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Assessing Change in Baseline Preparedness Knowledge in Long-term Care Facilities

Heidi L. Wheeler
University of Nebraska Medical Center

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Assessing Change in Baseline Preparedness Knowledge in Long-term Care Facilities

by

Heidi L. Wheeler

A THESIS

Presented to the Faculty of
The University of Nebraska Graduate College
In Partial Fulfillment of the Requirements
For the Degree of Master of Science

Health Promotion & Disease Prevention
Research Graduate Program

Under the Supervision of Professor Sharon Medcalf

University of Nebraska Medical Center
Omaha, Nebraska

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Advisory Committee:

Sharon Medcalf, PhD

Philip Smith, M.D.

Jungyoon Kim, PhD

ASSESSING CHANGE IN BASELINE PREPAREDNESS KNOWLEDGE

Heidi L. Wheeler

University of Nebraska, 2016

ABSTRACT

Advisor: Sharon Medcalf, PhD.

With much of the focus and federal resources in recent history going to support hospital preparedness, long-term care facilities have been left behind even though they house one of our most vulnerable populations. Few regulations and standards have required these facilities to keep pace with preparing for an increasingly volatile environment and aging society. This is changing with the proposal of new federal standards and regulations requiring more thorough and robust preparedness planning. These new requirements do not have to be overwhelming or burdensome to facilities but can be included quite simply into routine planning and training. This study looks at how minimal education can significantly increase knowledge.

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CHAPTER 1: INTRODUCTION

Background

The events of September 11, 2001 changed the way this Nation viewed preparedness; similarly the aftermath of Hurricane Katrina changed the way healthcare facilities viewed readiness. The terrorist attacks and subsequent anthrax incidents of 9/11 and the response, or lack thereof, to Katrina have been a wakeup call to all that we must be alert and proactive when dealing with safety and preparedness. To date, many of the funding sources and government actions have been focused on hospital preparedness. Only recently has there been a recognition that healthcare during and after a disaster goes beyond the walls of the hospital and many are attempting to make preparedness a healthcare *system* function, not just a *hospital* function.

In 2002 the United States Department of Health and Human Services developed the Hospital Preparedness Program (HPP) to enhance hospitals' and other healthcare systems' abilities to respond to disasters and public health emergencies. Although the intent of this funding was to assist other healthcare systems, most of the focus and advancement has been with the hospitals (Department of Health and Human Services, 2013). Other facilities, including long-term care facilities, have lagged behind in improving and upgrading their preparedness response capacities, while significant improvements have been shown in hospitals.

The Pandemic and All-Hazards Preparedness Act (PAHPA) was signed into law in December 2006 which was to improve the nation's public health and medical capabilities to prepare and respond to all types of emergencies.

The population of those 65 years and older is projected to increase to 55 million in 2020 and by 2030 there will be about 72.1 million older persons, over twice the number reported in 2000 (Agency on Aging, n.d.). This creates an enormous population of elderly people who largely have several comorbid and chronic health conditions and who are solely dependent on the preparedness of the facility in which they live (Department of Health and Human Services, 2013).

This growing sector of frail elderly must be recognized as a vulnerable population who needs emergency planners, whether inside an institution or out, to develop concerted and targeted strategies for preparedness (Fernandez, 2002). Like other vulnerable populations, these individuals rely on someone to provide all aspects of their daily health and welfare needs, such as appropriate food, medicines, toiletry, and general nursing care. Although age does not singlehandedly make a person vulnerable, without assistance residents of nursing homes are surely defenseless and unprotected from serious injury and death. We owe it to those we serve to fill these preparedness gaps and provide a home that is as safe and secure as possible.

Since 9/11 three Presidential Directives have outlined what preparedness efforts we should be able to expect from providers. The Centers for Medicare and Medicaid Services (CMS) have used these directives as a basis for many of their new regulation requirements regarding emergency preparedness within the healthcare system (Department of Health and Human Services, 2013).

Statement of Problem

The problem today is that many long-term care facilities are under-prepared for disasters within their workplace (Hyer, 2013). A survey conducted with nursing home administrators in 2005 substantiates this claim with 90% of the respondents indicating their employees were “not well-prepared for a disaster” (Laditka, Laditka, Cornman, Davis, & Richter, 2009). This lack of preparedness comes in many forms, namely deficient knowledge and planning. Some long-term care facilities have little more than a paragraph stating to where they will place residents when in a tornado watch.

A 2006 Office of Inspector General (OIG) report found that in 2004-2005, 94 percent of nursing homes met federal requirements for emergency training and 80 percent met requirements for emergency plans (Levinson, 2012); however, it is important to note that these regulations may not have been adequate for comprehensive preparedness and also may not be adequate for today’s

environment. For example, previous requirements for CMS certified nursing homes stated they would have “detailed written plans and procedures” (Levinson, 2012), but does not provide guidance or structure regarding what those details should include. Current regulations do not address key planning elements (Department of Health and Human Services, 2013), so although the compliance rates in this OIG report was high, the standards that were met were quite low.

The same OIG report found that in 2009-2010 the percentages of adequate planning and training had decreased slightly. We must work to develop an emergency preparedness *program* that will work through all aspects of emergency preparedness, so we are moving forward and not declining.

In the Levinson report, 28 percent of the nursing homes were found to have inadequately trained staff concerning their facility’s emergency plans, mentioning that this number is most likely higher in reality because of the lack of consistency in the survey process. Only 50 percent of the facilities used the Center for Medicare and Medicaid Services’ preparedness checklist. Most glaringly was the fact that over 70 percent of the facilities reported “facing substantial challenges” in responding to disasters (Levinson, 2012).

A challenge in assessing training and competence levels in nursing home staff is the fact that facilities from region to region and from state to state are frequently required to maintain different types and amounts of training (Laditka, Laditka, Cornman, Davis, & Richter, 2009). The current “regulatory patchwork” of federal, state, and local laws and the different requirements of accrediting organizations (Department of Health and Human Services, 2013) does not provide for uniform or streamlined preparedness from one jurisdiction to another.

This project will assist nursing homes three-fold with addressing this problem. First it will increase participants’ knowledge regarding preparedness and show that the process neither has to be complicated nor time-consuming. Second, it will provide a plan template for six of the core planning recommendations as written in the proposed CMS regulations for facilities to use as

they feel is appropriate. Third, it will identify an educational standard (time, content, delivery, etc.) for which administrators and preparedness planners can build their preparedness program.

I intend to show that with six 1-hour educational sessions participants will increase their preparedness knowledge by a minimum of 25 percent.

Significance of Project

This project is designed to increase the knowledge of key staff of long-term care facilities, while gathering data to assess this change. I hypothesize that this study will show a 25 percent increase in participants' knowledge by the end of the project, measured by a pretest at the beginning and a post-test at the conclusion.

