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Disaster Preparedness Levels Among Firefighters

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ABSTRACT

DISASTER PREPAREDNESS LEVELS AMONG FIREFIGHTERS

Shelby G. Coonts

There are numerous studies that focus on household preparedness however, there are few studies that focus on the preparedness levels of first responders. The purpose of this quantitative comparative study was to (a) establish, analyze, and compare the current level of disaster preparedness among Hinesville City Fire Department and Liberty County Fire Services located within the same region of Southeastern, Georgia and (b) analyze any correlation between demographics of the Firefighters and their level of disaster preparedness. This research sought to benchmark the organizational level of disaster preparedness of two critical departments (city and county fire services) by measuring three key attributes: knowledge, skills, and personal preparedness. The researcher collected data by using the Disaster Preparedness section of the Disaster Preparedness Evaluation Tool (DPET) via an in-person distributed survey. The DPET results provide scores for each organization and determines the overall organizational mean preparedness level for knowledge, skills, and personal preparedness. The differences in organizational preparedness across city and county fire services and the correlation between demographics and level of disaster preparedness is observed and discussed.

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CHAPTER I

INTRODUCTION

The increase in disasters, both natural and manmade, stresses the overall need for disaster preparedness (Kapucu, 2008). Preparedness is a vital area of concern, even with the ongoing increase of disasters worldwide (Annis et al., 2016). Despite the vast number of expected natural disasters that happen throughout our lives, people still consistently do not prepare adequately (Annis et al., 2016). Since so few people are prepared for a disaster, many citizens are vulnerable to the dangers and consequences of natural disasters (Annis et al., 2016). Numerous attempts have been made by government and non-government agencies to stress the importance of preparedness; however, the national level of overall preparedness remains low (Annis et al., 2016). The low disaster preparedness levels place more responsibility and effort on emergency services, such as firefighters, to properly prepare for response and recovery operations. Preparedness is essential throughout emergency service occupations (Rahmati-Najarkolaei et al., 2016).

There is a low number of studies that evaluate and research the preparedness levels of rescue workers after a disaster (Perdersen et al., 2016). Even fewer studies (Johnson, 2022; Perdersen et al., 2016) evaluate the preparedness level of firefighters and first responders in the event of a disaster. Primarily, people in disaster-prone regions realize the need to prepare for disasters, but not many people prepare (Kapucu, 2008). Disaster preparedness for citizens is vital when a disaster or emergency strikes (Kapucu, 2008). Far too often, firefighters must respond to disaster recovery operations. Fire departments manage hazardous responses daily by mitigating life-threatening situations while, at the same time, maximizing assistance to the public (Cohen-Hatton et al., 2015).

Continuous response to disaster-prone environments requires numerous preparedness efforts by all fire departments. The goal of preparedness is to enhance response activities, so lack of preparedness results in delayed and ineffective response efforts, thus impacting overall resilience of a community.

Currently, there is an overall lack of empirical data pertaining to studies that develop and analyze preparedness levels of firefighters. There is a continuous gap in research without analysis of this type of sample, which is a problem. The problem addressed by Cohen-Hatton et al., (2015) was the need to examine the level of preparedness among firefighters and identify any additional information to improve such level of preparedness. King et al. (2019) conducted a study on the overall preparedness knowledge and skill set of a United States Naval Medical unit before embarking on a disaster response rotation. King et al. (2019) research recognized the need for improvement within the unit in regard to natural disaster preparedness among military health personnel (King et al., 2019). Many scholars (Annis et al., 2016; Rahmati-Najarkolaei et al., 2016; Tatham, 2011) concurred the need for improvement throughout personnel who respond to disasters in the form of emergency services and medical assistance. Due to the lack of empirical data, there is a clear opportunity to increase the overall level of preparedness among emergency services, such as firefighters. This study examines the current level of preparedness of firefighters employed at Hinesville Fire Department (HFD) and Liberty County Fire Services (LCFS).

Research Questions

RQ1: To what extent, if any, is there a difference between the disaster preparedness levels of the firefighters employed at HFD and LCFS?

RQ2: To what extent, if any, is there a difference between employee demographics (age, level of education, and previous deployment to natural disasters) and the disaster preparedness level?

Hypotheses

H1: Since HFD has been established longer, they will have a higher level of disaster skills and knowledge compared to LCFS.

$H1_{a:}$ There is a statistically significant difference between the level of preparedness of HFD and LCFS.

$H1_{0\ (Null)}$: There is not a statistically significant difference between the level of preparedness of HFD and LCFS.

H2: The demographical questions pertaining to age, level of education, and any previous deployments for disaster response of firefighters will correlate with higher levels of disaster preparedness.

$H2_a$: There is a statistically significant difference between age, level of education, and any previous deployments for disaster response of firefighters and their level of preparedness.

$H2_{0\ (Null)}$: There is no statistically significant difference between age, level of education, and any previous deployments for firefighters' disaster response and their preparedness level.

Purpose of the Study

The purpose of this quantitative casual-comparative study is to (a) determine if there is a difference between the disaster preparedness levels of the firefighters employed at HFD and the firefighters employed at LCFS and (b) determine if there is a direct

correlation between firefighters age, level of education, and previous deployments for disaster response of firefighters and their level of disaster preparedness. This research seeks to benchmark the level of disaster preparedness among the firefighters employed at two critical departments, HFD and LCFS, located in the same county in Southeastern Georgia. Further, this research examines the correlation between firefighter's age, level of education, and any previous deployments for disaster response of firefighters and their level of disaster preparedness. City and county officials should be aware of the current level of disaster preparedness across their city and county fire services in order to evaluate and improve any current or future efforts toward preparedness.

Significance of the Study

Numerous studies have established and discussed the disaster preparedness, response, and recovery levels across nurse practitioners and medical personnel (Al Khalaileh et al., 2010, Chen et al., 2015; Han & Chun, 2021). However, studies have yet to survey and establish the preparedness level of firefighters utilizing the specific methods of this study. This quantitative study seeks to address the lack of empirical data by benchmarking and comparing two critical fire departments' levels of disaster preparedness. Further, this study seeks to analyze any correlation between various firefighters' demographics and their level of preparedness. This study is crucial because the results can provide insight for improving preparedness levels across the firefighters located in a specific county. The results from this study will benchmark the current level of preparedness across firefighters employed in Liberty County, GA and determine if demographics directly correlate to higher levels of disaster preparedness.

The results of this study provide city council members, county emergency management directors, fire department chiefs, and leadership with a starting point to evaluate and improve disaster preparedness. Officials can use the results from this study to implement further training and reevaluate current policies. The findings from this research can also provide insight into the current level of preparedness for natural disasters and identify the need for additional training and planning strategies to help improve overall preparedness among firefighters employed at HFD and LCFS. The results additionally add to a body of research aiming to increase awareness of firefighter preparedness.

Summary

This thesis is a more in-depth analysis of the current level of preparedness among firefighters who are mobilized to respond for emergencies and often disasters. A review of previous scholars who have utilized the Disaster Preparedness Evaluation Tool (DPET) (Al Khalaileh et al., 2010, Chen et al., 2015; Han & Chun, 2021) revealed no sample outside of medical personnel. King et al. (2019) slightly broadened the scope with a sample of military medical professionals, but there is no empirical research focused on first-responders such as firefighters. This study builds upon results from King et al., (2019), which will lead to more empirical data, as the analysis is conducted on a sample of firefighters, specifically from HFD and LCFS.

This project benchmarked and compared the level of disaster preparedness throughout HFD and LCFS. Further, this project examined any correlation between numerous demographic variables and the level of preparedness of the firefighters employed at HFD and LCFS. Chapter II details a comprehensive literature review of

disaster preparedness, important of preparedness for firefighters and first responders, and history and utilization of the Disaster Preparedness Evaluation Tool (DPET). Chapter III reviews the methodology to collect firefighter demographics and benchmark firefighter disaster preparedness levels at HFD and LCFS. Chapter IV presents the analysis of data collected from HFD and LCFS. Chapter V includes discussions about the results from Chapter IV. Chapter VI provides conclusions and offers recommendations for future research.

CHAPTER II

LITERATURE REVIEW

Preparedness enhances response capabilities further resulting in quick and effective response. There are numerous studies that focus on the preparedness level of personnel across different demographics (Al Khalaileh et al., 2010, Chen et al., 2015; Han & Chun, 2021; King et al., 2019). This study specifically examines the overall preparedness level among first responders, specifically chosen firefighters from a specific county. The scholarly review for this research examines and details a comprehensive literature review of disaster preparedness, importance of preparedness for firefighters and first responders, and history and utilization of the Disaster Preparedness Evaluation Tool (DPET). Arkansas Tech University Ross Pendergraft Library and Technology Center website was used to access the ProQuest and EBSCOhost Academic databases. Comprehensive searches of peer-reviewed articles in all databases within both ProQuest and EBSCOhost Academic databases were conducted that included numerous combinations of search terms including: natural disasters, military medical, preparedness, disaster preparedness, military disaster preparedness, firefighters, fire fighter response to disasters, firefighter preparedness, firefighter disaster preparedness, disaster mitigation, fire services, fire services emergency management, military disaster mitigation, firefighter disaster. All dates were considered; however, articles written after 2015 were preferred. Additionally, similar searches were conducted throughout Google and Google Scholar to see if any alternate sources could be utilized.

The structure of this literature review involves three major areas: (a) disaster

preparedness; (b) importance of preparedness for firefighters and first responders; and (c) history and utilization of the Disaster Preparedness Evaluation Tool (DPET).

Disaster Preparedness

Disasters are usually defined as non-routine incidents that occur at specific points in time, which involve significant harm to people or social infrastructure, lead to a cultural and social disruptions and inspect a social collective response (Perry, 2017; Tierney, 2007). Natural disasters are characterized by being caused by abnormal intensity within nature. According to Merriam-Webster Dictionary (2022), natural disasters are sudden and terrible events within nature to include hurricanes, tornados, floods and earthquakes that usually result in serious damage and death. Disaster specific research has shown an increase in the number of individuals injured and killed (McEntire, 1999). Additionally, the cost, burden, and implications of financial loss in response and recovery has steadily increased (McEntire, 1999). According to EM-DAT (2021), the International Disaster Database, between the months of January and November 2023, there were 268 recorded and documented natural disasters throughout the world. The cost, not only financially, but emotionally will lead to astronomical turmoil throughout our country when facing a natural disaster. Disasters, in return, create higher demands for first responders which correlates to preparedness and readiness to act being essential (Rahmati-Najarkolaei et al., 2016).

Preparedness encompasses predicting, mitigating, and developing plans prior to, during, and subsequent to disaster events to reduce harmful impacts (Cordner, 2021). Preparedness is a state of readiness to respond to crises, with the sole purpose of reduction of negative outcomes (Pedersen et al., (2016). According to Sutton & Tierney

(2006), preparedness refers to activities undertaken prior to the commencement of a disaster to augment the response capabilities of individuals and households, organizations, communities, states and nations. Preparedness is defined as "a continuous cycle of planning, organizing, training, equipping, exercising, evaluating and taking corrective action in an effort to ensure effective coordination during incident response" (Department of Homeland Security, 2022).

