since this study was limited to a sample of emergency department registered nurses from the New York City combined statistical area, future research should include conducting similar research in different combined statistical areas, different regions of the United States of America, or nationally. Further investigating disaster preparedness knowledge in other locations may be beneficial in determining best disaster preparedness educational/training practices as well as support the overall development and justification of disaster preparedness education and training programs for nurses, especially nurses employed at small non-trauma center hospitals.

Researchers conducting further research related to perceived use of intuition may want to consider utilizing a sample of ED nurses with the following inclusion criteria: previous disaster experience, triage experience, experience being employed at a level 1 trauma center, or ED nurses living/employed in rural areas. Such a sample may reveal differences with the findings of this study and whether intuition plays a role in a sample more experienced with disaster and trauma.

Finally, future research that examines disaster preparedness knowledge should broaden the sample to include non-emergency department registered nurses. Although emergency department registered nurses would most likely be the first to encounter patients from a disaster event, medical-surgical and critical care registered nurses often possess specialized skills and may be a valuable resource to support patient care during a disaster event. Investigating disaster preparedness knowledge in non-emergency department nurses could assist nurse administrators and educators to understand learning needs and create education programs aimed at non-emergency department nurses.

Implications

The relationship between disaster preparedness knowledge and triage decision-making suggests that emergency department registered nurses who posses' higher levels of triage decision-making skill, have more disaster preparedness knowledge. Meaning "to sort or prioritize" (Cork, 2014, p. 244) triage and decisions pertaining to triage are important skills for emergency department registered nurses during disaster events as they are instrumental in the sorting and prioritizing of disaster victims to receive care.

The relationships between disaster preparedness knowledge and 1) years as an emergency department registered nurse; 2) previous experience caring for a patient during a disaster and, 3) receiving disaster preparedness training suggests education and experience contribute to disaster preparedness knowledge in nurses. Therefore, it is suggested that hospital administrators and professional organizations promote disaster preparedness education and experiential learning programs in the form of exercises and drills to allow emergency department nurses to acquire experience.

Practice and Education

Emergency department registered nurses will be on the front lines of healthcare's response to a disaster event. As such, it is vital that hospital administration, government officials, and professional practice organizations understand the importance of disaster preparedness knowledge and both explore and promote innovative methods to educate and train this population of nurses. This study found support for Benner's (1984*) Novice to Expert* theory and represents an opportunity for hospital administration, government officials, and professional practice organizations to develop and promote disaster preparedness education using Benner's theory as a foundation by creating stages of disaster preparedness training just as Benner asserts

stages of experience. Furthermore, Benner's *Novice to Expert* theory could be used to support experiential learning, including but not limited to case study, drills, and real-world exercises.

Finally, Benner (1984) suggested that knowledge among nurses develops over time and the development of knowledge is founded on enriched experiential learning related to familiarity with a situation. Given that the number of disaster events are expected to continue to increase (Slettebak, 2012), non-emergency department nurses and nursing students may represent the greatest population of focus for disaster preparedness education and discussion. According to Benner, the novice stage of experience not only applies to nursing students, but to active nurses as well; nurses without experience outside of an already experienced clinical setting. Therefore, nurses with no disaster training or experience, including nursing students, are considered novices. Thus, the earlier novice nurses are exposed to disaster preparedness knowledge, the more familiar they can be with the concept. The more familiar they are with the concept, the greater the learning will be. Therefore, hospitals and nursing schools that effectively educate and train novice nurses about disaster preparedness are contributing to the professions ability to be a valuable resource during a disaster event.

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APPENDICES

Appendix A

Letter of Solicitation to Participant-Emergency Nurse

Dear Emergency Nurse:

My name is Brian Schneider, MSN, RN, NE-BC and I am a PhD student at Seton Hall University College of Nursing. In order to meet the degree requirements for the PhD, I am conducting a study that will assist emergency nurses with their roles in the hospital setting. Please review the Information for Participants form included in the survey packet prior to completing the three surveys and Demographic Data Information Form.

Purpose: The purpose of this study is to better understand the role of the emergency nurse practicing in acute care hospitals. Findings of this study may serve as an impetus for nurse leaders of acute care organizations to design innovative initiatives that can promote the nurse's ability in the work practice environment.

