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The Role of Law Enforcement-Community Communication in Disaster Readiness

Amanda Perez
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Amanda Perez

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Walden University
2018

Abstract

The Role of Law Enforcement-Community Communication in Disaster Readiness

by

Amanda Perez

MSA, Central Michigan University, 2003

BS, Wayland Baptist University, 2001

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Public Policy, Homeland Security

Walden University

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Abstract

A lack of effective communication structures within local communities could have devastating consequences during an emergency. Therefore, the key problem addressed in this study was that the most effective methods (channels) of communication between law enforcement officials and the general public in the event of a natural disaster has not been studied. The purpose of this study was to weigh the benefits of three types of communication media—social media, radio, and word-of-mouth—to provide a framework for promoting effective communications between local government emergency responders and civilians. This single case study focused on a large county in the State of Virginia. The chosen instruments were a survey of 25 community leaders and semistructured interviews with 10 members of local governance and law enforcement (all participants were over the age of 30). Thematic analysis was conducted using NVivo software. Additionally, supporting documentation from open-access governmental or law enforcement websites were collected and analyzed. Collated data and findings were compared across the surveys, interviews and documentation. The notions of community resilience, adaptive capacity and coping capacity were the theories used to frame this research. Six themes emerged from the data, these were (a) involving the public, (b) availability of public information, (c) being more proactive than reactive, (d) collaboration among stakeholders, (e) proper emergency management system, and (f) avoiding miscommunications. The results are relevant to local government officials and law enforcement leaders when they consider various methods of communication. This will assist law enforcement officials to organize the community and minimize damage in the event of a natural disaster.

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Chapter 1: Introduction to the Study

Introduction

The question of community readiness for natural disasters has never been more important in the age of climate change, as extreme weather events, such as floods and severe and unexpected storms, increase in prevalence (Thomsen & Sørensen, 2016; Van Aalst, 2006). For this reason, the notion of community resilience and preparation takes on a new urgency, as natural disasters are occurring on a scale that one cannot predict. Municipal decision making must take into account the rapidity of natural disasters, meaning that the duty of preparation should not be restricted to professionals, but distributed throughout the community (Thomsen & Sørensen, 2016). Given this environment, the question on the best way to distribute responsibility throughout local communities has become increasingly important in scholarship on homeland security and disaster readiness (Hughes, St. Denis, Palen, & Anderson, 2014).

The study was important because the results could provide insight into the best ways to distribute responsibility for preparation among local authorities, especially law enforcement and the general public. While law enforcement officials shoulder most of the burden of disaster preparation and community readiness, emphasis on the notion of distribution of responsibility for readiness by means of communication is needed. The theme of communication was prominent in the literature on the topic of community readiness (Hughes et al., 2014; McElreath, Doss, Lackey, Wigginton, & Jones, 2016). Hughes et al. (2014) noted that social media and online communication tools created flexibility for state and local fire and police departments when deciding what constituted

an acceptable communications platform in the midst of an emergency. Conversely, McElreath et al. (2016) noted the importance of maintaining a select few highly trained officials embedded within the community to take charge in the event of a disaster. The study was completed by examining the perspectives of law enforcement officers and members of the community within a county in the state of Virginia (United States) regarding communication in the event of a natural disaster.

In this chapter, several topics will be discussed to further illuminate the research topic. The organization of the chapter will be based on the following: (a) background of the study; (b) problem statement; (c) purpose of the study; (d) research questions; (e) advancing scientific knowledge; (f) significance of the study; (g) rationale for methodology; (h) nature of the research design for the study; (i) definition of terms; and (j) assumptions, limitations, and delimitations. The chapter ends with a summary of the chapter and an overview of the contents of the rest of the proposal.

Background of the Study

In the event of a natural disaster, the key to ensuring the limitation and reduction of damage is the development and implementation of an effective response plan (Norris, Stevens, Pfefferbaum, Wyche, & Pfefferbaum, 2008; Osgood et al, 2015; Thomsen & Sørensen, 2016). Researchers have found that preparation is key to reducing the costs of disasters, both in terms of human and financial resources (Cutter et al., 2008; Osgood et al., 2015). However, preparation for disasters comes in many forms, and plans for preparation differ according to the size and location of the community under threat. For instance, Cutter et al. (2008) showed that communities near coastlines are particularly

sensitive to flooding, and their preparation should be coordinated across community leaders, law enforcement, fire officials, and community authorities. Integrating questions of community size and location into the discussion are key to understanding what is at stake in the present study.

Scholars and security experts have explored different strategies to address the challenges posed by clear communication between law enforcement and the general public (McElreath et al., 2016; Meijer, & Torenvlied, 2016; St. Denis, Palen, & Anderson, 2013). According to Hughes et al. (2014), one strategy that has received some empirical support is the use of social media to improve the channel between the law enforcement or state officials and the general public. The question of communication is important because it is one manner in which law enforcement officials can distribute responsibility for disaster response and preparation across the community. Clear channels of communication between law enforcement officials and the general public help decrease panic in a disaster and improve community cooperation (Hughes et al., 2014).

Although the importance of communication and environmental factors has been established, it is not known which form of communication is the most effective for establishing the connection between law enforcement and the general public in suburban communities in Virginia. While many of the studies about community resilience, preparation, response, and communication take place within an urban framework (Hughes et al., 2014; Osgood et al., 2015), no study to date has taken up such questions to consider how they relate to communities where there is little natural disaster preparation in place and few systems to distribute communications to the general public. Moreover,

the situational nature of the questions involved—namely, that these were hypothetical questions regarding how to respond in the event of a natural disaster—indicated a problem for researchers and scholars working in issues regarding homeland security.

The rationale for selecting this area as the particular community and case was that the county represented a large suburban community with few communication infrastructures in place. However, the multidimensional nature of communication meant that conclusions from the present study could be extrapolated to other types of communities, which necessitated the importance of exploring and comparing further the influence of communication techniques on community readiness and response.

Problem Statement

The problem of creating community awareness of natural disasters—without arousing panic or suspicion—is paramount (Wex, Schryen, Feuerriegel, & Neumann, 2014). However, disaster readiness is a complex issue, and it depends not only on location and resilience, but also on the structure and communication of disaster plans throughout the general public (Cutter et al., 2008; Hughes et al., 2014). A lack of effective communication structures within local communities could have devastating consequences in an emergency, in which communication was key for saving lives (Hughes et al., 2014). With this in mind, the problem addressed was the lack of a clear communication channel between local communities and state and local emergency services.

The study also included the theoretical framework provided by Parsons et al. (2016), who identified two different capacities for disaster readiness, namely, adaptive

capacity and coping capacity. Adaptive capacity was divided into themes of governance, policy, and leadership, while coping capacity consisted of social character, economic capital, emergency services, information, and engagement. This theoretical framework provided an adequate scale to measure community readiness (Parsons et al., 2016).

Purpose of the Study

The purpose of this qualitative, single-case study was to explore how community readiness for natural disasters could be improved by creating effective communication channels between local authorities and the general public. At this stage in the research, the notion of community readiness was defined as the ability to execute a recovery plan in the event of a natural disaster or emergency. To undertake the study, I conducted surveys (25) and interviews (10) with members of law enforcement, community leaders, and local governance that served the county of Virginia. The interviews improved the data by providing first-hand accounts of the communication systems currently in place.

Research Questions

Based on the problem identified and the theoretical framework, I focused on exploring how law enforcement officials should work to improve communication channels with the general public in the event of a natural disaster. The particular case to be explored was that of a Virginia county with law enforcement and community relations. Three research questions guided the study:

RQ1. How should law enforcement officials improve communication with the general public in the event of a natural disaster?

RQ2. How is community readiness for natural disasters dependent on communication?

RQ3. Which specific methods of communication should law enforcement officials use to most effectively interface with the public?

Theoretical Framework

Norris et al.'s (2008) notion of community resilience and Parsons et al.'s (2016) notions of adaptive capacity and coping capacity were the theories I used to support this research project. As Norris et al. (2008) noted, resilience encompasses contemporary understandings of stress, adaptation, wellness, and resource dynamics. Resilience was considered a process linking networks of adaptive capacities; in this way, it was an important factor in deciding on the allocation of resources, as well as to adaptation after a disturbance or series of adverse incidents (Norris et al., 2008). Key to this notion was population wellness, which the authors defined as high and nondisparate levels of mental and behavior health, functioning, and quality of life. The authors distinguished four different sets of adaptive capacities, namely, economic development, social capital, information and communication, and community competence. These four functioned together to provide a strategy for disaster readiness. The authors suggested that communities should reduce risk and resource inequalities, engage local people in mitigation, create organizational linkages, boost and protect social supports, and plan ahead using flexible criteria (Norris et al., 2008).

The theories of adaptive capacity and coping capacity, according to Parsons et al. (2016), provided a useful framework for assessing how communities and community

services, such as police and fire departments, could adapt and change their communication techniques. Coping capacity referred to the means by which people or organizations used available resources, skills, and opportunities to face adverse consequences, while adaptive capacity referred to the arrangements and processes that enabled adjustment through learning, adaptation, and transformation. For instance, the authors noted that coping capacity generally consisted of factors, such as social character, economic capital, infrastructure, planning, emergency series, and community engagement. Conversely, adaptive capacity referred to those themes that were more malleable, which generally consisted of state or federal bodies, such as governance and leadership (Parsons et al., 2016). The theory of community resilience was key to understanding the factors that contributed to coping capacity, such as the health of the community bond. Community resilience linked up with the notions of adaptive capacity and coping capacity by providing a rigorous framework in which to test both capacities.

I used these theories to limit the scope of the discussion regarding community response to natural disasters. The notions of resilience, coping capacity, and adaptive capacity functioned together to provide a framework for understanding how community services should improve communication with local communities to facilitate smooth emergency response plans. For instance, Thomsen and Sørensen (2016) used the notion of community resilience to measure, effectively, the efficacy of risk reduction services in coastal communities affected by climate change. Such a theoretical framework was used to improve emergency response plans.

Pertaining to Norris et al.'s (2008) theoretical framework, current studies have shown that certain modes of preparation and communication can influence the response to disasters, both natural and manmade (McElreath et al., 2016; Osgood et al., 2015), which made the present study increasingly necessary. However, there was still a gap in the literature on which type of communication yields the most effective results for local communities. Therefore, I addressed the problem of insufficient literature on how communication channels between officials and the public affected community readiness for natural disasters. By weighing the benefits of three types of communication media—social media, radio, and word of mouth—the present study provided a more adequate framework for promoting effective communications between local government emergency responders and civilians in the community. These modifications could improve the efficacy of disaster response plans through communication and education. The three were selected because they were the common communication channels for members of the community.

Nature of the Study

A qualitative design was employed to consider the perspective of local authorities and community members. As Creswell (1997) made clear, a qualitative researcher could seek to provide information on process, as well as to fill in the knowledge gap that existed in how to research the presented problem from the perspective of the participants. I studied the perspective of law enforcement officers and community leaders as key to understanding the efficacy of communication between officials and the community. A quantitative study would not work well here, because the resulting data would not be

specific enough to give an accurate account of what constitutes community readiness.

While quantitative researchers offer precision in their work, the present research project did not require the numerical data offered by quantitative studies, instead requiring more subjective accounts acquired through a qualitative study (Creswell, 1997).

The specific methodology used in the present work was case study. I conducted a case study of a large county in Virginia to consider the subjective experiences of law enforcement officials and community members. A case study offered the advantage of being able to weigh different forms of communication against one another. The aim of a case study was to study a complex phenomenon in its own context (Yin, 2013). The notion of context was crucial, as environmental and social factors played key roles in understanding how certain phenomena, such as community readiness, developed (Baxter & Jack, 2008). The rationale for selecting a case study with the theoretical framework of community resilience, adaptive capacity, and coping capacity, was that such a framework and methodology would provide specific answers to the questions being posed.

Specificity was extremely important to the present study, as it asked how to manage a crisis in which the situation was often shifting. The key concept being investigated was the notion of communication and how a clear channel could be opened up between the community and law enforcement. The phenomenon of communication was especially difficult to measure in the event of an emergency, as the channels being used to send messages to and from the community might be stopped (Hughes et al., 2014). This difficulty was why the chosen method of communication was so important and why the

chosen methodology of case study was the most effective method for determining effective modes of communication.

The sample for this study consisted of police officers, public officials, and members of the general public working in a Virginia county. The community participants were limited to leaders in the local community, such as business owners and adults over the age of 30. Children were excluded from the study. This limited the discussion to those who dealt with crises and operated with the public to implement disaster-response initiatives. The sample size was 25 participants for the survey and 10 participants for the interviews. This sample was justified by the limited scope of the study, which focused on community readiness and communication between public officials and the general public (Yin, 2013).

The chosen instruments were a survey and semistructured interview (see Appendices A and B), along with supporting documentation. Semistructured interviews provided the most representative answers to the questions posed, and surveys gave context to the issues by expanding the subject field providing specific information to determine the interview questions (Taylor, Bogdan, & DeVault, 2015). For a case study analysis, surveys have the advantage of providing access to a wide amount of subject data without generalizing the community-specific issues at stake. To achieve the most appropriate results, a survey guide was prepared, listing all the key questions needed to answer the research questions (see Appendix A). The survey guide served as a tool that I relied on to ensure that all survey questions were answered, and that the responses fit into

a data analysis scheme (Taylor et al., 2015). This guide was adjusted after a pilot study review.

In addition, an interview protocol was prepared, listing all the key questions needed to answer the research questions (see Appendix B). The interview protocol served as a tool that I relied on to ensure the interview questions were all asked and delivered in the same structure and with the same choice of words (Drever, 1995). The current protocol changed after a pilot study review following aspects noted in the surveys that needed to be altered. Interviewees (where possible) provided supporting documentation, such as business policies regarding natural disasters. I also gathered additional documentation via open-access governmental and or law enforcement websites. These documents were analyzed using Yin's (2013) method.

The surveys were accessed online, and those police, governmental, and or community leaders meeting selection criteria could access the survey via an e-mailed link. The interview featured questions regarding the past and present experiences of participants who coordinated community response plans, set up policies and procedures regarding natural disasters, and dealt with communication to the general public. Participants were provided with my e-mail address during the recruitment phase, so they could reach me in instances where questions or concerns arose during the course of the study.

Data analysis followed the protocol developed by Yin (2013), using electronic thematic analysis via NVivo. Further thematic analysis occurred using NVivo software to compare and collate data and findings better across the interviews, surveys, and

documentation. Thus, analysis was done manually by the reading and rereading of transcripts, survey answers, and documentation, using Yin's (2013) approach. Analysis was done electronically to ensure that findings were thorough and objective.

Definition of Terms

The phenomenon investigated was the nature of communication techniques between law enforcement and the members of the general public in a county in Virginia. Based on the problem and purpose of the study, the following key terms were defined:

Communication: Communication refers to the process of distributing information in a cogent and effective way, with the criteria for success being the delivery of a coherent message to multiple people throughout the community (Norris et al., 2008).

General public: The general public includes civilian members of the community who are not involved in governance or emergency services (Hughes et al., 2014).

Law enforcement officials: Law enforcement officials refer to employees of the state who work under for the police and fire departments. Law enforcement officials are generally assigned with the task of planning a response and executing such a plan in an emergency (McElreath et al., 2016).

Assumptions, Limitations, Delimitations

Based on the selected methodology, theoretical framework, and research topics, two assumptions of the study were as follows:

- I assumed that both law enforcement officials and members of the general public were honest with their responses to the interview questions.

The following limitation was identified:

- Lack of participation of homeland security experts limited the scope of the study. I used a small sample size. The results might not be generalizable to all communities, especially to more urban or inner-city communities.

The following delimitations were identified:

- This study was delimited to three types of communication media: social media, radio, and word of mouth. These three were selected because these were the common communication channels for members of the community.
- This study was delimited to interviews, surveys, and substantiating documentation. Using the three data collection tools was sufficient to gain in-depth information about the phenomenon. However, the study was also limited in its transferability, as the data gathered were case specific.

Advancing Scientific Knowledge

The gap in the literature was the seeming lack of research regarding which type of communication corresponded to the most effective results for communities, such as the county under study in Virginia. Therefore, I addressed the problem of insufficient literature on how communication channels between officials and the public affected community readiness for natural disasters. The implication of the results was improved readiness in communities, such as the county under study, and improved communication channels between law officials and the public.

The theory of community resilience was enhanced because of this study by developing better understanding of how communication played into readiness and

resilience. Focusing on a single community, such as the county under study, underscored the importance of developing an infrastructure and plan for communication to enhance homeland security tactics. At stake in this study was more than just a theory; the results of the study could lead to developments that improve relations within communities and might save lives in the event of a natural disaster. The knowledge acquired through a better understanding of communication techniques between law enforcement and local communities could be expanded to different fields, such as communications research and security studies.

Significance of the Study

This study was significant because I addressed how the flow of information between state officials and local residents could improve community resilience and readiness for natural disasters. The results of the study provided a more comprehensive understanding of the benefits of improving the channels of communication between the law enforcement officials and the general public within a local community. Specifically, the advantages of various methods or techniques for communication, including social media, television, radio, or word of mouth, were weighed against one another to determine the most effective method of communicating. This process could help law enforcement officials organize the community and minimize damage in the event of a natural disaster.

The results of the study were significant to professional practice because local government officials or law enforcement leaders might have a better understanding of how the flow of information could ease their job of planning and preparing for natural

disasters. A better understanding of the way information travels between officials and members of the public was an important safety issue because intensification in readiness and increased awareness throughout communities could lead to improved social cohesion and disaster readiness (Hughes et al., 2014). Through improved understanding of this issue, officials could develop new modes of communication when interfacing with the public.

Summary

The problem addressed in this study was that the most effective method of communication between law enforcement officials and the general public in the event of a natural disaster was not known. Most studies that examined natural disasters and community readiness did not consider effective methods of communication. The purpose of this qualitative case study was to address the gap in the literature by exploring the perceptions of law enforcement officials and the general public about the benefits of various types of communication for community readiness. The target population was law enforcement officials who were tasked with organizing and planning preparations in the event of a natural disaster, as well as members of the general public and community leaders who were tasked with helping to organize the stated plan.

The timeline for the research was months for the data collection, involving interviews and the collection of journal notes and documents. The data analysis lasted two months, which included the transcription and the coding process. The results were written a month after the analysis was completed.

In Chapter 2 I will review the literature. The topics will include the various communication techniques, including social media, word of mouth and radio, as well as the benefits of community preparation for resilience in natural disasters. In Chapter 3 I involve the methodological plan of the study, including the research methods and design, sampling procedure, data collection, data analysis, ethical considerations, and validity and reliability. In Chapter 4 I will review the findings from the conducted surveys, and the themes that were revealed. In Chapter 5 I will discuss the how the results of the study could be utilized now and into the future on multiple levels.

Chapter 2: Literature Review

Introduction

The purpose of this qualitative single-case study was to explore how community readiness for natural disasters could be improved by creating effective communication channels between local authorities and the general public. This statement was based on research indicating that communication could play an important role in the efficacy and efficiency with which disasters could be managed and assist in better preparing communities for, and making them more resilient regarding, such inevitabilities (Cutter et al., 2008; Hughes et al., 2014; McElreath et al., 2016; Osgood et al., 2015). However, there was a noted problem—the lack of clear communication channels or research on the kinds of communication currently employed between communities and law enforcement in regard to disaster preparation, readiness, and management (Hughes et al., 2014). I attempted to address this problem. The study also filled in the gap in current literature on how communication channels between officials and the public affected community readiness for natural disasters.

This chapter will highlight key aspects of communication channels, disaster readiness, and current literature related to this study purpose and the problem under study. It will be divided into the following sections: (a) the literature search strategy; (b) the theoretical framework; and (c) the review of the literature, which will deal with aspects of disaster management, community resilience, communication and social media use, and education.

