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Experiences of Community Leaders Following an Enhanced Fujita 5 Tornado

Thomas Edward Orr
Walden University

Walden University

College of Social and Behavioral Sciences

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Thomas Orr

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Review Committee
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Dr. Barbara DeVelasco, Committee Member, Psychology Faculty
Dr. Thomas Edman, University Reviewer, Psychology Faculty

Chief Academic Officer
Eric Riedel, Ph.D.

Walden University
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Abstract

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MSEd, Northern State University, 1978

BA, Colorado Christian University, 1976

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

General Psychology

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Abstract

Many U.S. communities experience tornadoes each year, causing a significant number of deaths and injuries. Proper community preparation and response can help reduce human suffering and psychological trauma that occur following a tornado. However, according to the National Institute of Standards and Technology most U.S. communities in tornado-prone areas are unprepared for a violent tornado, and there are few national, state, or local tornado-related definitions, standard or code to guide preparations. Social constructionism was the underlying theory of this qualitative study. The purpose of this study was to improve tornado preparations by examining the experiences of community leaders following a rare category 5 tornado occurring in Joplin, Missouri in 2011. The key research question considered the experiences of Joplin community leaders following the tornado. Twelve community leaders, 4 females and 8 males participated in individual face-to-face interviews, and were asked about preparations, emergency responses, trauma services and rebuilding. Giorgi's descriptive phenomenological method was used to analyze data. Findings include specific recommendations to improve community preparation, emergency response, trauma service and rebuilding. Community leaders experienced difficulty in coordinating appropriate resources to meet individual victim needs. They described ways in which the community was unprepared and changes that could be made in the future. This study may contribute to positive social change by providing communities with knowledge about tornado preparation and response to improve networks, reduce fatalities, injuries, trauma effects, and property damage in tornado prone areas.

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Dedication

I dedicate this study to the Joplin, Missouri community leaders who shouldered the responsibility of recovering from the May 22, 2011 EF5 tornado. You led the city through immense pain and directed a tremendous rebuilding of the entire community. Joplin is a city with great heart, soul, and faith. The community shines brightly today thanks to the leaders who stepped forward from the darkness to guide a city that always retained hope.

In addition, I want to dedicate this work to my mother who taught me to always believe in myself. Also, to my children and grandchildren, remember to count the cost before committing to a new challenge, but once you begin that challenge, remain determined to finish.

Acknowledgments

To my wife who always offered help when needed, despite having her hands full with her own dissertation.

To Dr. Ruth Crocker who patiently guided me through the entire dissertation process with great skill and wisdom. I will always be grateful for the quality time you offered to me and my classmates. Thank you.

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Chapter 1: Introduction to the Study

Introduction

According to the International Federation of Red Cross (IFRC, 2015), a disaster is a sudden, calamitous event that seriously disrupts the functioning of a community or society and causes human, material, economic, or environmental losses that exceed a community's or society's ability to cope using its own resources. Tornadoes are violent windstorms occurring overland and characterized by a long funnel cloud made visible by condensation and debris. These destructive storms strike nearly 1,200 U.S. communities each year (National Oceanic and Atmospheric Administration (NOAA, 2009).Significant human suffering caused by death, injuries, loss of home, loss of personal keepsakes and memories lead to psychological trauma following a tornado(Adams et al., 2014; Fujikawa, 2013; Houston et al., 2015; Prevatt et al., 2012).

After a tornado, community leaders, persons responsible for responding and directing the community following such an event, must help provide basic emergency services such as food, clothing, and shelter to residents (Fujikawa, 2013; Kuligowski et al., 2014; Prevatt et al., 2013).They then must establish emergency response plans, address trauma treatment for survivors, and decide how to rebuild their communities (Kuligowski et al., 2014; Prevatt et al., 2013). However, few national, state, or local, tornado related definitions, standards, and codes are available to help communities prepare for, or respond to tornadoes (Ablah, Konda, & Kelly, 2009; Fujikawa, 2013; Kuligowski, Lombardo, Phan, Levitan, & Jorgensen, 2014; Prevatt et al., 2012; Yamashita, 2012). A spokesman for the National Institute of Standards and Technology

stated in a November, 2011 that the institute had standards for earthquakes, hurricanes, and floods but not for tornadoes (Kennedy, 2011).