Additional benefits of this project are to provide them with a helpful tool (plan template) and present a starting point in which facilities can use to build or enhance their preparedness program. By the end of the project each participating facility will have disaster plan templates for each of the six educational topics, which correspond directly to the requirements of CMS and their proposed new preparedness regulations. These topics include: communication and collaboration, evacuation and patient tracking, shelter-in-place and emergency supplies, emergency staffing, surge planning, and training and testing. This will provide participating long-term care facilities a template in which they can build their initial plan if needed or include parts as needed to enhance their already existing plan.

The goal of CMS' new preparedness regulations and hopefully a byproduct of this project, at least with a small number of local LTC facilities, is to begin to see preparedness as a program (Department of Health and Human Services, 2013), not just a planning document or an annual drill. Developing a preparedness program encourages constant improvement and building as time, events and environments change. This project will assist nursing home administration and emergency planners in identifying a baseline standard for their facility, in terms of time commitment and educational content, in which to continue to build their preparedness programs.

Recent disasters have proved that staff training in disaster preparedness is inadequate (Laditka, Laditka, Cornman, Davis, & Richter, 2009). This project will show that developing a preparedness training program does not have to cost a lot of time or money for the facility to increase their staff's level of awareness and disaster preparedness knowledge. It will show that preparedness training can become integrated as a part of their monthly and yearly routine without extraordinary commitments from staff or administration.

This project will be significant to participating long-term care facilities because it addresses six of the issues outlined in the proposed new CMS regulations that are set to possibly take effect in 2016. These issues have been identified from recent disasters as deficiencies in planning and preparedness, thus by the end of the project, participants will have a significant start to fulfilling planning requirements for their facilities.

Although there has been some concern about the robustness of the proposed CMS regulations, professionals in emergency preparedness agree this is an invaluable step toward advancing the level of knowledge and awareness among healthcare professionals in a wide variety of settings (Walsh, Craddock, Gulley, Strauss-Riggs, & Schor, 2015), not just hospitals.

CHAPTER 2: LITERATURE REVIEW

Most Significant Gaps in Planning and Training

The U.S. Department of Health and Human Services concluded that current healthcare system preparedness regulatory requirements are not thorough enough to address the complexities of a real-life disaster (Department of Health and Human Services, 2013), specifically planning and training requirements. These findings are significant because they explicitly deal with the morbidity and mortality of human life.

More specifically, gaps have been noted in several common areas throughout different disasters—communication, supplies, staffing, transportation, and loss of power (Laditka, Laditka,

Cornman, Davis, & Richter, 2009). Problems identified during evacuations in the gulf region during Hurricane Katrina were communicating with family members, maintaining hydration and hygiene of residents, and staff exhaustion (Laditka, Laditka, Cornman, Davis, & Richter, 2009).

All-hazards planning is required to address shortcomings from all types of disasters, particularly the most predictable events to the area surrounding each individual facility (Hyer, 2013). The all-hazards methodology also requires planning to take place at a system level not only at an individual or facility level (Veenema, 2006). Nursing home preparedness has focused primarily on fire and a minimal number of other events, such as tornadoes, and have generally missed the all-hazards perspective.

In addition to the initial response phase, the ability to sustain response operations to move seamlessly into and sustain recovery operations (Hyer, 2013) are also important reasons to build and maintain a robust disaster program.

Training and education standards are not currently required of nursing programs and competency-based emergency education as it pertains to disasters, and bioterrorism has also not be addressed (Veenema, 2006). To provide the most effective training, it should be based on vulnerabilities, which are identified by the facility's hazard vulnerability or risk assessment. These assessments are not currently a requirement of nursing homes, so defining training needs and content is problematic (Walsh, Craddock, Gulley, Strauss-Riggs, & Schor, 2015).

Literature Regarding LTCF Disaster Planning

A study conducted by the U.S. Department of Health and Human Services (DHHS) found that 92 percent of the nursing homes they studied lacked a sufficient communication plan and the necessary collaboration with local emergency management agencies (Department of Health and Human Services, 2013). In a survey of nursing home administrators after Hurricane Katrina, roughly 80 percent reported being unaware of state or local emergency plans (Laditka, Laditka, Cornman, Davis, & Richter, 2009) and most felt abandoned by all levels of government

throughout their ordeal (Blanchard & Dosa, 2009). Furthermore, many nursing homes after the 2004 hurricanes in Florida reported having no knowledge of or communication with the emergency operations center to report their status or request assistance (Hyer, 2013). A positive development in the recovery process after Katrina was a reported 73 percent increase in cooperation with state agencies (Blanchard & Dosa, 2009).

Nursing homes are seldom included in community planning and training (Laditka, Laditka, Cornman, Davis, & Richter, 2009) even though they are a major partner in the healthcare *system* approach to disaster preparedness. The absence of nursing homes from community emergency planning left many of them at the bottom of the list for acquiring critical supplies and resources after a disaster (Hyer, 2013). It has also minimized the sharing of already-developed policies, procedures, or other planning pieces that could benefit nursing homes in their preparedness efforts (Walsh, Craddock, Gulley, Strauss-Riggs, & Schor, 2015).

A newly emerging structure for community planning and training is the healthcare coalition (HCC). These groups develop preparedness plans on a regional basis to include many stakeholders, including hospitals, nursing homes, emergency medical services, outpatient providers, medical volunteers, emergency management and others to increase the response capacity of the healthcare system. The planning, training, and resource sharing that is a staple with the HCCs increases capacities and capabilities and reduces redundancy (Walsh, Craddock, Gulley, Strauss-Riggs, & Schor, 2015).

The DHHS study found that 71 percent lacked the details and relevant information to effectively execute their plans during a response (Department of Health and Human Services, 2013). The majority of nursing homes surveyed after Hurricane Katrina said they needed to improve their plans and increase collaboration in the areas of transportation, supplies, staffing, and communications (Laditka, Laditka, Cornman, Davis, & Richter, 2009).

The majority of nursing homes studied in the DHHS report did not use the CMS emergency preparedness checklist to guide their planning efforts and most nursing homes' plans lacked many of the recommended actions (Department of Health and Human Services, 2013).

Having a well-organized disaster plan has been reported as a positive from some nursing homes during the evacuations and response to Hurricane Katrina (Laditka, Laditka, Cornman, Davis, & Richter, 2009). Although it has been suggested that you can never do enough planning, it also true that your plan must be well-organized and functional (Dolan, Long Term Care: Lessons Learned from Impacted Facilities, 2011).

In a study conducted by Blanchard and Dosa comparing the readiness of nursing homes between Hurricanes Katrina and Gustav (a three-year interval), they found that much improvement had occurred in planning. Fewer logistical problems occurred, administrators had more confidence in their preparedness efforts, and collaboration with state agencies improved (Blanchard & Dosa, 2009), all positive progresses in planning efforts.