Literature Search Strategy

To gain the most recent and relevant data related to this study's subject, I conducted a literature search using the following search engines and databases : Google Scholar, ProQuest, EBSCOHost, Elsevier, and JStor. I used the following search terms, phrases, and combinations: *natural disaster, management, readiness, public, law enforcement, government, policies, education, procedures, effective, communication, community, resilience, and social media*. I used these terms and combinations to find studies related to various aspects of this study, as well as highlighting where literature might be missing and where I might fill such gaps. In all, 89% of the sources were published between 2014 and 2017. The remaining 11% were published before 2014. These sources are reviewed later in this chapter.

Theoretical Framework

To frame this study, I used Norris et al.'s (2008) notion of community resilience and Parsons et al.'s (2016) notions of adaptive capacity and coping capacity. These two frames provided a basis from which to study and better understand issues relating to disaster management and communication. In this section, I provide information on both theories to establish how they related to this research project.

Community Resilience

Norris et al.'s (2008) concept of community resilience related to how well a given community could deal with, or recover from, a disaster. The more able a community was to adapt and begin "normal" functioning in a timely manner, the more "resilient" it was to

disasters. To achieve this kind of resilience, the authors posited that there were four key aspects to consider and “build” (Norris et al., 2008).

First, the authors noted the importance of economic development. This means that the more economically sound and developed a community was and the more access it (and especially its most socially, physically, and economically disadvantaged members) had to financial resources, aid, and generation, the easier it would be for the community to recover from a disaster (Norris et al., 2008). This notion implied that before a disaster struck, that community members, organizations, and governmental officials created strategic policies and practices to advance the community economy and prepare financially for an inevitable disaster (Norris et al., 2008). Additionally, communities prone to natural disasters, such as coastal communities that might be particularly subject to flooding or hurricanes, should take preventative economic measures focused on the kinds of disasters more likely to occur—for example, taking out insurance for water damage (Paton & Johnson, 2017).

Second, Norris et al. (2008) highlighted how social capital or the capabilities of community members could also improve community resilience. Communities that can effectively harness the strengths of community members, both at the governmental and civil levels, would be better able to reestablish themselves after a disaster (Norris et al., 2008). In other words, providing public sector community members, such as police and fire department officials, with the necessary resources and training to manage and assist during a crisis, would ensure that less time and resources would be needed to get the community “back on track” (Norris et al., 2008). Similarly, allowing community leaders

and members to work with public officials, providing them with the training and preparation to assist in a crisis, or giving them the opportunity to quickly rebuild after a disaster could further assist resilience (Norris et al., 2008). Utilizing businesses and other buildings or providing the community with opportunities for giving of their services and talents (e.g., catering, medical assistance, or carpentry) could also work to make a community more resilient (Norris et al., 2008). For social capital to be effective and used appropriately, officials would need to know from whom and where they could gain the necessary knowledge, assistance, or resources.

This concept led to Norris et al.'s (2008) next point: Information and communication was important for community resilience. Without clear avenues for communication between governmental departments and community members, effective use of community human and other resources could be missed. Similarly, community members who were unaware of or misinformed about how local law officials and departments could have or would deal with a disaster might act in ways detrimental to their own safety, the safety of others, or in ways that could hinder the effective response of such departments (Hughes et al., 2014). This concept formed the “backbone” of this particular study because I explored the kinds of communication available to officials and community members, how effective such communication was, and where improvements were needed to ensure higher levels of community resilience in the future.

Finally, Norris et al. (2008) highlighted how community competence could lead to community resilience. In other words, the more prepared community members and officials were for dealing with various potential disasters, the sooner a community could

recover from a crisis. Thus, the more economically sound, the more resources and knowledge at officials' and community members' disposal, and the more effectively governmental and civil society could communicate and rally to deal with a disaster and fill the needs left in its wake, the better and more effectively a community could deal with and recover from a disaster (Norris et al., 2008). This aspect implied that community members, whether at the government or civil level, would need to have the ability to manage stress, adapt to trying situations, and be mentally and physically healthy. Thus, not only was it important for disaster policies to deal with *crisis management*, but such governmental and community initiatives promoting a generally healthy lifestyle, poverty alleviation, mental wellness awareness campaigns, and public education on disaster management and communication were also needed to ensure better community resilience (Cutter et al., 2013; Iacoviello & Charney, 2014; Norris et al., 2008).

I used this theoretical framework to study the interplay between these noted factors, as these were presented in the Virginia county where the study was being conducted. The theory of community resilience also provided a much-needed base from which an in-depth exploration into the effects of communication was conducted. The theory also provided evidence for how community flexibility and adaptability during a disaster could be achieved and how, in turn, such adaptability could work to assist communities in their resilience and recovery. Thus, the inclusion of Norris et al.'s (2008) theory was beneficial as part of this study's framework.

Adaptive Capacity

As with Norris et al. (2008), Parsons et al. (2016) highlighted the importance of flexibility and adaptability in the face of disasters. They referred to this as *adaptive capacity* (Parsons et al., 2016). For individuals and broader communities to have effective adaptive capacity, they needed proper education to assist with their ability to deal with challenges and transform problems into solutions. In particular, governmental departments needed to have effective education, training, and policies in place for their officials, so they could effectively deal with disasters (Parsons et al., 2016). If leaders and governmental departments could effectively adapt to and implement strategies for dealing with and relieving a crisis, the more successful the community as a whole would be in recovering from a disaster (Parsons et al., 2016). Therefore, leaders needed to have the skills and abilities to assess and adjust disaster management strategies to suit the specific situation. Officials must make arrangements effectively and efficiently (Parsons et al., 2016). Policies and procedures already in place also needed to provide officials with leeway to adjust processes if and where necessary (Parsons et al., 2016).

I included this section of Parson et al.'s (2016) greater disaster resilience theory into this study's framework to understand the role that governmental departments, particularly law enforcement officials, played in dealing with disasters. The theory also showed how policies and processes should work to assist officials, rather than hinder them in making decisions and adapting to disaster situations. Thus, I used the theory to provide a basis from which to explore to what extent current policies, particularly in relation to communication, were either helping or hindering disaster response.

Coping Capacity

The second section of Parsons et al.'s (2016) theory related to what they termed *coping capacity*. Coping capacity refers to the level to which individuals, as well as private and public organizations or departments, could gain and use available resources, skills, and opportunities during and after a disaster (Parsons et al., 2016). Coping capacity complemented Norris et al.'s (2008) theory of community resilience because it highlighted the need for enhancing and accessing social and economic capital, infrastructure, and promoting community involvement.

Coping capacity also related to how effectively governmental and civil sectors of society planned for disasters, and where and how best to use emergency services (Parsons et al., 2016). In other words, Parsons et al.'s (2016) adaptive capacity was concerned with how officials might best employ and adapt policies and processes to meet the needs of a specific disaster context. Coping capacity was concerned with the initial preparation and planning of such policies and processes. Therefore, this theory promoted the notion that proper communication between governmental departments, such as law enforcement, and the general public was important. In particular, proper communication could work to ensure that not only were sound policies and practices decided on and placed, but also that all members, whether civil or governmental, were properly prepared for a disaster. If officials knew what kinds of social, economic, infrastructural, or other resources were available to them, and where and how community members and organizations could assist, they would be better able to *cope* with the disaster (Parsons et al., 2016).

I combined Norris et al.'s (2008) theory of community resilience with Parsons et al.'s (2016) theory of disaster resilience regarding adaptive and coping capacities to develop a robust theoretical framework. I did this because each supplemented the other in how it approached disaster resilience. Norris et al.'s (2008) notion focused more on the community, and Parsons et al. (2016) focused more on the government. Due to this study dealing with views on disaster communication from both these sectors, the combined framework better met the study needs than just using one. The two theories also provided a clear basis from which to understand the interplay between community and law enforcement when responding to a disaster. This, in turn, would allow a better line of questioning during the data collection phase to find ways of improving communication between these two sectors.

Review of the Literature

Disaster Management

Disaster management relates to how efficiently and effectively governmental departments, such emergency services, and communities can respond to a crisis (Wex et al., 2014). For successful disaster management to occur, plans, procedures, and policies for dealing with inevitable crises should be put in place before a disaster occurrence (Drennan, McConnell, & Stark, 2015). Drennan et al. (2015) noted that the current global political, economic, and environmental climate created an uncertain world. The increase of natural disasters over the past few decades has also been directly linked to climate change. This means that as continued climate change occurs, it will become ever more likely that disasters such as tsunamis, heatwaves, and hurricanes will take place more

frequently (Klinenberg, 2015; Li, Li, Lui, Khan, & Ghani, 2014). However, many disaster management response strategies have not successfully adapted to or been able to adequately respond to this changing and uncertain context (Schwab, Sandler, & Bower, 2017). Disaster managers need to, therefore, find ways of adapting and improving previously established policies and procedures so as to better respond to disasters in the future (Drennan et al., 2015; Schwab et al., 2017). Drennan et al. (2015) also highlighted how all those involved within disaster management also have to create or utilize new and innovative approaches to disaster managements, as well as attempt to foresee potential disasters and make appropriate preparations for such events.

While it is difficult to make preparations for events that have not yet occurred, there are various models and approaches for creating a solid disaster response base from which officials and community members may be better able to navigate disasters, including those unforeseen (Barzinpour & Esmaili, 2014; Wex et al., 2014). Some of these models include *all-hazard response* or *metamodeling* plans and processes, open communication practices, and using early warning detection systems (Gregory, 2015; Othman, Beydoun, & Sugumaran, 2014). Barzinpour and Esmaili (2014), and Ding et al. (2015) stated the importance of utilizing effective early warning detection systems, conducting area risk assessments, determining relocation locations prior to disasters, and establishing “immediate response” protocols. In other words, the sooner departments and individuals are aware of an impending disaster (e.g., a hurricane), and the more aware they are of their particular area’s level of risk and how to proceed in case of emergency, the quicker such processes as evacuations and emergency service preparations can begin

(Barzinpour & Esmaeili, 2014; Ding et al., 2015). Such quick response, as well as an effective and timeous response “after-the-fact,” can translate into far less devastation and potential loss of life (Gregory, 2015).

In a 2015 study, Gregory compared governmental response to hurricanes Katrina and Sandy. The author noted that the government’s response to Katrina had been largely ineffectual and had, in many ways, exacerbated the devastation and trauma for those affected (Gregory, 2015). This was due to a lack of structured and efficient implementation of post-hurricane aid and large population displacement (Gregory, 2015). In contrast, the government’s response to Sandy was far more effective. One of the main reasons for this effective response was the governments’ use of proper communication channels, where the public were warned timeously about the impending storm and were, thus, given enough time to evacuate (Gregory, 2015). Clear communication and emergency response readiness also played an important role in post-event recovery, as departments and the community could more seamlessly provide necessary aid and “clean up” (Gregory, 2015). From this comparison, the study highlighted the value of early warning detection systems, as well as how and why clear communication between governmental departments and civil society (Ding et al., 2015; Gregory, 2015).

Gregory (2015) also noted the value of an effectively managed and implemented “all-hazard” response. Instead of utilizing numerous “narrow focus” responses aimed at different disasters, the government uses basic but comprehensive response strategies across any number of different disasters, making minor adjustments as per disaster-specific requirements (Othman et al., 2014). Othman et al. (2014) referred to this

approach as *multimodeling*, where models used across different disasters were joined to form one overarching disaster response strategy. Thus, evacuation protocols, law enforcement responsibilities, medical service strategies, or any other related disaster management area would remain relatively stable regardless of what disaster occurred.

These authors asserted that the best way to improve disaster management was to learn from how various countries addressed specific disasters, what responses worked, what strategies could have been improved, and how these models might be implemented in alternate disaster occurrences (Othman et al., 2014). For example, a fire, flood, or hurricane might each be a different disaster *form* and cause different kinds of damage within a community, but emergency responses can still remain the same. By maintaining a generally stable response strategy across varying disasters, community members and officials will have less confusion as to who, where, and how to respond (Gregory, 2015; Othman et al., 2014). If communities can remain calm and emergency services can be allowed to implement response strategies without needing to deal with other crises due to misunderstandings or incorrect behavior, disaster management can be more successful (Hughes et al., 2014). By having a firm base from which to conduct disaster management operations, managers will also be able to better adapt strategies if and where necessary to meet the needs and counter the effects caused during the disaster (Parsons et al., 2016).

Wex et al. (2014) also established that scheduling and a decision support model could assist in improving disaster management. The authors believed that cross-departmental computerized scheduling could improve emergency response time, and lessen confusion as to which department would be responsible for what aspect of the

disaster management process (Wex et al., 2014). For example, if the police department know that they are responsible for general evacuation, and the fire department know that they are responsible for retrieval of individuals or groups in need of assistance during an evacuation (e.g., the elderly, sick, or disabled), a far more streamline and larger evacuation can occur. This is because responders have access to information regarding who is responsible for which response, what kinds of resources are available to them, and where the greatest need for response will be, thereby improving their decision making and collaboration (Li et al., 2014).

Thus, computerizing scheduling and emergency service-related decision making can allow for a much larger pool of potential respondents to all effectively and efficiently work together to monitor, assist, and respond before, during, and after a disaster (Li et al., 2014; Wex et al., 2014). Ding et al. (2015) also highlighted how a computerized and centralized approach to disaster management could allow for higher distribution and allocation of resources, serve to streamline service chains, and allow quicker response from regions outside of the disaster-affected area. Wex et al. (2014) stated that such an approach could reduce overall harm (i.e., loss of life, destruction of property etc.) by almost 82%. However, regardless of how effective models, such as early warning detection systems, computerized scheduling, and communication channels, might be in and of themselves, if these models and procedures were not managed and maintained effectively, these were relatively useless during responding to a disaster (Gregory, 2015). This called for continued public and officials-specific disaster management education and updating of systems. Education will be discussed in more detail later in the chapter.

From the literature reviewed in this section, there appears to be a strong move toward *holistic* disaster management (Gregory, 2015; Othman et al., 2014). This approach is further aided through the digitization and centralization of management protocols, and the sharing of information across various countries so as to improve disaster response locally and on a global scale (Ding et al., 2015; Othman et al., 2014; Wex et al., 2014). Communication plays a key role in how effective disaster management strategies can be understood and implemented (Gregory, 2015). Thus, this study allowed deeper insight into how to improve this particular area of disaster management, which could stand disaster managers in good stead in the future.

Community initiatives. While disaster management literature tended to focus on governmental strategies, more research into and calls for community involvement have begun gaining momentum in recent years. As was seen in the previous section, it was not enough for law enforcement and other emergency services to have effective strategies in place if the community was not aware of and could work within these strategies (Gregory, 2015; Hughes et al., 2014; Othman et al., 2014). The government was also not solely responsible for disaster management, and there were various voluntary civil organizations and NGOs that could and did play an important part in effective disaster management (Aldrich & Meyer, 2015; Li et al., 2014). It was also found that the more resilient local businesses were to disasters, the quicker communities could overcome the challenges and damages caused by disasters (Sahebjamnia, Torabi, & Mansouri, 2015). Operational businesses could strengthen and stabilize the local economy, as well as

provide needed infrastructure, products, and services during a crisis (Sahebjamini et al., 2015).

Haworth and Bruce (2015) noted how public involvement in providing geographic data—what the authors termed volunteered geographic information (VGI)—could greatly assist research into ways of improving disaster management, prevention, preparation, response, and recovery strategies. This finding substantiated Li et al.'s (2014) findings that utilizing community-based virtual databases could improve collaboration between public and private sectors and promote effective resource mobilization. Such improvements were due to instead of government officials or academic researchers being solely responsible for gathering disaster-related data, they could employ new or access technology already used by the public to effectively collaborate with community members to gain necessary information (Haworth & Bruce, 2015; Li et al., 2014). By using technology, and having the public volunteer information, disaster management can reduce unnecessary expenditure, and rather filter that money toward improving response resources and training (Haworth & Bruce, 2015; Wex et al., 2014).

Community and private organizations could not only assist in disaster data gathering, but could also play an important role in post-disaster aid. For example, Finch (2016) studied how various sport organizations assisted in community recovery after the Boston bombings in 2013. The author found that how these organizations responded to the event, the kinds of assistance they provided to the community and emergency services, and their attempts at communicating with the public worked to smooth over

some of the challenges the community and public officials faced (Finch, 2016). Similarly, Kenney and Phibbs (2015), and Paton, Johnson, Mamula-Seadon, and Kenney (2014) found that community-led disaster responses within the Māori community in the wake of Ōtautahi (Christchurch) earthquakes also greatly assisted in the community's recovery. Not only were there community initiatives in place to address risk assessment and best practices in case of a disaster, but the Māori cultural values of extending love and assistance to others played a key role (Kenney & Phibbs, 2015). Paton et al. (2014) also found that combined civil and governmental approaches to disaster risk reduction, preparation, and post-disaster development assisted in improving disaster response and community resilience in the wake of the 2009 Victoria wildfires and 2001 Ōtautahi earthquake.

In both the Boston bombing and Ōtautahi earthquakes cases, community organizations provided valuable resources to emergency services, such as manpower, area knowledge, or catering (Finch, 2016; Kenney & Phibbs, 2015). They also provided avenues for community involvement and promoted communal well-being through support, counseling, and or communication strategies (Finch, 2016; Kenney & Phibbs, 2015). By taking on some of these responsibilities and providing needed resources, these community and sport organization initiatives assisted in speeding the process toward recovery. Furthermore, effective use, development, and implementation of community initiatives and the social capital available to law enforcement and other governmental departments can greatly improve recovery time and general community resilience (Aldrich & Meyer, 2015).

Community resilience will be discussed in more detail later in the chapter.

However, communities that could effectively “pull together” and use the social capital (i.e., the resources and talents found within individuals and the community) were more able to meet the challenges posed in the face of a disaster (Aldrich & Meyer, 2015).

Again, communication between community members and public officials could pave the way toward such improved use of social capital, hence the need for this particular study.

Communication can also assist in improving the formalization of community or *crowdsourcing/crowdfunding* initiatives (Liu, 2014). Liu (2014) found that online disaster crowdfunding or crowdsourcing, where individuals within the local and broader communities either donated money or volunteered valuable services through online platforms, had gained momentum in recent years. However, these community initiatives may not always meet the most pressing needs during times of disaster as finances and aid may not always reach those people or departments most in need (Boucken, Komorek, & Kraus, 2015; Yang et al., 2014). Better communication on these platforms from both “on the ground” volunteers, as well as law enforcement, might work to ensure that money, services, and other resources go to who, where, what needed them most (Liu, 2014). Liu (2014) suggested that a formalized interface or crowdsourcing framework be created so as to more effectively centralize, operationalize, and integrate such initiatives with governmental responses. More research into how this may be achieved is still necessary; therefore, this study might highlight this particular matter related to improving communication between civil and governmental sectors.

The Kenney and Phibbs (2015) findings also highlighted the key role culture could play in improving disaster response. The community in Christchurch had an already established culture of helping others in need, which led to greater assistance during a moment of crisis. Krüger, Bankoff, Cannon, Orłowski, and Schipper (2015) also noted that community cultural attitudes toward disaster could impact both on their readiness for, and their ability to “bounce back” from a disaster. That is, cultures that are more aware of risk will likely be more apt at preparing for and dealing with disasters, while cultures that are less aware of or apathetic toward disasters will put less emphasis on disaster management (Krüger et al., 2015). For disaster management and response to be effective, community leaders as well as governments need to find ways of engaging the public and, if necessary, change the culture around risk perception and disaster response within communities. However, more research into how different cultures could be engaged or changed where necessary to promote effective disaster management remained needed.

Another key aspect related to community disaster initiatives is that of assisting those with disabilities during times of crisis. Generally, disabled persons often find it difficult to access disaster relief, due to their inability to communicate with or physically get to where those responsible for providing aid are (Hemmingway & Priestly, 2014; White, 2014). Community-based organizations and initiatives focusing on these vulnerable people may provide a valuable solution to the increased adverse effects of a disaster on this group (Hemmingway & Priestly, 2014).