In this study I examined the experiences of Joplin community leaders following the Enhanced Fujita 5 tornado (EF5) that struck the city on May 22, 2011.Thetornado set records for tornado-related death and destruction. One key issue that community leaders had to address was trauma among residents. According to the National Weather Service (NWS) Joplin residents experienced significant trauma through the loss of loved ones, homes, schools, jobs, and social status; others were exposed to trauma because of disability resulting from the disaster (NWS, 2011). Over half of the community's schools were affected; six were destroyed while four were badly damaged (Kuligowski et al., 2014)The National Center for Biotechnology Information (NCBI) conducted cross-sectional assessments at 6 months and 2.5 years post event in Joplin. The first survey given at6 months post event showed that the probable prevalence of posttraumatic stress disorder (PTSD) among residents was 12.63%. The second survey given after 2.5 years found probable PTSD prevalence was 26.74%. These findings illustrate the long term psychological effects that are often experienced by tornado survivors (Houston et al., 2015).

I wanted to provide insight about what steps leaders can take to reduce trauma in their communities. Researchers have found that proper community preparation and response may reduce trauma among survivors (Ablah, Konda & Kelly, 2009, Dennison, McKernan, Cryan, & Dinan, 2012; 2014; Melton & Sianko, 2010; Stough & Mayhorn, 2013).Significant disruptions producing psychological effects occurred following the

Joplin tornado due to structural failure in several Joplin schools (Houston et al., 2015; Kuligowski et al., 2014). More than 4,200 students were without schools to attend after the tornado (Kuligowski et al., 2014). The tornado occurred on a Sunday following graduation ceremonies, and many still wonder what would have been the impact if schools had been in session. When schools reopened in the fall, more than 3,200 students attended temporary locations, such as the Joplin mall (Kuligowski et al., 2014).The significant social and psychological impact upon students may merit long term research (Houston et al., 2015; Joplin Schools, 2016).

My goal was not to establish guidelines for communities to follow. Rather, I sought to illuminate the experiences, problems, and solutions community leaders encountered in attempting to rebuild following a tornado. Understanding the steps taken by Joplin community leaders in the aftermath of the tornado may help other communities improve tornado preparation and response and prevent or mitigate the social disruptions and negative psychological effects stemming from these natural disasters (Fujikawa, 2013; Houston et al., 2015, Kuligowski et al., 2014). In addition, studying the Joplin tornado provides a rare opportunity for tornado researchers. According to the Storm Prevention Center (SPC) there have only been 59 EF5 tornadoes since 1950, and most did not occur in a significantly populated area such as Joplin (SPC, 2012).

In this chapter, I provided background information, clarified my research problem, explained my study purpose, and presented my research questions. Additionally, the conceptual framework of the study, nature of the study, definitions,

assumptions, delimitations, limitations, significance, and a summary of the study are provided.

Background

The negative economic, social, and psychological effects of tornadoes are an important concern in the United States (Adams et al., 2014; Choi & Coffey, 2011; Fujikawa, 2013; Houston et al., 2015; Kuligowski et al., 2014; Lloyd's, 2013; Prevatt et al., 2012; Smith & Katz, 2013). Often, natural disasters such as tornadoes have a greater negative impact on vulnerable populations such as children, older adults, and individuals who are mentally ill and have disabilities (Dennison, McKernan, Cryan, & Dinan, 2012; Kuligowski, et al., 2014; Melton & Sianko, 2010; Stough & Mayhorn, 2013). However, according to the National Institute of Standards and Technology (NIST), while the U.S. government provides national guidelines and protections regarding hurricanes, floods, and earthquakes, at that time it did not do so for tornadoes (Kuligowski et al., 2014). Additionally, according to some researchers, the federal government response to disasters (e.g., to Hurricane Katrina) is often inadequate citing failed communications, unclear priorities, and not addressing long term mental health needs(Melton & Sianko, 2010; Smith & Sutter, 2013).