Currently there are low variety of studies which research the specifics of disaster response. Nonetheless, there are abundant studies that outline the challenges of disaster preparedness, response logistics, and relief management through both military and non-military aspects (Tatham et al., 2011). One of the primary studies conducted on first responders analyzed and compared the level of disaster preparedness in the emergency department and other sections of one military hospital within Tehran, Iraq (Rahmati-Najarkolaei et al. (2016). Rahmati-Najarkolaei et al. (2016) utilized specific demographics, nurse practitioners and registered nurses, within the military and in a military medical setting. Rahmati-Najarkolaei et al. (2016) used three data-collection instruments based upon a unit evaluation checklist, self-reported questionnaire, and maneuver checklist. The results from Rahmati-Najarkolaei et al. (2016) demonstrated a moderate level of disaster preparedness within the hospital but a need for improvement within self-efficacy. The results from the study conducted by Rahmati-Najarkolaei et al. (2016) correlated with King et al. (2019), which revealed a direct relationship and correlation between the preparedness among specific personnel and occupation. Rahmati-Najarkolaei et al. (2016) study did not establish the perception of preparedness among the

medical personnel; however, links of improvement with preparedness among medical personnel were present.

Importance of Preparedness Among Firefighters and First Responders

The perception of knowledge for preparedness among medical personnel has been identified and studied by few scholars (Al Khalaileh et al., 2010, Chen et al., 2015; Han & Chun, 2021; King et al., 2019); however, studies pertaining to the preparedness of firefighters are even fewer (Johnson, 2022; Perdersen et al., 2016). Personal perception could contribute as a vital role in the preparedness and response to a natural disaster; however, first responders are no more prepared than the general public for a natural disaster (Annis et al., 2016).

First responders are defined as three major groups: emergency medical service, firefighters, and police officers (NORC Walsh Center, 2022). First responders are first to respond and arrive to a situation of an emergency or disaster (NORC Walsh Center, 2022). Firefighting is one of the nation's most dangerous and hazardous occupations (Stanek et al., 2017) since firefighters are one of the frontline respondents to emergencies and disasters. Firefighters are one of the major responders to disasters and emergency services throughout the public communities and areas. When a large-scale incident occurs, firefighters are expected to respond and engage in disaster rescue activities (Koizumi et al., 2021). Often firefighters must be prepared to respond to harsh conditions and exert efforts of high intensity for an extended period of time (Koizumi et al., 2021). The first 48-hours after a disaster situation are vital as the priority is focused on saving lives and this is a time wherein firefighters usually work without sleep and rest (Koizumi et al., 2021).

The purpose of emergency response is to mitigate and further reduce damage to the affected areas and population within the community (Gyenes, 2018). Specifically, for preparedness levels to have an increase across a sample, numerous effects can be imposed, such as training (Pedersen et al., 2016). Prior experience, preparation, and training can lead to higher success rates of disaster response (Pedersen et al., 2016). These attributes, prior experience, preparation, and training can be defined and studied through various means. The overall purpose of this data would be to benchmark current levels of preparedness of a specific sample and to enhance or increase protocols and procedures utilized by an organization.

Disaster Preparedness Evaluation Tool (DPET)

There are numerous ways to measure and evaluate the emergency awareness and preparedness levels across a sample (Kapucu, 2014). One of the numerous statistical ways to measure and evaluate disaster preparedness, response and recovery aptitudes is via an instrument known as the Disaster Preparedness Evaluation Tool. The DPET was first developed by Bond and Tichy (2007) and has been used by numerous scholars to study and determine the level of perception across disaster preparedness and response. The DPET was used to assess disaster preparedness, response capabilities, recovery procedures, and overall preparedness (Arcipowski, 2020). Numerous studies (Al Khalaieh et al., 2012; Chen et al., 2015; Han & Chun, 2021; King et al., 2019) utilized the DPET in order to establish analytical results; proving this tool as a method to establish overall personnel perception levels of preparedness, response and recovery.

The DPET is comprised of three main categories: preparedness, response, and recovery. The DPET is a 47-item tool which measures perceptions of knowledge, skills,

and preparedness for the three stages of disasters: pre-disaster, response, and recovery (King et al., (2019). The DPET includes 25 questions pertaining to pre-disaster preparedness, 16 questions related to response, and six questions focusing of the recovery stage of disasters. The DPET concludes with 20 demographic questions. The DPET is designed to measure nurse practitioners' perception of preparedness for disaster management. Tichy et al. (2009) concluded that 75% of their participants, medical personnel, felt unprepared for a natural disaster and how to manage it in regards to all three stages (Al Khalaieh et al., 2012). Utilizing data collected when the DPET is distributed to a sample population has allowed numerous scholars to identify the levels of preparedness across medical personnel (Al Khalaieh et al., 2012). Practical training regimes, programs, and enhancement of the overall level of preparedness across all stages of disasters are developed with the data gathered from the DPET (Al Khalaieh et al., 2012). Training and development of preparation programs can potentially help enable medical personnel to become more adaptive and help mitigate the lack of preparedness for a disaster.

Al Khalaieh et al. (2012) outlined the DPET, explained the background and use, and allows scholars to have confidence in the tool. Al Khalaieh et al. (2012) study was conducted in order to translate, into Arabic, the DPET and verify the validity. Specifically, Al Khalaieh et al. (2012) studied the psychometric properties of the DPET and established reliability, validity, and structure. Al Khalaieh et al.,(2012) concluded the psychometric properties of the DPET promote a full understanding and suggest the tool is a reliable and valid instrument to measure medical personnel preparation for disasters. Both King et al. (2019) and Al Khalaieh et al. (2012) explain throughout their studies

about the background of the DPET, its demographics of questions and the analytical nature. An additional study utilized the DPET to examine the current state of disaster preparedness among a sample population was King et al., (2019).

King et al. (2019) used military medical personnel for their research due to the mobility and frequent relocation of military personnel. One of the many ways to determine the overall level of knowledge and skills across preparedness, response and recovery for disasters is the use of the DPET. The framework for the research conducted by King et al. (2019) used military medical personnel as the sample to complete the DPET survey instrument, in order to measure the perception of knowledge, skills, and preparedness for numerous disaster stages such as pre-disaster, response and recovery. The results from King et al. (2019) proved a moderate level of perceived preparedness across the sample of naval medical personnel and additionally displayed room for improvement throughout the entire unit in regards to knowledge and preparedness for disasters. Another key element to the research of King et al. (2019), was the military health care providers reported higher mean scores compared to civilian health care counterparts. The results from King et al. (2019) revealed that specific demographics, such as previous training and real-life scenario situations, led to higher scores on the DPET and higher levels of disaster preparedness. King et al. (2019) found a direct correlation between the variables pre-deployment training and previous disaster situational experience to higher averages across the DPET survey. Based on the literature review, this research mimicked numerous variables utilized by King et al. (2019) however, the sample, demographics and methods were slightly modified.

CHAPTER III

METHODOLOGY

This study utilized an in-person survey method to benchmark preparedness levels of firefighters. The purpose of this quantitative casual-comparative study was to (a) determine if there is a difference between the disaster preparedness levels of the firefighters employed at HFD and the firefighters employed at LCFS and (b) analyze survey responses to determine if there is a difference between firefighters age, level of education, and any previous deployments for disaster response and their level of disaster preparedness. This research sought to benchmark and further compare the level of disaster preparedness across firefighters employed at two departments, HFD and LCFS, located in the same county in Southeastern, Georgia by measuring three key attributes: knowledge, skills, and personal preparedness. Further, this research sought to compare any correlation between firefighters age, level of education, and any previous deployments for disaster response and their level of disaster preparedness. An in-person brief and subsequent hand-written survey methods was used for data collection. Once completed, the survey was manually entered into an identical QuestionPro survey, to facilitate data exportation. QuestionPro survey data was exported into Microsoft Excel, which was then analyzed.

Population and Sample

Firefighters are known for disaster preparedness, response, and recovery efforts. Firefighters were selected for this research because of emergency, medical, and response technical expertise, and the array of equipment firefighters use to help with response

efforts. The participants included firefighters employed under the City of Hinesville Fire Department and Liberty County Fire Services located throughout Liberty County, GA.

Multistage procedures were used to determine the sampling population. The names of participants were not obtained; however, the organizations (Hinesville and Liberty County Fire Services) were known, which determined the sample, as the employees of the organizations were the surveyors. The type of sampling used for this research was through means of convenience. There was no selection of a specific employee or firefighter for the survey, as all employees were provided a survey based on convenience and availability located at work. However, to ensure all employees were present, the fire stations paused daily operations to attend the survey brief and complete the survey. An in-person brief was conducted prior to the start of the survey (See Appendix A). Informed Consent procedures were provided to personnel who participated (See Appendix B). There was no sample stratification as the population was randomly assorted by gender, race, age, and firefighter rank. Personal demographics were collected with the survey instrument. The sample size was determined by the number of personnel employed by city and county fire services who actively work as firefighters and respond regularly to emergency situations. The administrators, office personnel, and volunteer-status firefighters employed at the fire stations were excluded from participating in this research.

Bias and Ethical Considerations

Prior to any data collection or interaction with participants, an Arkansas Tech University (ATU) Institutional Review process was performed. Institutional Review Board (IRB) approval allows the researcher to interact, conduct the survey, and collect

data from participants. A copy of the ATU IRB approval letter is presented in Appendix C. On April 21, 2013, the Collaborative Institutional Training Initiative (CITI) Program web-based Social and Behavioral Research Course was completed (Appendix E), and the refresher training was completed on January 12, 2021 (Appendix F). Permission to use the DPET in this research study was not directly granted as the survey is open-source. Inquiries were made to the researchers in King et al.'s (2019) study, who used the DPET on military medical personnel, and they provided assistance and guidance for this research.

Instrument

A quantitative study involves testing hypotheses by examining the relationships between variables (Creswell, 2018). This research mimics King et al. (2019) with a quantitative framework by testing hypotheses using empirical data collected using a survey. This research utilized the first section (disaster preparedness) and the demographic portion of the DPET for a total of 37 questions (Appendix D). There were 25 questions on disaster preparedness and seven categorical demographical questions to collect biographical data (age, gender, education level, firefighter rank/ position, primary employment facility, years of experience as a firefighter, previous disaster response history). The disaster preparedness portion (25 items) is based on a five-point Likert scale, with values ranging from 1 (strongly disagree) to 5 (strongly agree). The original authors (Tichy and Bond, 2007) utilized a 6-point Likert-scale and calculated the item means between 1.00 and 2.99, as perceived weak preparedness, means between 3.00 and 4.99 as moderate levels of preparedness and means between 5.00 and 6.00 were documented as high level of preparedness. Since this study utilized a 5-point Likert-scale,

the level of preparedness was re-formulated and determined means between 1.00 and 2.99 documented as low level of preparedness, means between 3.00 and 3.99 described as moderate level of preparedness and means between 4.00 and 5.00 meant high level of preparedness. Responses with higher numbers will present more significant levels of preparedness. The demographic questions are categorical. The survey took participants approximately 15 minutes to complete.