For example, White (2014) noted how organizations within and focusing on the deaf community in New Orleans provided aid to deaf individuals in the wake of Hurricane Katrina. Community individuals and deaf social workers attempted to assist deaf evacuees, while the greater governmental departments were more focused on other groups and areas (White, 2014). Hemmingway and Priestly (2014) also highlighted how a social model approach, rather than a (solely) governmental approach could greatly assist disabled persons in navigating and recovering after a disaster. Again, utilizing communal resources and social capital, such as those individuals with expertise in aiding disabled persons, could improve community resilience and disaster management as a whole (Ding et al., 2015; Hemmingway & Priestly, 2014; Kenney & Phibbs, 2015).

However, research into how best to incorporate social or community initiatives for (other) vulnerable groups, such as the poor, children, and animals during a disaster, remained needed. In all, the research presented in this section indicated the valuable role communities and social capital can play in disaster management. This study assisted in providing one aspect for improving this role through effective communication leading to collaboration between government and civil sectors.

Government and law enforcement. Involving the community and utilizing social capital is key to successful disaster management (Aldrich & Meyer, 2015; Norris et al., 2008). However, the majority of responsibility for disaster response still falls to government departments, law enforcement, emergency services, and other disaster management professionals (Sylves, 2014). Therefore, leaders of these institutions must properly plan for disaster response to assist in community recover after-the-fact

(Waeckerle, 1991). As already established, a central component for successful disaster management for these departments is communication (Swanson, Territo, & Taylor, 2016).

In their study of community resilience within Danish communities affected by coastal storms, Thomsen and Sørensen (2016) found that such storms could often negatively impact infrastructure, such as levies, designed to protect communities. When such infrastructure failed, the authors noted that how officials communicated emergency response plans to their citizens played a crucial role in how resilient and effective communities were in dealing with the disaster (Thomsen & Sørensen, 2016). Another important finding was that the more inflexible governmental and law enforcement policies were regarding their responses and communication policies, the more ineffectual and potentially detrimental the final outcome (Thomsen & Sørensen, 2016). These findings echoed and substantiated the work of Hughes et al. (2014), and Parsons et al. (2016) that also noted the need for flexible disaster response policy.

Flexibility becomes even more important when attempting to communicate crisis management plans to an extended and potentially fragmented population (Grove, 2014; Thomsen & Sørensen, 2016). Different population groups might have different levels of access to communication, view disasters differently, and also have differing levels of access to aid and resources during and after a disaster (Grove, 2014; Hemmingway & Priestly, 2014). To ensure the greatest number of a community or population receives the correct information, can access resources and aid, and will show resilience and preparation for a disaster is to have sound, overarching governmental policies and

approaches in place (Chan, 2014). However, Chan (2014) also highlighted that an entirely government-centric approach to disaster management could be largely ineffective. Instead, as part of governmental policy, officials should employ the assistance of engineering and technology companies to aid in improving physical, technological, and communication infrastructure; allow for community and NGO participation in policy and process creation; and attempt to create an overall more collaborative and pro-active approach to disaster response (Chan, 2014; Li et al., 2014).

However, this kind of collaboration between stakeholders could not occur during a crisis. Instead, proper policy, procedure, and communal involvement requires preparation and the establishing of such during “non-crisis” times (Cutter et al., 2008; Schwab et al., 2017). Policies and processes should include development of infrastructure and socio-economic status of the general population, and particularly within areas and communities where disasters are more likely to occur, or where larger groups of vulnerable people live [i.e., poorer neighborhoods or institutions for the disabled] (Cutter, Ash, & Emrich, 2014; Hemmingway & Priestly, 2014). Many departments often tend to focus on growing their “pre-positioning relief inventory” (Kunz, Reiner, & Gold, 2014, p. 261).

However, such focus only assists during the immediate response phase and can be a costly endeavor (Kunz et al., 2014). Calkin, Cohen, Finney, and Thompson (2014) noted that investing extensively in disaster-specific solutions (e.g., improving the fire department’s capacity in high risk wildfire areas) were also not very effective and could lead to increased expenses. Therefore, officials should focus not only on stocking up food

and medical supplies or overly investing in one or two “prime” disaster response areas but should also work to prepare the entire fabric of private and public life to respond effectively both in the immediate aftermath and in the months and years after a disaster (Calkin et al., 2014; Parsons et al., 2016; Rivera & Kapucu, 2015). Kunz et al. (2014) found that proper governmental preparedness, particularly relating to investing in disaster management in terms of both short- and long-term response strategies and infrastructure could reduce response and initial recovery time by 67%.

Part of why departments including law enforcement and other emergency services could reduce the time it takes for them to effectively respond to a disaster, when proper governmental policies and procedures have been put in place, is due to their potentially higher levels of access to additional, cross-state resources (Kapucu, Augustin, & Garayev, 2009). Not only should leaders of governmental departments develop their own community and or state policies and infrastructure to deal with a crisis, but sharing knowledge, resources, and processes across state lines could also prove valuable (Kapucu et al., 2009). Kapucu et al. (2009) found that Emergency Management Assistance Compact (EMAC) between states allowed for better response, particularly when it came to the need for federal disaster assistance. However, the authors found that a lack of training for responders could negatively impact such initiatives (Kapucu et al., 2009). More regarding training and education will be presented later in the chapter. Cross-state collaboration would also require greater emphasis on clear communication. Therefore, this current study could highlight how better departments and emergency responders

across different states could communicate to improve disaster response strategies, effectiveness, and efficiency.

Another part of disaster management planning that falls to governmental departments includes establishing general supply locations (Akgün, Gümüşbuğa, & Tansel, 2015). While it is not enough to simply focus on gathering and storing emergency supplies (Kunz et al., 2014), such activity should occur, and storage locations are selected to minimize their risk of being affected by a disaster (Akgün et al., 2015). Akgün et al. (2015) provided a model where officials could base their facility choice on where resources might most be needed in case of a crisis, the likelihood of a disaster occurring in a specific area, where a facility would most and least likely be affected by a disaster, and the cost-benefit of placing a supply facility in a chosen location. The authors referred to this model as the fault tree analysis—where officials mathematically determine the “center” (trunk) of a disaster “zone,” and map their supply facilities outwards, scattering them like branches of a tree that can easily access the center in case of emergency (Akgün et al., 2015). Again, such a model requires preplanning and active governmental engagement to best prepare for a disaster (Waeckerle, 1991).

The Akgün et al. (2015) model also highlighted the need of disaster managers within governmental departments to accurately gauge and identify particularly vulnerable areas. In other words, one should focus more investment and emergency response resources and planning on those areas more likely to be hit by a disaster (e.g., coastal areas prone to flooding, or inland areas subject to wildfires), as such areas would need more assistance and resources than areas less likely to be affected by a disaster (Rivera &

Kapucu, 2015). Officials must assess post-disaster response to see where improvements might be made, as seeing where and what approaches were effective and what could be streamlined would ensure better response to future disasters in both vulnerable and less-vulnerable areas (Sylves, 2015). By learning from the past, and what occurred in high-risk areas, departments and response teams would be less “surprised” by or ill-equipped to deal with disasters if and when such occur in lower-risk areas (Sylves, 2015). This is particularly true when governments take an all-hazards or metamodeling approach to disaster management, as previously discussed (Gregory, 2015; Othman et al., 2014).

A key aspect of successful all-hazard disaster planning and response is that of law enforcement and emergency (such as medical or firefighting) services (Sylves, 2015). Here, it is important that each such service or department has proper management in place to deal with disasters (Henstra, 2010). This, again, calls for comprehensive local government policies and procedures that can be easily followed, adapted, and implemented by such departments in case of an emergency (Henstra, 2010; Thomsen & Sørensen, 2016). Additionally, deliberate attempts at fostering healthy relations between these departments and the community could be made (Cordner, 2014).

Cordner (2014) found that effective community policing, where police officers and officials clearly communicated and engaged with communities could greatly improve emergency response and civilian aid during times of crisis. When police departments can establish a culture of cooperation and have clearly communicated coordination procedures between public and private sectors before a disaster has occurred, communities, as a whole, become more resilient (Cordner, 2014; Cutter et al., 2008).

Communities that perceive law enforcement in a positive manner will also be more willing to provide aid and behave in ways that make police and other emergency service response easier (Swanson et al., 2016). Furthermore, law enforcement and other emergency responders who are properly trained and understand policies around specific disaster responses can also better assist the community (Paton & Johnson, 2017). Officers and officials who find themselves in high-risk areas should be well-equipped to deal with such areas' specific disaster likelihood, as well as general or all-hazard approaches (Paton & Johnson, 2017). They can then better educate and liaise with the public during time of crisis.

Therefore, these governmental institutions and personnel should be provided with the necessary training and resources to meet the preparation and response requirements of a disaster (Swanson et al., 2016). Officers and officials must be assisted in improving their communication with the public, as well as across different local and state sister-departments (McAdam, 2014; Swanson et al., 2016). Communication regarding inter-departmental and or cross-state scheduling in terms of emergency response is also needed to limit confusion and decrease the response time for varying teams (McAdam, 2014). This study, in part, provided assistance and insight into how such law-enforcement-public/inter-departmental communication could be improved.

Considering the important role law enforcement played in disaster management, there was relatively little research data into what specific roles these departments should play in disaster management, where their roles could be improved, or how they could better their communication with the public and their sister-departments (McAdam, 2014).

Therefore, the current study filled a clear gap in the literature regarding law enforcement-public communication. However, this section did note that clear political and government departmental strategies, policies, and processes be put in place before a disaster event to smooth the response process and ensure timeous and successful recovery. While models, such as Akgün et al.'s (2015) fault tree analysis, could greatly assist local and state officials in properly assessing where and how resources should be focused, there remained much research needed into finding ways of improving general disaster management at the local, state, and federal government levels. Thus, while this study provided a needed addition to the literature, future researchers would still need to address these issues, as well.

Community Resilience

As part of this study's theoretical framework, Norris et al.'s (2008) notion on community resilience highlighted the importance of dealing with aspects around stress, adaptation, wellness, and resource dynamics. By approaching community resilience in this way, more effective response plans can be developed and implemented (Norris et al., 2008). Community resilience was an important measure for how successful disaster management approaches were and where such approaches might be improved (Cutter, Burton, & Emrich, 2010).

Various researchers have studied aspects around ways of improving community resilience, as well as more effectively measuring such for future disaster management development. For example, Cutter et al. (2010) noted that proper disaster management could be improved by findings and understanding metrics and standards for measuring

the levels of community resilience across varying populations. Similarly, Aldunce, Beilin, Handmer, and Howden (2014) noted that a more definite understanding and definition of what community resilience entailed could assist government and communities to better work toward creating and promoting such resilience.

To that end, Cutter et al. (2010) compared community resilience between urban and rural areas. They found that urban areas, particularly those with higher social, economic, institutional, infrastructure, and community capacities, reported higher levels of resilience than rural areas and those with lower capacities (Cutter et al., 2010). Therefore, to foster more resilience within communities, socio-economic, infrastructural, and other related aspects within society must be addressed before a disaster (Cutter et al., 2014).

Cutter et al. (2014) also found that varying resilience of communities with different geographical landscapes and likelihoods of disasters occurring did not directly correlate with the environmental propensity for disaster (i.e., a community's level of vulnerability). In other words, communities more likely to experience a disaster e.g., those situated within "Tornado Alley, the central part of the United States"—central Texas going north through Oklahoma, central Kansas and Nebraska and eastern South Dakota—were not naturally more apt at dealing with a disaster or reporting higher levels of resilience after-the-fact (Cutter et al., 2014). One of the reasons for this is that other factors, such as population, economic status, and infrastructure, play a key role in how able communities are in preparing for, responding to, and recovering from a disaster (Lowe, Sampson, Gruebner, & Galea, 2015). Generally, urban areas report higher access

to funding, better infrastructure, and access to resources. Thus, such communities may be more able to deal effectively with a crisis, even if they have not experience many, or even any, such disasters in the past (Cutter et al., 2014). More research into how to improve disaster-related factors, such as individual community members' socio-economic standing, was needed to respond to disasters in poorer and or rural communities more effectively.

Psychological and emotional resilience also plays an important role in community resilience (Iacoviello & Charney, 2014; Lowe et al., 2015). That is, it is not enough to develop sound disaster response policies in terms of emergency services, relocation strategies, rebuild protocols, or other such disaster-related aspects (Barzinpour & Esmaeili, 2014; Ding et al., 2015). The most resilient communities are those that can successfully assist members with dealing with and overcoming the trauma of a disaster (Iacoviello & Charney, 2014). Again, economic and social wellbeing comes to the fore, where Lowe et al. (2015) found that communities with higher economic development and access to more social capital were less likely to report increased levels of stress and depression in their members than those with lower economic development and social capital access. Having community members who are naturally more equipped to deal with trauma even before a disaster occurs, as well as being able to provide members with the needed counseling and medical assistance for such mental concerns as PTSD or depression caused by experiencing a disaster, can greatly improve communal functioning during a crisis and lesson recovery time after a disaster (Iacoviello & Charney, 2014).

Therefore, one must put structures in place to aid those most vulnerable within a community. Grove (2014) referred to this as creating a “culture of safety” within communities for the vulnerable and marginalized. However, Grove noted that current approaches tended to rely on creating an imagined reality of safety or manipulating a populace into believing that the government would look after these groups, as opposed to providing active solutions and taking part in deliberate engagement to promote adaptive capacity and community resilience. Cutter et al. (2013) made similar assertions, noting that disaster management often failed to adequately assist poorer or marginalized communities and community members due to systemic and political failures. In other words, it is not enough to simply educate the public or incorporate the vulnerable into policies; instead new ethical and political designs need to be found and implemented that actively seek to uplift these groups even before a disaster occurs (Hemmingway & Priestly, 2014).

When disaster managers in both the political and social spheres understand that entirely new ways of approaching disaster management are needed, particularly in terms of addressing social issues such as economic and infrastructural disparities, while simultaneously utilizing and establishing those approaches that have been proven to be effective, a more holistic and streamline disaster management approach may be found (Matyas & Pelling, 2014). In other words, disaster managers need to adopt a reflexive approach, noting where and how disaster management and response might be improved, and how to better meet the needs of the vulnerable and marginalized during and after a disaster event (Matyas & Pelling, 2014). Such reflexive assessment could be aided

through using measurements of what Cutter (2016) termed “attributes” and “assets,” namely economic, social, environmental, and infrastructure factors. Chang, McDaniels, Fox, Dhariwal, and Longstaff (2014) found that measuring and improving infrastructure played a key role in community resilience. The more effective this and the other aforementioned factors are in meeting the preparatory, occurrence, and post-disaster needs for all community members, the more successful the disaster management approach (Cutter, 2016).

Disaster managers would also be required to adopt more effective and focused decision making, and risk assessment and management approaches when attempting to proactively include the vulnerable and marginalized into response policies and processes (Matyas & Pelling, 2014). Therefore, disaster managers would have to measure and more deliberately implement capacities, such as social capital, community functions, connectivity, and planning (Cutter, 2016; Parsons et al., 2016). Hence, community resilience is reliant not only communities’ own approaches to disaster management, but also on the creative, purposeful, and continuous attempts at the government level to uplift all members of society (Thornley, Ball, Signal, Lawson-Te Aho, & Rawson, 2015).

Thornley et al. (2015), in their study of the Christchurch earthquakes, found that disasters could exacerbate pre-existing socio-economic issues. However, if communities were well-functioning and had proper infrastructure in place already, their levels of resilience were higher (Thornley et al., 2015). As with the aforementioned Kenney and Phibbs (2015), and Paton et al. (2014) studies, Thornley et al. (2015) also found that effective and well-established community and cultural organizations and leaders greatly

assisted in improving community resilience. This finding again calls for proper communication between civil and political stakeholders (Chang et al., 2014). However, understanding the important role that infrastructure plays in community resilience, it is not enough to simply have access to numerous communication methods, such as social media or news hotlines. Governments would also need to ensure that proper telecommunication and other communication infrastructure is up-to-date, resistant to potential disaster damage, and is quickly fixed and running after a disaster (Chang et al., 2014). This study did not focus specifically on communication infrastructure, as I am more concerned with cross-sectional communication methods and procedures. However, aspects around communication infrastructure were highlighted during data collection and discussed accordingly. Nevertheless, more research into improving communication infrastructure must be conducted in the future.

This section provided information into how and why developing community resilience is important. The section also worked to further establish the use of Norris et al.'s (2008), and Parsons et al.'s (2016) notions as part of the theoretical framework, particularly with regard to the value of resilient communities and community organizations during times of crises, socioeconomic enhancement, and employing and tending to capacities. Understanding the importance of developing sound and well-established economic, social, infrastructure, and other related factors, such as communication, before a disaster strikes could greatly assist in improving general community resilience in the future. This study assisted in developing such factors, especially regarding communication.

Disaster Communication

The need for clear and comprehensive communication between the public and government and law enforcement officials, as well as between various emergency service departments during times of crisis has been clearly established throughout the previous sections of this literature review (Cordner, 2014; Cutter et al., 2008; Hughes et al., 2014; McAdam, 2014). This section provides more information regarding how such effective communication can be achieved. A discussion on various alternative communication avenues, including social media, which officials might use to further improve communication in the future is also presented.

In any disaster occurrence, there are various emergency services that would need to respond, and be responsible for differing aspects of aid provision (Raungratanaamporn, Pakdeeburee, Kamiko, & Denpaiboon, 2014). It is not enough for hospitals, police, and fire departments to have their own clear protocols for dealing with a crisis (Bryson & Crosby, 2015). Rather, every department should be equally aware of the others' roles and procedures, and find ways of supplementing and aiding these endeavors (Bryson & Crosby, 2015). This calls for clear communication, scheduling, and attempts at finding "joint protocols," which can be followed and complemented across departments before a crisis occurs (McAdam, 2014; Wex et al., 2014). The need for collaboration across departments also implies a need for clear and definitive leadership, where individual departments, as well as cross-departmental officials, all understand who to look to for directives in different situations (Bingham, O'Leary, & Carlson, 2015). Additionally, if leaders from various departments can communicate and collaborate effectively with one

another, they can set an example of positive inter-departmental collaboration for their subordinates to follow (Bingham et al., 2015).

Bingham et al. (2015) referred to this kind of leadership as being “multifaceted” and situational. Leaders learn and glean from others to streamline their own disaster protocols and, depending on the kind of crisis situation, can defer to the department (i.e., accept said department’s “leading” the crisis management process) most apt at dealing with the situation (Bingham et al., 2015). For example, police and homeland security are better equipped for dealing with terror attacks and hospitals then play a supporting role, while the CDC is better equipped to deal with a mass disease outbreak and police assist with maintaining order (McElreath et al., 2016; Osgood et al., 2015). Better inter-departmental collaboration could also work to lower unnecessary expenses for departments, particularly when such collaboration removes responsibilities from less-equipped departments (Osgood et al., 2015). Similarly, a better linkage between departments could assist in better adaptation and decision-making capabilities for all departments (Hou & Xiao, 2015).

Proper communication would also allow for certain departments to not become overwhelmed in their duties. For example, if police and EMTs are aware of which hospitals are available and equipped for large populations of patients, they might be able to spread casualties more evenly across several hospitals, as opposed to opting for a “closest-is-best” approach (Osgood et al., 2015). Hospitals themselves could also more effectively and efficiently process and, if need be, send patients to the correct facilities,

soon after their arrival if clear communication structures are in place (Osgood et al., 2015).

Bryson and Crosby (2015) noted that the best cross-departmental disaster management occurred when departments moved from cooperation (i.e., the basic or minimum requirement of sharing information and working together) to eventual merger (i.e., the seamless interchange of department responsibilities as though all the departments were one unit). Much still needs to be done to ensure that different departments view themselves as part of a greater whole during times of crisis, so as to create such a merger (Bryson & Crosby, 2015). While there was currently much literature on the need for inter-departmental communication and the need for better communication strategies, research into current methods and means for improving such methods was needed. Therefore, this study filled a clear gap in the literature.