Based on findings from its study of the Joplin tornado, NIST (2014) produced 16 recommendations to establish national tornado standards. The first of these recommendations, which was adopted in December 2015 by the International Code Council (ICC), includes stronger standards for school construction (Newman, 2015).The newly adopted codes will apply to schools in tornado-prone areas and are scheduled to be

published by the ICC in 2018 (Newman, 2015). Adopting the first recommendation is a positive step, but the remaining recommendations are in a lengthy process of consideration. Which recommendations, if any, will be adopted nationally is uncertain (Newman, 2015).Although NIST has significant influence on disaster related standards, it is a not a regulatory institute of the U.S. federal government (Kuligowski et al., 2014). State and local governments, as well as individuals and businesses, may follow these recommendations if they regard them as beneficial, but they are not required to do so.

It is important that adequate preparation takes place before a tornado occurs in a community as there is often little warning time before a tornado strikes (NOAA, 2009). According to many experts, preparedness by the public is inadequate (Ablah, Konda, & Kelly, 2009; Fujikawa, 2013; Kuligowski et al., 2014; Prevatt et al., 2012). The lack of preparedness often stems from individual's low perception of risk. Many residents delay preparation because they perceive the probability of a tornado affecting their community as low (Fujikawa, 2013; Kuligowski et al., 2014; NWS, 2011).

The majority of Joplin residents did not immediately take protective action after hearing a warning siren (NWS, 2011).The NIST conducted 168 interviews with survivors of the storm, including individuals, community officials, and business owners. In the final report, NIST researchers provide recommendations regarding warning systems. They also acknowledge that, at present, there are no national standards regarding warning systems (Kuligowski et al., 2014). The NIST recommendations are important, but they do not have the force of law. Most have yet to be adopted by codifying bodies such as ICC

(Newman, 2015).It is not certain which of any of the remaining recommendations will be adopted and translated into regulatory codes, thus having the force of law.

Authors of the NIST study noted that warning sirens systems varied throughout areas. Differences in siren warning systems included length of sustained sounding, multiple meanings of warnings, and times between intervals of siren activation. Reasons for activation varied and included information from the National Weather Service, trained tornado spotters, local emergency teams, and fire and police and decisions by local officials (Kuligowski et al., 2014). Many visitors during the tornado were confused and did not understand how to interpret the local siren system (Kuligowski et al., 2014). Researchers who interviewed residents found that many were accustomed to living in a tornado-prone area and felt that the chances of the community being struck by a tornado were very small. This perception was reinforced by the false alarm rate. False alarms were recognized as occurring when sirens were sounded and spotters observed tornado circulation, but a tornado did not land on the ground and cause destruction. The false alarm rate for NWS warnings for the city of Joplin increased to 92 % during the period of 2007-2011 (Kuligowski et al., 2014).

At present, there is a gap between perceived and actual preparedness by individuals, households, communities, and local, state, and federal government (Ablah, Konda, & Kelly, 2009; Fujikawa, 2013; Kuligowski et al., 2014; NWS, 2011). This low perception of risk affects community action concerning tornado preparation and response. Numerous researchers have linked disasters to physical, social, and mental health problems which may be short term or long term (Adams et al., 2014; Houston et al.,

2015; IFRC, 2015; Prevatt el al., 2012; Zimmerman, 2015). More research however is needed to help expand the knowledge base regarding the impact of violent tornadoes and how to effectively prepare and respond to such an event. Communities may benefit from having more knowledge about how to reduce fatalities, injuries, property damage, trauma, and other negative social and psychological effects resulting from tornadoes. The Joplin tornado was the most significant tornado event to occur in the U.S. since modern record keeping began in 1950 (Kuligowski et al., 2014). The tornado event presented an opportunity to examine the widest possible range of negative impacts caused by tornadoes. This particular case also allowed me to gain insight about the steps that community leaders took to mitigate these impacts and rebuild their community.