The use of face-to-face and in-person surveys has many advantages. In-person face-to-face surveys allow for accurate responses and increase response rates, and the surveyor is allowed to collect verbal and non-verbal cues and behaviors (Szolonoki and Hoffmann, 2013). Face-to-face survey methods also allows the researcher a high degree of control over the data collection process (Doyle, 2014). One of the key variables affecting data collection and quality in a survey is the response rate (Doyle, 2014). Face-to-face methods of conducting research can provide high-quality data, with significant completion rates and reliability (Saloniki et al., 2019). For this study, face-to-face methods were chosen as they typically offer the highest response rates obtainable (Doyle, year). However, an online survey disseminated via email also has some advantages, such as providing quick and easily dissected data without the need to conduct any travel (Doyle, 2014). Face-to-face methods are also often time-consuming and can limit the geographical area of the research, especially when compared to internet-based approaches (Saloniki et al., 2019). This research could have been conducted utilizing an online survey platform via email; however, with the opportunity and advantages of face-to-face interactions with the sample and the smaller area of travel, face-to-face, in-person survey methods were chosen.

This survey was a cross-sectional survey collecting data pertaining to self-preparedness, knowledge, and skills for disasters. The survey was conducted face to face, at the location of occupation, and no sample had to travel to conduct the survey or participate. The face-to-face survey procedure method allowed personal interactions with the sample and allowed for more than normal response rates compared to other studies (King et al, 2019; Al Khalaieh et al., 2012; Tobaity et al., 2015). One weakness was the time consumption of travel. Although the sample population was within one county and city, the commute from one fire station to another was about forty-five minutes. In-person survey collection was quick and easy as all data was collected on-site and took little time per station. From arrival, brief, survey conducted, and departure was an estimated thirty minutes per station before driving forty minutes to the next station. Data collection spanned six days throughout March 2023, including three days at HFD and three days at LCFS stations. Data collection took place around the same time per day; however, there was some travel time between survey collections when visiting the LCFS stations (Figure 1).

Operation Definition of Variables

Operational definitions describe how the researcher measures the variables. Providing operational definitions offers credibility and imitability to the study design (Creswell, 2018). This research sought to benchmark the preparedness levels of two fire department organizations (HFD and LCFS) by measuring the influence of three interdependent attributes (knowledge, skills, and personal preparedness).

The independent variables (i.e., grouping variable) in this study were the demographics that were collected and utilized for correlation analysis (participants' age,

level of education, and prior disaster response deployment). Surveys were also separated between HFD and LCFS for the comparative data analysis between departments. The independent variables were chosen due to the distinct separation of demographics and from review of previous studies (King et al. 2019). Specific demographics, such as age, level of education, and prior disaster response deployment led to the ability to group participants based on these characteristics. Demographic questions allowed individual study participants to self-identify the fire department at which they were employed.

The dependent variables were the questions and subsequent answers from the participants of the survey. Sections were broken into three main groups: knowledge, skills, and personal preparedness. The knowledge section consisted of questions pertaining to the individual competencies of local disaster vulnerabilities, proper command structure, proper notification protocols and contacts, limits of authority as a firefighter, previous research conducted on disaster preparedness and management (if any), participation and knowledge of local educational activities and emergency plan drafting and local guidelines. The skills section consisted of questions pertaining to the individual training and knowledge on triage procedures, frequency of participation in disaster drills, bioterrorism protocols and procedures, use of personal protective equipment, and performance execution in the event of a disaster. The personal preparedness section consisted of questions pertaining to the individual knowledge and implementation of household plans, protocols, procedures, and execution of such in the event of a disaster. There was not a specific single question or group of questions that were looked at for analysis. The entire survey instrument was collectively analyzed, and answers varied throughout per participant. Each question is scaled from one to five: one

being strongly disagree and five being strongly agree. Lower answers equate to lower levels of preparedness. Higher answers equate to higher levels of preparedness. Each survey included a total of 25 question that participants answered collectively; however, responses per question differed based on their own perception of preparedness level.

Data Collection

An IRB Application was submitted and approved through Arkansas Tech University (Appendix C) to conduct the survey. Before IRB application submission, Hinesville and Liberty Country Fire Department Chiefs provided approval to conduct the study. On March 6, 2023, Mr. Andy Fowler, Deputy Fire Chief, HFD, stated he would have to discuss with Fire Chief Robert Kitchings before providing official approval. On March 9, 2023, Deputy Chief Andy Fowler provided official approval to conduct the survey on HFD firefighters. On February 27, 2023, Mr. Brian Darby, Fire Chief, LCFS, approved to conduct the survey during the meeting. During the separate meetings, a synopsis of the research, an example of the survey, the significance of the research, and supporting literature were presented to both Fire Chiefs. Chief Kitchings and Chief Darby both approved the survey without any issues. When the IRB application was approved, dates were set to conduct the surveys at the specific fire station locations. Both Fire Chiefs stated the best time for survey briefing and collection would be around 10 am throughout three days to provide the survey to all employees within the Department.

Data collection occurred across six days in March 2023, with three days at each city and county fire service station to account for shift work as the firefighters work a 24-hour on/ 48-hour off schedule. HFD survey brief and collection was conducted at 1000 on March 7-9, 2023, at Fire Station 1, located at 103 Liberty Street, Hinesville, GA

31313. HFD survey collection was completed at the same fire station at the same time throughout all three days. LCFS survey brief and collection was conducted between 0930-1300 on March 15-17, 2023. To conduct the surveys of LCFS, three stations were visited throughout the three days. The researcher traveled across the LCFS and surveyed Fire Station 15, 7199 GA-196, Hinesville, GA 31313, Fire Station 20, 4305 Islands Hwy, Midway, GA 31320, and Fire Station 12, 1951 Limerick Rd, Midway, GA 31320 (Figure 1).

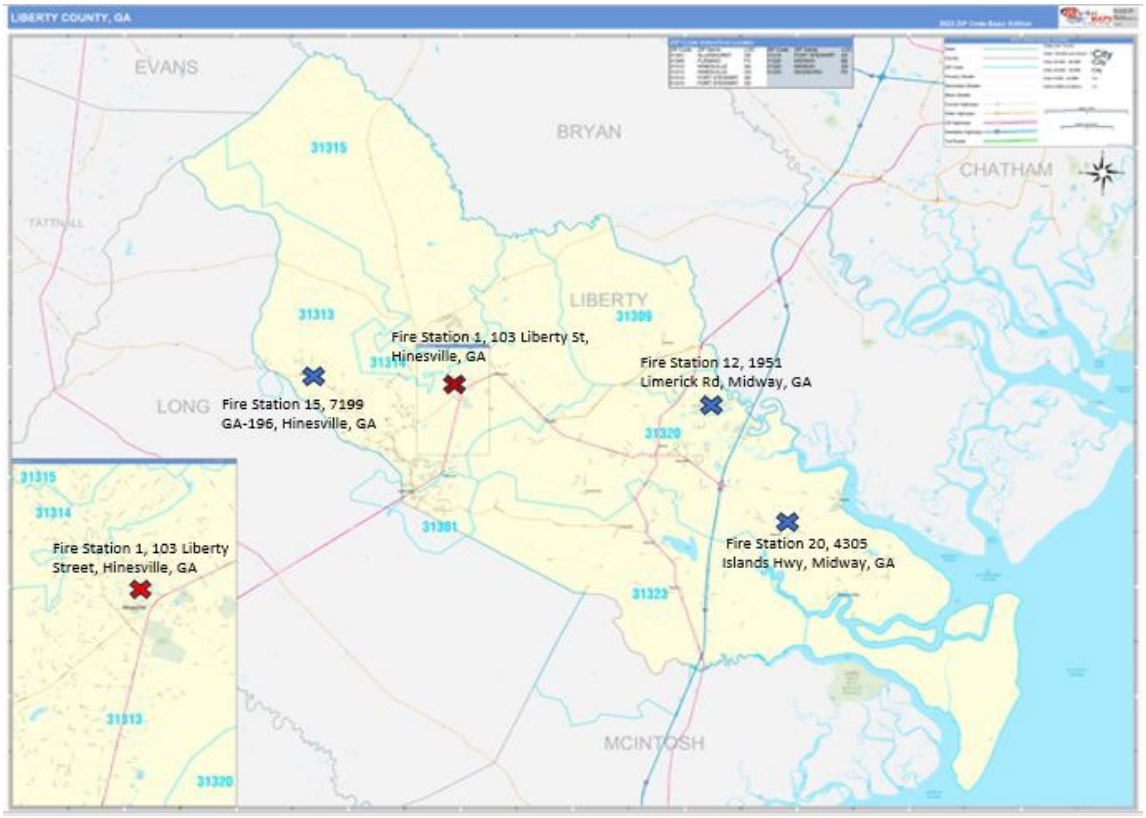

Figure 1: Overhead Map of Liberty County, GA (HFD and LCFS Stations)

An estimated thirty minutes per station was needed for arrival, overview, informed consent, survey conduction, and departure. The survey was distributed to sixty-eight employees. All sixty-eight participants completed the survey. One survey was excluded from data analysis due to incompletion, as one question was not answered. In

order to check for response bias, no personal identification information was collected on the survey. Responses from the sample throughout the study were similar, as all personnel took approximately the same time to read, respond, and turn in the survey. Each day, the firefighters were read an approved brief (Appendix A), followed by a physical survey to complete at their own pace. There was no time limit for the survey, which allowed for no added pressure on the participants. The study was completely voluntary and was not mandatory for anyone. A consent form was located on the top of each survey as Page 1, which had to be read, understood, and physically marked "I agree" or "I do not agree" before proceeding with the survey (Appendix D). The survey was completed physically by participants and then the researcher input the survey results into QuestionPro. QuesionPro data from the survey was then exported into Microsoft Excel and analyzed.

Validity

The survey instrument mimics the Disaster Preparedness Evaluation Tool (DPET), initially designed and developed by Tichy and Bond in 2007. The DPET collects and measures the perception of knowledge, skills, and preparedness in regard to pre-preparedness, response, and recovery stages of disasters (King et al., 2019). The DPET was modified for this study, as only the disaster preparedness portion was utilized, and some demographical questions were also added to relate to the firefighter sample, to include information about firefighter ranks and occupational positions. The original DPET contained the demographic questions of gender, age, highest degree of education, facility of occupation, time as a registered nurse, time as a nurse practitioner, and hours worked. The demographics for this study were slightly modified to include current rank/

job position and any previous disaster deployment. Firefighter job position demographics were annotated as: probationary firefighter, firefighter, driver/engineer, lieutenant, captain, and chief position. The DPET has been used and validated through numerous previous studies, including a study on naval medical personnel (Al Khalaileh et al., 2010, Chen et al., 2015; Han & Chun, 2021; King et al., 2019).

