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Modifiable Factors Impeding Nurses' Willingness to Report in a Disaster

An honors thesis/project in partial fulfillment of the
requirements for the degree of Honors
Baccalaureate in Nursing

By

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From 2000 to 2016, there were 388 disasters in the US which included tornados, floods, severe storms, diseases, wildfires, and biological, radiological and chemical events. Because of these events, almost 6,500 people were killed and over 21 million people were affected at a cost of over \$570 million in damages (Guha-Sapir, Below, & Hoyois, 2016). More recently in 2017, natural disasters have been the cause of crisis. Hurricane Harvey is speculated to have killed 82 people, flooded hospitals, and displaced thousands of people from their homes (Moravec, 2017). Just days later, Hurricane Irma hit the Caribbean and Florida, which resulted in an estimated death toll of 72 in Florida and countless more injured ("Hurricane Irma Death Toll Rises," 2017). Yet, natural disasters have not been the only source of emergency of late. In October of 2017, Las Vegas experienced the deadliest mass shooting in American history (Fadel & Detrow, 2017). On November 5, 2017 at least 26 people were killed during a mass shooting at a church in Texas (Andone, Hartung, & Jones, 2017). During such crisis, there is an increased patient demand which many times exceeds the operational capacity of a health care facility (Department of Health & Human Services & Assistant Secretary for Preparedness and Response, 2012).

As a given crisis impacts both citizens and health care workers alike, workforce issues during an emergency are of great concern (Adams & Berry, 2012; Balicer, Omer, Barnett, & Everly, 2006; Qureshi et al., 2005). Hospitals routinely operate at or near 100% daily (Smith, 2009) so facilitating the reporting to work of nurses in emergent circumstances is of great importance since nurses make up the biggest population of health care workers (Bureau of Labor Statistics, 2017). To adequately care for patients who are affected by emergencies, nurses must be able and willing to work. Current research provides ample evidence there may be decreases in reporting to work in such situations (Adams & Berry, 2012; Milburn & McNeill, 2016; Qureshi et al., 2005). Understanding what factors impede nurses from reporting to work in an

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emergency may lead to increased health care staffing in times of need and therefore more lives saved in the future. Thus, the purpose of this research is to discover what modifiable factors influence a nurse's willingness to report to work during a disaster.

Review of Literature

Nurses are instrumental in disaster response to facilitate positive patient outcomes. However, nurses report inadequate education preparing them to report to such disasters (Veenema, 2016). Recently, Nash (2015) found that of the graduate student nurses surveyed, the majority were not personally prepared to respond to a disaster. Knowledge has been positively correlated to the willingness to report to work in a disaster (Adams & Berry, 2012; Chilton, McNeill & Alfred, 2016; Qureshi et al., 2005). This study emphasized the need for more research regarding factors that influence willingness to report to work and treat patients as well as knowledge about the disease and its symptoms.

Researchers have demonstrated that willingness to work, conceptualized as "a personal decision to report to work" (Qureshi et al., 2005, p. 379), during a disaster varies by the type of disaster or emergency (Qureshi et al., 2005). Participants in related studies have cited fear, concern for family and self, transportation issues, responsibility to care for others (children, elders, and pets), and personal health problems as reasons they would not be able to work (Adams & Berry, 2012; Qureshi et al., 2005; Stergachis et al., 2011). In a study of 200 Israeli nursing students, 76% said they were willing to report to work during an Avian Influenza pandemic if they received financial incentives and 69% said they would be willing to report to work if they were provided personal protective equipment (Natan, Zilberstein, & Alaey, 2015). According to Bell et al. (2014), 84% of nurses were willing to work during an Avian Influenza emergency but 33% did not have confidence that their co-worker would come to work. In this

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study, intention versus actual behavior was found to be unknown. Of the unwilling nurses, most said they would be willing to either give education, administer vaccinations, or triage in their surrounding area (Bell et al., 2014). Conversely, the more optimistic a person, the higher the level of performance and lower the absenteeism during crisis situations (Boldor, Bar-Dayana, Rosenbloom, Sheme, & Bar-Dayana, 2012).