Problem Statement

The problem is that significant human suffering and psychological trauma occurs following a tornado and this trauma needs to be reduced by proper community preparation and response. However, few national, state, or local definitions, standards, and codes are available to help communities prepare for tornadoes or respond to them (Fujikawa, 2013; Kuligowski et al., 2014; Prevatt et al., 2012). The National Weather Service considers EF4 and EF5 tornadoes as violent, comprising 2% of all tornadoes, but accounting for 70% of tornado deaths annually (NWS, 2012). The relative infrequency of violent tornadoes affects a community's perception of risk and reduces their belief that a violent tornado will actually strike them (Kuligowski et al., 2014; NWS, 2012).

The role of local, state, and federal government in relation to preparation and response is significant. Leadership, especially by the federal government, is a vital

component in terms of equipping a community to effectively prepare for and respond to a natural disaster (Melton & Sianko, 2010). Unfortunately, there are few national definitions, standards, and codes concerning tornado preparation and response that community leaders can rely upon for critical decision making following a violent tornado (Fujikawa, 2013; Kuligowski et al., 2014; Prevatt, et al., 2012). Critical areas considered in this study were community tornado preparation, short term and long term emergency response planning, trauma mental health services, and determining effective avenues for rebuilding communities. Many researchers have criticized the role of government at various levels for the lack of direction concerning the development of clear guidelines, definitions, and standards regarding tornadoes and contend this has led to increased death, injury, psychological trauma, and social disruption (Ablah, Konda, & Kelly, 2009; Adams et al., 2014; Fujikawa, 2013; Houston et al., 2015; Kuligowski et al., 2014; Levitan, 2013; Prevatt et al., 2012).

Several experts have contended that more social sciences research is needed to assist in the development of effective emergency response plans (Abrahamsson, Hassel, & Theler, 2010; Fujikawa, 2013; Levitan, 2013; Miehl, 2011). Additionally, other researchers contend there is a need across the nation for more research and guidance from the U.S. government concerning mental health services and trauma psychology in order to effectively deal with disaster (Berger & Quiros, 2014; Cook & Newman, 2014; Guliver, Zimering, Carpenter, Giardina & Farrar, 2014; Melton &Sianko, 2010; Yamashita, 2012). The National Institute of Standards and Technology acknowledged

that the U.S. has national standards in place to protect against, earthquakes, floods, and hurricanes, but not for tornadoes (Kuligowski et al., 2014).

As noted previously, experiencing a devastating tornado is difficult, and community leaders can find it very confusing when attempting to better prepare for a tornado, adopt new emergency response plans, provide trauma mental health services, and determine the most effective course for rebuilding the community. Decision must be made, plans must be developed, and rebuilding must begin immediately following a tornado. Community leaders do not have the luxury of waiting years for national directions to be defined or codified. They must find the best information available and decide what they will do at that time. This study considered the experiences of community leaders faced with such difficult decisions following the aftermath of a deadly tornado and may serve to enlighten other communities wishing to assess their risk and prepare for a similar catastrophe. Improved emergency response plans, trauma focused mental health services, and adoption of more tornado resistant building standards will help reduce incidences of trauma and the ensuing negative social and psychological effects (Kuligowski et al., 2014; Miehl, 2011; Prevatt et al., 2012; Smith & Sutter, 2013).

Purpose of the Study

The purpose of this study was to examine the experiences of Joplin community leaders following an EF5 tornado to improve tornado preparation and response for other communities and potentially mitigate traumatic effects. Research arising from the findings of the study may assist community leaders in deciding how to improve tornado preparation and response, emergency response plans, and trauma-related mental health

services. Findings may also help leaders identify the best approach for rebuilding structures in their communities following a devastating tornado. Findings may be useful to disaster aid and relief agencies whose workers serve communities in the wake of tornadoes.

