12-2019

Hosptial Preparedness for an Internal Mass Casualty Event

Jason Farr
East Tennessee State University

Hospital Preparedness for an Internal Mass Casualty Event

A thesis

presented to

the faculty of the Department of Allied Health

East Tennessee State University

In partial fulfillment

of the requirements for the degree

Master of Science in Allied Health

---

by

Jason M. Farr

December 2019

Randy Lee Byington, Ed.D. Chair

Ester L. Verhovsek-Hughes, Ed.D

J. Michael Stoots, Ed.D

Keywords: Mass Casualty, Mass Shooting, Internal Disaster

ABSTRACT

Hospital Preparedness for an Internal Mass Casualty Event

by

Jason M. Farr

The purpose of this study was to determine hospital preparedness for an internal mass casualty/active shooter event at Tennessee hospitals. Data were collected during May of 2019 by surveying the CEOs of the 86 acute care hospitals in Tennessee. The survey solicited responses about training, preparedness, and internal evaluation of procedures. CEOs of 28 (32.5%) of Tennessee's acute care hospitals responded to the survey. Just over half (53.6%) of those responding indicated that they believed their facility was prepared or well prepared for an active shooter event. The mean responses of CEOs who had experienced an active shooter event were significantly lower than those CEOs who had not. Seventy-two percent of CEOs indicated that policies and procedures for active shooter/mass casualty events were updated at least every other year.

DEDICATION

To my wife, Rhonda Sturm Farr, and my five boys, Jackson, Jarom, Brigg, Pearce and Wesley. Thank you for your love and support as I pursued this degree.

TABLE OF CONTENTS

CHAPTER 1

INTRODUCTION

The National Institute for Occupational Safety and Health (2015) defined workplace violence as physical assaults and threats toward another person. Hospitals and other healthcare settings are at a high risk for violence from patients, visitors and coworkers. Healthcare professionals are victims of violent crimes in the workplace each year. In 2007, a survey of 3,500 emergency nurses revealed that 86% of those responding experienced physical violence at work. The physical violence ranged from pushing, to hitting, to assault with weapons. Seventy-two percent of the nurses reported that they did not feel safe and 19% stated that they were looking to leave because of violence. However, incidences of violence are unreported due to fear of retaliation or inconvenience (Sanson & Tavernero, 2011). From 2002 to 2013 workplace violence was four times more common in healthcare than in private industry (OSHA, 2015). Specifically, "Between 1996 and 2000 there were 69 homicides reported in health services, and 23% of the homicides took place in the emergency department" (Sanson & Tavernero, 2011, p. 16). According to OSHA (2016), inpatient acute care, long term care settings, and emergency departments present the highest risk.

Hospitals are open to the public every day of the year and securing the building and screening every person who enters presents a challenge. High-traffic areas such as the emergency department, followed by medical patient rooms, are the hardest areas to secure (JCAHO, 2010). Controlling access to a facility and having ongoing surveillance is necessary to reduce the risk of violence. In addition, preventative measures could be taken to control environmental factors that may provoke violence (Sanson & Tavernero, 2011).

The healthcare industry has many factors that increase the risk of violence. Risk factors include patients who have a history of violence or who may be under the influence of drugs; buildings with poorly lit corridors, rooms, or parking lots; and location in cities or neighborhoods with high crime rates (OSHA, 2015). According to the International Association for Healthcare Security and Safety Foundation, as cited by the Metropolitan Chicago Healthcare Council (2015) "between 2012 and 2014, the U.S hospital violent crimes rate increased by 40%, from 2.0 to 2.8 incidents per bed. In U.S. hospitals, 44% of aggravated assaults and 46% of assaults occurred in emergency departments in 2014 compared to other hospital spaces" (p. 2).

Between 2011 and 2013, 74% of workplace assaults occurred in healthcare settings and these assaults on healthcare workers resulted in 11% of involved employees taking days away from work compared to 3% of private sector employees (OSHA, 2016).

Statement of the Problem

Instances of workplace violence such as mass casualty events that result in internal disaster responses are one example of violence in the healthcare workplace. Leaders at hospitals learn from each response and adopt new practices; however, this practice results in additional time and money for employee training. While a hospital's role in external disaster management is well documented, little is known about their measures taken to prepare for workplace violence such as that found in mass casualty events that result in internal disaster responses. A focus on safety and security should be a priority to reduce knowledge gaps and create a secure environment for patients and employees.

Purpose of the Study

The purpose of this study was to investigate the attitudes and beliefs of hospital administrators regarding the preparedness of their organizations for internal disasters such as

mass causality events and to identify the current state of preparedness for internal disasters such as mass casualty events in Tennessee's hospitals.

Research Questions

The following questions guide this research:

1. What, if any, processes do the hospitals have in place to mitigate hostile situations?
2. What, if any, processes do the hospitals have in place to handle mass casualties that occur within their facilities?
3. What is the common method used to train hospital staff for workplace violence?
4. How often do hospital leaders identify gaps in their procedures resulting from new information gained from the analysis of other mass shootings and mitigate strategies to close those gaps?
5. How often do hospital leaders conduct live exercises to assess hospital readiness for acts of violence that may occur within their facilities?
6. How often do hospital employees practice responses to internal hostile situations (internal code testing)?

Significance of the Study

This study is important because while much is known about hospitals' preparedness for their responses to a community's response to mass casualty events, little is known about their level of preparedness for an event that could occur within a hospital. Hospitals play a pivotal role in disaster-response and routine planning and training of staff members. However, internal emergency preparedness requires hospitals to invest time and money in staff and training. Preparedness is a dynamic process that changes over time. Hospitals must learn from each emergency and adopt the best practices and incorporate new technology into their emergency

plans. Unfortunately, one plan does not fit all. Evaluation of past threats and hazards should be conducted in conjunction with multi-hazard training of hospital staff. When an emergency occurs, personnel must respond immediately, notify the response team and give instruction to others (Curtis, 2015). A new risk model for hospital security is emerging that uses technology as a proactive approach to help forecast potential incidents. The focus of this model is to provide continual assessment of security controls. Security events that have taken place in hospitals have occurred because of gaps in the existing security of the healthcare facility. Focus on prevention in healthcare, assessing security, and reduce gaps by tightening security will create a secure environment (Hamilton, 2014).

Delimitations and Limitations of this Study

This study was delimited to the Chief Executive Officer (CEOs) of 86 acute care hospitals in the state of Tennessee. This study was limited by the truthfulness of those responding.

Definitions of Terms

For the purpose of this study the terms mass casualty, mass shooting, or internal disaster are used interchangeably. Mass shootings are defined by the FBI as four or more shot and/or killed in a single incident (Borchers, 2017) and are considered one form of mass casualty event (Ben-Ishay et al., 2016).

CHAPTER 2

REVIEW OF LITERATURE

There are few scholarly articles or literature reviews on the topic of internal preparedness for hospitals during a mass casualty event. Databases such as PubMed and Google Scholar were searched but there was little content on this topic. Most of the information contained herein was pulled from governmental agencies and policies from other healthcare organizations.

Workplace violence is recognized as a specific category of violent crime. Most violent incidents include cases of assault, harassment, and physical and emotional abuse that are rarely reported to company management or police. Workplace violence damages trust and minimizes a sense of security that employees expect at work. Employers have an obligation to keep the work environment free from threats of violence and can face economic loss in the form of lost work time, damaged employee morale, and lawsuits (U.S. Department of Justice, 2001).

Statistics

From 2011 to 2013, U.S. healthcare workers experienced 15,000 - 20,000 workplace-violence-related injuries that required time away from work for treatment and recovery (OSHA, 2015). A rapid response to a critical event could prevent further harm to hospital employees and patients (JCAHO, 2010).