Duration: The estimated time for your participation in this research study will be approximately 20 minutes to compete the three survey style instruments/ questionnaires and a Demographic Data Information Form.

Procedures: The survey is attached to a link posted on the Emergency Nurses Association (ENA) External Research Opportunity webpage that once clicked, will direct you to a survey assessment site called Qualtrics. Upon arriving to the site, you will start the questionnaire. Completion and submission the questionnaire will imply your consent to participating in this research study thus your signature for consent is not required. Participation in this study is voluntary. Your decision to complete or waive participation will remain anonymous. You have the right to withdraw from

the study at any point after starting the questionnaire. There is no penalty for withdrawal from this study. All data collected as part of this research is done anonymously.

The instruments used as part of this study include a demographics questionnaire, the Emergency Preparedness Information Questionnaire (EPIQ), the Acknowledges Using Intuition in Nursing Scale (AUINS), and the Triage Decision Making Inventory (TDMI). The demographics questionnaire asks general demographic data and information about your experience as an emergency room nurse. The EPIQ asks you to rate your familiarity with items related to emergency preparedness on a Likert scale of 1 = not familiar to 5 = very familiar. The AUINS asks you to rate the degree to which you agree or disagree with each statement related to perceived use of intuition on a Likert scale of 1 = strongly disagree to 7 = strongly agree. The final instrument, the TDMI, asks you to rate the degree to which you agree or disagree with each statement related to making decisions related to triaging patients on a Likert scale of 1 = strongly disagree to 6 = strongly agree. After you have completed the questionnaires, you will receive a prompt to submit your responses and complete the entire survey.

Voluntary Participation: Participation in this study is completely voluntary and declining to participate involves no penalty, reprisal or loss of benefits. Participation in this study is not required and you can choose to withdraw from the study at any time prior to completing the online survey. If you decide to not participate in the study, or if you begin to answer the questionnaires and then decide to not continue, you may stop completing the study questionnaires at any time and your decision to stop participation will remain anonymous. Anonymity: Your participation will be anonymous. Please do not enter your name or any personal identifiers on any part of the survey. Each participant's survey will have a unique, randomly assigned identification (ID) number. The ID number will allow for anonymous matching of demographic data across measures and facilitate

statistical analyses of the data. The ID number cannot be linked with your identity since you are not being asked for any personal identifiers such as your name on any of the questionnaires. I will create a master list of ID code numbers and maintain it as a single electronic list that I will store on an individual, password protected thumb drive. The thumb drive will be stored in a locked desk drawer in my locked, private office at home. The only desk drawer key will be kept by me. Please note, there is no consent form for you to sign. Your voluntary completion and return of the questionnaires provides your implied, informed consent to participate in my study. In addition, because you are not being asked to sign a consent form, your anonymity is further assured.

Benefits and Risks of the study: There are no known direct benefits and no known risks to you for participating in my study. It is hoped that the additional information gained from this study may be useful to better understand the role of the emergency nurse practicing in acute care hospitals. Although, completion of the questionnaires should be as complete as possible, please know that if at any time you are uncomfortable answering any particular question, you may choose not to answer the question and you may, at any point, stop completing the online questionnaires. If there are any concerns or questions about this study please contact the researcher, my Dissertation Committee Chairperson, or the Director of the SHU IRB office using the contact information listed below.

Payment or Remuneration for Participating in this Study: There is no payment or remuneration for participating in this study.

Contact Information: If you have any questions or possible concerns about your participation in this research study please feel free to contact the Principal Investigator, Brian Schneider, MSN, RN, NE-BC, at (973) 761 - 9000. You may also contact the Principal Investigator's Dissertation Committee Chairperson Judith Lothian, PhD, RN at (973 761 - 9000). If you have any questions

regarding your rights as a research subject in this study, you should contact the Institutional Review Board Office Director, Mary Ruzicka, PhD, Professor, Seton Hall University at IRB@shu.edu or at (973) 313 - 6314. As mentioned earlier, there is no consent form for you to sign. By voluntarily participating in this research study and returning the data in the sealed manila envelope you are providing implied consent.