Hypotheses and Analysis

H1: Since HFD has been established longer, they will have a higher level of disaster skills and knowledge compared to LCFS.

$H1_a$: There is a statistically significant difference between the level of preparedness of HFD and LCFS.

$H1_{0\ (Null)}$: There is not a statistically significant difference between the level of preparedness of HFD and LCFS.

H2: The demographical questions pertaining to age, level of education and/or any previous deployments for disaster response of firefighters will correlate with higher levels disaster preparedness.

$H2_a$: There is a statistically significant difference between age, level of education, and any previous deployments for disaster response of firefighters and their level of preparedness.

$H2_{0\ (Null)}$: There is not a statistically significant difference between age, level of education, and/ or any previous deployments for disaster response of firefighters and their level of preparedness.

To test H1, a comparative analysis was conducted between the fire service organizations across the 25-item survey (Appendix D). From the results, the mean relationship for both city and county fire services were compared. To test H2, correlation

analysis was conducted to identify any correlation between firefighters' demographic variables of age, education level, and any previous deployments for disaster response of firefighters and their level of preparedness. The demographic of age was determined by participant answers across sub-groups of 18-24, 25-30, 31-35, 36-40, 40+. The demographic of education level was determined by participant answers across sub-groups of high school diploma, some college but no degree, associates degree, bachelors degree, masters degree and doctoral degree. The demographic of previous deployment response was determined by participant answers across the answers of "yes" or "no". Previous deployment history was measured by outside local area (outside county, city , and/or state) in response to any previous natural disasters.

CHAPTER IV

RESULTS

The findings of this study benchmarked the current level of disaster preparedness among firefights located throughout Liberty County, GA (Table 2 and Figure 2). This study also identified the differences in preparedness levels between the Hinesville Fire Department and Liberty County Fire Services (Table 3 and Figure 3). Lastly, this study outlined and discussed specific demographics that determined higher or lower levels of preparedness across the Departments (Figures 4-9).

Out of a total of 68 participants who received surveys, one survey was excluded due to an unanswered question, resulting in a final dataset of 67 surveys for analysis. These surveys were categorized into two groups: (HFD) and (LCFS). Among the completed surveys, 37 belonged to the HFD group, while 30 were from the LCFS group. The survey responses were meticulously transcribed into the QuestionPro platform to facilitate data collection and analysis. Subsequently, raw data was extracted from QuestionPro and imported into Excel spreadsheets. These spreadsheets were then utilized to generate the subsequent findings and results tables.

To derive the statistical results presented in Table 1, raw data was analyzed from QuestionPro to annotate the demographic characteristics of the sample population. Both HFD and LCFS were combined in this total, which depicted the demographic information for personnel who conducted the survey. Data from Table 1 is referenced in all further discussions of demographic variables and their potential correlation with levels of disaster preparedness. From the research questions for the analytical discussion below,

focus on the demographics of age, education level, and previous response efforts, which will be analyzed for correlation between them and the level of disaster preparedness.

Table 1

Demographic Characteristics of Sample (HFD and LCFS)

Baseline characteristics	Full sample	
	n	%
Gender		
Male	62	92.5%
Female	5	7.5%
Age		
18-24	16	23.9%
25-30	13	19.4%
31-35	15	22.4%
36-40	5	7.5%
40+	18	26.9%
Highest Level of Education		
High School Diploma	29	43.3%
Some College, No Degree	27	40.3%
Associates Degree	7	10.4%
Bachelors Degree	3	4.5%
Masters Degree	1	1.5%
Doctoral Degree	0	0%
Current Rank/ Job Position		
Probationary Firefighter	4	6.0%
Firefighter	37	55.2%
Driver/ Engineer	7	10.4%
Lieutenant	5	7.5%
Captain	7	10.4%
Chief Position	7	10.4%
Facility of Primary Employment		
Fire Station	61	91.0%
Administration Office	6	9.0%
Years of Experience as a Firefighter		
1-4	34	50.7%
5-10	11	16.4%
10-15	6	9.0%
15-20	8	11.9%
20+	8	11.9%
Previously deployed in response to a Disaster		
Yes	34	50.7%
No	33	49.3%

One limitation of Table 1 and the survey is the misinformation of data collected in the demographic question of years of experience (Q7). Since the answers overlap in years, the data is skewed and could not to be tested or utilized for analysis. This limitation was irrelevant and did not affect the results since this specific demographic question was not utilized when observing the correlation between variables and levels of disaster preparedness. The variables used from Table 1 to compare the overall potential correlation were Q3, Q4, and Q8, which will be discussed further.

To derive the statistical results presented in Table 2 and Figure 2, an inclusive approach was employed to assess the disaster preparedness levels within the entire study population. Table 2 and Figure 2 used the combined data sets from all participants involved aggregating responses from (HFD) and (LCFS) groups across all survey questions, mainly focusing on the Disaster section of the DPET. The questionnaire items were categorized into three distinct subcomponents: knowledge, skills, and personal preparedness. The initial 16 questions were related to knowledge, followed by 7 questions assessing skills and concluding with 2 questions gauging Personal Preparedness. To calculate the benchmark for disaster preparedness, the total survey score for each participant was determined and subsequently divided by the number of participants who conducted the survey. Further division was carried out, considering the number of questions within the respective subsections of the survey, namely knowledge, skills, and personal preparedness. As depicted in the results, this comprehensive analysis has provided a benchmark for the current state of disaster preparedness across both the

HFD and LCFS groups. The combined average score indicates that both departments are currently operating at a moderate level of preparedness, with an average score of 3.64 out of 5.

Table 2

Combined (HFD and LCFS) Level of Preparedness Average Score

	Participants (*n*)	Total Score	Question Count	Average/ Mean (μ)
Knowledge Section	67	3810	16	3.55
Skills Section	67	1790	7	3.82
Personal Section	67	494	2	3.69
Total DPET	67	6094	25	3.64

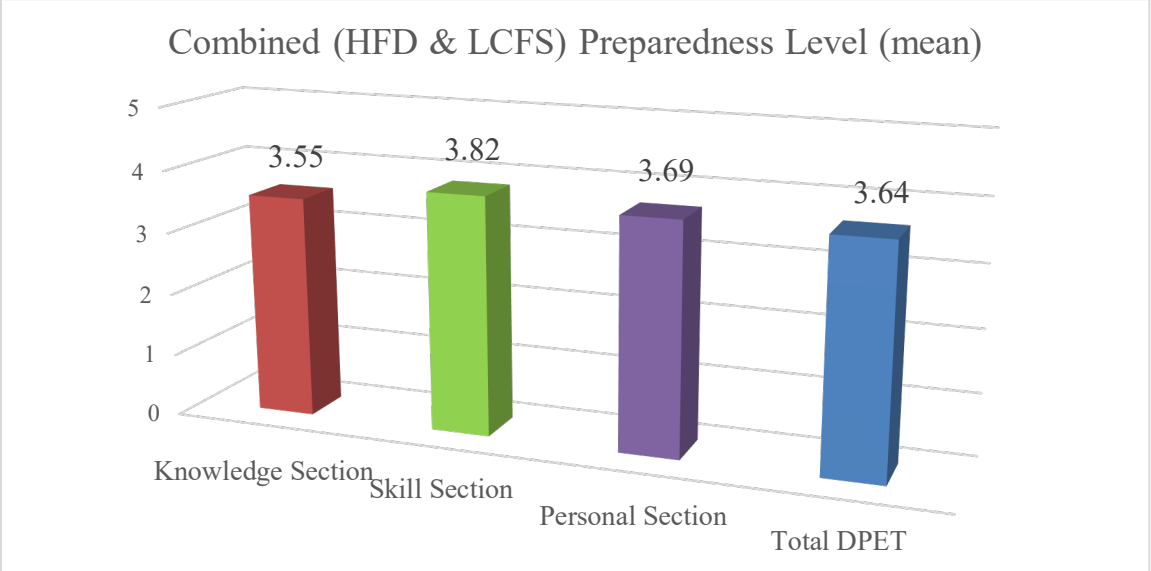

Figure 2: Combined (HFD and LCFS) Level of Preparedness Average Score

To derive the statistical results presented in Table 3 and Figure 3, the same methods were utilized to obtain the data as in Table 2; however, the data was separated into two categories from the respective departments of HFD and LCFS and was

compared. The average score was assessed per category (Knowledge, Skills, and Personal) and through means of a combined total across the respective departments. As depicted in the results, this comprehensive analysis has provided comparative results for the current disaster preparedness state between the HFD and LCFS groups. Comparative data between the two departments revealed that LCFS has a higher preparedness level in all categories (Knowledge, Skills, and Personal) and total overall (3.87 out of 5) when compared to HFD (3.45 out of 5) (Table 3 and Figure 3). One of the significant differences in LCFS and HFD results is in the Personal Section, wherein LCFS had an average score of 4.27 out of 5, compared to HFD 3.22 out of 5.

Table 3

Comparative of (LCFS vs HFD) Level of Preparedness

	Knowledge Section		Skills Section		Personal Section		Total DPET	
	LCFS	HFD	LCFS	HFD	LCFS	HFD	LCFS	HFD
Score	1791	2019	858	932	256	238	2905	3189
Sample (*n)*	30	37	30	37	30	37	30	37
Q:Count	16	16	7	7	2	2	25	25
Mean (μ)	3.73	3.41	4.09	3.60	4.27	3.22	3.87	3.45

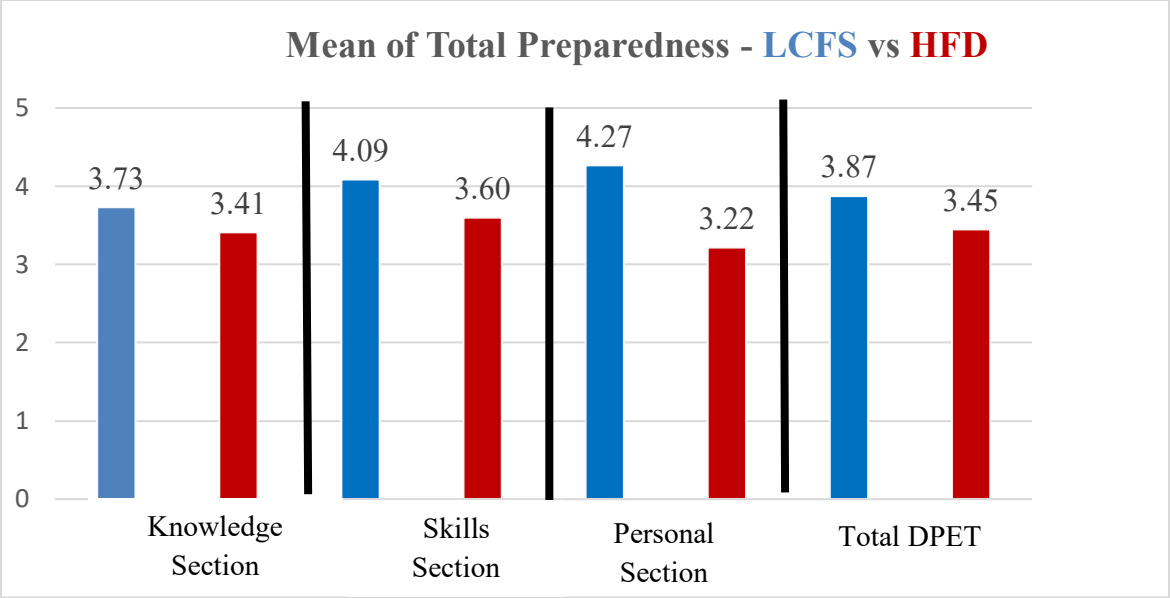

Figure 3: Comparative of (**LCFS vs HFD**) Level of Preparedness

To derive the statistical data from Figures 4-9, correlation analysis was conducted in Excel utilizing the results from the DPET survey conducted by participants from both LCFS and HFD combined. Specific correlation tests and polynomial scatterplot datasets were conducted between specific variables and the results from those demographics on the DPET.