According to the U.S. Department of Justice as reported by the Emergency Medical System in Virginia (2001), "violence associated with patient care is the primary source of non-fatal injury in all health care organizations today. Hospital based medical workers currently have the highest rate of non-fatal assaults over all other sectors of employment" (p.54). Nurses experience the most assaults but physicians, nurse practitioners, and technicians are all at risk of violence by patients or relatives (U.S. Department of Justice, 2001). On June 30th, 2017, a

physician walked into a Bronx Hospital with an AR-15 rifle and began shooting, wounding six people and killing another physician. The physician had previously been in trouble with the law and was arrested for assaulting a woman. This Bronx hospital averaged around 1.1 million patient visits and 140,000 emergency room visits each year. On this particular day the hospital and emergency room were at capacity levels. A quick response by local authorities prevented the attacker from causing further harm to people within the hospital (Nir, 2017).

According to the U.S Department of Justice and the Federal Bureau of Investigation (FBI) there were fifty active shooting events in the United States from 2016 to 2017. Those fifty events occurred in twenty-one states with 221 people being killed and 722 being wounded. All fifty shooters were male, and each acted alone. The attack of a lone gunman has become more common in communities and cities in the United States (FBI, 2018).

In 2012, researchers at Johns Hopkins University School of Medicine published a study of 154 hospital-related shootings in 40 states between 2000 and 2011. Fifty-nine percent occurred inside a hospital. Thirty-percent occurred within the emergency department (ED) and nineteen-percent in patients' rooms (Kelen et al., 2012). According to the U.S Bureau of Labor and Statistics, the healthcare industry witnessed nineteen homicides in 2015, of which sixteen were committed intentionally by gun violence. The number represents a forty-six percent increase from 2014 when the industry experienced seven homicides (Rege, 2017). Researchers at Brown University conducted a study in 2015 and found that, much of hospital shootings took place at facilities located in the South (105 shootings), followed by the Midwest (56), the West (42) and the Northeast (38) (Rege, 2017). According to the Bureau of Labor Statistics as reported by the Joint Commission for hospitals (2016) violence in healthcare is more prevalent than any private industry. From 2012 to 2014, workers in private industry missed an average of

four days, employees in state jobs missed an average of fifteen days, private healthcare and social service workers missed an average of thirty-four, and state healthcare and social service workers missed an average of 142 days. Employees should feel safe at work therefore leadership should look for ways, such as increased security rounds, to decrease the risk of violence towards patients and employees.

Risk and Analysis

Risks are not always apparent and unfortunately employees may become victims of a violent crime as was the case for two hospital employees in Long Beach. In April 2009, a man who others described as quiet but friendly and who had a smile or joke for others, walked into Long Beach Memorial Hospital and shot two of his managers, fatally wounding them, and then shot himself. There had been layoffs at the hospital; he was one of the employees who had been let go. (Dillon, 2009).

Tavernero (2009) stated that hospital leadership should examine their facilities to determine if there is a need for a risk analysis and determine if there are barriers that may prevent a quick response to a violent situation. Leadership should evaluate current processes and programs to determine their effectiveness. Hospital administrators have a responsibility to ensure that their facilities are safe. Although, there are challenges to reducing violence against healthcare employees, training may help reduce the number of violent incidences. Risk analysis will help to determine gaps in processes that make up the framework for administrators to assess vulnerability for violence within their facilities and take measures to prevent it (Tavernero, 2009).

According to Tavernero (2009) hospital leadership should be familiar with violence risk and local crime index reports which add insight to a facility's risks and assess and update the

violence prevention program. Training staff members to understand their responsibilities is a key to improving workplace safety. Hospital staff should be involved in developing the training programs, in identifying potential risks, and in encouraging the reporting of violent incidents. Hospital administrators need to support violence prevention and promote reporting of every incidence of workplace violence. Depending on the nature of the event, crisis management should be used to ensure positive outcome for staff members (Tavernero, 2009). Unfortunately, despite the value of such training, many healthcare organizations do not offer hands-on training or real-life scenarios.

According to the World Health Organization (WHO) (2011) security staff must institute levels of control which include securing the perimeter of the property through lighting, and controlling access through entrances, exits, and stairwells. Security should continually improve their readiness to cope with the challenges of a critical event. They must be prepared to execute their processes and prioritize actions to any disaster event. However, hospitals frequently operate near capacity and even in a well-prepared hospital, employee shortage or a complex challenge will greatly affect a timely response to an emergency (WHO, 2011).

According to the Center for Disease Control and Prevention (CDC) (2005), hospital staff and security must remain vigilant for potential threats to their patients, visitors and employees. However, some healthcare organizations may overlook the potential for violence and remain unconvinced that they need to address the issue. Violence within a hospital may not be recognized as a high priority until a tragic event occurs. Leaders who set out to raise awareness about violence in the workplace provide a foundation for risk assessment, training development and implementation. The Joint Commission on Accreditation of Healthcare Organizations (JCAHO) has advised that health care organizations must prepare their staff for an active shooter

event. It's recommended that hospitals implement a process, develop a communication plan, involve law enforcement and train employees (Wands, 2016).

Unfortunately, there are no profiles that exist for an active shooter; however, studies have shown there may be signs or indicators. Hospital staff should learn the signs that could develop into a hostile situation and proactively find ways to prevent such incidents (U.S. Department of Education, 2010). In 2002, the FBI published a monograph on workplace violence, including problematic behaviors of concern that may telegraph violent ideations and plans in which they identified behavioral warning signs including personal grievance, recent acquisition of weapons, escalation in target practice, interest in explosives, fascination with shootings, and significant personal loss such as a death, divorce or loss of job (p.1).

In 2010, the U.S. Department of Education published a report that featured observations to pre-attack behaviors. Highlighting common pre-attack behaviors displayed by past offenders, federal researchers have sought to enhance the detection and prevention of tragic attacks of violence, including active shooting situations. In 13% of the cases, the subject made direct verbal or written threats to a target. In 19% of the cases, the subject stalked or harassed the target prior to the attack. In 10% of the cases, the subject engaged in physical aggression towards the target. In 31% of the cases, law enforcement, friends, and family observed certain behaviors such as changes in personality, depressed mood, odd behavior, or an acquisition of weapons (USDOE, 2010).

Safety and Security

To develop an emergency response plan, health care organizations should first conduct a risk assessment to identify potential threats to hospital staff and patients. Knowing potential threats will enable health care organizations to determine resource requirements and develop

processes for hospital staff to follow in case of a threat. However, emergency preparedness requires significant investment that changes over time. It's important that hospitals learn from each emergency and allocate funds appropriately to continue implementing best practices (American Hospital Association, 2014). Employers must assess and manage threats to make sure employees do not feel frightened or intimidated and should encourage the reporting of threats to management or security and to create a climate in which safety is accepted as a common goal (U.S. Department of Justice, 2001).

According to the Joint Commission on Accreditation of Health Care Organizations (2012), "safety culture is known to vary widely across organizations, and performance on the specific domains varies within organizations. For example, it is conceivable that hospitals may score high on dimensions related to patient safety but low on worker safety" (p.10). Changing and improving a healthcare organization's culture can be challenging because culture has embedded values and beliefs (The Joint Commission on Accreditation of Health Care Organizations, 2012). Healthcare organizations should take a proactive approach to continuously improve their processes in an effort to limit critical events, such as an active shooter. Ongoing analysis of potential hazards will help determine appropriate preventive actions, therefore, annual review of facility processes and procedures should occur to update current practice with new guidelines from accredited agencies such as the Joint Commission on Accreditation of Health Care Organizations. Senior management, supervisors, and clinical employees working together in a committee will bring knowledge and perspective to planning, maintaining, and improving these processes. However, the composition and commitment of the committee or task force are key factors in its success or failure (OSHA, 2015). Active support and involvement from a CEO, senior leadership, and managers is crucial in gaining employee buy-in to build

support for organization awareness (The Joint Commission on Accreditation of Health Care Organizations, 2012).

According to Occupational Safety and Health Administration (2015), the healthcare industry has many unique factors that increase the risk of violence, such as working directly with people who have a history of violence. According to The Centers for Disease Control and Prevention (CDC) (2002), assaults may occur when service is denied, when a patient is involuntarily admitted, or when a health care worker attempts to set limits on eating, drinking, or tobacco or alcohol use. Violence can range from threatening language to physical assault and homicide. Therefore, hospitals need to identify high risk areas, the emergency department being one of those areas, and add an extra level of security. Violence may occur anywhere in the hospital, but it is most frequent in psychiatric wards, emergency rooms, waiting rooms, and geriatric units (CDC, 2012).