Timeframe for Data Collection: I am asking that all questionnaires be completed and submitted by January 15th, 2019.

Thank you for participating in my research study,

Brian Schneider, MSN, RN, NE-BC
Doctoral Student, PhD in Nursing Program
Seton Hall University College of Nursing
400 South Orange Avenue, South Orange, New Jersey 07028

Appendix B

This is not a test and no way reflects on you personally.....so don't worry if you are unfamiliar with certain areas.

	Very Familiar 1	2	3	4	Not Familiar 5
Detection of and Response to an Event					
1. *Signs/symptoms* of exposure to different biological agents					
2. *Signs/symptoms* of anthrax inhalation					
3. *Modes of transmission* for different types of biological agents (i.e. anthrax, smallpox, etc.)					
4. Match antidote and prophylactic medications to specific biological/chemical agents					
5. Possible adverse reactions to smallpox vaccination					
6. *Basic first aid* in a large-scale emergency event (including oxygen administration and ventilation)					
7. How to *evaluate the effectiveness* of your own actions during a large-scale emergency event					
The Incident Command System (ICS) and Your Role Within It					
8. The content of the *Emergency Operations Plan (EOP)* in your agency/organization					
9. To which functional group in the *Incident Command System* (ICS) you would be assigned during a large-scale emergency event					
10. The *physical location* where you would report to if a large-scale emergency event occurred					
11. Assess and respond to *site safety issues* for self, co-workers, and victims during a large-scale emergency event					
12. The strategic rationale used to develop the ICS response/action plan					
13. Your agency's preparedness level for responding to a large-scale emergency event					

14. Differences between *decision-making processes* in the *Incident Command System* for a large-scale emergency event and non-emergency situations					
15. Tasks that *should NOT be delegated to volunteers* in a large-scale emergency event					
Ethical Issues in Triage					
16. How to perform a rapid *physical* assessment of a victim of a large-scale emergency event					
17. How to perform a rapid *mental health* assessment of a victim of a large-scale emergency event					
18. How to assist with *triage* in a large-scale emergency event					
19. General issues related to the proper handling of the dead during a large-scale emergency event (ethical, legal, cultural, and safety)					
Epidemiology and Surveillance					
20. History and physical assessment surveillance data for creating a high index of suspicion that a patient has been exposed to a Category A, B, or C biological agent					
21. *When to report* an unusual set of symptoms to an epidemiologist					
22. Diseases that are *immediately reportable* to state health departments					
23. Ability to identify the exacerbation of an underlying disease due to exposure to a chemical or biological agent, or to radiation					
Isolation/Quarantine					
24. Isolation procedures for persons exposed to biological or chemical agents					
25. Your facility's/community's *quarantine process*					
Decontamination					
26. Selection of the appropriate *personal protective equipment* (PPE) when caring for patients exposed to a biological, chemical, or radiological agent					
27. The *decontamination procedures* stated in your facility's *Emergency Operations Plan*					
28. The impact on the environment from a large-scale emergency event					
Communication/Connectivity					
29. The procedures used to document *provision of care* in a large-scale emergency event					
30. *Chain of Custody* during a large-scale emergency event					
31. Procedures for *communicating* critical patient information to those *transporting* patients					
32. Effectively present information about degree of risk to various audiences					
33. Identify the *different abilities* of key partners in your Emergency Operations Plan (EOP)					
34. Appropriate *debriefing activities* following a large-scale emergency event					
35. Use of ***ALL*** types of communication devices (phone, fax, email, satellite phones, PDAs, etc.)					

Psychological Issues					
36. Appropriate *psychological support* for all parties involved in a large-scale emergency event					
37. Provide health counseling/education to patients regarding the *long-term impact* of *B-NICE* agents (**b**iological, **n**uclear, **i**ncendiary, **c**hemical, and **e**xplosive)					
38. *Signs of post-traumatic stress* in patients seen for *routine health care following* an event					
39. How to evaluate a *teenager* to detect *post-traumatic mental health* problems					
Special Populations					
40. Procedures for providing care to children/youth during a large-scale emergency event in cases where prior consent from parent/legal guardian is not possible					
41. The appropriate care of sensitive/vulnerable patient groups during a large-scale emergency (i.e., aged, pregnant women, and the disabled)					
Accessing Critical Resources					
42. *During an event*, where to quickly access up-to-date resources about specific biological, nuclear, incendiary, chemical, explosive agents					
43. Determine the appropriate agency to which reportable diseases are to be directed					
44. The process for gaining access to the Strategic National Stockpile (SNS)					
OVERALL FAMILARITY					
45. Please provide an assessment of your OVERALL FAMILARITY with response activities/preparedness in the case of a large-scale emergency event					