Based on the identified problem I decided that the study should be qualitative, utilizing a phenomenological methodology. Qualitative studies are often employed when little is known about a subject and requires exploration at a basic level (Creswell, 2013). There were no other studies that specifically examined the experience of Joplin community leaders following the EF5 tornado.

The NIST has done substantial work toward establishing national tornado standards but these standards are not presently in effect. In addition, if some or all of the recommendations are adopted by communities the effectiveness of these recommendations will not have been tested in the newly designated tornado prone areas as determined by the NIST. No other studies concerning the Joplin tornado were strictly phenomenological and based on the personal experience of community leaders.

Positive social change will be achieved by adding to the body of knowledge concerning the impact of violent tornadoes on communities. This knowledge will assist communities regarding tornado preparation and response and may serve to enlighten other community leaders concerning the problems they may encountered while guiding a community through such a disaster. It is contended that the study findings will help other communities mitigate the effects of violent tornadoes by limiting property damage,

reducing associated cost, improving the quality of life, lowering the number of injuries and loss of life, reducing social disruptions, and trauma experiences.

The EF5 tornado which occurred on May 22, 2011 in Joplin, Mo. is the phenomenon of interest for this study. This rare tornado was the deadliest and most costly to occur since modern record keeping began in 1950. It is hoped this study will help achieve a better understanding of how the tornado impacted the community leaders of Joplin and by doing so contribute to the preparedness of other communities facing a similar situation. An effort was made to capture the essence of their described experiences of responsible community leaders following this phenomenon through using open ended questions. Participants described how the tornado affected their decision making regarding obstacles encountered and solutions that emerged. In addition, community leaders detailed their thoughts, feelings, and experiences concerning addressing emergency response plans, trauma related mental health services, and rebuilding the community.

Research Questions

The primary research question for this study was as follows: How did community leaders in Joplin, Missouri perceive efforts to improve community preparedness, emergency response plans, trauma mental health treatment, and the rebuilding of community structures following the 2011 EF5 tornado? The subquestions were as follows:

RQ1. According to Joplin community leaders, what obstacles, opportunities, and solutions resulted from the tornado?

RQ2. Have participants' understanding and perceptions of tornado preparedness, emergency response plans, trauma mental health services, and the rebuilding of community structures changed? If so, how have perceptions changed?

Conceptual Framework

Social constructionism (hereafter constructionism) is the theory that formed the basis for the conceptual framework of this study. It is important to distinguish constructionism from constructivism as the two are often confused. Constructivism is focused exclusively on the meaning making activity of the individual mind. Constructionism emphasizes the influence that culture has upon individuals and thus shapes the way individuals view things, and even feel things (Patton, 2002).

The exact origin of constructionism is in dispute among scholars (Andrews, 2012). The conceptual framework for this study was largely based on the work of Berger and Luckmann (1967) *The Social Construction of Reality*. However, some researchers believe their work was substantially influenced by several historical thinkers and the theory remains in an evolutionary process (Andrews, 2012). Other scholars argue that the fundamental tenets of constructionism can be found in the writings of Vico's*The New Science* which was first published in 1725 (Costelloe, 2014).

Constructionism and its major propositions are concerned with the nature of knowledge, and the process of knowledge creation through interactions within society. According to this theory society exists in both objective and subjective reality where frequently repeated actions are cast into patterns, requiring little effort for reproduction (Andrews, 2012). Individuals develop a number of varied meanings and seek out

complexities of views rather than narrow meanings or ideas. Meaning is then forged through discussion and interactions with others. In this process knowledge, concepts, and beliefs become woven into society and reality is socially constructed (Berger & Luckmann, 1967). A more detailed explanation of the conceptual framework was presented in chapter two.

The theory of constructionism is appropriate for this study as it was focused on the individual perceptions of community leaders as they contemplated their experiences following an EF5 tornado. Qualitative research relies heavily on open-ended questions such as those used in this study. Open-ended questions that were used helped to better understand the experiences and perceptions of participants and enhanced insights concerning community leaders in real life situations (Creswell, 2009). In addition, qualitative research promotes awareness as to what a participant experienced and how they understood the phenomenon (Moustakas, 1994). Constructionism contends that we learn from discussions and interactions with others. However, it is important that questions are designed in a way as to not influence the participant's descriptions of their experiences or perceptions concerning the event being studied.