Risk factors may vary from hospital to hospital depending on location and size but common risks factors for violence in healthcare include working directly with people who abuse drugs or alcohol; distressed relatives or friends of patients; long waits for patients; people who have a history of violence; prevalence of firearms, knives, and other weapons among patients and their families; and working in neighborhoods with high crime rates.

In order to address these, the Joint Commission on Accreditation of Health Care Organizations (2010) mandates that health care facilities maintain a written plan that describes the security for patients, visitors, and employees. They must conduct a risk assessment to determine any potential threats and create a response plan if an incident occurs. Specific environmental designs should be considered to prevent security threats. Hospitals should have security cameras in high traffic areas such as waiting rooms and entrances. Metal detectors

should be placed in high traffic areas, such as the main entrance to the emergency department and main entrance to the hospital, to prevent an armed person entering the hospital (JACHO, 2010). Waiting areas should be designed to accommodate visitors and patients if there is a delay in service. Foremost, hospitals need to be prepared to handle any consequence of violence against their employees and offer counseling whenever an employee is threatened (CDC, 2002).

A potential threat must be dealt with swiftly to limit the potential harm to a patient, or an employee. The FBI defines four categories of workplace violence. Type 1, criminals who have no connection to the hospital but who will commit a crime. Type 2, violence directed towards, patients, employees, students, or any other person to whom the organization provides service. Type 3, violence against a coworker or a manager by a current or former employee. Type 4, violence against an employee with whom there is a personal relationship (International Association of Emergency Medical Services Chiefs, 2017).

According to the International Association of Emergency Medical Services Chiefs (2017), one of the most useful tools academic and non-academic healthcare facilities can develop to identify, evaluate, and address these troubling signs is a multidisciplinary Threat Assessment Team (TAT). A TAT with diverse representation often will operate more efficiently and effectively. TAT members should include healthcare facility administrators, counselors, current employees, medical and behavioral health professionals, residential life, and public safety and law enforcement personnel. The TAT serves as the central body to coordinate with healthcare facility policy and set annual training requirements. The TAT may review threatening behavior of staff, patients, or visitors. They identify individuals who may pose a threat and address the situation. However, they should rely on facts such as observed behavior to avoid labeling and be compliant with civil rights and other state and federal laws. Local FBI will work with TATs and

coordinate access to the FBI Behavioral Analysis Unit (International Association of Emergency Medical Services Chiefs, 2017).

Since an active shooter event is highly dynamic, there are no single answers for what to do, but according to Metropolitan Chicago Healthcare Council (2015) a response plan should be simple when there is an active shooter. There are three basic rules to follow which are run, hide, and fight. First, if an active shooter is close, run then after escaping the area of danger, call 9-1-1 immediately and give as much information as possible.

Second, if unable to leave the building secure a room by locking or barricading the door. Turn off lights and silence any electronic devices such as cell phones, pagers or any other device that may reveal the location to the shooter. Use objects in a room to hide from the shooter's view and to protect against gunfire or explosives (Metropolitan Chicago Healthcare Council, 2015).

Third, if unable to escape or secure a safe location the final option is to fight. Staff members should use any object that will incapacitate the shooter and work together to overpower the shooter (Metropolitan Chicago Healthcare Council, 2015).

Staff Training

Violence occurs in hospitals, and employers should examine their facilities and execute training with greater frequency to keep all employees up to date with their emergency response plans. Through annual training employees should able to assess potential threats, detect unusual behavior, and stop potentially dangerous situations. According to the FBI (2001), threat assessment has two parts: an evaluation of the threat itself; that is, the assessment of the credibility and overall viability of an expression of an intent to do harm, and an evaluation of the threatened. It is important to note that in the great majority of cases, a threat will not lead to a violent act. The threat itself, however, damages workplace safety and must be responded to.

Preparing hospital staff to handle emergency situations such as an active shooter requires planning, and conducting active drills is the most effective way to ensure that employees know their roles. Training for an active shooter situation allows each employee to know what to do, and how to handle the situation as it develops (International Association of Emergency Medical Services Chiefs, 2017).

Summary

Hospitals should require employees and management to participate in safety training and be familiar with their policies and procedures on violence prevention. Assaults may occur at any time; therefore, hospitals must be aware of the risk factors and find ways to reduce exposure to these factors. There is no universal strategy that will prevent violence; however, hospitals should continually monitor and evaluate their processes to decrease violent acts against employees, family members and patients (CDC, 2002).

CHAPTER 3

METHODS

Introduction

The purpose of this study was to investigate the attitudes and beliefs of hospital administrators regarding the preparedness of their organizations for internal disasters such as mass causality events and to identify the current state of preparedness for internal disasters such as mass casualty events in Tennessee's hospitals. This study also determined if these critical care hospitals have processes in place to handle situations such as an active shooter or mass casualty incident (MCI). This study determined if any differences existed between the critical care hospitals based on select demographic variables (geographic, region, age, etc.). A quantitative survey questionnaire was mailed to the Chief Executive Officer (CEO) at each critical care hospital. The study was approved by the East Tennessee State University Institutional Review Board (IRB) on April 15, 2019 (IRB# 0319.18e).

Strengths and Limitations of Design

This study used a cross sectional design. The strength of this research design is that it can be administered easily and evaluated quickly and yields data about attitudes and opinions at a single point in time. The responses can be tabulated within a short time and will allow for comparisons between the different organization's demographic attributes (Choy, 2014).

The data collection methodology was that of a mailed survey. Respondents feel more anonymous when completing mailed questionnaires than responding on the phone or in a face-to-face interview (Cottrell & McKenzie, 2005). However, mailed surveys do not allow the researcher to ask follow-up questions and can lead to limited outcomes.

Population

The population of this study consisted of the chief executive officer at the 86 acute care hospitals in Tennessee (Appendix A). These facilities are spread throughout multiple counties in Tennessee; however, for analysis the population will be broken up into the three traditional/historical Tennessee regions west Tennessee, middle Tennessee and east Tennessee in order to determine if differences in preparedness exist by region.

Survey Instrument Development

According to Cottrell and McKenzie (2011), survey research involves the administration of a questionnaire to a sample or to an entire population of people in order to determine the attitudes, opinions, beliefs, values, or characteristics of the group being studied (Cottrell & McKenzie, 2011). The survey (Appendix B) was developed using the information gained from the literature review. The survey was reviewed by the chief executive officers at Ballad Health hospitals located in southwest Virginia for content validity (Appendix C). These reviewers did not suggest any changes to the survey.

Data Collection Procedures

The data collection for this project is based on a structured pattern of quantitative research and is a modification of the methods of Dillman as described by Byington (2003). A survey questionnaire was developed and mailed to all the Tennessee acute care hospital chief executive officers on May 2, 2019. The participants were asked to answer questions regarding the hospital staff preparedness for an active shooter event including the hospital's processes to respond to an active shooter situation, and how often the hospital simulates an event to train their employees.

Following a modified Dillman protocol, on April 24, 2019 a pre-study purpose letter (Appendix D) was sent to the chief executive officers a week before the mailed survey. On May 2, 2019 I mailed an informed consent document and survey to the chief executive officer at each of the 86 acute care hospitals. The CEOs were to return the informed consent document along with the survey in a self-addressed envelope. The respondents were given one week to complete the survey. A letter of reminder (Appendix E) was sent to the CEOs on May 9, 2019, five days after the survey was mailed to remind them to complete the informed consent document and the survey. Surveys were numbered, and a spread sheet was created to keep track of the hospitals that did or did not respond to the survey. Two weeks after the initial survey mailing, on May 20, 2019, a second survey was mailed to those CEOs who had not responded. All responses to the survey will remain confidential and maintained in a secured area.