For Figures 4 and 5, the correlation between the variables of total DPET Score and the demographic characteristic of age (Q3) was analyzed. Age was determined into 5 sub-group answers, as displayed in both Figures 4 and 5, by 18-24, 25-30, 31-15, 36-40, and 40+. As the data revealed, the variance of age does not positively or negatively correlate with higher scores on the DPET or correlate with higher or lower levels of preparedness. The results from this analysis revealed no correlation (coefficient of 0.0251) between the variable of age and that of the score on the survey, DEPT (Figure 4).

The analysis revealed a variance of results between the demographic characteristics. However, the variance was insignificant enough to cause a positive or negative correlation (Figure 5).

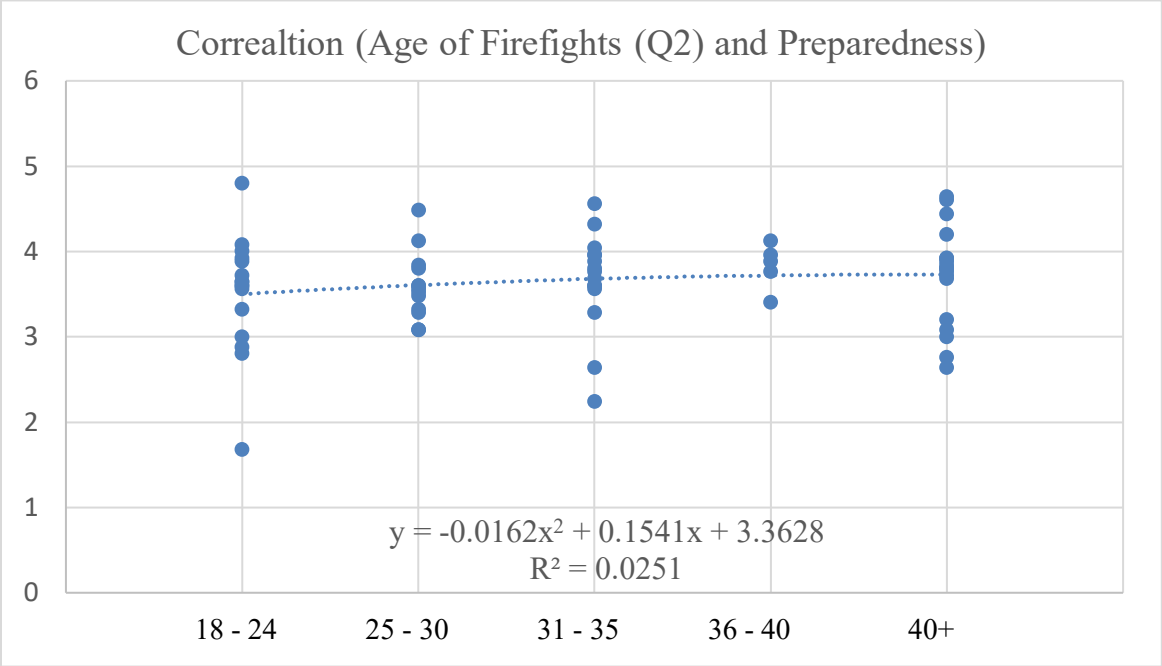

Figure 4: CORRELATION (Age (Q2) to Level of Preparedness)

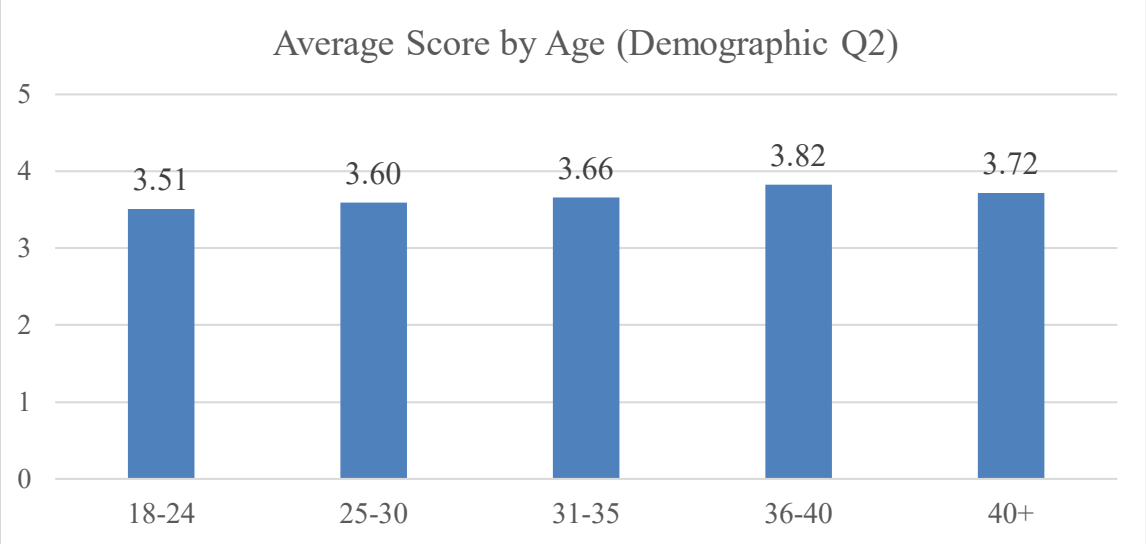

Figure 5: Preparedness Mean Across the Demographic of Age

For Figures 6 and 7, the correlation between the variables of total DPET Score and the demographic characteristic of the level of education (Q4) was analyzed. The DPET survey contained 6 sub-group answers for education level, including a Doctoral Degree; however, since none of the participants in the sample had a Doctoral Degree, this variable was removed from the figures for clarity purposes. Completed level of education was determined into the following 5 sub-group answers, as displayed in both Figures 6 and 7, by High School Diploma, Some College but No Degree, Associate's Degree, Bachelor's Degree, and Master's Degree. As the data revealed, the variable of completed education level does not positively or negatively correlate with higher scores on the DPET or with higher or lower levels of preparedness. The results from this analysis revealed there is no correlation (coefficient of 0.0238) between the variable of level of education and that of the score on the survey, DEPT (Figure 6). The results from the analysis revealed a variance of results between the demographic characteristics; however, the variance was not significant enough to cause a positive or negative correlation (Figure 7).

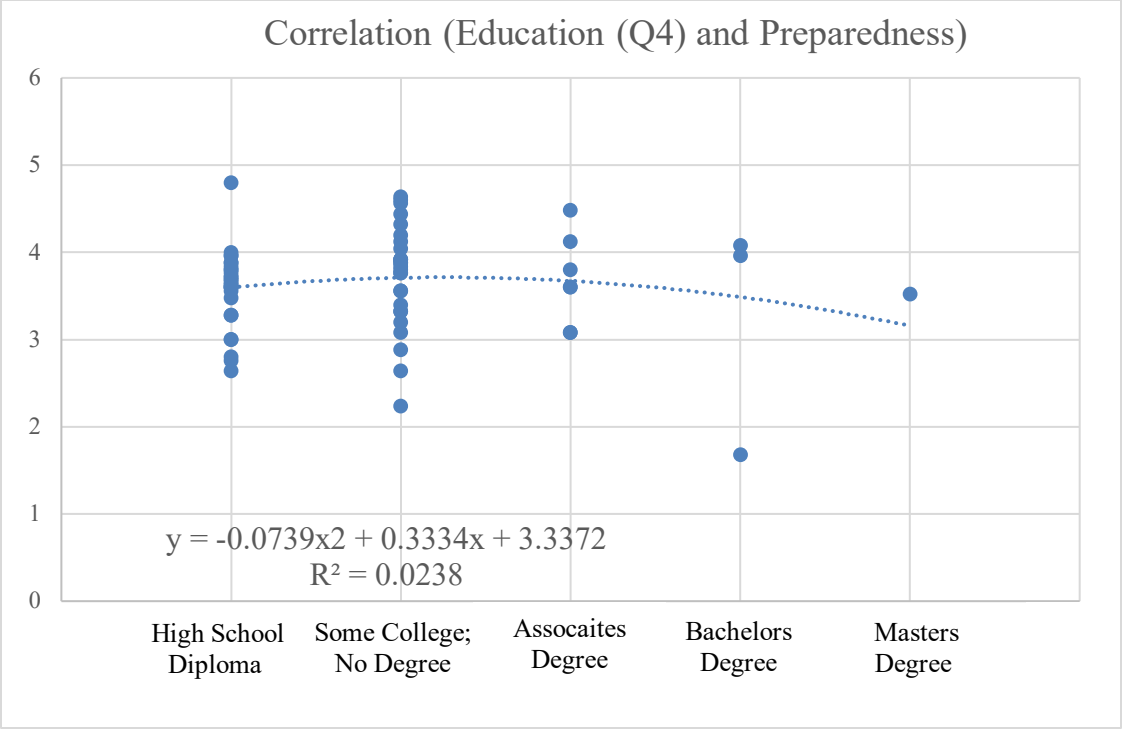

Figure 6: Correlation (Level of Education (Q4) to Level of Preparedness)