Literature Regarding Basic Employee Preparedness Knowledge

There is growing concern over the emergency preparedness training and education that healthcare professionals are receiving both in school and in the workplace. One survey of deans and directors of nursing schools showed that 75 percent of the respondents said their graduating nurses were unprepared in disaster management (Weiner, Irwin, Trangenstein, & Gordon, 2005). Nursing programs provide limited training and instruction in disaster preparedness (Weiner, Irwin, Trangenstein, & Gordon, 2005).

It is important to establish a minimum set of competencies for nurses to determine their role in a disaster as well as guide the development of the training and education program. Most degree nursing programs lack this disaster training in their curriculum (Pang, Chan, & Cheng, 2009). Adding disaster preparedness education and training to nursing degree requirements presents several challenges. One of the problems is that nursing schools report having trouble

finding subject matter experts in this area to provide the training and instruction (Weiner, Irwin, Trangenstein, & Gordon, 2005). Moreover, there is not a national standard determining what should be included in the curriculum, no agency to oversee its development, and an already packed schedule of requirements with little room to add new courses (Weiner, Irwin, Trangenstein, & Gordon, 2005).

There are further challenges regarding how to build capacity in today's nurses with a knowledge base and minimum set of skills to respond to the challenges and complexities of a variety of disasters. As the environment continually changes and disasters become more frequent and severe, it is more important than ever to recruit and train nurses that are able to respond to a disaster efficiently and effectively (Pang, Chan, & Cheng, 2009).

Nursing home providers are at an added disadvantage from hospital providers who many see trauma on a daily basis and were trained in trauma and emergency response. Nurses working at a long-term care facility do not work or plan for community disasters as part of their normal routine, so the amount of disaster preparedness training for them is significantly less than hospital nurses (Gebbie & Qureshi, 2002).

Additionally, disaster preparedness must go beyond nurses to anyone within the facility that is responsible for the physical and emotional safety and wellbeing of the individuals for whom they care (Laditka, Laditka, Cornman, Davis, & Richter, 2009). This could include social workers, administration, maintenance workers, and even office personnel. To forge an effective response it takes many skills, not just medical knowledge, from a range of personnel within a facility (Laditka, Laditka, Cornman, Davis, & Richter, 2009). Administration must lead this charge and make it among his/her priorities. Without this commitment from healthcare leaders, a valuable and successful preparedness program will likely not happen. This notion is supported by a survey that showed 76 percent of patient care providers indicated that preparedness training be limited to "less than one day per year" (Walsh, Craddock, Gulley, Strauss-Riggs, & Schor, 2015).

Currently, many nursing homes do not adequately prepare their staff to respond to a disaster even though it is currently a participation requirement of CMS. In fact, the number may be concerningly low. Less than ten percent of nursing home administrators in one survey reported providing education to staff by conducting disaster drills, a fact that was backed by an OIG evaluation ten months after Katrina (Laditka, Laditka, Cornman, Davis, & Richter, 2009). The primary barrier to providing disaster training was reported as time constraints (Walsh, Craddock, Gulley, Strauss-Riggs, & Schor, 2015). It is imperative that administration and nursing leaders develop a program that works for their needs and fits within the constructs of their organization.

Lessons Learned in Relation to Planning and Training Gaps

The six topics chosen for the educational sessions for this project were specifically outlined in the proposed new regulations by CMS because they have been identified from past disasters as significant problems and/or gaps in the subsequent response operations. Below is information that will be included in the educational sessions as significant lessons learned from previous disaster responses and possibly details that will need to be included or further explored by project participants for their facility's disaster plans and future training and education.

Many of these topics were also cited by nursing home staff as helpful elements in caring for evacuees after Katrina or other disasters including internal and external collaboration, having a useful preparedness plan, having extra supplies available and dependable staff (Laditka, Laditka, Cornman, Davis, & Richter, 2009).

1. Communication and Collaboration

- Collaborating with agencies within the emergency management and response system became noticeably important after Katrina, which prompted nursing homes to revise their plans to incorporate incident command information specific to nursing homes into their disaster plans (Hyer, 2013).

- Those Florida nursing homes who had a collaborative relationship with emergency management before the hurricanes of 2004 were “far more likely” to procure assistance from local emergency responders than those who did not have a prior relationship (Hyer, 2013).
- Nursing homes often did not have the phone numbers of local or state emergency management officials to call after a disaster (Hyer, 2013).
- Alternate forms of communication (e.g. satellite phones or radios) are recommended to aid in communication between facilities and to government emergency response agencies (Cefalu, 2006).
- Recognizing their vulnerability of not being a priority healthcare facility, many long-term care facilities are developing mutual aid agreements with other partners and response agencies (Hyer, 2013).
- Joining a healthcare coalition provided a forum for collaboration with many organizations, building capacities and capabilities, understanding and filling community gaps and resources, and planning alliances (Walsh, Craddock, Gulley, Strauss-Riggs, & Schor, 2015).

2. Evacuation and Patient and Information Tracking

- Sharing patient information and associated documentation has been a significant problem with facilities during hurricanes and subsequent flooding (Department of Health and Human Services, 2013). Improve and create a basic resident identification, personal and medical information, and photo identification system (Dolan, Long Term Care: Lessons Learned from Impacted Facilities, 2011).
- Tracking residents who were spread to alternate facilities was difficult (Levinson, 2012).
- In many disasters transportation is the weakest link in the ‘evacuation chain’ (Benson, n.d.). Evacuation issues that arose after the hurricanes were due to the fact that facilities could not secure transportation (Department of Health and Human Services, 2013). Plans

can “never have enough transportation” identified (Dolan, Long Term Care: Lessons Learned from Impacted Facilities, 2011).

- Ninety-six percent of the plans reviewed did not include how to handle residents’ illness or death while being evacuated (Levinson, 2012). Significant morbidity issues occurred during evacuation, including traumatic falls, hip fractures, and heart attacks (Blanchard & Dosa, 2009). Evacuation causes higher morbidity and mortality than sheltering-in-place (Hyer, 2013).
- Challenges of evacuating nursing home residents after Katrina included communicating with families, staff exhaustion, and lack of supplies to maintain hygiene and hydration of resident evacuees (Laditka, Laditka, Cornman, Davis, & Richter, 2009).
- Identifying receiving facilities at the time of a disaster (not having prior agreements in place) was a monumental task (Levinson, 2012).
- In preparing for evacuation all residents were triaged by mobility status and a personal bag was developed to include a change of clothes, medical record, medications and associated pharmaceutical records (Hyer, 2013). Develop a triage plan to evacuate the frailest residents first, possibly a day before other residents (Blanchard & Dosa, 2009).
- Keep vital medication records in a separate (backup) location to ensure access after a disaster (Cefalu, 2006).
- Most administrators felt conflicted in the decision to evacuate or shelter-in-place (SIP) with little assistance and felt pressure to evacuate even though they preferred to SIP (Blanchard & Dosa, 2009).