Data Analysis

Statistical Package for Social Sciences (SPSS) was used for data analysis. The data was extracted from the returned mailed questionnaire and entered into the SPSS (v25) system. I used descriptive statistics and inferential statistics to present the data. Descriptive statistics are used to summarize data about a given population or variable, so they can be easily comprehended (Cottrell & McKenzie, 2011). Inferential statistics can be used to help us draw inferences about differences among respondents that might be found (Cottrell & McKenzie, 2011).

> Rather than split hairs, many researchers make a practical decision. Whenever possible, they choose to treat ordinal variables as interval, but only when it is reasonable to assume that the scale has roughly equal intervals. …Treating ordinal variables that have nearly evenly spaced values as if they were interval allows researchers to use more powerful statistical procedures (Levine & Fox, 2006, p.13).

An independent samples *t*-test was used to determine if differences existed based upon the gender of the respondent or based on the respondent's previous experience with a mass casualty event. A one-way ANOVA was used to determine if regional differences exist. Because multiple age categories contained less than five respondents, a one-way ANOVA was not performed using the respondent age as a grouping variable. The data was analyzed within the context of the study's research questions.

CHAPTER 4

PRESENTATION AND ANALYSIS OF THE DATA

While the popular media often report significant occurrences of mass shootings at schools and businesses, hospitals are not immune to active shooter events. The purpose of this study was to investigate attitudes and beliefs of hospital administrators regarding the preparedness of their organizations for internal disasters such as mass casualty events.

The study elicited responses to survey questions in an effort to answer the following:

1. What, if any, processes do the hospitals have in place to mitigate hostile situations?
2. What, if any, processes do the hospitals have in place to handle mass casualties that occur within their facilities?
3. What method is used to train hospital staff for workplace violence?
4. How often do hospital leaders identify gaps in their procedures resulting from new information gained from the analysis of other mass shootings and mitigate strategies to close those gaps?
5. How often do hospital leaders conduct live exercises to assess hospital readiness for acts of violence that may occur within their facilities?
6. How often do hospital employees practice responses to internal hostile situations (internal code testing)?

Analysis of the Data

Population

The researcher sent a survey to all 86 CEOs of acute care hospitals in Tennessee. Of those, 28 responded. The total number of acute care hospitals are listed in order to compare the proportion between the three regions. Western Tennessee with 19 acute care hospitals represents

the smallest region with 47% (9 responses) of the CEOs responded to the survey, east Tennessee with 27 acute care hospitals with 29% (8 responses) of the CEOs responded, however middle Tennessee represented the largest population with 40 acute care hospitals, 27% (11 responses) of the CEOs responded to the survey.

Respondents

Twenty-eight of the 86 hospital CEOs (32%) responded to the request for participation in this study. It is generally recognized that Tennessee has three geographic subdivisions (west, middle, and east Tennessee) and the respondents were nearly evenly split among the three regions (west Tennessee *n*=9, middle Tennessee *n*=11, east Tennessee *n*=8). Fifty-seven percent (*n*=16) of the respondents were male, and 53% (*n*=12) of the respondents were female. The median age of the respondents was skewed slightly to the left and frequency distribution for respondents' age is found in (See Figure 1).

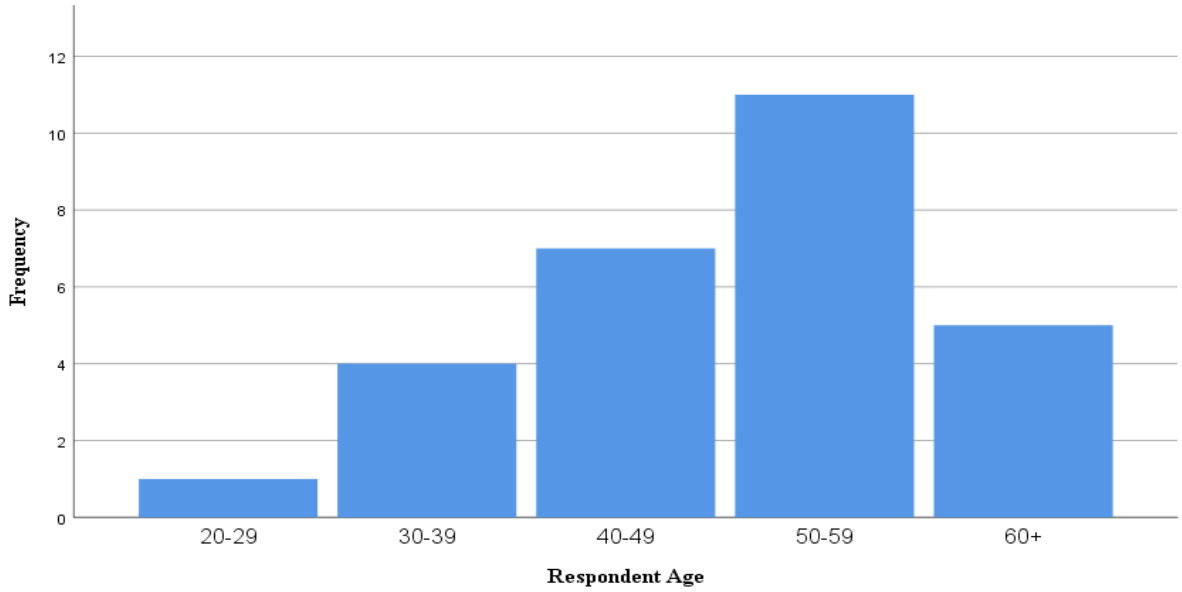


Figure 1. Number of Chief Executive Officers by Age

Twenty-five percent (n=7) of the CEOs indicated that their facility had been involved in an internal mass casualty event. While a research question specifically asked about an internal mass casualty event, that was no definition provided so the response was based on the CEO's understanding and perception of what constitutes a mass casualty event. Sixty-eight percent of those responding indicated an increasing level of concern for safety at their facilities.

Research Question 1. Internal Processes for Hostile Situations

The study's first research question was what, if any, processes does the hospital have in place to mitigate hostile situations? A single survey question was used to determine the presence or absence of a plan for mass casualty events. Of those responding an overwhelming majority (96.4%, *n*=27) of the CEOs indicated that a plan had been developed. A single respondent indicated that no plan for mass casualty events had been developed at their hospital. While the research question specifically sought information about those plans, in reality, the plans of each facility are different and examination of the nuances of each facilities plan was beyond the scope of this project.

Research Question 2. How Prepared is Facility?

The study's second research asked what, if any, processes do the hospitals have in place to mass casualties that occur within their facilities? Three survey questions were used to determine the level of preparedness for a mass casualty event within your hospital.

Is the facility prepared? Of those who responded, 53.6% (n=15) of the CEOs indicated that their facilities are prepared or well prepared to handle a mass casualty/active shooter event. Eleven CEOs (39.3%) indicated that their facility was somewhat prepared, and one respondent indicated that their facility is not prepared to handle such an event. An independent samples *t*-test was used to determine if the CEOs' responses differed based upon gender. Using a 95%

confidence level (alpha=.05), no differences were found based upon gender (p=0.271). An independent samples *t*-test was used to determine if the CEOs' responses differed based upon the CEOs experience with a mass casualty event. Using a 95% confidence level (alpha=.05), a significant difference was found based upon the CEOs experience with a previous mass casualty event (p=0.080). The mean response of CEOs who had experienced a previous mass casualty event was lower ($\bar{x}$=2.14) than CEOs who had not experienced a mass casualty event ($\bar{x}$=2.52). A one-way ANOVA with Tukey's post-hoc testing was calculated to determine if the CEOs' responses differed based upon Tennessee's geographic regions. Using a 95% confidence level (alpha=.05), a significant difference was found (p=.010). While there were no differences in the respondents from east and west Tennessee (p=.0.948), the responses from middle Tennessee CEOs ($\bar{x}$=2.00) were significantly lower than respondents located in west Tennessee (p=0.031, $\bar{x}$=2.67) and lower than respondents located in east Tennessee (p=0.018, $\bar{x}$=2.75).