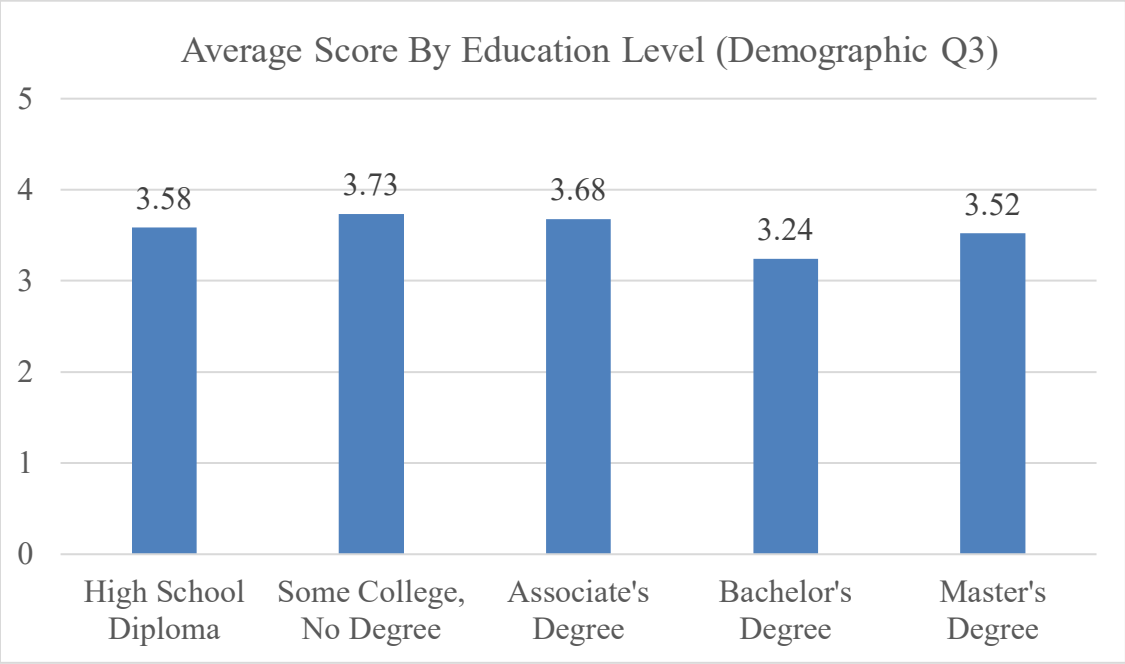

Figure 7: Preparedness Mean Across the Demographic of Education Level

For Figures 8 and 9, the correlation between the variables of total DPET Score and the demographic characteristic of the previous deployment for a disaster (Q8) was analyzed. The DPET survey contained 2 sub-group answers for previous disaster response efforts, as displayed in both Figures 6 and 7, by Have Deployed Previously to a Disaster and Have Not Deployed Previously to a Disaster. As the data revealed, the variable of previous disaster deployment positively correlates with higher scores on the DPET and results in higher levels of disaster preparedness. The results from this analysis revealed there is a positive correlation (coefficient of 0.1093) between the variable of previous disaster deployment and that of the score on the survey, DEPT (Figure 8). The results from the analysis revealed a variance of results between the demographic characteristics, and the variance was significant enough to cause a positive correlation (Figure 9). The data revealed that firefighters who have previously deployed in disaster response efforts are more prepared for a disaster (3.82 out of 5) compared to firefighters without a deployment (3.45 out of 5). This is a significant difference and shows a direct positive correlation that previous disaster response deployment efforts equate to higher scores on the DPET and higher levels of preparedness.

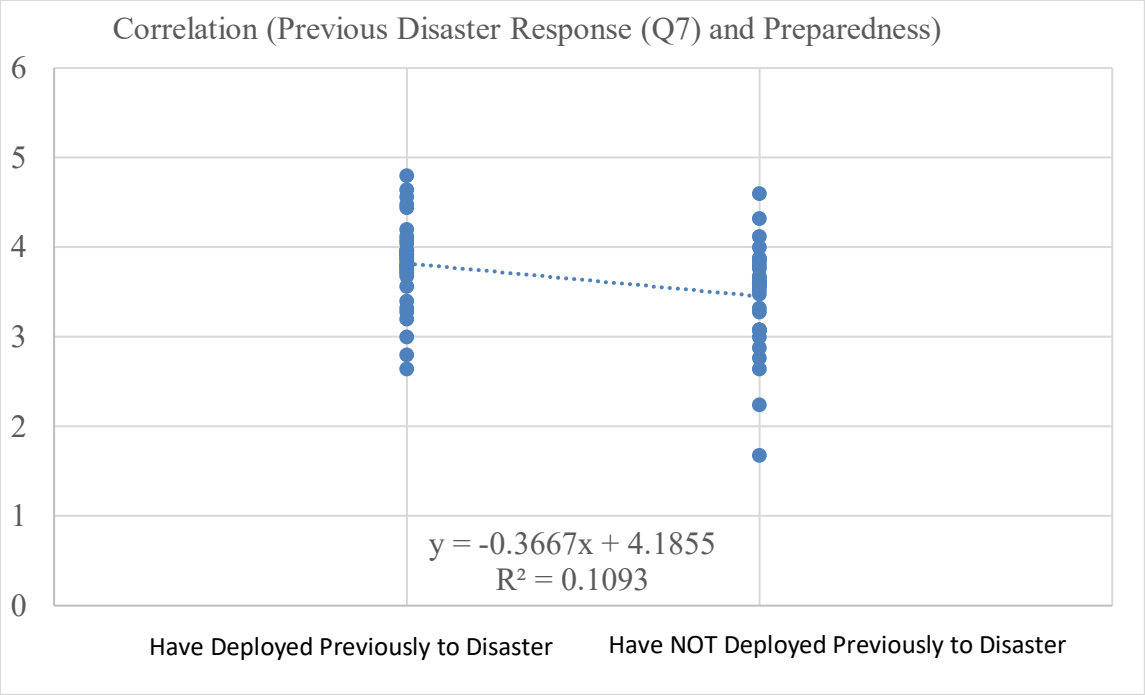

Figure 8: CORRELATION (Previous Response Deployment (Q7) to Level of Preparedness)

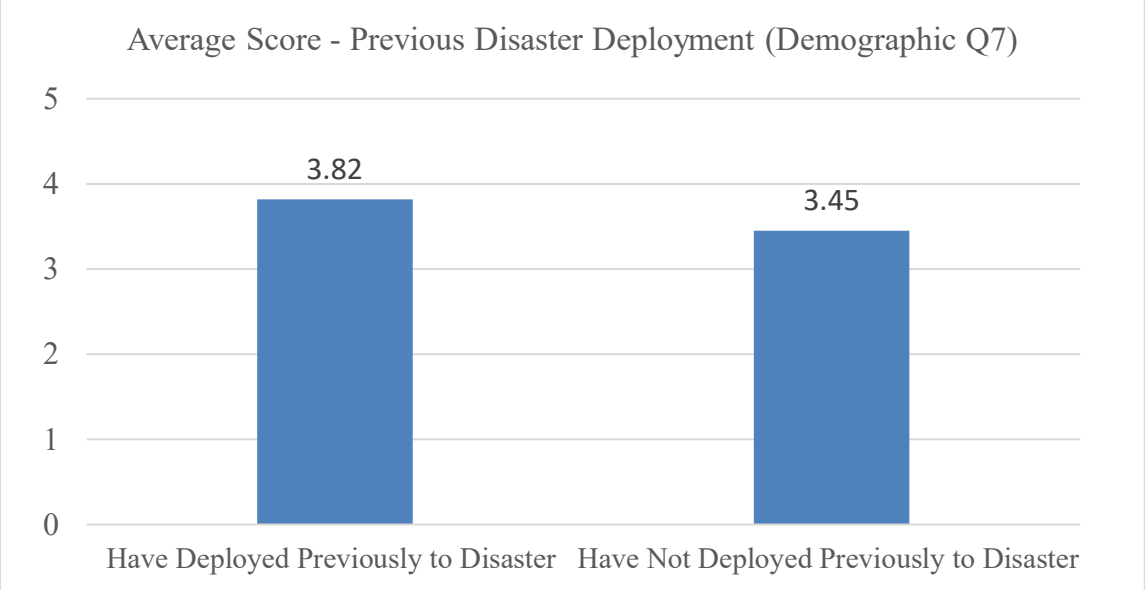

Figure 9: Preparedness Mean Across the Demographic of Previous Disaster Deployment

CHAPTER V

DISCUSSION

Analysis of survey responses revealed a benchmark of the disaster preparedness levels across firefighters employed within Liberty County, GA. One of the significant factors of success is the established baseline for the current preparedness level for HFD and LCFS. Even though the sample size is small at 68, there was a successful rate of return on the responses from firefighters. There is ample statistical data to discuss, and the survey and sample accomplished the overall significance and purpose of the thesis. The use of the DPET, with the sample of both HFD and LCFS firefighters, led to proper research being completed, analyzed, and documented to answer the research questions and hypotheses set forth previously. There are some primary areas of concern to discuss and some expansive research that could be conducted.

Benchmark and Comparison

The first research question was answered with benchmarking and comparing preparedness levels between HFD and LCFS. The benchmark of both HFD and LCFS combined was found to have a score on the DPET of 3.64 out of 5, which resulted in a moderate level of preparedness. When comparing the HFD and LCFS departments, LCFS had a significantly higher overall mean score on the survey. The data did not provide support for Hypothesis 1 (H1), which posited that the organization with a longer establishment history, HFD, would have higher scores compared to LCFS. There was a statistically significant difference between the two fire departments, as LCFS score was 3.87 out of 5, compared to HFD at 3.45 out of 5, which supports $H1_a$. $H1_0$ was not supported by the data as there was a difference. $H1_0$ was a null hypothesis, meaning there

would not be a difference between the preparedness level between HFD and LCFS, which was not supported. Nonetheless, this thesis benchmarked the disaster preparedness levels of both departments, which can be used in future research.

Correlation Between Variables

Correlation analysis was conducted, and only one out of three variables tested proved to provide a correlation between demographic characteristics and preparedness levels. Correlation analysis did not reveal statistical significance between the variables of age and level of education. However, a significant correlation was found when examining the demographic of previous disaster responses. The data closely mimics the results of King et al. (2019), whereas this correlation matches their results. Correlation analysis was performed, and Hypothesis 2 (H2) and its sub-hypothesis $H2_a$ received partial support, with 33% of the tested variables showing a significant correlation with the level of disaster preparedness. Specifically, the variable of previous deployment for a disaster was found to have a direct correlation with higher scores on the DPET, indicating higher levels of disaster preparedness within the sample possessing this background. However, 66% of H2 and $H2_a$ were not supported because the demographics of age and level of education did not provide any statistical significance for variation between sub-groups. $H2_0$ was supported, as the correlation between higher DPET scores and the variables of age and education level was inexistent. Further, there was no statistical significance between these variables and the overall level of disaster preparedness across answers on the DPET.

Areas of Concern

Although most of the results revealed that both departments were in the scope of moderate level of preparedness, some categories scored lower across the sample when compared to others. HFD not only scored overall lower than LCFS, but every section of the DPET, knowledge, skills, and personal, was lower when compared to LCFS. Each section margin was at least .32 lower in comparison to LCFS DPET answers. Further, across both departments, HFD and LCFS, the knowledge section was the lowest at 3.55 out of 5. This data can be used to reiterate knowledge-based training based on the questions and answers from the DPET throughout both departments.