3. Shelter-in-Place (SIP)

- SIP results in the rapid depletion of supplies and subsistence needs (Department of Health and Human Services, 2013). None of the plans that were reviewed specified the amount of water required for SIP (Levinson, 2012). Several nursing homes reported the importance of having extra supplies (Laditka, Laditka, Cornman, Davis, & Richter, 2009)

or ensuring that all resources can be replenished in the aftermath of the event (Hyer, 2013).

- Plans need to include provisions for visitors, families, and volunteers (Department of Health and Human Services, 2013).
- Supplies that need to be ready to accompany each vehicle include hygiene and medical supplies, food, water, towels and oxygen to last a significant amount of time (Cefalu, 2006).

4. Emergency Staffing.

- The majority of the plans reviewed did not include ways for ensuring sufficient staffing levels (Levinson, 2012).
- Staff reported that caring for evacuees was difficult because the evacuees were in poor physical and mental condition (Laditka, Laditka, Cornman, Davis, & Richter, 2009), thus having extra helpers can become vital.
- Staff exhaustion became an issues because of the overtime and extra work required to provide continuous care (Laditka, Laditka, Cornman, Davis, & Richter, 2009). The impact of the tornado on employees was devastating that will “take time and there will always be a lasting impact” (Dolan, Long Term Care: Lessons Learned from Impacted Facilities, 2011).
- Plans needed to include how to use volunteers (organized volunteers such as from the Medical Reserve Corp and spontaneous) and what tasks are appropriate for them (Hyer, 2013).
- During a disaster response, many staff are used in a capacity other than their normal job. Cross-training, education, and training for all staff members increases capabilities (Laditka, Laditka, Cornman, Davis, & Richter, 2009).

5. Resident Surge

- Resident population could double overnight (Cefalu, 2006). During Super Storm Sandy one nursing home told emergency responders they could accept twenty residents as part of their surge plans; they received 40 (Montgomery, 2014).
- Residents should be triage upon arrival (Cefalu, 2006).
- Incoming evacuees may need new orders issued if arriving without medical and dietary records, thus close and early contact with medical direction is critical (Cefalu, 2006).

6. Training and Testing

- The importance of preparedness training and well planned and systematic exercises cannot be understated (Laditka, Laditka, Cornman, Davis, & Richter, 2009).
- As mentioned above 80 percent of nursing homes met federal standards for emergency training even as these standards have proven to be inadequate (Department of Health and Human Services, 2013).
- Core and basic training is an ongoing need because of employee turnover and the need for continual review. Focusing on care capabilities is important (Walsh, Craddock, Gulley, Strauss-Riggs, & Schor, 2015).
- Plans that are never practiced or not understood will likely be useless (Gebbie & Qureshi, 2002).
- None of the nursing homes reviewed had participated in regional preparedness exercises before the disaster (Levinson, 2012).

CHAPTER 3: METHODS AND PROJECT DESIGN

Project Outline

Project Objective

The goal of this project is to be able to assist long-term care facilities with their disaster preparedness planning and staff education and subsequently be able to measure the increase in staff knowledge about disaster preparedness.

I intended at the genesis of this project to show that with six 1-hour educational sessions participants will increase their preparedness knowledge by a minimum of 25 percent.

Study Population

My study population consists of rural long-term care facilities in 15 counties in southwest Nebraska. Participants hold a variety of positions within their facilities (e.g. safety, administration, nursing, ward clerks, maintenance, etc.). Recruitment was conducted from a convenience sample through already established long-term care facility contacts of Southwest Nebraska Public Health Department (SWNPHD) and the Nebraska Plains Healthcare Coalition (NPHCC).

Test Design

The thirty-question test was designed to include two or more questions for each of the six focus areas, as well as facility and demographic information. The number of questions per topic area are as follows:

- Topic 1—Communications and Collaboration 8 questions
- Topic 2—Evacuation, Patient Tracking and Identification 5 questions
- Topic 3—Shelter-in-Place and Emergency Supplies..... 2 questions
- Topic 4—Emergency Staffing 3 questions
- Topic 5—Surge Planning..... 2 questions
- Topic 6—Training and Testing..... 5 questions

Facility, demographic, and personal information was captured with five questions which asked the participant to identify the:

- Licensed bed capacity of their facility.
- Current number of residents of their facility.
- Participant’s position or title of employment for the facility
- Participant’s perception of how well their current disaster plan meets CMS’ new preparedness regulations.

- Participant's ranking of their understanding and knowledge of emergency preparedness.

Confidentiality was assured to all participants by using the web-based survey program, Survey Monkey.

Project Design

All regional nursing homes were contacted via email or phone and asked to participate by selecting at least three employees to join in the project. Coordination of the project among the participants was then done through email. Selecting participants in this manner may have created self-selection bias; possibly those who are generally more familiar with emergency procedures. Submission of the project was reviewed by the Internal Review Board of the University of Nebraska Medical Center (UNMC).

This project began with all participants completing a pretest consisting of 30 questions regarding general and nursing home preparedness, which will incorporate the six CMS topics outlined above. The pretest was offered through Survey Monkey, a web-based data collection program. A link was provided via email to all participants in which they can follow electronically to the pretest on Survey Monkey. Some of the pretests were completed and submitted electronically through the Survey Monkey program, while other participants chose to complete their test manually with pen and paper.

After the pretest was completed, I led six 1-hour educational sessions with all study participants via conference call and/or GoToMeeting, a web-based conferencing system. The conferencing/educational sessions were recorded (both audio and visual via the GoToMeeting system) for those participants who were absent from the educational sessions and provided to him/her via a link in Dropbox (an online file hosting service) for viewing at their convenience.

Each session covered one of the following topics:

1. Communication plan
2. Evacuation plan / Resident identification, information & tracking
3. SIP plan / Emergency supplies
4. Emergency staffing
5. Resident surge

6. Training and testing

The educational sessions included a review of a plan template containing vital planning information retrieved from a literature review that should conceivably be included in each participant's plans. We discussed the information included in the template and why it's important to preparedness. Pertinent supplemental material was also included, such as applicable forms and data. Additionally, lessons learned from past disasters related to the above topics was reviewed. A sample of the lessons learned data is included above.

Once all six of the educational sessions were concluded, the participants completed a post-test identical to the pretest in content and delivery. I used manual and Survey Monkey's capabilities to aggregate and compile the test data, which was used to show any change in baseline preparedness knowledge among participants.

Timeline

August	Have project participants in place
September	Approval of project
October	Administer pretest
October-April	Six 1-hour education/planning session
April	Administer post-test
June	Committee have final project
July	Final presentation

Results Analysis

Descripted statistics were used to examine demographic information. Chi-Square tests were used to examine the association between variables. The T-test was used with paired samples.