Update of policies and procedures. A majority (71.4%) of respondents indicated that policies addressing mass casualty/active shooter events were updated every two years. Seven respondents (25%) indicated that their policies were updated more frequently than two years and a single respondent reported that it had been more than two years since policies were updated at their facility. An independent samples *t*-test was used to determine if the CEOs' responses differed based upon gender. Using a 95% confidence level (alpha=.05), no differences were found based upon gender (p=0.189). An independent samples *t*-test was used to determine if the CEOs' responses differed based upon the CEO's experience with a mass casualty event. Using a 95% confidence level (alpha=.05), no differences were found based upon previous experience with mass casualty events (p=0.412). A one-way ANOVA was calculated to determine if the

CEOs' responses differed based upon Tennessee's geographic regions. Using a 95% confidence interval (alpha=.05), no significant difference was found (p=0.247).

CEO confidence in facility response. Fifteen CEOs (53.5%) indicated that they were confident or very confident in their employees' abilities to follow procedures and respond to a mass casualty event or mass shooting. Twelve CEOs (42.9%) responded that they were somewhat confident in their employees' ability to respond and a single CEO indicated that they had little confidence that employees at their facility could respond to a mass casualty event or mass shooting. An independent samples *t*-test was used to determine if the CEOs' responses differed based upon gender. Using a 95% confidence level (alpha=.05), no differences were found based upon gender (p=0.412). An independent samples *t*-test was used to determine if the CEOs' responses differed based upon the CEOs experience with a mass casualty event. Using a 95% confidence level (alpha=.05), no differences were found based upon previous experience with mass casualty events (p=0.600). A one-way ANOVA was calculated to determine if the CEOs' responses differed based upon Tennessee's geographic regions. Using a 95% confidence interval (alpha=.05), no significant difference was found (p=0.247).

Research Question 3. Training

The study's third question asked what method was used to train hospital staff for workplace violence? Two survey questions were used to determine what method hospitals use to train their leadership and employees to respond to an internal mass casualty event such as an active shooter. Because both questions were nominal in scale of measure, frequency of response was used to analyze the data. Of those who responded, 42.9% (*n*=12) of the CEOs indicated that their facility used computer-based learning, classroom instruction, and live simulation to train their employees for an active shooter event. One respondent indicated that their facility had not conducted any staff training. Thirty-nine percent (*n*=11) of the CEOs indicated that they received

training through computer-based learning, classroom instruction, and live simulation. A second question was used to determine if training methods for hospital chief executives differed from staff training methods. The responses to the two questions regarding training were identical. CEOs and staff were trained using the same methods.

Research Question 4. Identify gaps

The study's fourth research question asked how often do hospital leaders identify gaps in their procedures resulting from new information gained from the analysis of other mass shootings and mitigate strategies to close those gaps? Two survey questions were used to determine the frequency in which hospitals conduct a risk assessment to determine if there are any gaps in their response to an internal mass casualty event.

Frequency of risk assessment. Of those who responded, 93% (n=26) of the CEOs indicated that their facility conducted a risk assessment every year. One respondent indicated that they conduct a risk assessment every six months and one respondent indicated that risk assessments at their facility were conducted every two years. An independent samples *t*-test was used to determine if the CEOs' responses differed based upon gender. Using a 95% confidence level (alpha=.05), no differences were found based upon gender (p=0.165). An independent samples *t*-test was used to determine if the CEOs' responses differed based upon the CEOs experience with a mass casualty event. Using a 95% confidence level (alpha=.05), no differences were found based upon previous experience with mass casualty events (p<1.000). A one-way ANOVA was calculated to determine if the CEOs' responses differed based upon Tennessee's geographic regions. Using a 95% confidence interval (alpha=.05), no significant difference was found (p=1.000).

Frequency of update of policies and procedures. This survey question has relevance for two of the study's research questions. A majority (71.4%) of respondents indicated that policies addressing mass casualty and active shooter events were updated every two years. Seven respondents (25%) indicated that their policies were updated more frequently than two years and a single respondent reported that it had been more than two years since policies were updated at their facility. An independent samples *t*-test was used to determine if the CEOs' responses differed based upon gender. Using a 95% confidence level (alpha=.05), no differences were found based upon gender (p=0.189). An independent samples *t*-test was used to determine if the CEOs' responses differed based upon the CEOs experience with a mass casualty event. Using a 95% confidence level (alpha=.05), no differences were found based upon previous experience with mass casualty events (p=0.412). A one-way ANOVA was calculated to determine if the CEOs' responses differed based upon Tennessee's geographic regions. Using a 95% confidence interval (alpha=.05), no significant difference was found (p=0.247).

Research question 5. Live Training

The study's fifth question asked how often do hospital leaders conduct live exercises to assess hospital readiness for acts of violence that may occur within their facilities? One survey question was used to determine how often hospitals conducted a *live* exercise to determine readiness. Of those who responded, 50% (*n*=14) of CEOs indicated that their hospital simulated an internal mass casualty or active shooter event quarterly. Thirty-five percent (n=10) of CEOs indicated that they simulated a mass casualty and active shooter event once a month. Two CEOs responded that simulations were staged at their facility every six months and one respondent indicated that simulations occurred once a year. One respondent indicated that they had never simulated an internal mass casualty event. An independent samples *t*-test was used to determine if the CEOs' responses differed based upon gender. Using a 95% confidence level (alpha=.05),

no differences were found based upon gender (p=0.852). An independent samples *t*-test was used to determine if the CEOs' responses differed based upon the CEOs experience with a mass casualty event. Using a 95% confidence level (alpha=.05), no differences were found based upon previous experience with mass casualty events (p=0.4574). A one-way ANOVA was calculated to determine if the CEOs' responses differed based upon Tennessee's geographic regions. Using a 95% confidence interval (alpha=.05), no significant difference was found (p=0.873).

Research Question 6. Internal Code Testing

The study's sixth question asked how often do hospital employees practice responses to internal hostile situations (internal code testing)? One survey question was used to garner data to answer this research question. Of those who responded, 39.3% (n=11) of CEOs indicated that their hospital employees practice internal code testing every six months. Thirty-two percent (n=9) indicated that their hospital employees practice internal code testing once a month. Five CEOs indicated that their employees practice internal code testing once each quarter and three respondents indicated that their employees practice internal code testing once a year. An independent samples *t*-test was used to determine if the CEOs' responses differed based upon gender. Using a 95% confidence level (alpha=.05), no differences were found based upon gender (p=0.199). An independent samples *t*-test was used to determine if the CEOs' responses differed based upon the CEOs experience with a mass casualty event. Using a 95% confidence level (alpha=.05), no differences were found based upon previous experience with mass casualty events (p=0.685). A one-way ANOVA was calculated to determine if the CEOs' responses differed based upon Tennessee's geographic regions. Using a 95% confidence interval (alpha=.05), no significant difference was found (p=0.247).

Summary

This chapter presented the data analysis from the CEOs responding to the survey questions. Chapter 5 will present the conclusions and recommendations from this research.

CHAPTER 5

SUMMARY OF FINDINGS, CONCLUSIONS AND RECMMENDATIONS

This chapter includes the findings, conclusions, and recommendations for further research.

It is not unusual for health care workers to experience violence in their workplace. According to the U.S. Department of Justice as reported by the Emergency Medical System in Virginia (2001) "violence associated with patient care is the primary source of non-fatal injury in all health care organizations today. Hospital based medical workers currently have the highest rate of non-fatal assaults over all other sectors of employment" (p.54). Hospital employees who work in areas such as the emergency department or work in hospitals that focus on behavioral health are more likely to encounter some form of assault. There is scant literature about the preparedness of hospitals for an internal mass casualty event such as an active shooter and the results of this study add to that body of knowledge. While there is existing literature about what *actions* employees should take in the event of an active shooter, the focus of this study was to determine if the CEOs and employees at Tennessee hospitals are prepared for an active shooter event.

Data were collected using the survey of Tennessee Hospital Chief Executive Officers (Appendix B) as described in Chapter 3. Data were collected using a methodology outlined by Dillman (1978) with modification and the survey was mailed to the 86 chief executive officers of Tennessee's acute care hospitals.