In a recent study, home health agencies were determined to have the ability to expand quickly to meet the increased demands of patients in the event of a large-scale public health emergency, known as surge capacity (Milburn & McNeill, 2016). The authors concluded that surge capacity may be lessened if health care providers (HCPs) are unwilling to come to work during an emergency. Masterson et al. (2009) determined there is a difference in HCPs willingness to report based on the type of an emergency; the more infectious the nature of the emergency, the lower the percentage of health care workers that would report to work. When comparing willingness and ability of HCPs in an earthquake versus an influenza pandemic emergency, more workers said that they were willing to report to work during an earthquake, but were less able. In the influenza pandemic scenario, the HCPs had increased ability to report to work, but had decreased willingness to report (Stergachis, 2011). In another study, 52% of respondents were unwilling to report if their families could potentially become infected with the disease but 96% were willing if the health care facility promised to provide an effective vaccine (Barnett et al., 2010).

Identified factors that increase health care provider's willingness to report to work during an infectious disease emergency included confidence in personal safety, confidence in facility, having a specific role in the situation, education about emergency preparedness, having a home disaster plan, having disaster training, and confidence in skills (Aoyagi, Beck, Dingwall, &

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Nguyen-Van-Tam 2015; Barnett et al., 2010; Connor, 2014; Goodhue et al., 2012). Additional dynamics resulting in higher willingness included prior education, belief in duty, prior work experience, and available personal protective equipment (Devnani, 2012). A study conducted in Texas found that nurses who believed a biological emergency was likely in their area were more willing to participate in emergency preparedness training (Jacobson et al., 2010). Yet, the current health care system cannot rely on nurses to report to work during a biological emergency and should be prepared to be short staffed (Syrett et al., 2007).

Factors that resulted in unwillingness to report to work included concern for family and personal obligations (Devnani 2012). Connor (2014) concluded that confidence in facility's ability to address safety concerns greatly increased willingness to respond during a disaster. In the event of a radiological emergency, HCP were less likely to be willing to report than for mass casualties or weather-related emergencies (Adams & Berry, 2012). In a study surveying nurse's willingness to respond to a radiation emergency, there was an association found between willingness to report to work and knowledge, perception of personal safety, and perception of clinical competence (Veenema et al., 2008). According to Martin (2011), nurse managers should have a staffing plan in place for when emergencies occur because many staff nurses will either be unwilling or unable to report to work and that this should be expected. Clearly, many factors impede the likelihood of health care workers reporting to work in emergent circumstances. However, there are modifiable factors that, if overcome, may facilitate health care workers reporting to work at a time when they are most needed.

Conceptual and Operational Definitions

For the purposes of this research, ability to work was conceptually defined as the capability to report to work, while willingness to work was defined as the personal decision to

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report to work (Qureshi et al., 2005). Ability and willingness were operationally defined by providing the conceptual definition of each before asking each question about the ability in each given scenario to include infectious disease, natural/weather events, terrorist events, nuclear/radiological events, and chemical/biological events and then being asked separately about their willingness to respond in each scenario.

Design and Methods

Research Questions

This study examines the self-reported levels of nurses' willingness to report to work during disaster with the following research questions: 1) What are the current self-reported levels of nurses' willingness to report to work during a disaster?, and 2) What modifiable factors impede or facilitate nurses willingness to report to work during a disaster?

Sample

Following Institutional Review Board approval, a convenience sampling with snowball technique was used and data from 313 nurses was collected. This study is a cross-sectional study to ascertain nurse self-reported willingness to report to work in an emergency at a single point in time. Inclusion criteria were that all participants must be 18 years or older, be able to read and write in English, and be a licensed nurse or a nursing student in the United States. Multiple resources were used to access potential participants including Facebook, the American Nurses Association member website, and a university sponsored internal website.

Instruments

The data was collected using a researcher developed questionnaire entitled, "Willingness and Ability to Report to Work in an Emergency". Three nurses with expertise in disaster nursing confirmed face validity of the instrument. The instrument consists of 35 "select all that apply"

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questions pertaining to the willingness and ability to report in various types of disasters and factors that may impede them from reporting to each one. Factors that may impede the willingness to report to work include family demands, physical limitations, medical conditions, lack of knowledge, concerns over personal safety, and perceived deficits in duty to care. Additionally, subscales were created utilizing five-point Likert style questions for the concepts of risk, perceived duty, education, resources, and faith in healthcare facility leadership. Nurse preparedness will also be assessed by asking dichotomous questions pertaining to whether or not participants possess recommended items of preparedness (e.g. evacuation plans, food, water, first aid kit, etc.). Finally, six demographic questions pertaining to age, marital status, dependents, etc. are also included.