CHAPTER 4: RESULTS

Demographics

The tests included five questions to capture facility, demographic and personal information from each participant including: licensed bed capacity, current number of residents, the position or

title of the participant, the participant’s perception of the completeness of their facility’s disaster plan, and the participant’s perception of their own preparedness knowledge.

Licensed Bed Capacity Results

Of the six participants who completed the project, two were employed at a facility that licensed 26-50 beds and four participants were from facilities with 50 or more beds. None of the participants identified with a 0-25 bed facility.

Those who worked in a 26-50 bed facility scored higher on their pretest than those from 50+ bed facilities with scores of 60% and 32% respectively. However, the larger facilities scored better on the post-test (98%) than the smaller facilities (96%). (See Table 1)

Facility’s Bed Capacity	Average Pretest Scores	Average Post-test Scores
26-50	60%	96%
50+	32%	98%

Resident Population Results

When asked how many residents each participant currently cared for in their facilities, one participant had the response of 15-30, two participants had the response of 31-45 residents and three participants responded as 46 or more residents under their care.

The pretest scores of those facilities who care for fewer residents were higher than those with more residents; the 15-30 resident facility scored 72%, 31-45 resident facilities scored an average of 38%, and facilities with 46 or more residents scored an average of 33% on the pretest.

The smaller facility also showed the highest post-test score with 100% accuracy. Facilities housing 31-45 residents scored 94% and facilities housing 46 or more residents score 97% on the post-test (see Table 2).

Facility’s Resident Population	Average Pretest Scores	Average Post-test Scores
15-30 residents	72%	100%

31-45 residents	38%	94%
46+ residents	33%	97%

Position/Title Results

Each participant was asked to identify their position or title as employed by the facility. Three participants identified as administration and three identified as a nurse, CNA, or other provider. There were no participants that identified their title or position as safety, risk, or emergency management or as ward clerk, clerical, or maintenance worker.

Administration did better on both the pretest (47%) and the post-test (100%) than did those who identify as a nurse, CNA, or other provider, who averaged 36% on their pretest and 98% on their post-test (see Table 3).

Position/Title	Pretest Average	Post-test Average
Administration	47%	100%
Nurse, CNA, other provider	36%	98%

Overall and Individual Test Results

Although there were several participants who took part in the educational sessions, the pretest and/or the posttest, only six participants completed all six sessions and both tests. These participants are referred to as Participants 1-6.

The tests included 25 multiple-choice questions that tested the participant's knowledge of emergency preparedness. The

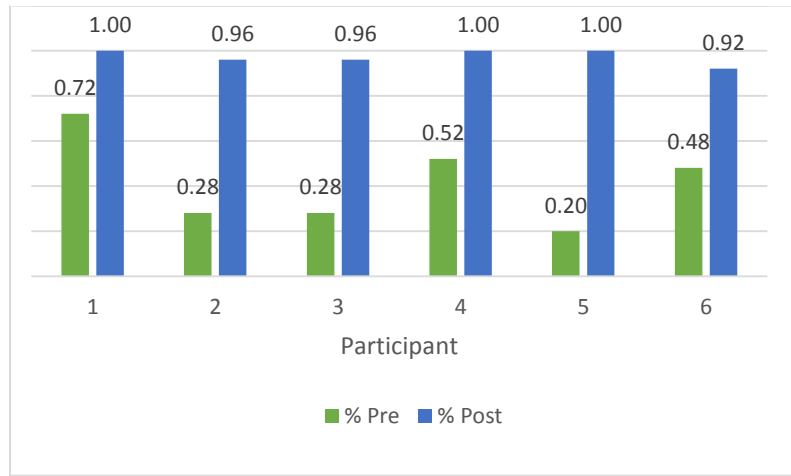
table below shows the results of both the pretest and post-test of each participant.

Table 4 shows each participants raw test scores and

Participant	Pretest Score	Pretest %	Post-test Score	Post-test %
1	18	0.72	25	1.00
2	7	0.28	24	0.96
3	7	0.28	24	0.96
4	13	0.52	25	1.00
5	5	0.20	25	1.00
6	12	0.48	23	0.92

the percentage accordingly. Figure 1 demonstrates the increase between the pretest and post-test for each participant. Each participant showed an increase in knowledge from the score of their pretest to the score of their post-test. Participant 1 increased their score by 28%, Participant 2 and 3 by 68%, Participant 4 by 48%, Participant 5 by 80%, and Participant 6 by 44% (see Figure 1). The average increase by all participants was 56%.

Figure 1: Changes in Test Score



Personal (Subjective) Ranking of Completeness of Current Disaster Plan

The participants were asked to rank how well they thought their current plan includes the new Center for Medicare and Medicaid Services' (CMS) requirements. They were given five choices that included: 1.) I don't know, 2.) <25%, 3.) 26-50%, 4.) 51-75%, and 5.) 76-100%.

Two participants' perceptions increased, 1 participant's perception decreased, and three remained the same (see Table 5).

	Pretest	Post-test
I don't know	2 3 5	3
<25%		
26-50%	1	1 5 6
51-75%	6	
76-100%	4	2 4

Personal (Subjective) Ranking of Preparedness Knowledge Results

Question Five asked, “How would you rate your understanding and/or knowledge of emergency preparedness?” The five choices given were 1.) I know very little, 2.) I have some knowledge, 3.) I have a basic understanding, 4.) I have a significant understanding, and 5.) I have a comprehensive/complete understanding.

For easy comparison, a typical academic letter grade is assigned to each of the above answer choices and compared with the letter grade that would have been assigned to the score each individual earned from their pretest (see Table 6). The letter grade that is assigned to each answer is as follows:

- I know very little..... F
- I have some knowledge..... D
- I have a basic understanding C
- I have a significant understanding B
- I have a comprehensive/complete understanding A

The letter grades assigned to the pretest scores are as follows:

- 90-100% A
- 80-89% B
- 70-79% C
- 60-69% D
- >59% F

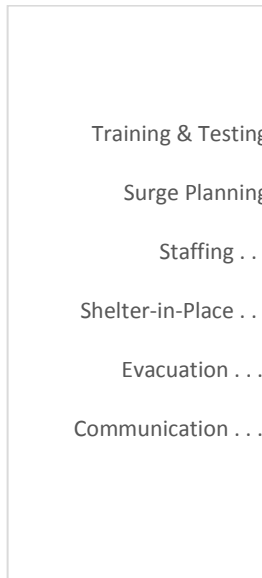
Table 6: Comparison of actual and perceived knowledge of emergency preparedness		
Participant	Perceived knowledge	Actual Pretest Letter Grade
1	B	C
2	A	F
3	D	F
4	B	F
5	C	F
6	B	F

Topic Area Results

The test questions were developed according to six topic areas described in Project Design above. All six topics were chosen because of their significance with the new proposed CMS regulations. On the pretest participants scored the highest in the area of Surge Planning (58%) and scored the lowest on the questions related to Emergency Staffing (28%). Other scores included 50% in Evacuation, Patient Tracking and Identification, 43% in Training and Testing, 42% in Shelter-in-Place and Emergency Supplies, and 33% in Communications and Collaboration (see Figure 2).