Summary of Findings

Twenty-eight (32%) of the CEOs in Tennessee hospitals provided input for the study. Using key measures (west Tennessee, middle Tennessee, east Tennessee regions and CEO age),

the respondents were nearly evenly split among the three regions. The response rate was above average given the targeted population of CEOs and can be attributed by a follow-up attempt. According to Paxson as reported by Byington (2003), the nationwide average return rate for mail surveys is 20% (Byington, 2003). Responses to mailed surveys are still higher than those distributed via email but both response rates vary widely.

The following findings are based on the analysis of the data generated from the survey of Tennessee hospital chief executive officers. The findings are framed by the study's research questions.

Internal Processes for Hostile Situations

Ninety-six percent of the CEOs responding agreed that their hospital has developed a plan to handle a mass casualty event. A single respondent indicated that they had no plan for a mass casualty event. The respondent's geographical region nor bed size was not indicated.

While plans are in place, leadership should evaluate current plans, processes, and programs to determine their effectiveness. While the research question specifically sought information about those plans, in reality, the plans are hospital specific and therefore don't allow for comparison; examination of the nuances of each facilities plan was beyond the scope of this project.

How Prepared is Facility?

The national media report more mass shootings at school and business, but hospitals are not immune to such an event so it is important that hospital CEOs work with their leadership teams to build a plan and prepare their employees so that they will have the necessary skills to respond appropriately to a mass casualty event. Fifty-three percent of CEOs responding indicated that their hospital is prepared or well prepared to handle a mass casualty event. However, 39.3%

of CEOs indicated that they feel their hospital is only *somewhat* prepared. Seven Tennessee hospitals had experienced a mass casualty event; however, no details of those event are described. Hospitals are open to the public twenty-four hours a day and even a well-prepared hospital face complex challenges. Hospitals experience employee shortage daily and operate at near capacity levels which could affect the outcome of a mass casualty event. Emergency preparedness requires significant investment and changes over time so the hospitals who had experienced a mass casualty event may not have been as prepared to handle such an event. Each hospital should learn from each emergency and continue to implement best practices. A majority (71.4%) of CEOs update their policy and procedures frequently to stay current with new trends in preparation for an active shooter event. Hospitals need to stay current with their processes and update them when new literature or changes are introduced to improve their preparedness to respond to an active shooter event.

Training

Forty-two percent of the CEOs responding indicated that their facility used three methods to train their employees for an active shooter event, computer-based learning, classroom instruction and live simulation. Thirty-nine percent of the CEOs indicated that they received training in the same manner as their staff training methods. The CDC (2004) stated "the presence of management at training sessions can increase the visibility of the organization's top-level commitment to prevention" (p.15).

The CEOs who responded indicated that the leadership routinely educate their employees on how to respond to an active shooter event. Hospital shootings are comparatively rare, but a single incidence of a mass shooting will bring significant tragedy to co-workers, patients, and families. To help prevent significant tragedy hospitals have a responsibility to train their staff

routinely on the most current strategies in emergency preparedness so employees understand their role and can respond appropriately to an active shooter event (Alice Training Institute, 2019).

Identify Gaps

Training staff consistently will improve response to future events therefore, leadership should take note of where their preparation might be lacking (ALICE, 2019). Hospital staff are accustomed to annual training cycles because of regulatory emphasis. For example, both the Joint Commission and OSHA mandate that learning be completed each year. Ninety-three percent of the CEOs stated that their hospital conducted risk assessments every year to determine if they have gaps in their processes. The CEOs who responded feel confident their hospital identifies gaps routinely and their hospital processes are current and follow regulation standards. However, a duplication of this study and further analysis would be needed to review the type of internal response plan they currently have and the type of notification system they have in place to alert employees, and law enforcement in the event of an active shooter.

Live Training

Hospitals are unique, and they present challenges especially in the case of an active shooter. Healthcare professionals may be faced with a moral dilemma during an active shooter event where they may be faced to leave patients because the staff may not be able to evacuate patients due to their severity of illness, injury, or age (ALICE, 2019). Live training can be beneficial for all employees because it should help them understand their role in response to a mass casualty event. Live training may be the best method to dramatize an active shooter event and the training experiences may be enhanced with the help of local law enforcement. An effective plan should have a method for reporting active shooter incidents, an evacuation policy

and procedure, and emergency escape procedures and route assignments. Ethical decisions should be incorporated in the training that considers the lease loss of life. Individual hospital administrative units and locations should have emergency operations plans, incident command systems, and information concerning local emergency response agencies and nearby hospitals.

Internal Code Testing

Hospital leaders are required to use universal codes to announce emergencies within their facility. When a code is announced employees should know how to react appropriately to the code. Practicing response is important to preparedness for emergencies; therefore, although healthcare organizations may have contingency plans, only when these plans are put to a test can hospitals determine the preparedness of their facility. In the event of an active shooter, a natural reaction for an employee will be anxiety and fear, however, when the emergency response is implemented, employees will rarely have all the information they need, but through consistent training the hospital employee will respond appropriately during the incident.

Conclusions

The study was limited to the perceptions of the 28 CEOs of acute care hospitals within the state of Tennessee who responded to the survey. Over 50% of the CEOs responded that their hospital is prepared to respond to a mass casualty event. This shows that CEOs are aware of the potential risk to their facility and are actively training and educating their employees to respond appropriately to a mass casualty event.

The CEOs responses to the survey are subject to their interpretation and their attitudes and beliefs about how their hospital prepares for an event. With a single exception, all respondents indicated that their facilities had plans in place to respond to mass casualty events that occur within their facilities. In general, the plans are updated at least every other year and

employee training occurs annually. While most CEOs perceived that their hospital is prepared there is no way to know for certain their hospital is ready until an incident occurs. CEOs who had experienced a mass casualty event were less likely to indicate that their facility was prepared.

Recommendations for Further Study

This study provides a small overview about hospital preparedness to an internal mass casualty or active shooter event. The following are recommendations for further study:

1. This study should be replicated in other states and if possible a national study of hospital preparedness for internal mass shooting events should be conducted.
2. This study should be replicated, and future responses compared to this baseline data.
3. A qualitative study of locations that have experienced active shooter events should be undertaken.
4. A qualitative study of the nuances of each facility's process should be undertaken.

REFERENCES

Alice Training Institute (2019). *Healthcare Training.* Retrieved from https://www.alicetraining.com/our-program/alice-training/healthcare/healthcare-training/

Baruch, Y., Holtom, B. C. (2008). Survey response rate levels and trends in organizational research. *Sage Journals.* Retrieved from https://doi.org/10.1177/0018726708094863

Ben-Ishay, O., Mitaritonno, M., Catena, F., Sartelli, M., Ansaloni, L., Kluger, Y. (2016). Mass casualty incidents- time to engage. *World Journal of Emergency Surgery, 11*(8). doi: 10.1186/s13017-016-0064-7

Byington, R. L. (2003). *Healthcare Strategic Management: The Impact of State and Federal Funding Levels on the Implementation of Strategic Plans at Tennessee Hospitals* (Doctoral dissertation). Retrieved from https://etsu-edu-primo.hosted.exlibrisgroup.com

Centers for Disease Control and Prevention, Department of Health and Human Services. (2002). *Occupational hazards in hospitals* (DHHS Publication No. 2002-101). Retrieved from https://www.cdc.gov/niosh/docs/2002-101/default.html

Choy, L. T. (2014). The strengths and weaknesses of research methodology: Comparison complimentary between qualitative and quantitative approaches. *Journal of Humanities and Social Science, 19*(4), 99-104. Retrieved from www.iosrjournals.org

Cottrell, R. R., & Mckenzie, J. F. (2011). *Health promotion and education research methods. Using the five-chapter thesis/dissertation model.* Jones and Bartlett Publishers.

Dillon, R. M. (2009, April 16), *Associated Press.* Retrieved from http://www.cbs8.com/story/10199502/3-dead-in-long-beach-memorial-hospital-shooting

Kelen, G. D., Catlett, C. L., Kubit, J. G. & Hsieh, Y. (2012). *Hospital-based shootings in the United States: 2000 to 2011. Emergency Medicine.* doi: 10.1016/j.annemergmed.2012.08.012

Levin, J., & Fox, J. (2006). *Elementary statistics in social research.* Boston, MA: Pearson Education.