Results

The participants represented all regions of the US with 5.8% ($N = 18$) from the Western Region, 49.5% ($N = 155$) from the Southwest Region, 10.9% ($N = 34$) from the Midwestern Region, 16.9% ($N = 53$) from the Southeast Region, and 16.6% ($N = 52$) from the Northeast Region. There was a wide range of education levels among the participants with 5.4% ($N = 17$) indicating they were Licensed Practical Nurses and 16.9% ($N = 53$) indicating they had a terminal degree in nursing. Most of the participants were female ($N = 291$), Caucasian ($N = 274$), and married ($N = 217$). The mean age of the participants was 51.53 years. Please see Table 1 for detailed demographics.

Table 1: Participant Demographics.

Demographic Category	Sample (%)
Participant Region of the US	
Western	$N=18$ (5.8)
Southwest	$N=155$ (49.5)
Midwest	$N =34$ (10.9)
Southeast	$N =53$ (16.9)

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Northeast	<i>N</i> =52 (16.6)
Highest Level of Nursing Education	
Nursing Student	<i>N</i> =5 (1.6)
LPN	<i>N</i> =17 (5.4)
RN (ADN and BSN)	<i>N</i> =133 (42.5)
Masters (Masters and NP)	<i>N</i> =103 (32.9)
Doctorate (PhD and DNP)	<i>N</i> =53 (16.9)
Current Employment Setting	
Acute Care	<i>N</i> =129 (41.2)
Non-Acute Care	<i>N</i> =64 (20.5)
College or University	<i>N</i> =66 (21.1)
Other/Unemployed	<i>N</i> =52 (16.6)
Race of Participants	
White/Caucasian	<i>N</i> =274 (87.5)
Black/African American	<i>N</i> =24 (7.7)
Asian	<i>N</i> =6 (1.9)
American Indian/Alaskan Native	<i>N</i> =3 (1.0)
Two or more races	<i>N</i> =3 (1.0)
Marital Status	
Single	<i>N</i> =27 (8.6)
Married	<i>N</i> =217 (69.3)
Committed Relationship	<i>N</i> =18 (5.8)
Single	<i>N</i> =48 (15.4)
Gender	
Male	<i>N</i> =19 (6.1)
Female	<i>N</i> =291 (93.0)
Age in Years	
21-35	<i>N</i> =37 (11.6)
36-50	<i>N</i> =91 (29)
51-65	<i>N</i> =125 (39.9)
Over 65	<i>N</i> =37 (11.8)
Years as a Licensed Nurse	
>0 but ≤ 2	<i>N</i> =18 (5.7)
>2 but ≤ 5	<i>N</i> =19 (6)
>5	<i>N</i> =257 (82.2)
Assigned Role in Employer Disaster Response Plan	
Yes	<i>N</i> =247 (78.9)
Unsure	<i>N</i> =40 (12.8)

Data Analysis

Data were analyzed using SPSS version 25. For the first question “What are the current self-reported levels of nurses’ willingness to report to work during a disaster?”, each of the

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categories of disaster were broken down by infectious disease, natural/weather, terrorist events, nuclear/radiological events, chemical/biological events. Nurses were asked to indicate their willingness to report using a 5-point Likert scale with 1 being unlikely to respond and 5 being very likely to respond. This questioning continued with regard to ability. Ability mean score was based on the self-reported ability to respond to infectious disease, natural/weather, terrorist, nuclear/radiological, and chemical/biological related events. Willingness mean score was based on the self-reported willingness to respond to infectious disease, natural/weather, terrorist, nuclear/radiological, and chemical/biological related events. The risk mean score was based on how likely the participant believed the following would occur where they live or work: infectious disease events, natural/weather events, terrorist events, nuclear or radiological events, and chemical/biological disasters. The work environment mean was calculated based on the participants belief that their employer would be sufficiently prepared to handle all types of disaster situations, if they would report to work if conditions deteriorate quickly, if their employer had sufficient personal protective equipment, if they were at high risk for exposure to pathogens or toxins, if they maintained freedom to leave at end of assigned shift, if they felt fear of abandonment by co-workers, chaotic level of work environment during a disaster, adequate staffing during a disaster, and employer availability of communication equipment for the participant to contact their families. The duty mean score was based on the participants sense of duty to report to work due to obligation, legal responsibilities, moral code, and nursing code of ethics. Detailed responses for overall willingness can be found in Table 2.