Nonetheless, some departments and categories scored higher across the survey. There were two sections, skills and personal, that LCFS scored in the high level of preparedness due to their mean score across the department in these two categories being over 4 (4.09 in skills and 4.27 in personal). This revealed that LCFS is very well equipped personally to include themselves and their family in disasters. The survey specifically discussed family members in the questions, and this score (4.27 out of 5) places LCFS in the high spectrum of being prepared. Also, the personal section was the lowest score for HFD, 3.22 out of 5. One department, LCFS, scored the highest across all sections on the survey: knowledge, skills, and personal. Whereas, HFD scored the lower across all sections of the survey.

Limitations

This study had several limitations. One limitation is the entire DPET Survey Instrument was not used. Another limitation was the regional size and participant

geolocation. Lastly, the limitation of correct data collection occurred during the analysis phase, and data could not be analyzed due to a miscommunication on the survey.

The DPET is comprised of three main sections: disaster preparedness, response, and recovery, with a total of 47 questions; however, for this study, only the preparedness section was used, with a total of 25 questions answered. The preparedness section was utilized for easy and straightforward data collection analysis and discussion for this research proposal. This limitation is noted; however, the overall scope and purpose of the research were still accomplished, as we now have a benchmark to use going forward.

Another limitation was the geolocation and regional size of the sample. Liberty County houses a small-scale population and a smaller scale of firefighters in the region of Southern GA. The survey could have obtained additional information with a broader scope if the location limitation was not a factor. This could be done in future research, as the entire Southern District of GA could be surveyed utilizing the entire 47-item question DPET.

Lastly, an additional limitation was miscommunication across the demographic question about years of experience. This oversight was costly in the data analysis section and prevented the data from being analyzed. The survey overlapped years of experience as some of the answers needed more accuracy, resulting in data that needed to be corrected. With the data as is, there is no specific way to determine how many years of experience each firefighter in the sample had at the time of the survey. The answers of "5-10, 10-15, 15-20" led participants to the inability to answer correctly, and this variable

could not be appropriately tested for correlation. There may have been information and data left out due to this oversight, and in future research, this answer needs a specific break in years and zero overlap.

CHAPTER VI

CONCLUSIONS

This study has provided the results and data originally intended to answer. The research questions were answered and the benchmark was established. The current level of disaster preparedness was found to be at a moderate level across both departments when combined and separated. The scores provided an overall score of 3.64 out of 5 on the DPET preparedness scale, which falls in the moderate range provided by Tichy and Bond (2007) and used by other scholars in their research (Al Khalaieh et al., 2012; King et al., 2019; Tobaity et al., 2015). This research closely mimicked that of other scholars who have dispatched, utilized, and studied results from the use of the DPET across various samples. The DPET provides measurements of the overall perceptions of knowledge, skills, and personal preparedness for numerous stages of preparedness, response, and recovery efforts for disasters (King et al., 2019). The DPET was validated by numerous scholars (Al Khalaieh et al., 2012; Chen et al., 2015; Han & Chun, 2021), who implemented data that led to reliability across all research platforms that have used this survey. This study used a portion of the DPET, and it has performed as expected and provided the answers to the research questions initially outlined in the introduction.

This study also provided greater expansion on previous research (Al Khalaieh et al., 2012; Chen et al., 2015; Han & Chun, 2021; King et al., 2019) who utilized the DPET for the benefit of emergency management. This thesis, its analysis, and results have established new research that is beneficial to emergency management literature expansion. Further, it has established answers to questions, such as disaster preparedness levels, for a sample that has not been conducted by scholars. The DPET has been used

numerous times for medical personnel however, this thesis expanded the use of the DPET across a new sample, which consisted of firefighters. With the research analysis and results from this thesis, additional samples can be studied utilizing the DPET. Why stop at nurse practitioners, military medical personnel, and firefighters? This research can also be further expanded through means of numerous opportunities.

There are numerous ways to complete additional research. One way would be to correct the demographic question regarding the years of experience of firefighters and deploy the survey again for further data collection. Additionally, the survey could be administered after specific guided training to the staff to see if there is an increase in the results across the DPET. The DPET, in its entirety, could be used as well. In this research, only 25 out of 67 questions on the DPET were used for data collection. If the entire DPET were to be used, the results would provide greater insight into the preparedness, response, and recovery data for both HFD and LCFS departments. This would add to the current benchmark and answer further research questions, such as the department's current level of disaster response and recovery operations.

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established and answer further research questions, such as the department's current level of disaster response and recovery operations.

Numerous offices and personnel can benefit from this data now that it has been conducted, analyzed, and documented. Firstly, the Chief of Fire within HFD and LCFS can assess their station's current level of disaster preparedness and move forward with proper training and implementation of any additional scenarios for employees and staff. At the very least, the fire chiefs and county emergency management director and staff can review this research and analyze their station's current state and level of preparedness for a disaster. Fire chiefs can analyze the results and see station pitfalls and prosperous areas. Additionally, city council members can initiate a policy to reflect the ongoing contributions by the departments to raise their levels of preparedness. The overall goal would be to answer five on every question as a firm agreement regarding all staff members' knowledge, skills, and personal side of preparedness. There is always room for improvement in this realm of work since not all employees scored 125 out of 125 on the DPET.

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APPENDICES

Appendix A: Survey Brief

Good morning/ afternoon Firefighters,

I am Shelby Coonts and I am currently pursing my Masters Degree in Emergency Management and Homeland Security at Arkansas Tech University. I invite you to take part in a research study, Natural Disaster Preparedness Levels Among Firefighters. This study seeks to establish the current natural disaster preparedness levels across the Firefighters located in the areas of Hinesville and Liberty County, GA. This study has been conducted numerous times throughout offices of medical personnel and in the Naval Medical Command. Taking part in this study is entirely voluntary. If you decide to participate you must annotate such on the survey document.

If you agree to take part in this study, it would take approximately 15 minutes of your time but will be completed at your own pace. Please answer all questions honestly for accuracy of the survey and data collection and analysis. There are no discomforts or risk associated with conducting this survey. You are not required to complete this, but I would be extremely grateful if you were to do so. I will keep your participation in this research study confidential to the extent permitted by law.

Thank you for your time and assistance with my research and furthering my education. For more information on this study, please obtain my contact information from your Deputy Fire Chief and reach out to me anytime. You can also approach me after the survey is completed.

Appendix B: Informed Consent Form

Title of Project: Natural Disaster Preparedness Levels Among Firefighters

Principal Investigator: Mr. Shelby G. Coonts

Other Investigators: Dr. Bethany Swindell and Dr. Jamie Stacy

Participant's Printed Name: Numerous Firefighters (Fire Stations/ Departments) in Hinesville and Liberty County, GA

The Introductory Paragraph:

You are invited to participate in a research study: Natural Disaster Preparedness Levels Among Firefighters. This study seeks to establish the current natural disaster preparedness levels across the Firefighters located in the surrounding areas of Hinesville and Liberty County, GA. Your participation is strictly voluntary. Please discuss any questions about this study with the researcher. If you decide to participate, please annotate such on the survey document. You may withdraw your participation at any time during the study.

Section 1. Purpose of the Research

The purpose of this research study is to obtain information on the current levels of natural disaster preparedness among firefighters across the city of Hinesville, GA and Liberty County, GA. You have been asked to take part in this study because of your occupational specialty and location of employment. Your answers may build research for future projects in regard to Emergency Disaster preparedness. Approximately 70 people will take part in this research throughout your unit.

Section 2. Procedures

This study is being conducted via an in-person written/ paper survey. The survey contains 14 Demographic Questions and 25 Disaster Preparedness Questions.

Section 3. Time Duration of the Procedures and Study

This study/ survey will take approximately 15 minutes of your time.

Section 4. Discomforts and Risks: None.

Section 5. Potential Benefits

The benefit of this study is that there will be an established baseline of the overall level of knowledge and preparedness pertaining to natural disasters within your city and county Fire Departments.

Section 6. Statement of Confidentiality: Records will be reviewed, analyzed and stored in a locked drawer in the researchers office. Hard copies will remain with the researcher and

a copy will be scanned and emailed to co-researchers for review. Data will be annotated in the research proposal in writing and in charts/ tables. Data will be kept for 36 months.

Section 7. Costs for Participation: Time; approximately 15 minutes.

Section 8. Compensation for Participation: None.

Section 9. Research Funding: None.

Section 10. Voluntary Participation

Taking part in this research study is voluntary. If you choose to take part in this research, your major responsibilities will include completing the survey and answering all questions truthfully. You do not have to participate in this research if you do not want to. If you decide not to participate there will be no penalty or loss of benefits to which you are otherwise entitled.

Section 11. Contact Information for Questions or Concerns

You have the right to ask any questions you may have about this research. If you have questions, complaints or concerns or believe you may have developed an injury related to this research, contact Mr. Shelby G. Coonts at 910-813-4034 or by email at scoonts@atu.edu

If you have questions regarding your rights as a research participant or you have concerns or general questions about the research, contact the research participants protection advocate in the Arkansas Tech University IRB Office at 479-968-0237. You may also call this number if you cannot reach the research team or wish to talk to someone else.

For more information about participation in a research study and about the Institutional Review Board (IRB), a group of people who review the research to protect your rights, please visit Arkansas Tech University's IRB web site at atu.edu. Included on this web site, under the heading "Participant Info", you can access federal regulations and information about the protection of human research participants. If you do not have access to the internet, copies of these federal regulations are available by calling the Arkansas Tech University at 479-968-0237.

Appendix C: ATU IRB Approval Letter

February 24, 2023

To Whom It May Concern:

The Arkansas Tech University Institutional Review Board has deemed the application for Shelby Coonts' proposed research, entitled "Natural Disaster Preparedness Levels Among Firefighters," to be exempt pursuant to federal regulation 45 CFR 46.104 (d)(2)(i). Please use number E-2023-30 when referencing this study.

Please note that in the event that any of the parameters of the study change, the researcher may be required to submit an amended application. Please proceed with your research. We wish you success with this endeavor.

Sincerely,

Tennille Lasker-Scott, Ph.D.

Institutional Review Board Chair

Arkansas Tech University

Appendix D: Survey Instrument w/ Consent Form

Survey Page 1 (CONSENT)

Taking part in this research study is voluntary. If you choose to take part in this research, your major responsibilities will include completing the survey and answering all questions truthfully. You do not have to participate in this research if you do not want to. If you decide not to participate there will be no penalty or loss of benefits to which you are otherwise entitled. If you do not want to participate please close this window.

If you do agree to take part in this survey and agree to all data being collected and analyzed and the results being documented; please mark next to "I AGREE" and continue. If you do not want to take part in this survey, please mark next to "I DO NOT AGREE" and turn in the survey.

I AGREE _____

I DO NOT AGREE_____

Thank you for your participation.