Nir, S. M. (2017, June 30), Doctor opens fire at Bronx hospital, *The New York Times.* Retrieved from https://www.nytimes.com/2017/06/30/nyregion/bronx-hospital-shooting.html

Occupational Safety and Health Administration. (2015). *Guidelines for preventing workplace violence for healthcare and social service workers.* (OSHA Publication No. 3148-06R). Retrieved from https://www.osha.gov/Publications/osha3148.pdf

Occupational Safety and Health Administration. (2015). *Workplace violence in healthcare understanding the challenge.* (OSHA Publication No. 3826-12). Retrieved from https://www.osha.gov/Publications/OSHA3826.pdf

Rege, A. (2017). *Hospital shootings: How common are they? 8 things to know.* Retrieved from http://www.beckershospitalreview.com/population-health/hospital-shootings-how common-are they-8-things-to-know.html

Sanson, T. G., & Tavernero, T. (2011, May). Emergency safety and security. *American College of Emergency Physicians.*

The Joint Commission. (2010, June). *Preventing violence in the health care setting* (Issue 45). Retrieved from

https://www.jointcommission.org/sentinel_event_alert_issue_45_preventing_violence_in_the_health_care_setting_/

U.S Department of Justice, Federal Bureau of Investigation. (2018). *Active shooter incidents in the United States in 2016 and 2017.* Retrieved from https://www.fbi.gov/file-repository/active-shooter-incidents-us-2016-2017.pdf/view

U.S Department of Justice, Federal Bureau of Investigation. (2014). *A study of active shooter incidents in the United States between 2000 and 2013.* Retrieved from https://www.fbi.gov/file-repository/active-shooter-study-2000-2013-1.pdf

Yimeng, G., Kopec, J. A., Cibere, J., Li, L. C., & Goldsmith, C. H. (2016). Population survey features and response rates: A randomized experiment. *American Journal of Public Health, 106*(8) Retrieved from https://doi.org/10.2105/AJPH.2016.303198

APPENDICES

Appendix A

Tennessee Hospitals Included in Study Population

Tristar Medical Center at Ashland City 313 North Main Street Nashville, TN 37015	**Camden General Hospital** 175 Hospital Drive Camden, TN 38320
Bolivar General Hospital 650 Nuckolls Road Bolivar, TN 38008	**Cumberland River Hospital** 100 Old Jefferson Street Celina, TN 38551
Erlanger Medical Center 975 East Third Street Chattanooga, TN 37403	**Parkridge Medical Center** 2333 McCallie Avenue Chattanooga, TN 37404
Baptist Memorial Hospital-Collierville 1500 West Poplar Avenue Memphis, TN 38017	**Cookeville Regional Medical Center** 1 Medical Center Boulevard Cookeville, TN 38501
Baptist Memorial Hospital- Tipton 1995 Highway 51 South Covington, TN 38019	**Rhea Medical Center** 9400 Rhea County Highway Dayton, TN 37321
Dyersburg Regional Medical Center 400 East Tickle Street Dyersburg, TN 38024	**Starr Regional Medical Center-Etowah** 886 U.S. 411 Etowah, TN 37331
Sumner Regional Medical Center 555 Hartsville Pike Gallatin, TN 37066	**Trousdale Medical Center** 500 Church Street Hartsville, TN 37074
Tristar Summit Medical Center 5655 First Boulevard Hermitage, TN 37076	**Madison County General Hospital-Jackson** 620 Skyline Drive Jackson, TN 38301
Jamestown Regional Medical Center 436 W Central Ave Jamestown, TN 38556	**Jefferson Memorial Hospital** 110 Hospital Drive Jefferson City, TN 37660
Fort Sanders Regional Medical Center 1901 West Clinch Avenue Knoxville, TN 37916	**Lafollette Medical Center** 923 E Central Ave Lafollette, TN 37766
Lawrenceburg Health System 1607 South Locust Ave Hwy 43 Lawrenceburg, TN 38464	**Winchester Health System** 185 Hospital Road Winchester, TN 37398
Pulaski Health System 1265 East College Street Pulaski, TN 38478	**Sewanee Health System** 1260 University Ave Sewanee, TN 37375
Fort Loudoun Medical Center 550 Fort Loudoun Medical Center Drive Lenoir City, TN 37772	**Henderson County Community Hospital** 200 West Church Street Lexington, TN 38351
Livingston Regional Hospital	**Volunteer Community Hospital**

315 Oak Street Livingston, TN 38570	161 Mount Pelia Road Martin, TN 38237

St. Thomas River Park Hospital 1559 Sparta Street McMinnville, TN 37110	**Baptist Memorial Hospital- Memphis** 6019 Walnut Grove Road Memphis, TN 38120
Regional One Health 877 Jefferson Avenue Memphis, TN 38103	**Milan General Hospital** 4039 Highland Street Milan, TN 38358
Morristown-Hamblen Healthcare 908 West Fourth North Street Morristown, TN 37814	**Nashville General Hospital** 1818 Albion Street Nashville, TN 37208
Saint Thomas West Hospital 4220 Harding Pike Nashville, TN 37205	**Tristar Skyline Medical Center** 3441 Dickerson Pike Nashville, TN 37207
Vanderbilt Hospital 1211 Medical Center Drive Nashville, TN 37232	**Methodist Medical Center-Oakridge** 990 Oak Ridge Turnpike Oak Ridge, TN 37830
Erlanger Bledsoe Hospital 71 Wheelertown Ave Pikeville, TN 37367	**Lauderdale Community Hospital** 326 Asbury Avenue Ripley, TN 38063
Leconte Medical Center 742 Middle Creek Road Sevierville, TN 37862	**Tristar Stonecrest Medical Center** 200 Stonecrest Boulevard Smyrna, TN 37167
Sweetwater Hospital 304 Wright Street Sweetwater, TN 37874	**Harton Regional Medical Center** 1801 North Jackson Street Tullahoma, TN 37388
Three Rivers Hospital 451 TN-13 Waverly, TN 37185	**Star Regional Medical Center** 1114 West Madison Avenue Brentwood, TN 37303
Saint Francis Hospital- Bartlett 2986 Kate Bond Road Bartlett, TN 38133	**Riverview Regional Medical Center** 158 Hospital Drive Carthage, TN 37030
Saint Thomas Hickman Hospital 135 East Swan Street Centerville, TN 37033	**Gateway Medical Center** 1370 Gateway Blvd Murfreesboro, TN 37129
Maury Regional Hospital 1224 Trotwood Avenue Columbia, TN 38401	**Cumberland Medical Center** 421 South Main Street Crossville, TN 38555
Tristar Horizon Medical Center 111 Highway 70 East Dickson, TN 37055	**Houston County Community Hospital** 5001 E Main Street Erin, TN 37061
Lincoln County Health System 106 Medical Center Boulevard	**Roane Medical Center** 8045 Roane Medical Center Drive

Fayetteville, TN 37334	Harriman, TN 37748
Tristar Hendersonville Medical Center 355 New Shackle Island Road Hendersonville, TN 37075	**Baptist Memorial Hospital-Huntingdon** 631 R.B. Wilson Drive Huntingdon, TN 38344