The post-test scores per topic area. The highest scores were recorded in three areas—Emergency Staffing, Shelter-in-Place and Emergency Supplies, and in Communications and Collaboration, all with 100% accuracy. The other scores in the remaining three areas, in descending order were Evacuation, Patient Tracking and Identification (97%), Surge Planning (92%), and Training and Testing (90%).

Figure 2: Test scores for each education topic



Statistical Analysis

There was no association between how the size of the participant's facilities and their pre-test scores ($p = 0.199$). However, we were not able to take into consideration the small sample size ($n=6$), see Table 7.

Table 7: Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	6.000 ^a	4	.199
Likelihood Ratio	7.638	4	.106
Linear-by-Linear Association	2.737	1	.098
McNemar-Bowker Test	.	.	. ^b
N of Valid Cases	6		

a. 10 cells (100.0%) have expected count less than 5. The minimum expected count is .33.
b. Computed only for a PxP table, where P must be greater than 1.

There was no association between how the size of the participant's facilities and their post-test scores ($p = 0.223$). However, we were not able to take into consideration the small sample size ($n=6$), see Table 8.

Table 8: Chi-Square Tests

	Value	df	Asymptotic Significance (2- sided)
Pearson Chi-Square	3.000 ^a	2	.223
Likelihood Ratio	3.819	2	.148
Linear-by-Linear Association	.500	1	.480
McNemar-Bowker Test	.	.	. ^b
N of Valid Cases	6		

a. 6 cells (100.0%) have expected count less than 5. The minimum expected count is .33.
b. Computed only for a PxP table, where P must be greater than 1.

There was no association between the job title of the participants and their pre-test scores ($p = 0.406$). However, we were not able to take into consideration the small sample size ($n=6$), see Table 9.

Table 9: Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	4.000 ^a	4	.406
Likelihood Ratio	5.545	4	.236
Linear-by-Linear Association	1.006	1	.316
McNemar-Bowker Test	.	.	. ^b
N of Valid Cases	6		

a. 10 cells (100.0%) have expected count less than 5. The minimum expected count is .50.

b. Computed only for a PxP table, where P must be greater than 1.

There was no association between the job title of the participants and their post-test scores ($p = 0.513$). However, we were not able to take into consideration the small sample size ($n=6$), see Table 10.

Table 10: Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	1.333 ^a	2	.513
Likelihood Ratio	1.726	2	.422
Linear-by-Linear Association	1.000	1	.317
McNemar-Bowker Test	.	.	. ^b
N of Valid Cases	6		

a. 6 cells (100.0%) have expected count less than 5. The minimum expected count is .50.

b. Computed only for a PxP table, where P must be greater than 1.

There was no association between how the participants rated themselves on their emergency preparedness knowledge and their pre-test scores ($p = 0.301$). However, we were not able to take into consideration the small sample size ($n=6$), see table 11.

Table 11: Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	14.000 ^a	12	.301

Likelihood Ratio	12.137	12	.435
Linear-by-Linear Association	.422	1	.516
McNemar-Bowker Test	.	.	^b
N of Valid Cases	6		

a. 20 cells (100.0%) have expected count less than 5. The minimum expected count is .17.
b. Computed only for a PxP table, where P must be greater than 1.

There was also no association between how the participants rated themselves on their emergency preparedness knowledge and their post-test scores ($p = 0.513$). However, we were not able to take into consideration the small sample size ($n=6$), see Table 12.

Table 12: Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	1.333 ^a	2	.513
Likelihood Ratio	1.726	2	.422
Linear-by-Linear Association	1.000	1	.317
McNemar-Bowker Test	.	.	^b
N of Valid Cases	6		

a. 6 cells (100.0%) have expected count less than 5. The minimum expected count is .50.
b. Computed only for a PxP table, where P must be greater than 1.

Pretest Descriptive Statistics

The average score of the pretest was 41.33%, see Table 13.

Table 13: Statistics

Score		
N	Valid	6
	Missing	0
Mean		41.3333
Median		38.0000
Std. Deviation		19.54141
Range		52.00
Minimum		20.00
Maximum		72.00

Post-test Descriptive Statistics

The average score of the posttest was 97.33%, see Table 14.

Table 14: Statistics

Score2		
N	Valid	6
	Missing	0
Mean		97.3333
Median		98.0000
Std. Deviation		3.26599
Range		8.00
Minimum		92.00
Maximum		100.00

Pair-samples t-test output:

Table 15: Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Score	41.3333	6	19.54141	7.97775
	Score2	97.3333	6	3.26599	1.33333

The mean scores of the pretest and posttest were significantly different ($p=0.001$). On average, there was a 56% increase in the posttest scores (95% CI [35.78, 76.22]), see Table 16.

Table 16: Paired Samples Test

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pair 1 Score2 – Score	56.00000	19.26655	7.86554	35.78099	76.21901	7.120	5	.001

CHAPTER 5: DISCUSSION

Project Objectives

The intent of this project at its inception was to assist nursing homes in three areas of disaster preparedness—to increase participants’ knowledge regarding preparedness, to provide plan templates for facilities to use as needed, and to identify an educational standard for their emergency preparedness program. Even though the study pool was smaller than anticipated, I believe that all three of my goals for this project were met.

First, I wanted to increase nursing home staff’s knowledge of the six preparedness topics outlined in the tests and educational sessions. As shown in the table and charts above, each participant that completed the program significantly increased their knowledge in the content areas of the training by as much as 80 percent. My original goal of increasing this knowledge by a minimum of 25 percent was met and surpassed as the smallest degree of increase by the end of this project was 28 percent.

The second objective of this project was to provide plan templates that can assist participating long-term care facilities with developing and updating their emergency response plan that includes requirements to address the new federal regulation standards that may soon be implemented. Participants were provided a plan template for each of the subjects discussed in the project that was developed from literature reviewed throughout this project, the Federal Register outlining the proposed preparedness regulations for healthcare facilities (Department of Health and Human Services, 2013), and the CMS Preparedness Checklist (2013, December).

The templates were used by participants and added to their disaster plans after updating to fit the needs of each facility. The templates will be continually revised by the facility and/or the disaster planning subgroup of SWNPHD and NPHCC that meets regularly to collaborate and share information.

Third, this project, with its pre- and post-tests and educational sessions, can be used as part of a facility’s preparedness program to identify baseline knowledge and quantify subsequent increases or decreases. Incorporating testing and education into a preparedness program will

allow preparedness program managers to assess where the strengths and weakness are in the training and skills of their staff and to then make necessary changes to fill those gaps.

In addition, this project demonstrates to administration there was an obvious return on their investment for the time and work they will put into preparing ongoing testing and education. They will be able to gage the amount of time needed to commit to education to increase knowledge according to their staff's test scores.