Appendix C

Acknowledges Using Intuition in Nursing Scale

The following scale is not a test. Please indicate how much you agree with each statement **as it relates to your clinical nursing practice**. Circle only one number per item to correspond with what you **usually do** in clinical practice. Use the following scale for your response:

7 = strongly agree

6 = agree

5 = slightly agree

4 = uncertain

3 = slightly disagree

2 = disagree

1 = strongly disagree

1. There are times when I suddenly know what to do for a patient,

but I don't know why. 1 2 3 4 5 6 7

2. I am inclined to make decisions based on a sudden flash of insight. 1 2 3 4 5 6 7

3. There are times when I immediately understand what to do for a patient,

but I can't explain it to other people. 1 2 3 4 5 6 7

4. There are times when I feel that I know what will happen to a patient, but I don't know why.

1 2 3 4 5 6 7

5. There are times when a decision about my patient's care just comes to me. 1 2 3 4 5 6 7

6. There are some things I suddenly know to be true about some of my patients, but I am unable to support this with concrete data. 1 2 3 4 5 6 7

7. Sometimes I act on a sudden knowledge about a patient to prevent a crisis from developing even when I can't explain it. 1 2 3 4 5 6 7

Appendix D

TRIAGE DECISION MAKING INVENTORY

Please respond to the items below and circle the number that corresponds with the following choices:

---

1. Strongly Disagree 2. Moderately Disagree 3. Minimally Disagree

4. Minimally Agree 5. Moderately Agree 6. Strongly Agree

---

1. I can prioritize patient care and get job the done.

   1 2 3 4 5 6

2. I am confident in my judgment to make good decisions that will improve my patient's outcomes.

   1 2 3 4 5 6

3. I can work under pressure and remain organized

   1 2 3 4 5 6

4. I am someone my coworkers can count on to make good decisions.

   1 2 3 4 5 6

5. I can reorganize my thoughts when busy in order to prioritize who should receive care first.

   1 2 3 4 5 6

6. When it is busy, I can still maintain calm focus.

   1 2 3 4 5 6

7. I know right questions to ask while I am working.

   1 2 3 4 5 6

8. I can communicate well with staff.

   1 2 3 4 5 6

9. I can narrow down information that I need when making triage decisions.

   1 2 3 4 5 6

10. I can count on my on skills and judgment while working.

1 2 3 4 5 6

11. I get positive feedback about my triage decisions.

1 2 3 4 5 6

12. I feel comfortable making triage decisions.

1 2 3 4 5 6

13. I am knowledgeable about different clinical areas.

1 2 3 4 5 6

14. I can communicate well with patients.

1 2 3 4 5 6

15. I feel confident in my triage skills.

1 2 3 4 5 6

16. I feel comfortable making triage decisions.

1 2 3 4 5 6

17. I know that I have the skills to make accurate triage decisions.

1 2 3 4 5 6

18. I do not know the right questions to ask when assessing the patient.

1 2 3 4 5 6

19. I know what questions to ask when triaging.

1 2 3 4 5 6

20. My past experiences make it easier to make a decision.

. 1 2 3 4 5 6

21. I get an inner feeling when something bad is going to happen

1 2 3 4 5 6

22. I get a gut feel about critical patients.

1 2 3 4 5 6

23. I have a sixth sense about critical patients.

1 2 3 4 5 6

24. Despite book learning, I follow my gut feeling when triaging.

1 2 3 4 5 6

25. I can often tell something detrimental is going to happen when I first assess patients.

1 2 3 4 5 6

26. I get a good idea how sick a patient is by just looking at them.

1 2 3 4 5 6

27. I can tell by a person's appearance whether or not they need immediate care.

1 2 3 4 5 6

End of Questionnaire

Thank you for taking the time to complete this questionnaire. Your contribution is appreciated.