As previously noted, not only was communication across departments important, but communication between public officials, emergency services, and civil society was also necessary (Ding et al., 2015; Gregory, 2015). Raungratanaamporn et al. (2014) found that the level of professionalism exhibited by officials before, during, and after a disaster occurrence could lead to higher levels of positive citizen involvement and assistance. That is, if the public can see that departments are effectively working together to address an issue (through how information is disseminated to the public across the various departments, and how consistent such information is, regardless of the source), the more likely they will be to collaborate with governmental disaster management efforts (Raungratanaamporn et al., 2014). However, for the public to gain such a

perception, leaders of departments need to communicate with the public effectively. The next subsection will deal with such communication in more detail.

Social media use. Traditionally, governmental departments would use mass, multi-media to communicate with the public during times of disaster (Mergel, 2016). Examples of such communication avenues would include radio announcements, television and newspaper news reports, and public billboard posters (Wukich, 2015). The most used tends to be news reports (Wukich, 2015). However, since the advent of new media, such as Facebook and Twitter, departments have increasingly begun to use this avenue for communication as well (Meijer & Torenvlied, 2016).

One reason for this increased use of social media communication is that it provides officials with a direct link to the public, as opposed to going through a third-party (Hughes et al., 2014). Using more traditional communication strategies, such as television news reports, means that authorities rely on the interpretation of information by the media house and journalists (McCombs, 2014). At times, this aspect could lead to the public receiving mixed messages (depending on who was doing the reporting) or incomplete information (McCombs, 2014). By using new media, the departments themselves can provide needed information in the time and way they deem best, and as clear as possible (Houston et al., 2015).

Not only does social media allow departments to provide information timeously and in the manner most appropriate for the situation, but it also allows citizens to directly communicate with officials (Vieweg, Castillo, & Imran, 2014). Citizens could, therefore, inform authorities as to impending disasters, immediately after a disaster has occurred, and

if and where the most need for assistance is (Vieweg et al., 2014). This would allow emergency services to respond more swiftly, and could greatly reduce casualties or delays in recovery (Wukich, 2015). The public could also immediately query announcements to gain clarity as to procedures or even the truth of whether or not a reported (or rumored) disaster is about to, or has, occurred (Burnap et al., 2014). Such clarity could lead to more immediate public response—such as avoiding a disaster area, providing necessary “on-the-ground” details to officials, or assisting with disaster management in any other way (Burnap et al., 2014; Wukich, 2015).

Additionally, social media does not only allow for officials to be more accessible during times of crisis, but can allow authorities the opportunity to develop a relationship with citizens before a disaster occurs (Davis, Alves, & Sklansky, 2014). This could allow for more effective policing during a disaster, as the public would be more willing to trust those officials and departments that have actively engaged, and attempted to build a relationship, with them over time (Davis et al., 2014). Furthermore, Hughes et al. (2014) found that had leaders of departments effectively used social media and other online communication avenues, such as weather blogs, to communicate with the public, fire departments and the police might have been more successful in their response to Hurricane Sandy. Citizens could have been more aware of the impending disaster, as well as the proposed strategies for evacuation and preparation, had these departments communicated via online formats, which would have assisted in emergency response upon the hurricane’s landfall (Hughes et al., 2014). Thus, social media could play a key

role in disaster preparation for citizens when used effectively by governmental departments (Meijer & Torenvlied, 2016).

Panagiotopoulos, Bigdeli, and Sams (2014) found that the “real-time” updates from new media, such as Twitter, could greatly assist in lowering the potentially negative impact of a crisis. For example, the authors found that social media allowed the public to share safety information with one another, as well as for law enforcement to update response initiatives to the public during the 2011 London riots (Panagiotopoulos et al., 2014). Thus, Twitter and other social media could assist in removing a strictly ‘top-down’ communication process whereby the public becomes passive receivers of information, and instead allows for a dynamic and active interchange between government and citizens (Meijer & Torenvlied, 2016). This “decentralized” approach to communication provides means for more active civil preparation for, and response to, disasters. A more active and engaged public, in turn, could lead to greater assistance for emergency services, as citizens would be better able to respond and behave in ways that aid, rather than hinder, response and recovery processes (Vieweg et al., 2014). This is particularly true for those disaster situations that allow for less preparation and response time, such as a terror attack or tsunami, as an active and communicative public would sooner become aware of the issue, and have access to information regarding how best to behave, respond to, or provide departments with assistance in dealing with such events (Vieweg et al., 2014).

For social media communication to be effective, departments need to be able to utilize various forms and understand the communication processes, protocols, and

dissemination procedures in each. For example, communicating on Twitter is different to communicating via Facebook (Sutton et al., 2014). This is partially due to these platform users being different audiences (with Facebook tending to appeal to an older demographic), and the character restrictions imposed on Twitter posts (Kim, Kim, Nam, 2014; Kwon, Park, & Kim, 2014).

Van de Velde, Meijer, and Homburg (2015) found that police messages using more informal language tended to be forwarded far more than more formal public announcements. Thus, departments would need to adjust their language and communication method (i.e., opt for short videos when using Instagram, provide more details and pictures on Facebook, etc.) depending on the new media they are using to reach the greatest amount of the population (Van de Velde et al., 2015). Furthermore, departments would need to be clear about the message they wished to communicate with the public, and then adapt their communication strategy, depending on their audience, the message, and the communication method chosen (Mergel, 2016).

In other words, while new media clearly has its place in disaster communication, it should not be used in isolation to other communication methods (Meijer & Torenvlied, 2016). This is due to various areas and or population groups having limited to no access to new media (e.g., the elderly, or rural areas where internet access may be less reliable). There is also a greater tendency for rumors and false information, which could cause unnecessary distress and confusion, to occur on social media sites (Alexander, 2014; Starbird, Maddock, Orand, Acherman, & Mason, 2014). Such falsification and rumor-mongering can occur due to there being no limitation on or regulation of information

presented on social media (Alexander, 2014). This, in turn, could lead to posts being made by seemingly legitimate sources that turn out to not be substantiated or even “real.” For example, anyone can open an account posing as a legitimate news agency or police department online, regardless of whether or not they actually represent the agency or department. When citizens engage and communicate with such “posers,” they may believe the information at face value due to trusting the legitimacy of the source. Departments can counteract this by having a visible presence across various online platforms, as well as providing communication via more traditional media methods (Starbird et al., 2014).

Starbird et al. (2014) found that it was far harder to correct misinformation spread on social media than it was to ensure correct, substantiated, and authoritative information in the first place. Thus, if the public can verify that the social media accounts of departments are the actual/real accounts, and when they can compare the information on these sites in relation to confirmed legitimate media sources, such as established newspaper or television news agencies, more effective communication could be achieved (Alexander, 2014; Houston et al., 2015). This effective communication could also assist in lowering potential confusion and panicked behavior, thereby streamlining disaster management processes and responses (Hughes et al., 2014).

The effective use of social media, in combination with other communication methods, could also assist authorities in better establishing where disasters are more likely to occur, thus assisting in preparation. Porto de Albuquerque, Herfort, Brenning, and Zipf (2015) found that citizens living in areas that frequently experienced flooding

were more likely to tweet or mention such occurrences online. As Hughes et al. (2014), noted earlier in this section, found that clear social media communication could have improved response and recovery during Hurricane Sandy, Porto de Albuquerque et al. (2015) noted that social media communication could allow officials to track geographic likelihoods of disasters, and thereby better communicate response processes to the public in case of emergency.

Social media could also provide different departments means to better coordinate disaster response initiatives, as they would be more aware of the others' strategies due to the "real-time" updates available on such platforms (St. Denis, Palen, & Anderson, 2013). This real-time information dissemination could also prove valuable during the initial 48-hour period after a disaster, as the constant updates could allow officials to better see where the most aid is required, where citizens may be in distress, or who has already responded to a particular issue (Sutton et al., 2014). This, in turn, allows for far more efficient response to a crisis, and allows for a shorter recovery period (Gregory, 2015; McAdam, 2014; Vieweg et al., 2014).

Additionally, due to current climate change, such social media engagement could also alert officials to changes in areas, and allow them to make better provision for disasters where, perhaps previously, such disasters were less likely to occur in the past (Hou & Xiao, 2015; Porto de Albuquerque et al., 2015). Again, this could greatly assist in improving current approaches to disaster management and lower related risks for the public and infrastructure (Cutter et al., 2010; Norris et al., 2008; Thomsen & Sørensen, 2016). However, while the researchers noted the importance of using social media to

improve communication, both at the inter-departmental and official-public levels, there was currently little research on the kinds of strategies and processes used to achieve successful communication across new media platforms. There was also currently little research on alternative forms of communication in correlation to social media use. Therefore, this study highlighted these particular areas.

Education

Education and training play an important part in the level of disaster management success (Gregory, 2015; Parsons et al., 2016). This refers to both emergency responders, and the general public (Mutch, 2014; Papazoglou & Andersen, 2014). This section deals with how improved training, particularly in relation to disaster communication may work to improve disaster management and response.

Papazoglou and Andersen (2014) asserted that educating police officers in managing their own stress, and finding help after dealing with traumatic experiences, such as disaster relief, could greatly benefit their mental health. Thus, it is not only important for local governments to put strategies in place to assist with mental and emotional resilience within the greater populace after a disaster, but they also need to ensure that their emergency responders can properly deal with the stress during response, and have access to services to assist them in recovering their mental health after-the-fact (Iacoviello & Charney, 2014; Norris et al., 2008; Papazoglou & Andersen, 2014). Papazoglou and Andersen (2014) highlighted how police educators and trainers could provide valuable assistance in this regard, through focusing their training on removing

the current taboos and stigmas around seeking mental health assistance often found within the larger law enforcement culture.

Another means of ensuring improved responder stress and general disaster management relates to training up proficient disaster management professionals. Jose and Dufrene (2014) found that nurses who were specifically trained in disaster preparedness were more apt at dealing with large-scale crisis. This was due to nurses being able to efficiently assess the situation, apply necessary courses of action, and remain calm during stressful times, as they felt more prepared due to their practical and theoretical knowledge for dealing with crises (Jose & Dufrene, 2014). However, the authors noted that there was currently little research into how to best present such teaching, and what lesson formats (i.e., online or traditional classroom) produced the most prepared nurses (Jose & Dufrene, 2014).

Similarly, Ingrassia et al. (2014) found that educating and training professionals in different key areas related to disaster management was important for how successful they could meet the challenges of a disaster. As with Jose and Dufrene (2014), these authors also established that there was currently no standardized approach to such education (Ingrassia et al., 2014). Khorram-Manesh et al. (2015) substantiated these earlier findings by highlighting how a lack of standardization in disaster management training had led to insufficient addressing of crises responses in the past. Therefore, Ingrassia et al. (2014) suggested disaster management educators and institutions should attempt to create a curriculum to cover all key areas of disaster management, which they could teach in and across various countries. Khorram-Manesh et al. (2015) also

highlighted the need to include ‘scenario-based training’ to provide responders with a more “hands-on,” practical understanding of how to work within and what to expect when faced with a disaster event.

Emergency responders also need to be educated as to what kinds of resources are available to them in times of disaster. McElreath et al. (2016) noted how volunteer-based state defense forces could provide much-needed assistance to more formalized law enforcement during a crisis. However, not all states implemented or made allowances for the creation of such a service. This implies a lack of understanding as to the value of utilizing such volunteers. The development and success of state defense forces also called for the creation of proper education programs so as to ensure that these volunteers would be adequately prepared and equipped to deal with any number of disasters (McElreath et al., 2016).

Additionally, educating responders as to what community organizations, individuals, NGOs, and other local bodies are capable of assisting in specific areas, or when a certain disaster occurs, could improve their response times and improve community resilience (Aldrich & Meyer, 2015; Li et al., 2014). However, for adequate education in this regard to occur, leaders of departments must (a) know what organizations, individuals, and general resources are available within a community and (b) properly provide their officials and responders with this information. This called for clear communication channels between departments and the public, as well as inter- and in-departmental communication, with which this study might assist.

Education in social media use may work to improve such communication. Hughes (2014) found that training governmental public information officers (i.e., those within departments responsible for communicating information to the public) in how to effectively use social media to bring across their message could improve disaster management. The author highlighted how improving the frequency, style, and consistency with which departments communicated with the public on online and new media platforms could lead to greater cooperation from the public in times of crisis (Hughes, 2014). However, there were many areas to consider when communicating over social media, such as population demographics, accepted style and language use on different sites, and other complexities (Kim et al., 2014; Kwon et al., 2014). Considering that many officials and public information officers were either wary of or unversed in such communication, workshops, such as that presented by Hughes (2016), seemed increasingly necessary.

This was particularly true when relating back to how social media use was on the increase and could provide valuable information both to and from the public, as presented in the previous social media use subsection. However, more research into available communication education programs for law enforcement and other emergency response personnel was also still needed, particularly regarding what courses and or workshops were the most beneficial and ways of standardizing communication education for all departments. This current study assisted such future research and curriculum creation by revealing how departments and the public currently communicate, what law enforcement

officers deemed most effective regarding current communication strategies, and where they believed other communication avenues might need to be explored or implemented.

Responders need education about where and how disasters occur. For example, Calkin et al. (2014) noted that educating fire fighters in understanding how wildland-urban fires actually occurred (i.e., that many begin in urban houses as opposed to in the wild) could change and improve how they respond to fire events. This also called for improvements in the public's education, as if they were more knowledgeable and better equipped with ways of preventing potential disasters (e.g., fires, extreme weather conditions caused by climate change, or mining-related faults in the earth), it was likely that fewer preventable disaster may occur (Calkin et al., 2014; Van Aalst, 2006). Van Aalst (2006) also noted the correlation between climate change and the increased occurrences of extreme weather conditions leading to droughts and dangerous storms. Educating businesses and the general public in ways of reducing their carbon footprint, and finding alternatives to reduce greenhouse gasses may also assist in preventing natural disasters (Van Aalst, 2006).

Therefore, schools play an important part in disaster management, as not only do they educate children about how to counter current global warming, but they can also prepare them should disasters strike (Mutch, 2014). Training children and adolescents as to what to expect, and what actions to take, during a disaster, could significantly lower their risk of injury or death (Johnson, Ronan, Johnston, & Peace, 2014). This could work to lessen the burden on emergency responders (Johnson et al., 2014). Schools can also provide much-needed infrastructure support (such as housing the displaced) in times of

crisis (Mutch, 2014). Thus, communication between departments and schools as to what children should learn about disaster management and preparation, and communication from school bodies to officials as to their infrastructure availability, is, again, important for the smooth implementation of disaster management processes and protocols.

Furthermore, an educated and prepared populace could lead to general risk reduction, both in terms of preventing and in case of disasters (Benadusi, 2014; Hughes et al., 2014). Benadusi (2014) believed that educating the public could improve their resilience and create a culture of preparedness within communities. Disaster risk education could also take weight off of emergency and law enforcement responders, as the public would be able to take on more responsibility for their own safety, rather than being almost wholly reliant on these governmental services (Aldrich & Meyer, 2015; Finch, 2016; Hughes et al., 2014). More research is needed, however, into what kinds of scholastic and community programs and curriculum are currently available for educating the public regarding disaster management (Johnson et al., 2014). More research was also needed regarding the effectiveness of such programs, the standardization of school curricula with relation to disaster preparation, and where additional education options and programs might need to be provided.

From the research presented in this section, it became clear that education of both officials and the public performed a vital function in the overall success of disaster management and community resilience. However, there were many gaps in the literature, especially regarding education systems and workshops available, program effectiveness, and school and professional curricula development. While there were moves to improve

professional disaster managers and responders' knowledge, regarding such aspects as mental health and communicating effectively with the public via social media through education, more still needs to be done. I assisted in providing curricula developers and public information officers with needed information to improve education programs related to communication in the future.

Summary

In this chapter, I reviewed the current literature regarding disaster management and, specifically, issues around disaster communication. That is, the more prepared both the public and governmental departments are for dealing with inevitable disasters, the more resilient their communities will be (Kunz et al., 2014; Paton & Johnson, 2017; Rivera & Kapucu, 2015; Sylves, 2014; Waeckerle, 1991).

Improved communication between different sectors of society could go a long way in creating such resilience (Cutter et al., 2013; Iacoviello & Charney, 2014; Swanson et al., 2016). This is because the public can offer law enforcement and emergency responders much-needed “on-the-ground” information, additional assistance and resources, and more varied and cost-effective options for quicker recovery (Burnap et al., 2014; Meijer & Torenvlied, 2016; Panagiotopoulos et al., 2014; Vieweg et al., 2014; Wukich, 2015). Businesses and schools could provide needed education, infrastructure, and economic development to further prepare the public for and assist with a speedier recovery of communities after a disaster (Aldrich & Meyer, 2015; Johnson et al., 2014; Li et al., 2014; Mutch, 2014; Norris et al., 2008; Sahebjamini et al., 2015). However, resources available to government departments can only be determined and developed

through clear communication channels that allow for better collaboration between these two sectors (Ding et al., 2015; Gregory, 2015; Hughes et al., 2014; McAdam, 2014; McElreath et al., 2016; Wex et al., 2014).

Similarly, open channels and easy access to authorities could lead to clearer information dissemination and lower levels of panic within the public (Hughes et al., 2014; Raungratanaamporn et al., 2014; Sutton et al., 2014; Wex et al., 2014). Inter-departmental communication also allows for a smoother running of operations during times of crisis (Bingham et al., 2015; Hou & Xiao, 2015; McAdam, 2014; Osgood et al., 2015). Such communication needs to be developed before a disaster, as government departments that are in constant communication with their communities and each other can create a bond of trust with the community and clear inter-departmental and cross-state collaboration that would then be easier to implement when needed (Akgün et al., 2015; Corder, 2014; Cutter et al., 2008; Davis et al., 2014; Drennan et al., 2015; Kapucu et al., 2009; McAdam, 2014; Norris et al., 2008). When communities know their disaster management departments and can see these departments working together, it allows for better and more willing cooperation and collaboration from the community during times of crisis (Davis et al., 2014; Raungratanaamporn et al., 2014).

Establishing an online presence is of great import for such communication (Hughes et al., 2014; Liu, 2014; Starbird et al., 2014). This is partly due to the increased use of social media by the public, which grants departments direct access to citizens (and vice versa). However, it also allows the public to know which social media pages communicate actual and legitimate government and disaster management information,

and which ones are not (Alexander, 2014; Houston et al., 2015; Starbird et al., 2014). In this way, correct information, processes, and logistics can be communicated to the public, thereby lessening levels of confusion and streamlining the disaster management approaches (Alexander, 2014; Chan, 2014; Grove, 2014; Hemmingway & Priestly, 2014; Hughes et al., 2014; Starbird et al., 2014). Departments can also use information posted on social media sites to better prepare for disasters and or establish where disasters are more likely to occur (Li et al., 2014; Porto de Albuquerque et al., 2015; St. Denis et al., 2013; Wex et al., 2014). While the sources reviewed in this chapter highlighted the benefits of social media communication, and why the public and departments should attempt to improve current communication, much research is still needed into how effective current communication strategies are, where communication between these sectors can improve, why certain communication strategies have not yet been (fully) implemented, and what other strategies may be considered for the future. I worked to fill at least some of these gaps.

The sources reviewed also highlighted how establishing good economic, social, infrastructural, and general health and welfare for citizens—particularly those who are most vulnerable and or marginalized—could improve community resilience (Barzinpour & Esmaeili, 2014; Cutter et al., 2014; Ding et al., 2015; Grove, 2014; Hemmingway & Priestly, 2014; Iacoviello & Charney, 2014; Kenney & Phibbs, 2015; Kunz et al., 2014; Li et al., 2014; Lowe et al., 2015; Matyas & Pelling, 2014; Thornley et al., 2015; White, 2014). These sources also linked back to Parson et al.'s (2016) theories on adaptive and coping capacity by noting the ways in which communities could adapt and cope with

disasters. The Parson et al. (2016) framework was also substantiated in that authors noted how authorities could employ all-hazard or multimodeling strategies that could provide standardized protocols for emergency services and the public to follow in case of emergency (Gregory, 2015; Othman et al., 2014). However, such an all-hazard approach could still be easily adapted and rely on different leadership from the most equipped department so as to meet the unique challenges of a specific disaster (Bingham et al., 2015; Chang et al., 2014; Henstra, 2010; Thomsen & Sørensen, 2016; Krüger et al., 2015).