The low pretest scores were indicative of a society that has traditionally been unwilling to invest in disaster preparedness in the long-term care community. Historically, fire safety has been the single-most focus on institutional homes, but as this world moves into a new, more comprehensive preparedness paradigm, the pretest scores show how deficient we currently are in the new standard of preparedness that we must adopt.

The average pretest score was 50 percent. This shows inadequacy in preparedness knowledge but gives preparedness professionals a baseline from which they can build their preparedness program. Professionals and administration can use this number as a baseline to set goals for their staff. Developing and implementing their own testing system will allow them to monitor the overall and ongoing preparedness knowledge of their staff and should expect this number to grow annually until it reaches the goal or standard they set internally.

This baseline number and testing system will also assist administration in monitoring their preparedness program. Directly, it will show whether they are moving toward their preparedness goals and what areas in which they may be lacking or showing strength. It can be used in conjunction with a hazard vulnerability assessment to ensure that the risks that most threaten their facility are the risks that the staff are most prepared to handle.

Indirectly, the baseline test score and testing system will support funding, staffing, and ongoing training for the preparedness program because it will show gaps in understanding and knowledge. Funding can be shifted to areas in the preparedness program that are substandard or that are not meeting the goals set by the facility. This may include funding for an increase in

professional staff, training and exercising, or equipment. This data may also show the need to increase the need for professional staff to attend outside, high-level training or provide consultants to assist with planning.

The high scores earned on the post-tests demonstrate that with a minor amount of time and effort, preparedness knowledge can be dramatically improved. The scores from the pretest to the post-test improved from an average of 50% to 97% with only six hours of instruction over a six-month time period. This should also assist administration and preparedness planners in developing their disaster preparedness program by setting a baseline for the number of hours that would be beneficial for their facility to conduct education with staff.

Possibly the most interesting data this study showed was that the smaller facilities scored higher on the pretest than the larger facilities—in both categories of licensed bed capacity and current number of residents. *In the category of Current Number of Residents, there was only one participant, so the higher test score may have been the result of employment in a smaller facility; however, it may also be the product of a particularly well educated or knowledgeable participant.*

In any event, there could be many reasons for larger facilities scoring lower on the pretest. It is possible that larger facilities have a smaller staffing ratio per resident, thus increasing each employee's daily responsibilities and decreasing their time and energy that can be dedicated to preparedness issues. Many facilities combine their safety and preparedness roles into one position, so larger facilities may have more safety issues to deal with just because of the greater size of their facility. This may eliminate more time that is available for conducting preparedness activities than smaller facilities.

How the two categories—bed capacity and resident numbers—scored on the post-test is noteworthy. The participants from the larger facilities scored higher on the post-test than the smaller facilities, which was opposite of the pretest scoring; however, the facilities caring for a larger number of residents did not score as well as the facilities with smaller resident populations.

This could be symptomatic of the taxing amount of work required by staff from facilities that house more residents, just to accomplish day-to-day necessities.

Further study related to the significance between facility size and resident population to preparedness standards would be beneficial to all facilities, namely larger ones. Notwithstanding, larger facilities must be prudent in their preparedness program development, whether it's staff, training, funding, and standards.

Preparedness professionals and administration must provide for the development and advancement of a preparedness program that protects the many lives they have in their facility. Staff's time can be very limited because of the demands of daily work and funding of the program has little to no return-on-investment, which makes justification of time, money, and staffing difficult. Preparedness planners can use this data to demonstrate to administration the need to direct resources to the preparedness program, particularly in larger and more populated facilities.

Administrators scored better than all the other positions/titles on both the pre- and post-tests. This is remarkable considering preparedness may be a very small part of their everyday job tasks. The reason for these higher test scores is quite possibly because the average administrator works in long-term care for 25 years, at 10 different facilities, and is 60 years of age (Murphy, 2004). This real-world experience is invaluable to many aspects of nursing home operations and cannot be underrated in preparedness.

Two subjective questions in the study mined interesting data. The questions asked participants how complete they felt their disaster plan addressed the soon-to-be planning and preparedness requirements and how they rated their knowledge of disaster preparedness. Asking persons to rate their perception of something is very subjective and difficult to quantify objectively, but much can be learned from these data.

When asked about the comprehensiveness of their disaster plan, of the six participants, three of their rankings stayed the same from the pretest to the post-test—one said (s)he didn't

know, one said it was 26-50% complete, and one said it was 76-100% complete. Other than the participant that stated (s)he didn't know, this may be telling that the other two have a good understanding of their disaster plan and of the new requirements.

Two of the participants' perceptions of the completeness of their plan increased. Both of these people recorded on the pretest that they didn't know, but on the post-test they had the idea that their plan was either 26-50% complete or 76-100% complete. This increase in ranking could be because they were exposed to several in-depth planning topics so they had a better understanding of what the new regulations will require. It could also be from just having time to collaborate with co-workers to learn more about their disaster plan.

One participant's ranking went down slightly, from thinking it included 51-75% of the necessary planning information to surmising it only included 26-50%. This decrease may have stemmed from the person not having a clear idea of what the new regulations will require and/or not having a solid knowledge of what was or was not included in their facility's disaster plan. Regardless of the direction these rankings moved, it shows that participants became more aware of their internal plans and what future requirements may be expected of them.

The second subjective question that was asked related to their perception of their personal knowledge regarding disaster preparedness. Data collected from this question can be important in developing a preparedness program. In an academic setting, five out of six students would have actually flunked the pretest, while the remaining one would have had an average score. Their perception of how well they knew disaster preparedness, which was a mixture of grades (A, B, C, and D) but mostly conveying average to above average scores, was contrary to their actual scores (five F's and one C). This information is significant to emergency preparedness professionals when providing training and education to their partners because the field of preparedness is vast and extensive; therefore, regardless of how much employees think they know about the subject, facilities need to train and educate all employees constantly.

Implementing a testing program will help quantify this aspect of preparedness. Staff who have been at the facility for several years or who have a higher level of education may feel that continued preparedness planning and training is rudimentary and therefore not worth their time and energy. However, a testing program may prove otherwise, and can give preparedness professionals support in requiring all staff to participate in preparedness activities.

The results of the tests were categorized in topic areas. The two highest scores on the pretests were recorded in the areas of Surge Planning (58%) and in Evacuation, Patient Tracking and Identification (50%). Although these scores are not outstanding, it is encouraging to see that participants had notable knowledge of these critical and tremendous operational tasks. These topics may have scored higher than the other four because they are so critical to the safety of residents that they are included in more training and exercising than other, less critical, matters.