Survey Page 2 (Instrument)

TABLE I: Participants Demographic Characteristics (Circle your answer)

1. Gender: I am a Male, Female, Prefer Not to Answer

2. How old are you? 18-24, 25-30, 31-35, 36-40, 40+

3. What is your Highest completed Level of Education? High School Diploma, Some College but no degree, Associate's degree, Bachelor's degree, Master's degree, Doctoral degree

4. My Current Rank/ Job Position is: Probationary Firefighter, Firefighter, Driver Engineer, Lieutenant, Captain, Chief Position

5. In which type of facility are you primarily employed? Station or Administration Office

6. How many years of experience do you have as a Firefighter? 1-4, 5-10, 10-15, 15-20, 20+

7. Have you ever deployed in response for a natural disaster? Yes No

TABLE II: Disaster Preparedness Education Tool (DPET) Disaster Preparedness Survey (Likert Scale 1-5: 1-Strongly Disagree, 2-Disagree, 3-Neither Disagree or Agree, 4-Agree, 5-Strongly Agree)

Disaster Knowledge

1. I am aware of what the potential vulnerabilities in my local area are (e.g., earthquake, floods, hurricanes, terror, etc.)

2. In case of a disaster situation, I think that there is sufficient support from local officials on the county or state level.

3. I have a list of contacts in the Department/ Stations in which I practice. I know referral contacts in case of a disaster situation (health department, FEMA, etc.)

4. I am familiar with the local emergency response system for disasters.

5. I know the limits of my authority as a Firefighter, acting in a disaster situation, and I would know when I exceed/ overstep the authorities I am allowed.

6. I know who to contact (chain of command) in disaster situations in my community (city/ county).

7. I find that the research literature on disaster preparedness and management is easily accessible.

8. I read journal articles related to disaster preparedness.

9. I find that the research literature on disaster preparedness is understandable.

10. I know where to find relevant research or information related to disaster preparedness and management to fill in gaps in my knowledge.

11. Finding relevant information about disaster preparedness related to my stations/ departments needs is an obstacle to my level of preparedness.

12. I am aware of classes about disaster preparedness and management that are offered at either my workplace or within my departments structured available online courses.

13. I would be interested in educational classes on disaster preparedness that relate specifically to my Departments location and situation.

14. I participate in one of the following educational activities on a regular basis: continuing education classes, seminars, or conferences dealing with disaster preparedness.

15. I participate/have participated in creating new guidelines, emergency plans, or lobbying for improvements on the local or national level.

16. I have participated in emergency plan drafting and emergency planning for disaster situation in my local area/ state.

Disaster Skills

1. I am familiar with accepted triage principles used in disaster situations.

2. I participate in disaster drills or exercises at my workplace (station/ department) on a regular basis.

3. I consider myself prepared for the management of disasters.

4. In case of a bioterrorism/biological attack, I know how to use personal protective equipment.

5. I would be considered a key leader asset in my station/ department in a disaster situation.

6. In a case of bioterrorism/biological attack, I know how to perform isolation procedures so that I minimize the risks of community exposure.

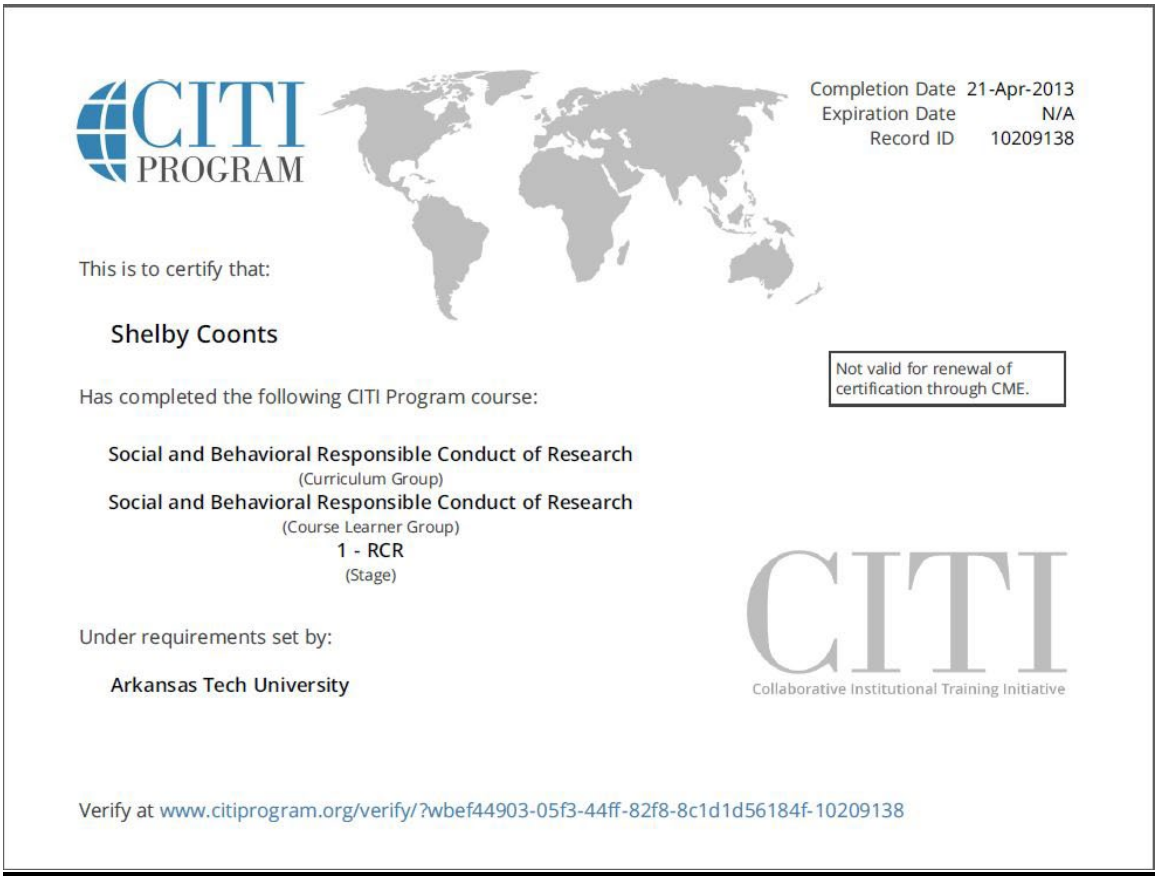
7. In case of a bioterrorism/biological attack, I know how to execute decontamination procedures.

Personal/ Family Preparedness for Disaster

1. I have personal/family emergency plans in place for disaster situations.

2. I have an agreement with loved ones and family members on how to execute our personal/family emergency.

Appendix E: CITI Program Social and Behavioral Research Course Certificate



CITI PROGRAM

Completion Date 21-Apr-2013
Expiration Date N/A
Record ID 10209138

This is to certify that:

Shelby Coonts

Not valid for renewal of certification through CME.

Has completed the following CITI Program course:

Social and Behavioral Responsible Conduct of Research
(Curriculum Group)
Social and Behavioral Responsible Conduct of Research
(Course Learner Group)
1 - RCR
(Stage)

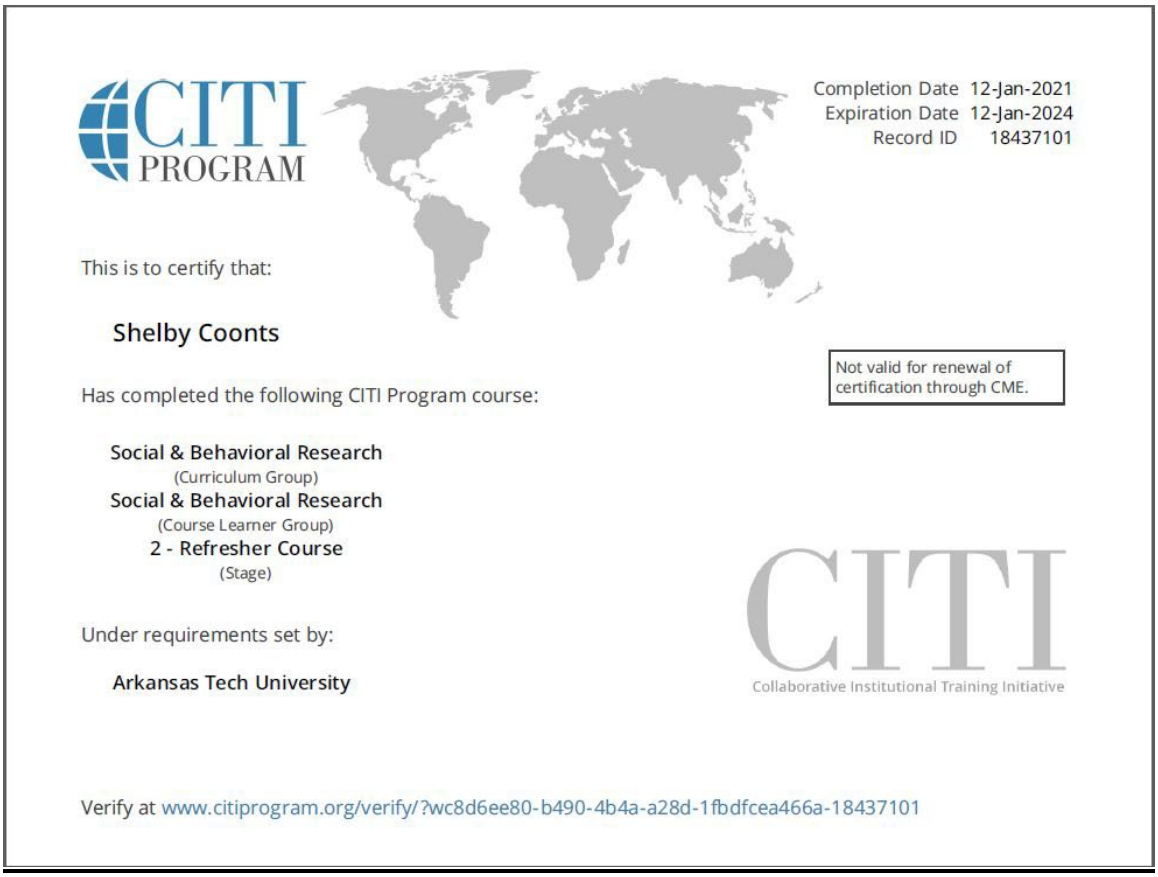
Under requirements set by:

Arkansas Tech University

CITI
Collaborative Institutional Training Initiative

Verify at www.citiprogram.org/verify/?wbef44903-05f3-44ff-82f8-8c1d1d56184f-10209138

Appendix F: CITI Program Social and Behavioral Research Refresher Training Certificate



CITI PROGRAM

Completion Date 12-Jan-2021
Expiration Date 12-Jan-2024
Record ID 18437101

This is to certify that:

Shelby Coonts

Not valid for renewal of certification through CME.

Has completed the following CITI Program course:

Social & Behavioral Research
(Curriculum Group)
Social & Behavioral Research
(Course Learner Group)
2 - Refresher Course
(Stage)

Under requirements set by:

Arkansas Tech University

CITI
Collaborative Institutional Training Initiative

Verify at www.citiprogram.org/verify/?wc8d6ee80-b490-4b4a-a28d-1fbdfcea466a-18437101