Finally, educating the public and officials and officers working in disaster management as to best practices, available resources (both in-community and cross-state), and methods for communication could greatly improve community resilience and disaster recovery (Cutter et al., 2013; Iacoviello & Charney, 2014; Ingrassia et al., 2014; McElreath et al., 2016; Norris et al., 2008; Papazoglou & Andersen, 2014; Parsons et al., 2016). There was currently little research on the kinds of educational programs or workshops available to these different stakeholders or their levels of effectiveness (Hughes, 2014; Kim et al., 2014; Kwon et al., 2014). However, Hughes (2014) found that educating officers in social media communication could benefit disaster management. More research is still needed in this area, as well as in other related education programs and standardization (Ingrassia et al., 2014; Johnson et al., 2014; Khorram-Manesh et al., 2015). While I did not focus on education, the information gleaned from the interviews and surveys highlighted where and how disaster educators, emergency professionals,

trainers, and school curricula developers could improve disaster communication education in the future.

In all, this review highlighted why research into government-community communication is necessary. The review also showed where and how this study might fill some of the current research gaps, as well as other aspects that future researchers might wish to address.

In Chapter 3, I will present more information on this study's methodology.

Chapter 3: Methodology

Introduction

The purpose of this qualitative, single-case study was to explore how community readiness for natural disasters could be improved by creating effective communication channels between local authorities and the general public. This chapter deals with the methodological aspects of this study, and how this purpose will be achieved through the research design and data analysis procedures. The following topics are covered: (a) research design and rationale; (b) role of the researcher; (c) methodology, including sampling, instrumentation, recruitment, and data analysis; and (d) issues of trustworthiness, including ethical procedures.

Research Design and Rationale

To meet the study purpose, I developed the following three research questions:

RQ1. How should law enforcement officials improve communication with the general public in the event of a natural disaster?

RQ2. How is community readiness for natural disasters dependent on communication?

RQ3. Which specific methods of communication should law enforcement officials use to most effectively interface with the public?

These questions directed the exploration of the phenomenon of perceptions regarding law enforcement communication with the public related to natural disasters. Specifically, using these questions I explored the kinds of communication methods currently used by law enforcement, and if, where, and how communication might be

improved in the future. Therefore, I used these questions to provide guidance for the interviews conducted in this case study.

I chose a qualitative, single-case study because this approach would allow me to study perspectives of law enforcement officials. Yin (2013) noted that case studies allow researchers the opportunity to explore real-world experiences and contexts (i.e., cases in which a particular phenomenon occurs) and better understand how a phenomenon influenced those individuals within said contexts. In other words, by focusing this study on one specific case, namely the county under study in Virginia, a more detailed understanding of disaster management and communication within this context was gained. Furthermore, perspectives and attitudes cannot be quantified (Bryman, 2016), meaning that quantifiable data could not accurately describe or provide reasoning for and individual perceptions of a phenomenon (Bryman, 2016). Instead, quantitative research approaches were more concerned with measuring trends or statistically analyzing commonalities and differences regarding individuals' responses to phenomena (Bryman, 2016). This approach would not work for the current study, because the aim was to gain insight into how and why law enforcement used the communication methods they did, where and if such communication strategies might be improved, and the current and future impact that communication strategies might have on disaster management and readiness. Qualitative case studies are far more apt at gleaning how and why data than quantitative studies (Yin, 2013).

Other qualitative approaches would also not be sufficient in meeting the purpose of this study. For example, a phenomenological study, while providing depth, would not

allow me to gain the necessary overview of law enforcement approaches to disaster communication in the same way as a case study approach would (Marshall & Rossman, 2016). I was also more concerned with contextual implications and methods of dealing with the phenomenon, rather than the phenomenon itself, which further discounted a phenomenological approach (Marshall & Rossman, 2016). I was also not concerned with issues of ethnography or aiming to establish new theory; thus, an ethnographic or grounded theory approach would not meet this study's purpose. Additionally, a mixed methods approach would be redundant because quantitative data would not meet the study purpose or provide the necessary data. Therefore, a case study would be the best fit for the purpose of this study.

Role of the Researcher

Due to the chosen research approach, I was both observer and participant. I was an observer because I gained information through surveys and in-depth semistructured interviews (see Appendices A and B) in which participants could express their perceptions as fully and to whatever degree they felt was sufficient (Merriam & Tisdell, 2016). In this case, I was merely the facilitator. I ensured answers were given, recorded and took notes, and payed attention to what was said (i.e., observing). I was also a participant because I created the questions used in the interviews and survey. I also asked follow-up questions if and where necessary in the interviews, thereby actively participating in dialogue that would lead to in-depth participant answers. Furthermore, I was a participant in the study because I was actively involved in the analysis and interpretation of the data collected (Merriam & Tisdell, 2016). I used Yin's (2013) case

study analysis approach, where I needed to consider aspects, such as theoretical propositions, rival explanations, and case descriptions.

To ensure that my active participation did not negatively influence or bias the study, I placed various “safeguards.” First, I did not have any personal contact or affiliation with law enforcement and community initiatives/business or any of the potential law enforcement officials/community members who took part in this study. Thus, their answers should not be swayed by how a relationship or their professional standing might be impacted by participating, or answering questions for me (Marshall & Rossman, 2016). Second, I created an interview protocol to follow the same line of questioning in each interview. This ensured that accurate and comprehensive data were collected during each interview. It also ensured that no important data were missed or that any of the interviews go off topic. Following the protocol also helped to ensure that questions were not leading or that I influenced potential answers in some other way (Marshall & Rossman, 2016).

Third, to ensure that both the survey and interview questions were accurate, comprehensive, and unbiased, I conducted a pilot study. The pilot study consisted of two law enforcement officials and one community leader who answered both the survey and interview questions, and then provided me with feedback about where and how questions might be improved, if they found any bias or ambiguity, and any other instances or aspects that might assist in my gaining the best and most objective data from these two instruments (Marshall & Rossman, 2016). The pilot study answers did not form part of the actual study. Finally, to ensure accurate and unbiased data analysis, I analyzed the

data using both Yin's (2013) method, as well as NVivo software to analyze and collate all collected data (Castlberry, 2014). In this way, while I still physically analyzed and reviewed the data, the software ensured that such analysis was objective.

Due to my having no direct involvement with law enforcement or community initiatives and or businesses, there was no conflict of interest or potentially weighted power dynamics during data collection that could sway the study. My knowledge on disaster response and readiness aided data analysis and provided insight to ensure comprehensive questioning but should not bias the study due to the aforementioned use of protocols, a pilot study, and analysis software. Thus, my active and observational roles provided depth and insight into the study, while also avoiding bias.

Participant Selection Logic

The population concerned for this study was public leaders and law enforcement officials from within the county under study within Virginia. From this greater population, I used purposive sampling to recruit and select a sample of 15 disaster management personnel and four active members of the community who completed the survey; moreover, eight law enforcement officers and firefighters participated in the interviews. Purposive sampling uses specific selection criteria and allows a researcher to find and select the most relevant and knowledgeable participants to form part of their study (Etikan, 2016). As this study was specific to disaster communication and law enforcement, one must include a sample population who could speak to these areas. The selection criteria appear later.

The respective sample numbers were sufficient for the purpose of this study, as qualitative case studies required far smaller samples than quantitative studies (Lewis, 2015). Furthermore, the greater population from which to draw was already reduced due to the limited number of officials operating within this particular area. Thus, 25 and 10 participants, respectively, were each adequately representative of the greater population (Lewis, 2015). However, should it be necessary to include more participants to meet data saturation for the interview phase, I drew from participants who took part in the survey but who were not selected for the interview phase (Fusch & Ness, 2015). Data saturation was reached when no new information could or was being gathered and all points of view were properly explored within a sample (Fusch & Ness, 2015).

For this study, participants had to meet the following criteria: (a) all participants must have had a minimum of 10 years working in disaster management, as this allowed for their sufficient knowledge of and involvement in the community and professional environments in relation to disaster management; (b) all participants should be active leaders, either within the community, such as business owners, or within law enforcement, such as police officials; and (c) all participants should have a working knowledge of current disaster-response initiatives as these pertained to their specific field. These criteria ensured that only those who were in some way directly involved in, responsible for, and or knowledgeable on disaster management and communication would take part in the study. This ensured the most accurate and comprehensive data were gathered. Participants had to answer questions to substantiate that they matched the needed criteria in the survey section of the study.

Participants were recruited via social media, such as Facebook and LinkedIn, as well as via e-mail. Before commencing recruitment, I also contacted various key departments via e-mails and or telephone calls to gauge and confirm their willingness to partake in the study. I also posted a request for participation on community leaders' social media pages. I e-mailed local law enforcement, governmental offices, and businesses with the same participation request on their confirmation of interest. I included the criteria as part of the request. Individuals wishing to partake in the study needed to confirm their eligibility by stating they read and met the criteria in their response. Further confirmation of their eligibility, particularly related to their working knowledge of disaster management and communication, was established in the survey phase, where each participant was required to answer specific criteria-related questions.

The recruitment (participation request) form included my e-mail address. Potential participants could then contact me via e-mail to express their willingness to participate in the study. After receipt of this confirmation, I sent potential participants a follow-up e-mail containing an informed consent form, which they needed to sign and e-mail back to me, and a link to the online survey on SurveyMonkey. Participants were only officially part of the study once I received their signed informed consent forms. More details regarding the informed consent form and survey are provided later in the chapter.

Instrumentation

I used various instruments for collecting data, namely a survey (see Appendix A), an interview protocol (see Appendix B), and supporting documentation. Using these

instruments in combination ensured data triangulation. Data triangulation referred to gaining data from various sources and in different ways to ensure better substantiation for findings (Noble & Smith, 2015).

I designed the interview and survey questions myself (see Appendices A and B), as there was currently no published instrument that specifically focused on gathering disaster communication data. I conducted a pilot study to ensure that the survey and interview questions provided holistic research into the issue, and these were in no way ambiguous, confusing, or biased (Marshall & Rossman, 2016). More information regarding the interviews, survey, and pilot study is provided later in this chapter.

Based on the response from the pilot study participants, I adapted the questions for each instrument if and where necessary. Questions for both the survey and interviews were qualitative and open-ended in nature, allowing participants to provide insight and reasoning into their answers. The survey questions were used to establish better current communication processes and views from the public and law officials about what aspects of disaster communication needed more work. The interviews were then used to gain further insight into the specific noted areas from the survey, which also allowed participants the opportunity to discuss other important and relevant aspects not addressed in the survey.

I requested substantiating documentation from interview participants. Such documentation included current law enforcement protocols and policies regarding disaster response and communication, and business and or other general public organizations' methods and policies for preparing for and responding to potential

disasters. I also gathered documentation from the county office and other open-access governmental department records regarding disaster response and communication protocols. All documentation was used to substantiate the survey and interview findings.

The three instruments all worked together to answer the given research questions. The instruments also worked to ensure the credibility and validity of the data collected. The findings from each worked to substantiate the others. The pilot study also ensured that the survey and interview protocol were valid and objective through having relevant participants answer and evaluate the two instruments.

Pilot Study

The pilot study consisted of two law enforcement officials and one community leader answering both the survey and interview questions. These participants were recruited in the same way as those participating in the actual study, namely via social media and e-mail. Participants in the pilot study also needed to meet the given criteria for participation to ensure better accuracy of the instruments. The pilot study participants needed to sign and return an informed consent form before being allowed to participate.

Each of the three participants was required to fill in the online qualitative survey on SurveyMonkey (see Appendix A). At the end of the survey, they needed to fill in a questionnaire that was e-mailed to them. This questionnaire related specifically to their experience of taking the survey and what questions they might have found ambiguous and or biased. The questionnaire also provided space for them to enter or write down ideas and suggestions for improving the survey or questions they believed should be included or excluded.

Participants then each took part in a face-to-face interview. At the beginning of the interview, each participant received the interview protocol (see Appendix B), so they could follow the questions I asked. I also asked them to make notes during the interview as and when they spot issues with the protocol. At the end of the interview, I discussed the interview process with the relevant participant and make notes regarding any issues with or suggestions for improving the interview questions. I also asked each participant to provide me with their notes to ensure that I adapted the questions accordingly.

Aside from participants evaluating the survey and interview questions, the pilot study was conducted in the same way as the actual study. Not only did participants in the pilot study need to sign an informed consent form, be recruited via e-mail and or social media, and need to meet the criteria in the same way that study participants would, but they also underwent the same survey and interview processes. In other words, the pilot survey was conducted online using SurveyMonkey. SurveyMonkey was an online questionnaire program that allowed researchers to create research-specific qualitative and or quantitative surveys (Waclawski, 2012). Participants could access this survey through a provided e-mail link. The survey took approximately 10 minutes to complete. After completion, their answers were saved on SurveyMonkey, where I could access these for manual analysis using Yin's (2013) method, as well as upload them to NVivo for thematic analysis.

NVivo was software designed specifically to assist researchers in analyzing qualitative data, particularly when attempting to establish themes and draw conclusions across various collection instruments (Castlberry, 2014). Putting the collected data

through this program allowed me to create better questions for the interview protocol, as the data gathered from the survey highlighted areas needing more discussion. Once I completed the initial interview protocol, I conducted the pilot interviews.

Each interview lasted approximately 1 hour. Interviews occurred place face-to-face at a time and place convenient for both parties. However, pilot participants needed to set aside an additional 10 to 20 minutes for the post-interview discussion. I manually analyzed their responses using Yin's (2013) method, and then also uploaded their answers to NVivo to conduct a thematic analysis of this data. I then compared and correlated the interview and survey answers to see if and where better analysis might be needed in the actual study. Based on participant feedback, as well as my own initial analysis, I adapted the interview and survey questions to ensure that the best collection and analysis for the actual study occurred.

As document analysis was used as supporting data collection, I did not include this as part of the pilot study. Instead, the pilot study was mainly used to assess and address any potential issues within the survey and interview questions that might affect data collection and analysis. Due to NVivo's capability for including, analyzing, and cross-referencing various data, and documented data were already assessed due to its formal nature, it was only necessary to include such analysis in the actual study. In all, the pilot study allowed me to better ascertain how long the survey, interviews, and analysis processes would take; where such processes and the questions themselves might be improved; and how I could better prepare actual study participants for their participation.

Procedures and Data Collection

As noted previously, data were collected from participants via three different instruments. Each of the data collection instruments worked to answer all of the noted research questions by providing either in-depth insight or reasoning via a survey and interviews or through supporting documentation. Participation for all phases was voluntary, and participants could exit the study at any time by sending me an e-mail noting their withdrawal. Should a participant need to be replaced, I conducted a second round of recruitment (for survey participants) and/or chose out of those participants not initially selected (for interview participants). The following subsections will deal more comprehensively with each instrument and its related data collection procedures.

Survey

After I recruited the necessary participants for this first phase of data collection and received their signed informed consent forms, participants could select their e-mail link and access the survey online at SurveyMonkey (see Appendix A). The survey design allowed each participant to fill in needed demographic details, such as their name and age; whether they were in public or law enforcement leadership roles; years of experience in their field; and years involved with disaster management, reaction, and or preparation. The demographic information was only used to assist with analysis and interview-participant selection. No identifying information formed part of the final study, and no one aside from myself would have access to this information. Furthermore, identifying information, such as names, was replaced by pseudonyms during the analysis phase. Thus, should I need to include information, such as direct quotes into my findings and

published work, participants were only identified through their pseudonyms, which assisted in protecting participants' anonymity.

Participants would then need to answer each of the survey questions by typing out their answers into SurveyMonkey. The survey took approximately 15 minutes to complete and was available online for a 3-week period. Participants took the survey anytime during that period. Once they completed the survey, they could save their answers and exit the program. Their answers were stored on SurveyMonkey, and I could access each participant's answers via the site.

I then manually analyzed the responses using Yin's (2013) method, as described in Chapter 1, and presented later in this chapter. I also physically read through participant answers and noted where more detail and research into areas they highlighted was needed for the interview phase. After this manual analysis, I uploaded their answers directly from SurveyMonkey in NVivo for thematic analysis. Here, participant answers were analyzed, compared, and collated into recurring themes. From this dual analysis, I could add questions to the interview protocol to ensure that all relevant aspects for this research were covered. The analysis also provided much-needed answers as per the research questions.

Interviews

Once I completed the survey phase, I contacted those participants who indicated on their informed consent form and survey that they would like to participate in the interview section. The interviews formed the main data collection strategy for this study. I only selected 10 of those who indicated their interest, as 10 was a sufficiently

representative number for the purpose and population size of this study (Lewis, 2015). Additionally, I based my selection from the available number of participants for the interview phase on their noted years of experience related to disaster management and communication, as indicated in the survey demographic information. In this way, I ensured that from those interested in participating in the interviews, I could include the most knowledgeable and representative across both public and law enforcement sectors. When additional interviews were needed to meet data saturation, I contacted other participants who took the survey and expressed interest in participating in the interview phase.

Each interview was conducted face-to-face at a safe and quiet location, such as the participant's office or a local coffee shop. The interviews each took approximately 60 minutes to complete and were held at a time convenient for both parties. However, there was no need for follow-up interviews because if interviews were over time or a participant desired to discuss other relevant aspects, an additional interview was set up on a case-by-case basis. The interviews, along with any possible follow-up interviews, were all completed within a 3-week timeframe.

I audio-recorded each interview and took notes with a pen and notebook. This dual collection ensured that all necessary information was gathered, and that anything, such as important gestures or other body language indicators that could not be picked up from audio-recording, was noted through my notes. The written notes also served as cues and or reminders in case I could not hear or remember the context of a statement while listening to the recordings.

I followed an interview protocol (see Appendix B), as established during the pilot study phase and adapted as per the study survey answers. This ensured that each interview followed the same structure, and interview discussions did not go off course. Using the protocol also guaranteed that all participants answered the same questions, thereby assisting in accurate data collection and analysis. However, the interview protocol also allowed for follow-up questions, as and when needed, that might be specific to an individual participant's answer to an actual protocol question. Follow-up questions assisted in gaining detail and further insight, where necessary. At the end of each interview, I also asked each participant if there were any other aspects they wished to discuss that did not form part of the initial interview. In this way, I could better ensure that I sufficiently dealt with all aspects related to this study.

After each interview, I transcribed the audio-recordings using Transcribe. Transcribe was an online transcription service that converts audio to text (www.transcribe.wreally.com). Once the transcription and addition of my written notes was completed, I sent a copy of the full transcript back to each participant for member checking. Member checking allowed participants to review the information and validate its accuracy (Noble & Smith, 2015). This worked to add validity and credibility to the data collected and the study as a whole (Noble & Smith, 2015). After receiving confirmation that the data were correct or making the necessary changes thereto, I analyzed the data using Yin's (2013) method. After this initial analysis, I uploaded the data to NVivo for thematic analysis. I discuss the analysis procedure in more detail later in the chapter.

Documentation

As part of participants' agreement to take part in the interview section of this study, they were also requested to provide any relevant documentation for analysis. I found additional relevant documentation through research and accessing public county records related to disaster response and communication. Relevant documents included business and law enforcement protocols and policies related to communicating on and responding to potential disasters. I read through all the documentation and, using Yin's (2013) method, highlighted aspects most relevant to the study. I then uploaded these data to NVivo for thematic analysis and compare current policies, protocols, and other relevant information from the documents to what was found during the survey and interview phases.

The inclusion of documentation assisted with data triangulation, which further added validity and credibility to the study (Noble & Smith, 2015). The documentation worked to highlight any discrepancies between current approaches and communication strategies to what participants voiced as being necessary. The documentation also worked as substantiation for participant assertions and provided evidence for what communication currently worked and where improvements were needed. In this way, the three collection methods, namely the survey, interviews, and documents, worked together to allow for comprehensive data collection and analysis, as well as to answer the posed research questions sufficiently.