Regional Hospital of Jackson 367 Hospital Boulevard Jackson, TN 38305	**Parkridge West Hospital** 1000 Highway 28 Jasper, TN 37347
Jellico Community Hospital 188 Hospital Lane Jellico, TN 37762	**Parkwest Medical Center** 9352 Park W Blvd Knoxville, TN 37923
University of Tennessee Medical Center 1924 Alcoa Highway Knoxville, TN 37920	**Macon County General Hospital** 204 Medical Dr. Lafayette, TN 37083
Marshall Medical Center 1080 N Ellington Pkwy Lewisburg, TN 37091	**Perry Community Hospital** 2718 Squirrel Hollow Drive Linden, TN 37096
Tristar Skyline Madison Campus 500 Hospital Drive Madison, TN 37115	**United Regional Medical Center** 1001 McArthur Street Manchester, TN 37355
Blount Memorial Hospital 907 East Lamar Alexander Parkway Maryville, TN 37804	**Methodist North Hospital** 3960 New Covington Pike Memphis, TN 38128
Methodist Le Bonheur Germantown Hosp 7691 Poplar Ave Germantown, TN 38138	**Methodist South Hospital** 1300 Wesley Drive Memphis, TN 38116
Saint Francis Hospital 5959 Park Avenue Memphis, TN 38187	**Saint Thomas Rutherford Hospital** 1700 Medical Center Parkway Murfreesboro, TN 37129
Saint Thomas Midtown Hospital 2000 Church Street Nashville, TN 37236	**Tristar Centennial Medical Center** 2300 Patterson Street Nashville, TN 37203
Tristar Southern Hills Medical Center 391 Wallace Road Nashville, TN 37211	**Tennova Newport Medical Center** 435 Second Street Newport, TN 37821
Henry County Medical Center 301 Tyson Avenue Paris, TN 38242	**Hardin Medical Center** 935 Wayne Road Savannah, TN 38372
Northcrest Medical Center 100 Northcrest Drive Springfield, TN 37172	**Claiborne Medical Center** 1850 Old Knoxville Road Tazewell, TN 37879
Baptist Memorial Hospital- Union City 1201 Bishop Street Union city, TN 38261	**Wayne Medical Center** 103 J.V. Mangubat Drive Waynesboro, TN 38485

Appendix B

Survey of Tennessee Hospital Chief Executive Officers

Section I: Survey Questions

1. **How often does your hospital simulate an internal mass casualty incident within your facility (such as an active shooter)?**

- ○ Once a year
- ○ Once a quarter
- ○ Every six months
- ○ Once a month
- ○ Never

2. **How often are your hospitals policies and procedures updated to reflect current practices for an internal mass casualty event within your facility?**

- ○ More than two years
- ○ Every two years
- ○ Every year
- ○ Every six months
- ○ They have never been updated

3. **How prepared do you feel your organization is in the event of an internal mass casualty event within your hospital (such as an active shooter)?**

- ○ Very prepared
- ○ Prepared
- ○ Somewhat prepared
- ○ A little prepared
- ○ Not prepared at all

4. **Has your organization ever been involved in an internal mass casualty event within your hospital?**

- ○ Yes
- ○ No

5. **How often are risk assessments conducted to identify gaps in your organizations processes?**

- ○ Every two years
- ○ Every year
- ○ Every six months
- ○ Every quarter
- ○ Never

6. **How confident are you that your organization can follow current processes effectively and respond appropriately to an internal mass casualty event (such as an active shooter event)?**

- ○ Very Confident
- ○ Confident
- ○ Somewhat Confident
- ○ Little Confident
- ○ Not Confident

7. **Executives and leaders in your organization are more concerned about employee and patient safety more than 2 years ago?**

- ○ More Concerned
- ○ Concerned
- ○ Somewhat Concerned
- ○ A little Concerned
- ○ Not at all concerned

8. **If you train for an internal mass casualty event (such as an active shooter), which tools do you use for training? Mark all that you use.**

- ○ Computer/Technology-based training
- ○ Live training
- ○ Classroom
- ○ No training

9. **Does leadership within your organization participate in training for an internal mass casualty event, if so, which tools do they use for training? Mark all that you use.**

- ○ Computer/Technology-based training
- ○ Live training
- ○ Classroom
- ○ No training

10. Does your organization have a preparedness plan for an internal mass casualty event (such as an active shooter)?

- ○ Yes
- ○ No

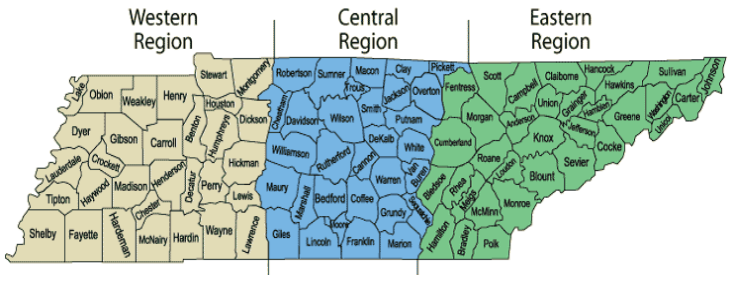
11. How often does your company practice internal code testing?

- ○ Once a year
- ○ Every six months
- ○ Once a quarter
- ○ Once a month
- ○ Never

12. Do you have a great level of confidence that your hospital can respond appropriately to an internal mass casualty event (such as an active shooter event)?

- ○ Very Confident
- ○ Confident
- ○ Somewhat Confident
- ○ Little Confident
- ○ Not Confident

Section II: Demographic Information



13. In what region is your hospital located?

○ Western Region

○ Central Region

○ Eastern Region

14. In what age group are you?

○ 20-29

○ 30-39

○ 40-49

○ 50-59

○ 60 +

15. Gender:

○ Male

○ Female

16. If you would like a copy of the results from this study, please check the box and it will be mailed to you.

○ Yes

Appendix C

Survey Assessment Tool

	Is this Question:	
Please answer the following questions regarding each item on the Survey of Internal Preparedness of Hospitals for a Mass Casualty Event (such as an active shooter).	**Clear and unambiguous? Yes or No**	**Relevant to this study? Yes or No**
Write recommended changes to question number.		
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		
13.		
14.		
15.		
16.		
What Questions or Issues should be added to this to this Survey? Add: Add: Add: How many minutes did it take you to complete the survey? _____		

Appendix D

Initial Mailing Letter

Date

Hospital Name
Hospital Address
City, State Zip

Dear Participant:

My name is Jason Farr and I am a graduate student at East Tennessee State University, a doctoral research university in Johnson City, Tennessee. For my thesis research, I am conducting a study to determine hospital preparedness for an internal mass casualty/active shooter event. I invite you to participate in this research study by completing a survey.

You will receive an informed consent document and a survey in the mail in approximately one week. The survey will require approximately 10 minutes to complete. Please complete the survey within a week but remember that your participation in this important research is strictly voluntary, and you may refuse to participate at any time. If you choose to participate, please answer each question honestly and as accurately as possible. The data collected will provide useful information regarding how prepared hospitals are in the state of Tennessee for an event such as an active shooter.

Your responses will remain confidential. Thank you for taking the time to assist me in my educational endeavors. If you have questions regarding this research project, please contact me by calling me at (423) 579-9021 or by email at jasonfarr1228@gmail.com.

Jason Farr
Master Thesis Candidate
East Tennessee State University

Appendix E

Follow-up Letter

Date

Hospital Name
Hospital Address
City, State ZIP

Last week a survey was mailed to you asking for your input regarding your hospital preparedness for an internal mass casualty/active shooter event.

If you have already returned the questionnaire, thank you for your promptness. If you haven't, please complete it today. In order to understand the preparedness of Tennessee hospitals, your input is needed.

If you did not receive the survey, or it has been misplaced, please contact me as soon as possible by calling me at (423) 579-9021 or by email at jasonfarr1228@gmail.com.

Thank you

Jason Farr
Master Thesis Candidate
East Tennessee State University

VITA

JASON M. FARR

Education:	Public Schools, Sandy, Utah A.S. Respiratory Therapy, Walters State Community College, Morristown, Tennessee 2006 B.S. Respiratory Therapy, East Tennessee State University, Johnson City, Tennessee 2008 M.S. Allied Health, East Tennessee State University, Johnson City, Tennessee 2019
Professional Experience:	EKG Technologist, Holston Valley Hospital, Kingsport, Tennessee, 2003-2006 Respiratory Therapist, Holston Valley Hospital, Kingsport, Tennessee, 2006-2010 Respiratory Therapist, Franklin Woods Hospital, Johnson City, Tennessee, 2010-2012 Information Technology, Ballad Health, Johnson City, Tennessee, 2012-2019