Appendix E

Demographic Data Information Form

Instructions: Please complete the following questions about yourself. Your response will be anonymous and cannot be connected with your name. It is important that you answer each question as fully as possible. **Do not write your name on this form.**

Carefully read each question and from the given options provided, please select the response that best describes you by placing an **X** mark within the bracket.

1. **Are you employed as an Emergency Department Registered Nurse?**

   a. [ ] Yes
   b. [ ] No

2. **How many years' experience do you have as an Emergency Department RN?**

   _____ Years

3. **How long have you been a registered nurse in the current hospitals Emergency Department?**

   _____ Years _____ Months

4. **How long have you been a registered nurse in the Emergency Department in your career?**

   _____ Years _____ Months

5. **How long have you been employed as a nurse at your current hospital?**

   Years: _____

6. **What category of hospital are you employed at?**
   a. [ ] Don't know
   b. [ ] Non-teaching hospital*
   c. [ ] Teaching hospital*/ University medical center*

   ** A teaching hospital is a hospital or medical center that is associated with a medical school and provides clinical education and training to future and current health professionals.*

7. **Is the hospital you are employed at designated as a Trauma Center?**
   a. [ ] Don't know
   b. [ ] Yes
   c. [ ] No

8. What level Trauma Center is the hospital you are employed at?

a. [ ] Don't know
b. [ ] Hospital is not a Trauma Center
c. [ ] Level 1
d. [ ] Level 2
e. [ ] Level 3
f. [ ] Level 4
g. [ ] Level 5

9. How many beds does the hospital you are employed at have?

a. [ ] Don't know
b. [ ] 50-250 beds
c. [ ] 251 – 500 beds
d. [ ] > 500 beds

10. How long have you been a registered nurse overall?

_____ Years _____ Months

11. Have you ever had any disaster preparedness training or education?

a. [ ] Yes
b. [ ] No

12. Is disaster preparedness training or education offered or required by your hospital?

a. [ ] Don't know
b. [ ] Yes
c. [ ] No

13. Have you had disaster preparedness training or education in the last 5 years?

a. [ ] Yes
b. [ ] No

14. Have you ever been involved in caring for patients during a disaster event?

a. [ ] Yes
b. [ ] No

15. Were you ever working at the hospital (on duty) during a disaster event?

a. [ ] Yes
b. [ ] No

16. Do you work in Triage?

a. [ ] Yes
b. [ ] No

17. Have you ever received Triage training or education?

a. [ ] Yes
b. [ ] No

18. Is Triage training or education offered or required by your hospital?

a. [ ] Don't know
b. [ ] Yes
c. [ ] No

19. Have you received Triage training or education in the last 5 years?

a. [ ] Yes
b. [ ] No

20. Please indicate the highest level of education that you have completed?

a. [ ] BSN Degree
b. [ ] Master's degree in nursing/NP
c. [ ] Master's degree in nursing/CNS
d. [ ] Master's degree in nursing/ Management
e. [ ] Master's degree in nursing/ CNL
f. [ ] Master's degree non-nursing
g. [ ] Doctoral Nursing degree DNP/PhD
h. [ ] Other (fill in) _____

21. Are you currently employed?

a. [ ] Full time: (36 hours or greater)
b. [ ] Part time: (20 hours but less than 36 hours)