Data Analysis

I used both manual and software data analysis methods. This combined approach to analysis ensured that findings were accurate (Noble & Smith, 2015). Yin's (2013) method for analyzing case study data was threefold: relying on theoretical propositions, considering rival explanations, and developing a case description. Such techniques were used to find patterns and build explanations of a given situation. As Yin (2013) recommended, analytic approaches were developed as part of the case study protocol, with desired lines of inquiry selected and parsed as the semistructured interviews were conducted.

By relying on theoretical propositions, Yin (2013) meant that the original objects and design of the case study should be kept in mind during analysis. Focusing on a proposition helped to narrow the focus on the case study in the analysis period. For instance, in the present study, I followed the proposition that communication channels between the general public and law enforcement officials was positive, creating better organizational structure. I also followed Yin's (2013) suggestion of considering rival explanations. Like the previous strategy, considering rival explanations, such as the hypothesis that communication channels between community and governance did not matter, could help focus the analysis and discussion by providing a counterweight to the assumptions.

I initially manually analyzed the survey data using Yin's (2013) method. I used theoretical propositions, consider rival explanations, and develop a case description to find patterns and explanations for the data (Yin, 2013). This method also allowed me to

analyze and ensure proper lines of inquiry were followed during the interview phase. I then uploaded all SurveyMonkey data to NVivo. During this process, any identifying information was coded, and participant names were replaced with pseudonyms. This protected participants' identities and ensured that interview respondents matched with their surveys to maintain accuracy across the collection instruments. NVivo also allowed the researcher to thematically analyze qualitative data (Castlberry, 2014). Once themes emerged through this software analysis, I read the analysis, compared this with the manual analysis, and made note of areas needing more discussion. These areas were then added to the interview protocol, as previously mentioned. The manual and electronic survey analysis findings were stored on NVivo for future comparison with interview and documentation findings.

Second, after completion, transcription, and member checking of the interviews, I used Yin's (2013) method to read through and analyze the data manually. Then, I uploaded the interview transcripts to NVivo for thematic analysis. I compared the manual and electronic analysis findings, and then saved these findings for future comparison with the survey and document analyses and findings.

Third, I used Yin's (2013) method to read through all documentation gathered manually and highlighted key areas of interest as per how communication strategies, policies, and other relevant information pertains to the study. I reread these documents numerous times to ensure that I found all the relevant information. From there, I uploaded the document notes and highlighted sections to NVivo for further thematic analysis. I

then compared the manual and electronic analysis findings, and I saved these for future comparison to the interview and survey data.

When all three sections were analyzed manually and electronically, and I placed these into themes through NVivo, I manually compared the themes across the three sections, using Yin's (2013) method. I highlighted and made notes on any similarities and differences across the three instruments. Specifically, I made note of theoretical propositions and rival explanations to develop a case description for the findings. In this way, I could better find patterns and explanations across the data (Yin, 2013). To check the accuracy of these noted patterns, I then conducted a NVivo analysis to place all the data into themes. I noted any differences between the two analyses and determine if such differences might be due to bias.

From this dual analysis across all data collected, I was better able to ascertain if, where, and how law enforcement officials might improve communication with the public regarding disasters, community readiness in event of natural disasters, the kinds and levels of effectiveness of current communication strategies, what kinds of communication strategies might be implemented in the future, and means for improving public readiness in case of disasters in the future. In this way, the data analysis provided thematic findings in answer to the various research questions posed in this study. The findings were then collated and published in the final dissertation.

Issues of Trustworthiness

I put various strategies in place to ensure the trustworthiness of this study. First, I ensured this study's credibility through data triangulation and member checking (Noble

& Smith, 2015). By collecting data through various instruments and different sources (namely participants and documentation), more comprehensive and substantiated data were collected (Noble & Smith, 2015). Furthermore, by allowing each interview participant to check their interview transcripts and make adjustments if and where necessary to improve accuracy of meaning, I was better able to ensure that all interview data were correct and interpreted in the way the participants meant, further improving the credibility and validity of the data gathered. The inclusion of substantiating data further assisted in ensuring credibility.

Second, I focused on transferability. While this study was qualitative and case-specific in nature, it might still be transferable to similar areas with similar populations and law enforcement approaches to disaster communication and public readiness. However, further research was needed to establish this assertion better. The general issue of communication and disaster might also be transferable to other populations and relevant sectors, as it was not only the county under study within Virginia, that needed to deal with and is affected by natural disasters. However, more research was needed to ascertain to what extent the findings of this study might be relevant to other sectors.

Last, I attempted to establish this study's dependability and confirmability through data triangulation, manual and software analyses, member checking, and a pilot study. The pilot study ensured that the questions in the survey and interview sections were unbiased, could be repeated and or adapted for other similar studies, and would properly gain the necessary information from participants. The manual and software analyses worked as checks for each to ensure that no important findings were missed, and

no analysis and subsequent findings were slanted or biased. Through the implementation of these strategies and being aware of ensuring the credibility, validity, potential transferability, dependability, and confirmability of the study during every phase of the data collection and analysis processes, I presented a trustworthy and academically sound study. As a further means for ensuring this study's trustworthiness, I also considered various ethical considerations during the entire duration of the study. These considerations are discussed in more detail in the following subsection.

Ethical Procedures

The first ethical consideration was that of gaining Institutional Review Board (IRB) approval for the inclusion of human subjects into my study (Marshall & Rossman, 2016). I submitted all relevant documentation for approval consideration and did not begin any data collection until I gained IRB approval (Approval No. xxxxxxxx). All participation was voluntary. I did my utmost to maintain participant confidentiality, and there was little to no physical, psychological, and or emotional harm to the participants, as all that was required was their opinions and insights into the study topic (Marshall & Rossman, 2016).

The study was ethically sound because no children formed part of the study, and only those who volunteered formed part of the study sample. Participants were recruited via general Facebook and LinkedIn posts, as well as e-mails. These posts and e-mails requested participation and provided a basic overview of the study, participant criteria, and what would be expected of the participants, should they wish to take part. Only those potential participants with public e-mail addresses and social media profiles were

contacted, and they could choose to simply ignore the e-mail and or social media post should they not wish to participate. Those with and without public social media profiles could view and if so wishing respond to my social media posts that I placed directly on my own profiles, as well as to relevant pages, such as local businesses and law enforcement agencies. Potential participants could also contact me via social media or through my e-mail address that appeared on the participant request form if they wished to find out more information about the study or to address any concerns they had before or during the study.

Each candidate, after written receipt (via e-mail) of their interest in participating, was e-mailed an informed consent form, which they needed to sign and e-mail back to me before they could take part in the study. The informed consent form provided more detail as to what the study was about and what was expected from potential participants. The form highlighted how participants could choose to take part in only the survey or the survey and interviews should they so wish. They were provided with a place to indicate their participation preference on this form. Participants were also informed that all interviews were audio-recorded.

Participants were also informed that their participation was completely voluntary, and they could choose to leave the study at any time with no negative consequences or repercussions their persons, employment, and or reputation. To leave the study, they needed to send me an e-mail stating their withdrawal. After receipt of such notification, I destroyed any and all digital and hard copies of data already collected and, if necessary,

found a “replacement participant” through a second round of recruiting and or choosing from out of the available pool of 25 participants (for the interview phase).

The informed consent form also highlighted that the survey took approximately 15 minutes, while the interviews took place face-to-face at the convenience of the participant and lasted approximately an hour. They were given a timeframe in which each of these two sections would need to be completed. I also informed potential participants about their role in member checking interviews, and each had access to their own SurveyMonkey and interview to complete answers and transcripts. There was little risk to participants, outside of needing to schedule time for the survey and face-to-face interviews. There might be some risk because participants might need to use transport to get to the chosen interview site. However, no “unreasonable” or “unusual” risk should be posed to participants’ physical, psychological, and or emotional well-being due to their participation. Participants could address any queries and or concerns with me before signing and e-mailing back the consent form.

To ensure further there was little to no risk to participants, I also did my best to ensure their anonymity. I did so by replacing their names with pseudonyms during the survey and interview analyses. Any other identifying and or demographic information was only used to inform the data collection and analysis and was not published outside of potential code or group representations (e.g., noting that the majority of respondents were male) if they were pertinent to the findings. Generalizations was also used in place of actual job titles or places of employment (e.g., a local business owner or a policeman with 20 years’ experience).

I also ensured confidentiality of participants by storing all hard copies of data, such as notes, memory disks, transcript printouts, and physical audio-recordings/CDs, in a locked safe in my office, to which only I had access. Digital data from SurveyMonkey were stored safely on the site itself. Only the participants and I had access to their survey answers, as the site required a login and password. Similarly, NVivo allowed for password protection, so all raw and analyzed data and findings in the program were stored safely. As an additional measure, I stored all digital data and copies on a password-protected computer to which only I have access. After the allotted 5 years, I will destroy all hard and digital data related to this study (Department of Health, Education, and Welfare, 1979).

This study was also trustworthy and ethical because I put various measures, such as a pilot study, member checking, and data triangulation, in place to limit potential researcher bias. I also had no professional or other relationship to anyone within law enforcement or local leadership positions; thus, there was no conflict of interest or concern regarding power dynamics that might negatively impact participant answers. Participants also were not compensated in any way for their participation, thereby further ensuring this study was conducted in an ethical manner (Marshall & Rossman, 2016).

Summary

This chapter provided an in-depth discussion on the chosen qualitative single-case study methodology, and reasoning about why this particular research approach was best for the purpose of this study. I also discussed the recruitment procedures (social media and e-mails), sample size (25 for survey, 10 for interviews), and sampling approach

(purposive). In this discussion, I provided reasoning and substantiation for these approaches, as well as how I addressed data saturation. The chapter also included details on the survey (see Appendix A), interview (see Appendix B), and documentation instruments to be used, and how I conducted a pilot study to ensure the accuracy of these instruments.

I also provided details relating to the data collection and analysis procedures, and the ways in which I attempted to maintain the validity, credibility, and dependability of this study at every phase of these procedures. Some of these “safeguards” included a pilot study, member checking, and data triangulation (Marshall & Rossman, 2016; Noble & Smith, 2015). The chapter ended with a discussion on how I ensured the trustworthiness and ethically sound nature of the study through ensuring participant anonymity, keeping data safe, gaining IRB approval, and only allowing those who signed and e-mailed back the informed consent form to participate in the study.

After completion of data collection and analysis, the findings are presented in Chapter 4. Chapter 4 will also include a summary of the main points from within this study.

Chapter 4: Results

Introduction

The purpose of this qualitative single-case study was to explore how community readiness for natural disasters could be improved by creating effective communication channels between local authorities and the general public. In this chapter I present the results of the study based on the following research questions:

RQ1. How should law enforcement officials improve communication with the general public in the event of a natural disaster?

RQ2. How is community readiness for natural disasters dependent on communication?

RQ3. Which specific methods of communication should law enforcement officials use to most effectively interface with the public?

This chapter is organized into eight sections. Following this introduction, the second section of the chapter explains the setting of the study. The third section contains the study's demographics. The fourth section contains a brief description of the data collection process, while the fifth section contains the details of the data analysis procedures. The sixth section gives evidence of trustworthiness applied in the study. The seventh section contains the results of the study, while the eighth section concludes the chapter with a summary.

Setting

The setting of the study was a largely suburban county in Virginia, next to a major metropolitan area. As of 2018, the county's population was estimated at 398,080 (U.S.

Census Bureau, 2017). The county is considered the third most populous county in Virginia (U.S. Census Bureau, 2017).

Demographics

The sample of the study consisted of 15 disaster management personnel and 4 active members of the community, all of whom completed the survey. Eight law enforcement officers and firefighters participated in the interviews. Purposive sampling was used to recruit the participants. They had to have sufficient and relevant knowledge about the ways in which community readiness for natural disasters could be improved by creating effective communication channels between local authorities and the general public. Participants had to meet the following inclusion criteria: (a) All participants had to have a minimum of 10 years working in disaster management; this requirement allowed for their sufficient knowledge of and involvement in the community and professional environments related to disaster management; (b) all participants had to be active leaders, either within the community, such as business owners, or within law enforcement, such as police officials; and (c) all participants had to have a working knowledge of current disaster-response initiatives that pertained to their field.

Table 1 shows the demographic information of the disaster management personnel survey participants, while Table 2 shows the demographic information of the active members of the community. Table 3 shows the position of the interview participants. The tables also show the random alpha numeric codes assigned to each participant to conceal their identities. The average age range of the survey participants was 30—45. Fourteen of the survey participants were male, and one participant was

female. The majority of the participants held positions in law enforcement, and firefighting.

Table 1

Demographic Information of Disaster Management Personnel Survey Respondents

Participant	Position/Employment	Age	Gender
1	Captain / EMT	51-65	Male
2	Technician / Sterling volunteer fire company	30-45	Male
3	Chief/SVRS medical specialist/VATF#1	51-65	Male
4	Executive director	30-45	Male
5	Firefighter/neighboring county	30-45	Male
6	Fire officer	46-50	Male
7	Police officer	30-45	Male
8	Emergency services	30-45	Male
9	Firefighter	29 or younger	Male
10	County sheriff's office	30-45	Female
11	Police officer/ neighboring county police	30-45	Male
12	Police officer	30-45	Male
13	EMT sergeant	30-45	Male
14	Paramedic	30-45	Male
15	Sergeant firefighter/paramedic neighboring volunteer fire department	30-45	Male

A disaster management survey of participants' years of experience in disaster management showed the years of experience ranged from 2–30 years, with an average of 13.57 years. Out of the five active members of the community who responded to the survey, Participant 2 did not complete the questionnaire; therefore, Participant 2 was excluded from data analysis. The four members of the community were involved in disaster management related to their employment as assistant principal, family service

specialist, federal police officer, and director of school counseling. The participants' experiences in disaster management ranged from 11—15 years.

Table 2

Demographic Information of Active Members of the Community Survey Respondents

Participant	Position	Years in Disaster Management	Age	Gender
1	High school assistant principal	13	46-50	Male
3	Family service specialist	11	30-45	Female
4	Federal police officer	15	30-45	Male
5	Director of school counseling	13	30-45	Female

The interview participants elaborated their experiences in disaster management outside of the position they currently held. The majority of the participants shared their experiences in disaster management from other counties and other positions, such as child protection services for V1. Only one participant, S1, from the interview claimed to be retired. All the other participants were on active duty. Furthermore, Participant G1 revealed that the position in firefighting was completely voluntary, and G1 did not receive payments for his services.

Table 3

Position/Employment of Interview Participants

Participant	Position/Employment
G1	Firefighter
V1	Service specialist
A1	Medical specialist/search and rescue team/physician assistant/ neighboring county
B1	Firefighter
J2	Police officer/ neighboring county

JE1	Marketing/firefighter
S1	Retired fire captain and station commander/EMT
T1	Police officer

Data Collection

Multiple sources of data were collected. The sources of data included survey of disaster management personnel, survey of active members of the community involved in disaster management, and interviews of law enforcement officers and firefighters. The primary data source for this study were semistructured interviews. The data collection process began with recruitment of participants. I selected the participants using a purposive sampling method. First, the inclusion criteria were identified. Second, I gained permissions from community leaders, local law enforcement, governmental offices, and businesses to conduct the study. I then promoted the study on Facebook and LinkedIn, and I sent e-mails to potential participants. I asked interested participants to contact me and state they read and met the inclusion criteria. Eligibility of participation was evidenced in the beginning of each survey and interview through asking criteria-related questions. I collected signed informed consent forms from the participant prior to the survey and interview (see Appendix A).

For the surveys and after receipt of the signed informed consent forms, I sent a link to the participants for access to the questionnaire posted in social media website. The questionnaire for disaster management personnel included four demographic items, and I developed nine open-ended questions to gather responses related to answering the research questions. The questionnaire for active members of the community included four

demographic items and 10 open-ended questions. Each survey was completed in approximately 15 minutes over a period of 3 weeks. The participants could choose to review and change their responses over the 3-week period. Only I could access the survey responses, which were downloadable in Microsoft Excel files through the social media website.

For the interviews, survey participants who indicated their interest in participating in interviews were contacted for an interview schedule. The interviews were face-to-face and had a duration of about 60 minutes each. An interview protocol (see Appendix B) was used to guide the flow of the interviews, while the semistructured nature of the interviews allowed me to ask follow-up questions. The participants consented to having the interviews audio recorded. The audio recordings were transcribed using the online transcription service Transcribe (www.transcribe.wreally.com). The transcripts were downloadable in separate Microsoft Word files. The interviews generated 77 pages of transcript. The transcripts were sent to the participants for review prior to beginning data analysis.

Data Analysis

Data analysis procedures were guided by Yin's (2013) data analysis method. Yin suggested that data analysis involved examining, categorizing, tabulating, and recombining the data related to the purpose of the study through pattern-matching. Data analysis was dependent on the theoretical concepts of community resilience (Norris et al., 2008), adaptive capacity, and coping capacity (Parsons et al., 2016), as patterns that emerged from raw survey and interview data were analyzed compared to predicted

patterns based on existing empirical data on the concepts. Comparisons of the predicted and actual patterns did not necessarily involve quantitative evidence, which required the interpretations of the researcher (Yin, 2013). The goal of data analysis was to develop themes from the patterns emergent from the data to the research questions.

I employed thematic analysis techniques to identify the patterns from the data, and I compared the patterns to the predicted ones. The analysis began with collating all the survey and interview data in respective Excel and Word files. I uploaded the files to NVivo 12, a qualitative data analysis software. The software included automatic coding features; however, in this study, the data were manually coded using the software's nodes and node hierarchies feature. Coding began with reading the data as a whole. The data were then reread, and chunks of data were highlighted. I assigned to nodes using key words to label the data and form codes. Labeling or coding the data was essential to identifying emergent patterns.

The codes were compared and contrasted to each other to evaluate patterns. Codes with similar content were clustered to develop the initial themes. The initial themes were reviewed in comparison to the data to establish that the themes emerged in the context of the participants' experiences and perceptions. The themes were finalized based on how these related to each other and how these answered the research questions.

Evidence of Trustworthiness

The trustworthiness of this study was increased through increasing credibility, transferability, dependability, and confirmability. Credibility referred to the truthfulness of the study findings, which was increased through data triangulation and member

checking (Noble & Smith, 2015). Data triangulation was achieved through collecting and analyzing multiple sources of data. Member checking involved having the participants review the accuracy of the transcripts and the interpretations.

Transferability referred to the generalizability of the study findings in other contexts. While the aim of a qualitative study was not to generalize, findings of this study might be transferable, with caution, to future studies containing similar aspects of this study, such as similar populations, counties, and law enforcement approaches to disaster communication and public readiness. By providing a thick description of the setting and sample of the study, I increased transferability.

Dependability referred to the reliability or consistency of the study findings, while confirmability referred to the extent in which the findings may be corroborated by others. Triangulation, documentation, member checking, and conducting the pilot study increased the dependability and confirmability of the study. Triangulation, documentation, and member checking ensured that the study could be replicated and yield similar results. The pilot study tested the survey and interview questions, minimizing bias.

Results

The results of the study involved six themes that emerged from the data. The themes were the following: (a) involving the public, (b) availability of public information, (c) being more proactive than reactive, (d) collaboration among stakeholders, (e) proper emergency management system, and (f) avoiding miscommunications. This section includes the description of each theme, as well as

excerpts from the data, to support the findings in answering the following primary research questions:

RQ1. How should law enforcement officials improve communication with the general public in the event of a natural disaster?

RQ2. How is community readiness for natural disasters dependent on communication?

RQ3. Which specific methods of communication should law enforcement officials use to most effectively interface with the public?

Table 4 below shows an overview of the themes. The table includes the number of references supporting each theme.