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Table 2: Nurse Willingness to Report to Work During a Disaster

Willingness to Respond by Category of Disaster	<i>N</i>	Min possible Score	Max possible Score	Mean Score
Infectious Disease event	312	1	5	3.94
Natural/Weather Event	312	1	5	4.37
Terrorist Event	311	1	5	3.66
Nuclear/Radiological Event	310	1	5	2.9
Chemical/Biological Event	310	1	5	3.0

For the second question, “What modifiable factors impede or facilitate nurses’ willingness to report to work during a disaster?”, a multiple regression analysis was used to test if nurses’ perceptions related to their ability to respond to various disaster events, risk that such disasters would occur, preparation of the work environment for such disasters, and the sense of moral or professional duty to respond significantly predicted their overall willingness to respond in various disasters on 312 participants (after listwise deletion). Sum scales were created for the ability to respond to various disaster scenarios (infectious disease, natural/weather, terrorist events, nuclear/radiological events, chemical/biological events), perceived risk for each disaster, perceptions of workplace preparedness, and sense of reporting to work for duty, legal, or ethical obligations and they were regressed upon the nurses’ perceived willingness to respond. Linearity was established by visual inspection of a scatterplot. There was independence of residuals, as assessed by a Durbin Watson statistic of 1.978. There was homoscedasticity, as assessed by visual inspection of a plot of standardized residuals versus standardized predicted values. Residuals were normally distributed as assessed by visual inspection of a normal probability plot.

Willingness to report varied little across sociodemographic dimensions, explaining virtually no variance. Subsequent models adding the nurses’ perceptions related to their ability to respond to various disaster events, risk that such disasters would occur, preparation of the

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work environment for such disasters, and the sense of moral or professional duty to respond during such events explained 57.8% of the variance in willingness to report to work with an adjusted $R^2 = 57.3$, a large effect size (Cohen, 1988). A nurses' perceptions related to their ability to respond to various disaster events, risk that such disasters would occur, preparation of the work environment for such disasters, and the sense of moral or professional duty to respond significantly predicted their willingness to respond in such events, $F(4,307) = 105.21, p = .000$. Please refer to Table 3 for the regression model.

Table 3. Multiple Linear Regression Analysis: Predictors of Willingness to Respond During Disaster Events

	<i>b</i> (SE)	β	<i>P</i>
Ability Mean Score	.536 (.041)	.523	.000
Risk Mean Score	.133 (.057)	.088	.020
Work Environment Mean Score	.578 (.094)	.291	.000
Duty Mean Score	.167 (.076)	.102	.028

According to Nash (2015), personal preparedness is having a plan at home in the case of a disastrous event and owning an emergency supply kit. Nash's (2015) study concluded that the participant medical surgical nurses were not personally prepared for a disaster, but after online education the participants were more interested in increasing their personal preparedness level. In this study, the data analysis showed that nurses are not personally prepared to respond to a disaster. Out of the participants, 68.7% did not have an emergency supply kit at home and 84.3% of participants did not have a written evacuation plan at home. Yet, 76.7% of participants self-reported the ownership of a first aid kit in their home. Please see Table 4 for detailed participant preparedness in the home.

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Table 4: Participant Preparedness in the Home