The two topic areas that scored the lowest on the pretests were Communication and Collaboration (33%) and Emergency Staffing (28%). This is not surprising as communication is many times problematic to response operations, whether it is tactical or information sharing communication. It is also not unexpected that Emergency Staffing scored low with participants as this is not a subject that seems to be a priority when planning. The reason for this could be because facilities do not think they have many options for increasing their staffing during an emergency and because there is so many other more acute and necessary tasks within emergency response that directly impacts life safety, such as evacuation planning.

The three lowest-scored topic areas on the pretest (Emergency Staffing, 28%; Communications and Collaboration, 33%; and Shelter-in-Place and Emergency Supplies, 42%) jumped to the three highest topic areas on the post-test, all ending with 100% accuracy in that topic area. This is noteworthy and could be because these are highly critical response operations (i.e. Shelter-in-Place, Communications) or topics that have not historically been trained on extensively (Collaboration, Staffing), so greater attention and further planning may have occurred when participants were listening to these particular educational sessions. Possibly, since this

information was relatively new to the participants, they just simply may have been more interested and, therefore, paid closer attention.

The two topic areas that scored the lowest on the post-test were Training and Testing (90%) and Surge Planning (92%). This data is not unexpected. Formal training and testing standards that go in depth into disaster planning is a new concept to the long-term care field. Many questions and concerns still remain about how this will be implemented and maintained within the daily operations of nursing facilities.

Likewise, surge planning is a relatively new concept to this sector of the healthcare system. Since LTC has been left out of much of the planning efforts at all levels, they have not considered themselves a critical element of surge planning, with either their own type of facility or with other types, such as hospitals, outpatient clinics, etc.

The long term care industry is plagued by an excessively high turnover rate at approximately 70 percent annually, according to a study by the American Health Care Association. This number could be as high as 200 percent in the Midwest region (Maun, 2007). This statistic alone demonstrates the need and monumental task of ongoing and continuous staff education and the further need to implement a testing system that will give a snapshot view of staff's readiness for disaster.

Challenges

There were several challenges experienced throughout this project. First, the number of participants who completed the project from beginning to end was much smaller than what was anticipated. This project was based on asking very busy professionals to take time out of their day to participate. There were several people who took the pretest, several who participated in educational sessions, and several who took the post-test, but inconsistently and intermittently only as their time allowed.

The sessions were scheduled for the same time of day, on the same day, every other week. This allowed them to be able to anticipate the educational sessions and plan accordingly,

but it did not plan around scheduling conflicts they may have had on that day. The sessions were recorded for those participants who may have been unable to attend the live session; however, many participants did not have, or take, the time to review the recording at a later time.

Another challenge was the process in which the tests were taken. The intent was to have all participants take the tests by using the web program Survey Monkey. A significant number of participants could not, or chose not, to take the tests in this manner but instead took them with pen and paper. This had to be acceptable because the process had to be done at the participant's convenience for fear they would be unwilling or unable to participate.

Taking the test with pen and paper created a few challenges. Survey Monkey tracks participants anonymously as was the intent of the project, but tests that were taken with pen and paper were returned with their names on them. Once the paper tests were turned in, a number was assigned to them to allow anonymity when reporting; however, it caused challenges in data collection and analysis.

Accepting hand-written tests created one limitation specifically with Question 5 which asked what position or title the participant held within their facility, since two of the participants wrote in responses that were not part of the given choices. Upon reflection of this question, it would have been sensible to add an "Other" option for those participants whose position/title did not fit within the given answers and also to reword the question to state, "What is your position/title *in which you most identify* within your facility?"

Rewards and Benefits

Many benefits resulted from this project beyond the increased awareness of emergency preparedness planning. First of all, this project allowed me to make contact with several LTCFs that I would not have been able to otherwise. Several facilities participated in this project because it was promoted and implemented with a dual-benefit purpose—they would be assisting with the completion of this project, at the same time they would gain valuable knowledge and

assistance with learning about and working toward compliance with the new regulation requirements.

Most importantly positive feedback was abundant from the participants. They felt their time was well spent, they substantially increased their knowledge of many aspects of preparedness, and the templates were very useful and helpful in updating and developing their plans. Remarkably, even seasoned emergency preparedness professionals reported they found value in the information shared throughout these sessions.

The program was so well liked, participants have asked to continue with the educational sessions and reviewing templates for more hazards and threats. They have also sent the recorded educational sessions on to management groups who have asked for them to share with other facilities to improve their plans.

This project introduced metrics into preparedness training for nursing homes. These metrics will begin to move preparedness beyond simply another activity or requirement into a measurable and achievable program that dramatically increases the safety of the people that rely on us for protecting their lives.

CONCLUSION

Outcomes from this project were positive in many respects. This project showed significant increases in staff's knowledge. Without a lot of time and effort, the facility's preparedness professional can put together a robust program that is progressive and advances the culture of preparedness in long-term care facilities.

I recommend that facilities build their preparedness program using some of the same elements as in this study, such as regular educational sessions dedicated to preparedness and testing of staff to establish goals and monitor progress. Consistency in the execution of the program (i.e. the time dedicated to the educational sessions, how often and when the sessions will

take place, etc.) will make quality assurance and improvement more easily examined and subsequently enhanced.

Although only six topics were chosen from many possibilities, there are a multitude more topics that need explored to have a comprehensive preparedness program and highly trained staff. These subjects can easily be found by looking at the proposed new regulations outlined in the Federal Register, the CMS preparedness checklist, and the facility's hazard vulnerability analysis, just to name a few. Facilities should ensure their plan addresses each subject, incorporates them into their training and exercise plan, and conducts annual testing on each staff member to ensure the facility as a whole is meeting quality standards regarding education and knowledge. Facilities should document the results of the testing each year to develop a picture over time of how the facility is hopefully progressing in preparedness knowledge.

Administration must continue to support disaster preparedness among their employees by providing time, training and funding to increase their knowledge and skills and cultivate a culture of excellence in this area. Changing the culture to one that values preparedness as a high priority starts at the top of the organizational chart. They must also require of themselves a commitment to being knowledgeable and proficient in all areas of disaster preparedness and response because they will be looked to as a leader in times of calamity.

Consistent and constructive collaboration with staff members may be the single most beneficial outcome of this project. The battle many times with any preparedness project is communication. This project increased the communication that occurred among members of each individual facility and among facilities within a region. This regional collaboration can be critical to the safety of residents, the financial strength of the facility, and the economic stability of the community. **These reasons for regional collaboration are the motivating factors behind the new preparedness standards which includes collaborating with the healthcare coalition, emergency management, and public health as critical tasks within any preparedness program.**

Safety and security goes beyond the four walls of any healthcare facility but starts within those same walls.

Training and education has to be continuous, diverse in content and scope, and mandatory for all staff regardless of how much they consider they understand or comprehend. We must strive to make emergency preparedness much more comprehensive than just fire drills. We must inject ourselves into the local, regional, and state disaster management system and learn broader response techniques. Emergency preparedness is moving into a new era of disaster response; long-term care must go with it.

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