Table 4

Overview of the Themes

Theme	Number of References
Involving the public	54
Availability of public information	63
Being more proactive than reactive	32
Collaboration among stakeholders	7
Proper emergency management system	68
Avoiding miscommunications	38

Theme 1: Involving the Public

The first theme emerged to answer the first research question that asked how to improve communication between the law enforcement officials and the general public. According to the participants, the current communication system used by law enforcement officials lacked the involvement of the public. Four participants shared that

with advancing technology and the widespread use of social media, social media might be utilized to improve communication with the general public. From the interviews, Participant G1 revealed that fewer people watched the news than used social media. More people tended to pay attention to “something flashy or colorful or shiny” on social media, which according to G1, helped people remember things. The majority of survey participants also believed in using social media to reach the general public. In addition, survey participants generally mentioned using reverse 911, a public alert system used to alert residences or businesses of danger in or near their geographic location. Among the interview participants, only participant T1 mentioned using reverse 911; however, the majority of the participants mentioned using landline and mobile phones to contact the general public. T1 also mentioned using text alerts and text blasts. To reiterate, T1 stated:

The text alerts have been a huge thing as far as reaching out to people too. That's been something that's been kind of new in the last few years. I think a ton of people signed up. I've signed up for it on my phone, I get alerts all the time [chuckles] of whatever happens. From the bad thunderstorms, to a missing person to something that is really critical. I think that we could probably continue to expand communication through social media.

For the other community members, Participant 1, the assistant school principal and Participant 5, the director of school counseling, utilized phones, texts, and e-mails to contact and disseminate information to school staff and parents. Participant 4, the federal police officer, described using “green screen messaging” on computer systems.

Participant 3, family services specialist, revealed using Wireless Emergency Alert (WEA). The participant elaborated the following:

Wireless Emergency Alert (WEA) system is currently being used. This system is used by particular government individuals that can push a message to deliver to individuals via their cell phones in a target location that might be impacted by the emergency. People do not sign up for this system rather you are already on it (depending on carrier). Alert County, the public signs up to get notifications of weather happenings, closures of facilities, taxes due dates, emergency information, and such. Alert County for employees that work for the county is different that they get the same information as the public but also information that deals directly with being an employee of county. (Participant 3)

Apart from social media and various alert systems, the participants also utilized outreach programs, drills, and exercises involving the general public. The most mentioned exercise was fire drills. Participant V1 claimed, "We did fire drills. What you need to do." Participant G1 claimed to practice Fire Safety Month every October to educate the general public about fire prevention, and what to do in case of fires.

Participant G1 shared the following:

So being a planner what I've found and being in the fire service is prevention and outreach programs letting people know the hazards that are out there what they can do to mitigate the hazards for or to at least slow them down or know what an appropriate response. So every October we have Fire Safety Month and we go over a different program so whether it be maintaining open flames like candles in

your house or check your smoke detectors or learned stop drop and all those different programs are the ones that really get out there.

Participants A1, J2, and JE1 agreed that public education was important in communicating with the general public. However, Participants J2 and JE1 perceived that the current system lacked in providing disaster management education to the public. Participant J2 stated that public education was limited to mentor programs in schools. Conversely, Participant JE1 believed communication with the general public might be improved through public education about disasters before and after the occurrence of an incident. Participant V1 similarly believed that debriefing after drills might be helpful to improving communication. Participant JE1 stated the following:

Obviously, part of it is the education purpose or part of it, we have to actually educate them before a natural disaster, but also after. Think of a house fire. After a house fire, we actually mobilize and we put together talking points or like one-page sheet of stuff that says, "Hey, make sure you change your smoke detector batteries. Don't discard fireplace ashes this way." We talk about when we go through the community. If a house in a particular area catches on fire, the next night the crews actually get together and we go door-to-door, we hand out this information saying, "Hey, we know there's an incident here the other night. We want to just inform you on how to prevent this in the future and protect yourself," so that's a part of it as well.

Theme 2: Availability of Public Information

The majority of the participants believed the availability of public information was vital on how community readiness for natural disasters was dependent on communication. Without using public documents, broadcasts, and alert systems, the community would likely be less prepared for disasters compared to when public information was readily available. Participant V1 claimed that testing out an emergency system in public helped determine the system's effectiveness. Participant G1 stated the emergency operating plan (EOP) of the county was currently not a public document. The participant hoped the county would imitate the neighboring counties and make the EOP a public document to inform the public of actions to be taken in the event of an emergency. Participant T1 believed availability of public information opened a "two-way flow of information," which contributed to community readiness. Participant T1 articulated the following:

I think it's huge. I think just the communication and the two-way flow of information is probably the most supported thing. A lot of the preparation that would come would be the general information about where people should go to actually seek the information in an emergency. What radio stations do they listen to and getting those messages out there on a routine basis? Like you always see the Emergency Broadcast System is a good example, there are monthly tests and on the television and on the radio. Getting that out there so people are familiar with their systems ahead of times.

The majority of the disaster management personnel survey respondents revealed that standard operating procedures and general orders were relevant to communication and community readiness for disaster. Other members of the community, especially the participants connected to schools, mentioned the importance of policies. From the other community members' survey, Participant 1 expressed the following:

Our school system has a Safety and Security department that works with senior staff to develop policies pertaining to natural disasters and the school system. These policies include the use of our facilities by local, state, and federal agencies as a base of operations for local natural disasters. Specific ways in which our facilities could be used include as a shelter for those who have lost their homes, as a place where medical care could be facilitated, and as a central location for law enforcement/fire & rescue to coordinate efforts.

Theme 3: Being More Proactive Than Reactive

Being proactive rather than reactive also helped in how community readiness was dependent on communication. Participant S1 explained that being proactive involved practicing disaster scenarios on a day-to-day basis. Participant S2 mentioned the following:

On a day-to-day basis with our job, within the fire department, we do what's called pre-incident planning. We would go out at least once a day and try to do some pre-planning of specific target hazards within our first day.... Specific target hazards would be places like the water authority or places of occupation like

school's high target hazards, hospitals, large group gathering areas, and industrial targets.

Nonetheless, Participant JE1 believed disaster management personnel might not be able to be fully prepared for all emergencies. However, the participant believed the mindset of disaster management personnel might be prepared to respond to emergencies. The participant reiterated the value of being proactive and reported the following:

I think really what it comes down to is being proactive instead of reactive. When I think of how things have gone negatively or things that I perceive as a negative communication strategy, is the last minute, it's the reactive and not the proactive. Especially, when we have things in place to try to prevent that. I think what it boils down to is people get tied up in the organizational aspect of it, sending out these briefs on, "Hey this is what's happening, this is what we're doing to prevent it."

Participant A1 shared their agency prepared for emergencies through anticipating worst case scenarios. In doing so, the agency could prepare and plan resources in response to emergency situations. Being in an urban/suburban location, Participant A1 shared emergency equipment was stored in waterproof containers in different areas in the county for easier access during emergencies. Participant A1 shared the following:

Typically in all the agencies that I work with we always are looking out for what could be the worst possible scenario. In the spring we look at flooding. In the summer we look at weather events and different changes that happen suddenly. In the winter we look at snow events. Each one of these particular events, we have

planning that goes on prior to so that we can make sure we can mitigate any problems that may happen. In other words, when we know there is potential for flooding or we know there is potential for high volumes of snow, we'll bring in additional personnel and support staff so that we can ensure that we can maintain our 24-hour operation.

Theme 4: Collaboration among Stakeholders

The final theme, which answered the second research question, was collaboration among stakeholders. The majority of the participants believed collaboration among stakeholders improved communication and community readiness for disaster. Stakeholders in disaster management involved, but were not limited to, law enforcement officers; firefighters; medical specialists; other first responders, such as paramedics; and emergency management coordinators. The majority of the interview participants believed collaboration among the stakeholders was not only limited to stakeholders in the county, but also in nearby counties. Participant G1 shared that joint plans for emergencies were made by several jurisdictions. The participant provided the development of the Hazard Mitigation Plan as an example. The plan was developed and used by 19 jurisdictions in Northern Virginia. Participant J2 stated the following:

When there is natural disasters or even when it comes to criminal issues or traffic issues and all that things we reach out to the surrounding jurisdictions of the county and we've become a unified command through the police department and the fire department.

Both participants G1 and J2 also mentioned automatic and mutual aid. The aid involved pacts from several involved counties to provide help in times of disaster. Participant T1 experienced similarly and shared, “There's always plans and contracts that the different counties have to make sure that there's a continuity and everything keeps rolling pretty smoothly as far as coverage.”

Theme 5: Proper Emergency Management System

With the presence of several stakeholders in disaster management, the participants generally believed that specific methods that communication law enforcement officials might use to interface with the public most effectively involved having a proper emergency management system. The majority of the participants believed having a specific person or a specific organization handle specific situations might help in establishing a proper emergency management system and improving communication in general. Participant A1 shared that as a member of the Urban Search and Rescue Team, the tasks were clear to each member resulting in a system of having each member being a self-contained unit. Participant A1 elaborated the following:

In other words, each member is issued a certain amount of gear, each member is issued a certain amount of food in the form MREs. Each member is responsible for having their own batteries and electrical supply if they need to. Each member is responsible for having their own medications and things like that. In addition to our cash that we usually bring into a country, we usually bring enough supplies to maintain our own self for 83 members for at least a week to two weeks, which means we do not put any burden on the system that we're going to help.

Participant JE1 recognized that the lack of a specific person in-charge was ineffective in communication. The participant believed that having one person in charge of coordinating and organizing human resources and equipment might make the system and communication easier. Conversely, Participant G1 experienced that dealing with individuals with specialized tasks did not help improve communication and emergency management systems. Participant G1 stated, “We have had it where he just had a person and yes they are the law enforcement representative but it's not their thing. So they are resistant to what they're doing because they don't know why they were there.”

Nonetheless, Participants B1 and JE1 reiterated the significance of following the chain of command for more effective communication to establish a system. Participant B1 shared the following:

For police, the biggest thing for us is we operate like a small unit leadership from the battalion chief all the way down to let's say the lieutenant manning the ladder truck. When we have an incident that works really well, the chief is running this, the captain is running this. The police they also have a certain dynamic like that, but when they get on scene, it might be like it could be six, seven, eight, nine cops on the scene, any type of leadership gets there.

Moreover, in establishing an effective emergency management system and communication, some participants believed in the importance of considering the demographics of the county. Participant G1 expressed that in rural areas, residents tended to have tools, such as chainsaws, in their homes. The tools might be useful in times of

emergency. However, in urban areas, residents tended to rely on the actions of the local government. Participant G1 explained the following:

You have to define your neighborhood. And if we have a power outage or something going on or a tree across in my neighborhood somebody will go out with a chainsaw and cut the tree and push it out of the way. Now we've opened the road so we've taken care of ourselves in our own neighborhood. I rely on VDOT or Department of Public Works to come and move that tree.

Participant V1 considered the large Hispanic population in the area. The participant considered issues, such as illegal residency, which led some Hispanics to be afraid to signing up for systems tracking their locations. The participant also saw language barrier as an issue in disseminating information. In addition, Participant B1 considered the demographics of the firefighters. Participant B1 revealed that neighboring County paid their firefighters, while the county relied on volunteer services. Participant B1 shared that several firefighters lived far from the fire stations due to the cost of living in urban areas. The participant advised to anticipate for such issues when establishing an emergency management system.

Theme 6: Avoiding Miscommunications

The majority of the participants believed the effectiveness of communication might be hindered by miscommunications. Therefore, avoiding miscommunications might help law enforcement officials to interface with the public most effectively. Miscommunication often happened due to poor information dissemination, reassignment/turn-over, misinformation, and getting specific and relevant information.

Establishing communication among the responders and having the same communication tools might help avoid miscommunication.

Participant B1 emphasized the significance of establishing a good working relationship at work as the baseline for good communication. Participant J2 shared his struggle with miscommunication and ways the fire department and the police department were working to improve communication. Participant J2 reported the following:

We did. However, over the last year or two our department has started to make that a little bit better amongst the fire department and the police department, which I never realized. A couple of years ago I was on a domestic violence call and we went to engage with the suspect and he lit the apartment on fire. We're suddenly trying to get him out and next thing I'm calling for the fire department and this and that. What I didn't know that was going on was as the fire department was responding they actually had the ability to listen to everything we were saying and that was something we never knew. The information that we were passing out I was doubling it because we were trying to repeat it again for the fire department thinking that they didn't know what was going on and actually did.

Participant S1 believed the 9/11 terrorist attack started the improvement of communication between the fire department and the police department to avoid miscommunication during emergency situations. Participant S1 narrated the following:

Working together between agencies Law Enforcement and Fire, has evolved a lot more since September 11th. Before September 11th, we were two separate entities serving the public. We didn't communicate a whole lot, we didn't share a whole

lot. I found that after September 11th, we became tighter, we started sharing information, we started working together hand-in-hand a little bit better, having to deal with planning for terrorist attacks on schools, that helped because we had the training together.

In relation, the majority of the participants believed that miscommunication might be avoided by having the same communication tools. Participant T1 believed that using a digital trunking radio system, instead of a third party dispatcher, improved the communication in the fire department. Communication was possible for the fire departments, as well as neighboring fire departments. Participant JE1 shared that using 800MHz radios for both counties, instead of the previous setting of 46MHz radios for the county and 800MHz for neighboring county, improved the communication between the law enforcement officers in two counties.

However, Participant G1 emphasized there were currently too many means of communication, which might be the cause of miscommunication. To avoid miscommunication, disaster management personnel needed to have one standard means of communication. G1 stated the following:

I think there are so many tools now with every bridge and e-mail and conference call lines. I think sometimes there's too many forms of communication because everybody kind of likes to they operate within a specific medium and there's some people I know that really still generally only just want to talk on the phone.

There's other people that want an outlook calendar invite and you give them the

conference call number they'll call in every single time. It's just knowing who the right person is.

Summary

This chapter contained the presentation of the results of the study and addressed the purpose of the study. The purpose of this qualitative single-case study was to explore how community readiness for natural disasters could be improved by creating effective communication channels between local authorities and the general public.

Six themes emerged from the data to answer the research questions. The themes included (a) involve the public, (b) availability of public information, (c) being more proactive than reactive, (d) collaboration among stakeholders, (e) proper emergency management system, and (f) avoiding miscommunications. The themes derived from thematic analysis of the interview and survey data collected from 15 disaster management personnel and four active members of the community who completed the survey. Eight law enforcement officers and firefighters participated in the interviews.

To answer the first research question, involving the public might help improve communication of law enforcement official with the general public. The participants generally believed in the effectiveness of phones, texts, e-mails, and social media in disseminating information to the general public. In addition, the majority of the participants believed that public education regarding what to do in the event of emergencies was helpful in improving communication. Standards and policies were considered helpful in improving communication especially in schools. School staff, as

well as parents, received information regarding emergency protocol and ways to use the schools as shelters or evacuation centers.

The second research question was answered in three themes: (a) availability of public information, (b) being more proactive than reactive, and (c) collaboration among stakeholders. The availability of public information showed ways community readiness depended on communication through using public documents, broadcasts, advisories, and a public alert system. Next, being proactive allowed law enforcement officers and firefighters to practice effective actions, including communication methods, in drills, exercises, or simulations. Practicing was believed to help disaster management personnel not only to be fully prepared for any emergency but to have the proper mindset in responding to emergencies. Last, collaboration among stakeholders also showed ways communication was vital to community readiness, as stakeholders from the police force, fire station, search and rescue, and other disaster management personnel learned the functions of each other and ways to work together in case of emergencies.

Two themes answered the third research question: (a) having a proper emergency management system and (b) avoiding miscommunications. A proper emergency management system involved having a specific person or specific organization tasked to handle certain tasks. Furthermore, a proper chain of command needed to be followed to establish a system. Lastly, learning the demographics of the involved area might also help in learning the effective way to interface with the general public. In communicating, the participants generally believed that avoiding miscommunications was vital. To avoid

miscommunications, establishing communication among responders, and having the same communication tools were perceived to be helpful.

The discussion of the results will be provided in the next chapter, including the theoretical framework and the related literature . Furthermore, the recommendations, implications, limitations, and conclusions of the study will also be presented in the next chapter.

Chapter 5: Discussion, Conclusions, and Recommendations

The problem of creating community awareness regarding natural disasters without arousing panic or suspicion is vital (Wex et al., 2014). To tackle this complex issue, I explored the effectiveness of clear communication channels between local communities, state emergency services, and local emergency services using the theoretical frameworks of Norris et al.'s (2008) notion of community resilience and Parsons et al.'s (2016) capacities for disaster readiness, including adaptive capacity and coping capacity.

Thus, the purpose of this phenomenological study was to explore how community readiness for natural disasters could be improved by creating effective communication channels between local authorities and the general public. Surveys and semistructured interviews (see Appendices A and B) were conducted to obtain sufficient data. I gathered additional documentation from open-access governmental and or law enforcement websites. These documents were analyzed using Yin's (2013) method. I conducted further thematic analysis using NVivo software, in specific, I compared and collated data and findings better across the interviews, surveys, and documentation.

I conducted this study to address the gap in the literature to determine which type of communication corresponded to the most effective results for local communities. For example, according to McElreath et al. (2016) and Osgood et al. (2015), certain modes of preparation and communication could influence the general public's response to disasters, both natural and manmade, but no specific communication method was identified as being the most effective type of communication channel between local authorities and the general public.

Six themes emerged from the data to answer the research questions. These themes included (a) involving the public, (b) availability of public information, (c) being more proactive than reactive, (d) collaboration among stakeholders, (e) proper emergency management system, and (f) avoiding miscommunications. These results (a) addressed the problem of insufficient literature on how communication channels between officials and the public affected community readiness for natural disasters and (b) supported the research questions.

This chapter is organized into six sections. Following this introduction, the second section of the chapter contains the interpretation of the findings. The third section contains the limitations of the study. The fourth section contains recommendations for further research grounded in the strengths and limitations of this study, as well as the reviewed literature. The fifth section contains the implications of positive social change, methods, and practice recommendations. Finally, the sixth section provides the conclusion of the chapter.

Interpretation of the Results

The results of the study are analyzed in this section. This section is organized by theme. The themes included (a) involving the public, (b) availability of public information, (c) being more proactive than reactive, (d) collaboration among stakeholders, (e) proper emergency management system, and (f) avoiding miscommunications.

Involving the Public

The first theme that emerged, regarding how to improve communication between the law enforcement officials and the general public, was to involve the public. Disaster management literature tended to focus on governmental strategies; however, researchers have shown it was insufficient for law enforcement and other emergency services to have effective strategies in place without community awareness (Gregory, 2015; Hughes et al., 2014; Othman et al., 2014). The results of this study supported the lack of enough communication as per the participants' beliefs that the current communication system used by law enforcement officials lacked the involvement of the public.

Traditionally, governmental departments would use mass, multi-media to communicate with the public during times of disaster (Mergel, 2016). Examples of such communication avenues would include radio announcements, television, news reports, and public billboard posters (Wukich, 2015). The most used tended to be news reports (Wukich, 2015). However, the participants generally believed law enforcement officials could improve communication with the general public in the event of a natural disaster using phones, texts, e-mails, and social media to disseminate information. One participant emphasized that fewer people watched the news than used social media. More people tended to pay attention to "something flashy or colorful or shiny" on social media, which, according to this participant, helped people remember things. This revelation was supported by the literature, as since the advent of new media (e.g., Facebook and Twitter), leaders of departments have increasingly begun to use this avenue for communication (Meijer & Torenvlied, 2016). Not only did social media allow

departments to provide information timeously and in the manner most appropriate for the situation, but it also allowed citizens to directly communicate with officials (Vieweg et al., 2014). Citizens could then inform authorities of the location for assistance in impending disasters (Vieweg et al., 2014). This method would improve emergency services' response and could greatly reduce casualties or delays in recovery (Wukich, 2015). The public could also query announcements in real time to gain clarity about procedures or even the truth of whether a reported (or rumored) disaster was about to occur (Burnap et al., 2014). Such clarity could facilitate public avoidance of disaster areas and improve communications to officials assisting with disaster management (Burnap et al., 2014; Wukich, 2015).