Preparedness Item	Sample (%)
Emergency Supply Kit Present	
No, I do not have this item	<i>N</i> =215 (68.7)
Yes, in my home	<i>N</i> =66 (21.1)
Yes, in my “go bag”	<i>N</i> =31 (9.9)
Written Evacuation Plan	
No, I do not have this item	<i>N</i> =264 (84.3)
Yes, in my home	<i>N</i> =38 (12.1)
Yes, in my “go bag”	<i>N</i> =10 (3.2)
Three Day Supply of Non-Perishable Food	
No, I do not have this item	<i>N</i> =112 (35.8)
Yes, in my home	<i>N</i> =188 (60.1)
Yes, in my “go bag”	<i>N</i> =12 (3.8)
Water Supply of One Gallon for Each Person in the Home for Three Days	
No, I do not have this item	<i>N</i> =175 (55.9)
Yes, in my home	<i>N</i> =126 (40.3)
Yes, in my “go bag”	<i>N</i> =11 (3.5)
Battery-powered or Hand Crank Radio and NOAA Weather Radio with Extra Batteries	
No, I do not have this item	<i>N</i> =182 (58.1)
Yes, in my home	<i>N</i> =116 (37.1)
Yes, in my “go bag”	<i>N</i> =13 (4.2)
First Aid Kit	
No, I do not have this item	<i>N</i> =41 (13.1)
Yes, in my home	<i>N</i> =240 (76.7)
Yes, in my “go bag”	<i>N</i> =31 (9.9)

Discussion

Modifiable factors influencing nurses' willingness to respond during a disaster event emerged from the analysis. The majority of participants were middle aged, white females that were educated. According to the analysis, willingness to report to work was dependent on the nature of the event. Nurses were least willing to report to work during a nuclear/radiological event and most willing to report to work during a weather related or natural disaster. This is concerning because nurses are an integral part of patient care during all types of disasters, not just weather-related disasters. Victims of nuclear/radiological, terrorist, and biological disasters

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(the three categories that scored the lowest in nurse self-reported willingness) need treatment as well to survive. If nurses are not willing to report in such disasters, patient outcomes will be negatively affected, especially in populations that are at higher risk for these types of disasters.

Nurses are overwhelmingly unprepared personally for a disaster. If nurses are not personally prepared on even the most basic level (such as having a written plan) for a disaster, it may be unrealistic to expect them to be prepared and to have the knowledge needed to adequately take care of victims of a disaster in the acute care setting. More research needs to be done to determine nurse personal preparedness and how to increase interest and willingness to become more personally prepared. Nurses must perceive they have the requisite skills to practice safely in response to events. Worksite preparation for patient care and protection of staff is critical.

The nurses' willingness to respond can be improved by increasing opportunities to train for and practice safe patient care in and after disastrous events. Factors that increase willingness include having a written plan in place, ensuring that the participant is not at risk, providing adequate personal protective equipment, decreasing fear of abandonment, providing adequate staffing, and allowing communication with families or friends. To increase willingness, there are implications for facilities to have a written disaster plan that is accessible and required for nurses to read and for facilities to readily have available personal protective equipment appropriate for any scenario. Furthermore, trust that there will be adequate staffing for support during an emergency increased willingness to report to work because the participants felt that they would not be abandoned or given an unmanageable patient assignment. Trust in work environment is the most important factor that contributes to willingness to report to work, followed by the ability to report to work. Other factors that increase willingness is a sense of moral or professional duty

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and perceiving that there is an actual risk of disasters occurring in the future. When nurses are confident in their personal ability and the facilities' ability to respond safely, they are more willing to report to work when they are most needed. Therefore, to increase nurse willingness, focus should be placed on interventions aimed at increasing employee trust in the workplace.

Limitations

Social desirability bias may have affected the results of this study because the participants will know the purpose of the study was to determine self-reported willingness to report and they may not wish to appear unwilling, which could be perceived with a negative connotation. However, the investigators will encourage participants to respond honestly and indicate the confidentiality of the results.

Conclusion

As we continue to face a world with various types of emergencies where the scale and severity of disasters are growing (Intergovernmental Panel on Climate Change, 2011), there is a great need to determine modifiable factors influencing health care provider's willingness to report so that we can begin working toward increasing the health care work force in times of need. The results of this study indicate that the most significant predictor of willingness to respond during a disaster is work environment. Facilities, both acute and non-acute, need to be aware that willingness of their nurse employees is most influenced by trust in the facility. After these factors are determined and recognized, health care facilities can begin implementing research based changes to increase willingness to report to work, such as having a written plan in place, providing adequate personal protective equipment, ensuring adequate staffing, and providing two-way communication for nurses and their families. Once these practices are in

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place in facilities, nurses' willingness to report during disasters should increase. As a result, more people who are affected by the disasters of the future will be treated and saved.

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