22. Which state do you reside in?

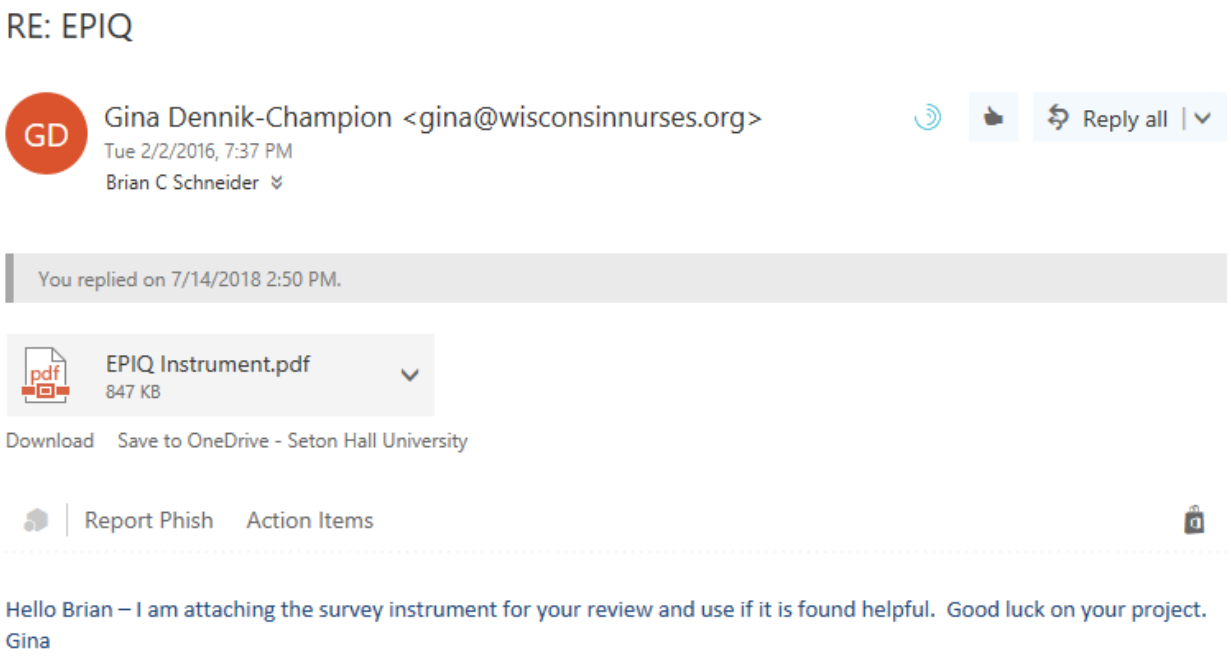
a. [ ] New York
b. [ ] New Jersey
c. [ ] Pennsylvania
d. [ ] Connecticut

23. Which *county* do you reside in? _____

24. What is your age? _____

25. What is your gender? Male [ ] Female [ ] Other [ ]

Thank you for completing this questionnaire



RE: EPIQ

GD

Gina Dennik-Champion <gina@wisconsinnurses.org>

Tue 2/2/2016, 7:37 PM

Brian C Schneider

Reply all

You replied on 7/14/2018 2:50 PM.

EPIQ Instrument.pdf

847 KB

Download Save to OneDrive - Seton Hall University

Report Phish Action Items

Hello Brian – I am attaching the survey instrument for your review and use if it is found helpful. Good luck on your project.
Gina

Re: Acknowledges Using Intuition in Nursing Scale

E

ellerew@gmail.com on behalf of Lynn Rew <ellerew@mail.utexas.edu>

Reply all

Sun 10/29/2017, 5:32 PM

Brian C Schneider

You replied on 11/2/2017 4:05 PM.

Rew Intuitive Judgment...
118 KB

Download Save to OneDrive - Seton Hall University

Report Phish

You have located the correct Lynn Rew. I have not used this scale in several years, but I am happy to have you use it. The instrument has also been called the Rew Intuitive Judgment Scale and it is attached. If you decide to use it in your research, I would appreciate hearing what you found.

Best wishes.

CJ

Cone, Kelly J. <Kelly.J.Cone@osfhealthcare.org>
Mon 5/15/2017, 3:29 PM
Brian C Schneider

Reply all

You forwarded this message on 2/17/2019 1:58 PM

TDMI Application Form....
32 KB

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Report Phish Action Items

Hello Brian,

I have shared my instrument with many organizations, students, and those in academia. I am happy to share the instrument with you. To ensure that I get the results of your work returned to me so I can continue to refine my instrument, I ask you to complete the attached form and forward the $25. Once this is received, I will send you the tool and the method for scoring. I will then return the $25 when I get your final report.

Thank you for your interest in the TDMI. Best of luck on your project!

Kelly Jo Cone, RN, PhD, CNE
Professor - Graduate Program
Lead Faculty: DNP – C and co-lead Adult/Gerontology CNS
Saint Francis Medical Center College of Nursing