In addition, if officials establish an online presence, it would allow the public to know which social media pages communicate actual and legitimate government and disaster management information, and which ones do not (Alexander, 2014; Houston et al., 2015; Starbird et al., 2014). This process would facilitate correct information, processes, and logistics to be communicated to the public, thereby lessening levels of confusion and streamlining the disaster management approaches (Alexander, 2014; Chan, 2014; Grove, 2014; Hemmingway & Priestly, 2014; Hughes et al., 2014; Starbird et al., 2014).

Apart from social media and various alert systems, including the utilization of phones, texts, e-mails, "green screen messaging," and the WEA to contact and disseminate information, the participants also reported using outreach programs, drills, and exercises involving the general public. The most mentioned exercise was fire drills.

One participant believed that communication with the general public might be improved through public education about disasters before and after the occurrence of an incident. Another participant believed that debriefing after drills might be helpful to improving communication.

However, some participants perceived that the current system lacked in providing disaster management education to the public. This concern was reinforced by the literature. According to Hughes (2014), Kim et al. (2014), and Kwon et al. (2014), there was currently little research on the kinds of educational programs or workshops available to different stakeholders or their levels of effectiveness. One participant stated that public education was limited to mentor programs in schools. This finding was supported by the literature, as most of the studies indicated training governmental public information officers and not the public, in how to effectively use social media or training up professionals in different key areas related to disaster management (Hughes, 2014; Ingrassia et al., 2014).

Public education appeared limited to institutes of education. According to Mutch (2014), schools play an important part in disaster management, as not only do they educate children as to how to counter current global warming, but they can also prepare them should disasters strike. Training children and adolescents as to what to expect, and what actions to take during a disaster, could significantly lower their risk of injury or death (Johnson et al., 2014). From this study, it appears that increased public education in the realm of disaster management should be implemented, not only in institutions of learning, but also to the general public in some form.

Availability of Public Information

The second theme which emerged, regarding how community readiness for natural disasters was dependent on communication, was availability of public information. The majority of the participants believed that the availability of public information was vital to community readiness for natural disasters and was dependent on communication. One participant pointed out that testing out an emergency system in public helped determine the system's effectiveness. These views were correlated with the literature. Without the use of public documents, broadcasts and advisories, and public alert systems, the community would likely be less prepared for disasters than when public information was readily available.

According to Cutter et al. (2013), Iacoviello and Charney (2014), Ingrassia et al. (2014), McElreath et al. (2016), Norris et al. (2008), Papazoglou and Andersen (2014), and Parsons et al. (2016), educating the public and officials working in disaster management as to best practices, available resources, and methods for communication could greatly improve community resilience and disaster recovery. However, one study participant noted that an emergency operating plan (EOP) that was not currently a public document might be amended to conform to neighboring EOP's and be made a public document to inform the public of actions to be taken in the event of an emergency. Availability of public information would enable a "two-way flow of information" to be opened, which would contribute to community readiness according to another participant. The majority of the disaster management personnel survey respondents revealed that standard operating procedures and general orders were relevant to communication and

community readiness for disaster. While other members of the community, especially the participants connected to schools, mentioned the importance of policies. These results are examples of the differences between how public information is made available dependent upon the source.

Being More Proactive Than Reactive

The third theme which emerged, regarding how community readiness for natural disasters depended on communication, was being more proactive than reactive. This theme was also supported by the literature. Official departments could use information posted on social media sites to prepare better for disasters and or establish where disasters were more likely to occur (Li et al., 2014; Porto de Albuquerque et al., 2015; St. Denis et al., 2013; Wex et al., 2014). Similarly, open channels and easy access to authorities could lead to clearer information dissemination and lower levels of panic within the public (Hughes et al., 2014; Raungratanaamporn et al., 2014; Sutton et al., 2014; Wex et al., 2014). Inter-departmental communication also allowed for a smoother running of operations during times of crisis (Bingham et al., 2015; Hou & Xiao, 2015; McAdam, 2014; Osgood et al., 2015).

Being proactive rather than reactive also helped in how community readiness depended on communication. This finding corresponded with the literature, as government departments that were in constant communication with their communities and each other could create a bond of trust with the community and clear inter-departmental and cross-state collaboration (Akgün et al., 2015; Corder, 2014; Cutter et al., 2008; Davis et al., 2014; Drennan et al., 2015; Kapucu et al., 2009; McAdam, 2014;

Norris et al., 2008). When communities knew their disaster management departments and could see these departments working together, it allowed for better and more willing cooperation and collaboration from the community during times of crisis (Davis et al., 2014; Raungratanaamporn et al., 2014).

However, for successful disaster management to occur, one should place plans, procedures, and policies for dealing with inevitable crises before a disaster happens (Drennan et al., 2015). This finding correlated with how one study participant explained that being proactive involved practicing disaster scenarios on a day-to-day basis, another participant shared how their agency prepared for emergencies through anticipating worst case scenarios, and how still another participant believed that despite disaster management personnel not being able to be fully prepared for all emergencies, disaster management personnel could gain the mindset to be properly prepared to respond to emergencies in general. These study results supported the literature because being more proactive would enable disaster managers to adopt more effective and focused decision making, as well as risk assessment and management approaches, when attempting to include the vulnerable and marginalized into response policies and processes (Matyas & Pelling, 2014). Practicing and imagining worst case scenarios, while considering all members of the community, including the vulnerable, would enable disaster management personnel to be better prepared when an actual disaster occurred. Community resilience was reliant on not only communities' own approaches to disaster management, but also on the creative, purposeful, and continuous attempts at the government level to uplift all members of society (Thornley et al., 2015).

Collaboration Among Stakeholders

The fourth theme that emerged, regarding how community readiness for natural disasters was dependent on communication, was collaboration among stakeholders. The majority of the participants believed that collaboration among stakeholders improved communication and community readiness for disaster. This result correlated with the literature. For example, Thornley et al. (2015) also found that effective and well-established community and cultural organizations and leaders greatly assisted in improving community resilience. Additionally, Chang et al. (2014) called for proper communication between civil and political stakeholders. Collaboration among stakeholders showed the importance of communication to community readiness, as stakeholders from the police force, fire station, search and rescue, and other disaster management personnel learned how to work together effectively in case of emergencies. This result added to the literature. According to Bryson and Crosby (2015), it was not enough for leaders of hospitals, police, and fire departments to have their own clear protocols for dealing with a crisis, every department should be equally aware of the others' roles and procedures to find ways of supplementing and aiding these endeavors.

As with being proactive rather than reactive, collaboration among stakeholders must occur before a disaster. This result reinforced the literature. A collaborative, proactive approach to disaster response between stakeholders allowed for community and NGO's participation in policy and process creation that could not occur during a crisis (Chan, 2014; Li et al., 2014). Instead, proper policy, procedure, and communal

involvement required preparation and establishing such during noncrisis times (Cutter et al., 2008; Schwab et al., 2017).

The majority of the interviewed participants believed collaboration among the stakeholders was not only limited to stakeholders in their county, but also in nearby counties. One participant shared that joint plans for emergencies were made by several jurisdictions. Participants also mentioned automatic and mutual aid. The aid involved pacts from several involved counties to provide help in times of disaster. This finding would mean that not only the location involved in the disaster would need to be prepared, but areas close by would also need to be ready to assist the neighboring affected locations. These results correlated with the literature. For example, improved communication between different sectors of society could create resilience (Cutter et al., 2013; Iacoviello & Charney, 2014; Swanson et al., 2016).

Proper Emergency Management System

The fifth theme that emerged, regarding which specific methods of communication law enforcement officials should use to most effectively interface with the public, was a proper emergency management system. The majority of participants believed having a specific person or a specific organization handle specific situations might help in establishing a proper emergency management system and improve communication in general. This result added to the literature because responders had access to information regarding who was responsible for which response, what kinds of resources were available to them, and where the greatest need for response would be, thereby improving their decision making and collaboration (Li et al., 2014). Another

example from the literature, which this result supported, was from Gregory (2015) and Othman et al. (2014). The authors suggested that by maintaining a generally stable response strategy across varying disasters, community members and officials would have less confusion as to who, where, and how to respond (Gregory, 2015; Othman et al., 2014). To illustrate, if the police department knew they were responsible for general evacuation, and the fire department knew they were responsible for retrieval of disabled individuals during an evacuation, a far more streamlined and larger evacuation could occur. This example was supported by Bingham et al. (2015). The researchers stated that the need for collaboration across departments implied a need for clear and definitive leadership, where individual departments, as well as cross-departmental officials, all understood where to go for directives in different situations. Participants reiterated the significance of following the chain of command for more effective communication and to establish a system.

Moreover, in establishing an effective emergency management system and communication, some participants believed in the importance of considering the demographics of the county. One participant expressed that in rural areas, residents tended to have tools like chainsaws in their homes. The tools might be useful in times of emergency. However, in urban areas, residents tended to rely on the actions of the local government. These results added to the literature in regards to knowing the demographics of an area, which could be useful to responders having access to information regarding what kinds of resources were available to them, thereby improving their decision making and collaboration (Li et al., 2014).

Another participant considered the large Hispanic population in the area. The participant considered issues, such as illegal residency, which led some Hispanics to be afraid to sign up for systems tracking. The participant also saw language barrier as an issue in disseminating information. This finding added to the literature regarding cultures' reactions to disasters. According to Krüger et al. (2015), cultures that were more aware of risk would likely be more apt at preparing for and dealing with disasters, while cultures that were less aware of or apathetic toward disasters would put less emphasis on disaster management.

Avoiding Miscommunications

The sixth theme that emerged, regarding which specific methods of communication law enforcement officials should use to most effectively interface with the public, was avoiding miscommunications. The majority of the participants believed the effectiveness of communication might be hindered by miscommunications. This result reinforced the literature. Starbird et al. (2014) found that it was far harder to correct misinformation spread on social media than it was to ensure correct, substantiated, and authoritative information in the first place. If the public could verify that the social media accounts of departments were the actual/real accounts, and when they could compare the information on these sites related to confirmed legitimate media sources, such as established newspaper or television news agencies, more effective communication could be achieved (Alexander, 2014; Houston et al., 2015). Avoiding miscommunications would assist law enforcement officials to interface with the public most effectively.

Miscommunication often happened due to poor information dissemination, reassignment or turnover, misinformation, and getting specific and relevant information.

In addition, the majority of participants believed that miscommunication could be avoided by having the same communication tools and establishing communication among the responders. One participant believed that using a digital trunking radio system instead of a third party dispatcher, improved the communication in the fire department; communication was possible between fire departments and improved the communication between the law enforcement officers in the two counties. This result contradicted the literature from Hughes et al. (2014), who claimed that there was a noted problem of a lack of clear communication channels between communities and law enforcement regarding disaster preparation, readiness, and management.

Another participant emphasized there were currently too many means of communication, which might be the cause of miscommunication. This result both supported Hughes et al. (2014) and added to the literature. According to Alexander (2014), falsification and rumor-mongering could occur due to there being no limitation on or regulation of information presented on social media.

Limitations of the Study

This study provided valuable in-depth data outlining the lived experiences of experienced, active, disaster management officials within the chosen county in Virginia. The study does, however, have some limitations. This study was limited to a single county and experienced disaster management officials which offered a limited pool of possible participants, the number of participants was therefore small. Some caution needs

to be exercised when transferring results to other similar counties as the communication networks in the counties may differ. Demographics of participants directly influence the nature of the lived experiences recorded. Eleven of the participants were between 30—45 years old, three participants were older than 45 years, and only one participant was younger than 30 years. The focus of this study was the lived experiences of experienced disaster workers, it could therefore be expected that more participants would fall in the age group older than 45 years. In addition, only one female participated in the study which then skewed the results in terms of gender. This study did not include homeland security experts or members of the general public, apart from active members, which could impact the findings. The latter was not part of the focus of the study, but inclusion of homeland security experts could add to the in-depth experiences of the disaster management officials.

Recommendations

The theory of community resilience was enhanced because of this study by one having a better understanding of how communication plays into readiness and resilience (Norris et al., 2008). Focusing on a single community, such as studied county, underscored the importance of developing an infrastructure and planning for communication to enhance homeland security tactics. At stake in this study was more than just a theory; the results of the study could lead to developments to improve relations within communities and save lives in the event of a natural disaster. The knowledge acquired through a better understanding of communication techniques between

law enforcement and local communities could be expanded to different fields, such as communications research and security studies.

More research into available communication education programs for law enforcement and other emergency response personnel is still needed, particularly regarding which courses and or workshops are the most beneficial and ways of standardizing communication education for all departments. More research is also needed into what kinds of scholastic and community programs and curriculum are currently available for educating the public regarding disaster management (Johnson et al., 2014).

Implications

The implication of the results was improved readiness in communities, such as the studied, and improved communication channels between law officials and the public. This study was significant because I addressed how the flow of information between state officials and local residents could improve community resilience and readiness for natural disasters. The results of the study provided a more comprehensive understanding of the benefits of improving the channels of communication between law enforcement officials and the general public within a local community. Specifically, the advantages of various methods or techniques for communication, including social media, television, radio, or word-of-mouth, were weighed against one another to determine the most effective method of communicating. This aspect was important because it helped law enforcement officials organize the community and minimize damage in the event of a natural disaster.

The results of the study were significant to professional practice because local government officials or law enforcement leaders should have a better understanding of how the flow of information could ease their job of planning and preparing for natural disasters. A better understanding of the ways information traveled between officials and members of the public was an important safety issue because a decrease in panic and increased awareness throughout communities could lead to improved social cohesion and disaster readiness (Hughes et al., 2014). Through improved understanding of this issue, officials might use new modes of communication when interfacing with the public. To reiterate an important aspect of communication improving readiness, training children and adolescents about what to expect and what actions to take during a disaster could significantly lower their risks of injury or death (Johnson et al., 2014).

Conclusion

The purpose of this qualitative phenomenological study was to explore how community readiness for natural disasters could be improved by creating effective communication channels between local authorities and the general public. Six themes emerged from the data: (a) involve the public, (b) make public information available, (c) be more proactive than reactive, (d) increase collaboration among stakeholders, (e) determine a proper emergency management system, and (f) avoid miscommunications.

Involving the public would help improve communication of law enforcement officials with the general public. Public education regarding what to do in the event of emergencies would be helpful in improving communication. Standards and policies were also considered helpful in improving communication. The availability of public

information showed how community readiness depended on communication through using public documents, broadcasts and advisories, and a public alert system. Being proactive allowed law enforcement officers and firefighters to practice effective actions. Practicing was believed to help disaster management personnel have the proper mindset in responding to emergencies. Collaboration among stakeholders showed how communication was vital to community readiness, as stakeholders from the police force, fire station, search and rescue, and other disaster management personnel learned the strengths of other departments in working together in case of emergencies. A proper emergency management system involved having a specific person or specific organization tasked to handle certain tasks with a proper chain of command to decrease confusion. Learning the demographics of the involved area might also facilitate the understanding of the strengths and weaknesses of that area.

Avoiding miscommunications was vital. Therefore, one should avoid miscommunications, establish communication among responders, and have the same communication tools. Standardizing and streamlining communication was key to improving effective communication channels between local authorities and the general public in the event of an emergency; it could reduce risks of potential harm and save lives.

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Appendix A: Survey Questions

Demographic and Other Information

Have you read, signed, and returned (via e-mail) this study's informed consent form? (please select): **Y/N**

Name & Surname:

Position/Employment:

Years in Disaster Management: **10-15; 16-25; more than 25 years**

Gender (please select): **M/F**

Would you like to take part in the follow-up interview? (please select): **Y/N**

Survey Questions

1. What policies does your law enforcement department/business/community initiative have for dealing with natural disasters? Please list.
2. How ready do you believe your law enforcement department/business/community initiative is for when a natural disaster occurs? Why?
3. What policies and procedures do you think could be improved or added to better prepare your department/business/community initiative for natural disasters?

Please answer the following if you are in LAW ENFORCEMENT

4. What communication strategies and procedures does your department currently use to communicate to the public about natural disasters?

5. Which of these communication strategies and procedures do you deem most effective?
6. Which of these communication strategies and procedures do you deem ineffective?
7. What other communication methods or approaches do you believe could be implemented to improve communication regarding natural disasters to the public?
8. What role does inter-departmental or cross-sector (e.g., weather bureau to emergency services) communication play in the efficacy of your department's communication to the public?
 - a. How can such communication be improved?
9. What role does community communication to your department play in the efficacy of your department being able to prepare for or assist in managing natural disaster crises?
 - a. How can such communication be improved?

Please answer the following if you are in COMMUNITY LEADERSHIP (e.g., a local business owner, local community disaster management representative etc.)

10. What communication strategies and procedures does your business/community initiative currently use to communicate to the public and or your employees about natural disasters?

11. Which of these communication strategies and procedures do you deem most effective?
12. Which of these communication strategies and procedures do you deem ineffective?
13. What other communication methods or approaches do you believe could be implemented in your business/community initiative to improve communication regarding natural disasters to the public and or your employees?
14. How effective do you find current law enforcement communication in relation to natural disasters?
15. In ways do you believe law enforcement could improve communication to local businesses/community initiatives and the general public regarding natural disasters?
16. How could improved law enforcement communication improve the public's readiness for when a natural disaster occurs?

If you wish to review your answers, please return to the relevant question(s). If you are happy with your answers, please save and exit the survey. Thank you for your participation.

Appendix B: Interview Protocol

Introduction

Hi, I am Amanda Myers. Thank you for taking part in my study survey and for being willing to take part in this interview. During analysis of your survey, you were given a pseudonym to protect your identity. Your pseudonym is:

[Provide pseudonym]

Please remember this for the duration of the interview, as I will be referring to you as such. I am now going to switch on the audio-recorder.

[Turn on audio-recorder]

Again, welcome to the interview. Please state for the record that you have read, signed, and returned (via e-mail) your informed consent form to me.

[Participant response]

Thank you. I will now briefly revise your rights as per what was contained in your informed consent form. Please indicate your agreement and understanding when asked to do so.

Your participation in this study is completely voluntary and you may choose to exit the study at any time. You may ask to have the recording stopped or paused at any time. You may be excused for a bathroom/coffee/smoke or any other break during the course of the interview. The interview will take approximately 60 minutes. You will be asked to review your interview transcript and have the right to keep a copy for your records. I will do everything in my power to keep your identity confidential through storing hard and digital data securely and no identifying information (such as your name or job title) will appear in any published work related to this study. You can ask any questions or clarify points whenever necessary during the interview. If, after the interview, you remember or wish to address additional information/areas for discussion, you may e-mail me your answers, or we can arrange for a second interview session. A more comprehensive outline of your rights and responsibilities, as well as mine have been provided to you in your signed informed consent form. Do you understand and accept your rights as presented here and in the informed consent form?

[Participant response]

Thank you. We will now begin the interview.

Questions

1. Please state the pseudonym given to you for the record.
2. Please state your job title and how many years you have worked in disaster management. Please state specifically your role related to managing or preparing for natural disasters.

3. How have you and or your place of employment attempted to preempt natural disasters and their potential consequences?
4. What kinds of polices and approaches have been put in place that you have found worked effectively?
 - a. Please provide an example or two of how and why these policies and approaches were effective.
5. What kinds of policies and approaches did you believe would work, but turned out not to be as effective as anticipated?
 - a. Please provide an example or two of how and why these policies and approaches were not effective.
6. How important do you think communication between law enforcement and the community is in preventing, preparing for, or better responding to natural disasters?
7. How has miscommunication between these two negatively impacted preparation and or response in the past?
 - a. How might such miscommunication be avoided in the future?
8. What avenues for communication could be explored or utilized more effectively in the future?
 - a. Why do you suggest these specifically?
9. Looking back at a time when you/your place of employment had to deal with a natural disaster, what worked, and what would you do differently? Why?
 - a. How might better communication between law enforcement and you/your place of employment have improved the situation/response time etc.?
10. Is there anything you still wish to discuss that has not already been dealt with?

End

Thank you again for your participation. Again, if you wish to discuss anything further, or have any queries or concerns, you are welcome to e-mail me. I am now going to switch off the audio-recorder.

[Turn off audio-recorder]

[End interview]