The phenomenon of interest is an EF5 tornado which occurred on May 22, 2011 in Joplin, Mo. causing 2.8 billion dollars in damage and killing 161 persons. This tornado is important for research because the U.S. averages 1,200 tornadoes each year but only 59 EF5 tornadoes have been documented since modern tornado record keeping began in 1950 and most of these were not in significantly populated areas (SPC, 2012).Constructionism serves as the worldview or lens whereby this study may be

understood and inform the parts of the proposal (Creswell, 2009). It was thought that culture influenced each participant differently and shaped how they viewed the phenomenon and how it has affected their feelings following the experience (Patton, 2002). More detailed information concerning the conceptual framework was presented in chapter two.

Nature of the Study

The nature of this study was qualitative utilizing a phenomenological methodology. A qualitative approach was chosen because of the usefulness of qualitative research as an exploratory approach (Creswell, 2013; Giorgi, 2014). Phenomenology was chosen for its usefulness as a tool for exploring the experience of individuals (Creswell, 2013; Giorgi, 2009). However, understanding obstacles and solutions encountered by community leaders who experienced this devastating tornado will provide new insights and guidance for other communities.

This study focused on an EF5 tornado which occurred on May 22, 2011 in Joplin, Mo., on the impact of this tornado, the aftermath, and how the rebuilding process affected Joplin community leaders. Much of the rebuilding in Joplin has been accomplished including a new hospital which opened in March of 2015 (Rubenfire, 2015).

Giorgi's (2009) modified Husserlian methodology was followed during data analysis. Sampling was purposeful and derived from a variety of Joplin community leaders who represented different community organizations affected by the tornado. Community or area organizations were contacted from various types that included business, clergy, government, law enforcement, medical, schools, charities, and

emergency services. This heterogeneous group comprised a sample size of 12 participants when saturation occurred (Creswell, 2013). One semi-structured interview lasting about an hour was recorded and transcribed with each participant. The researcher functioned as the instrument, presenting participants with open-ended questions for response. The researcher kept a self-reflective journal to enhance trustworthiness. Member checking with participants was utilized at an agreed upon time following the interview. All participants signed necessary release and confidentiality forms. Chapter three presented a more detailed discussion concerning the nature of the study.

Definitions

Building codes: City, county, and state laws that apply to buildings. In drafting such codes, lawmakers use a mandatory language, which makes them enforceable under specific statutory language (Green, 2004).

Building standards: Rules or comparison criteria in the construction industry for addressing quality of materials, installation methods, classification, and design criteria (Green, 2004).

Community leader: A person recognized and empowered by an organization to make decisions; speak on its behalf; direct others; delegate tasks; and provide information. Organization members may turn to this leader for guidance in times of crisis (Helmrich, 2016).

Disaster: A sudden, calamitous event that seriously disrupts the function of a community or society and causes human, material, and economic or environmental losses

that exceed the community's or society's ability to cope using its own resources (IFRC, 2015).

Emergency Response: The organizing, coordinating, and directing of available resources in order to respond to the event and bring the emergency under control. The goal of the coordinated response is to protect public health by minimizing the impact of the event on the community and environment (National Institute of Environmental Health Sciences, 2014).

Enhanced Fujita Scale: A damage scale for rating tornadoes EF0 through EF5, replacing the original Fujita scale. It is considered a more precise, robust way to assess tornado damage. Meteorologists and engineers calibrate damage to structures across 28 different types of damage indicators (SPC, 2014).

Natural Disaster: Naturally occurring physical phenomena caused either by rapid or slow onset events which can be geophysical (earthquakes, landslides, tsunamis and volcanic activity), hydrological (avalanches and floods), climatological (extreme temperatures, drought, and wildfires), or biological (disease epidemics and insect or animal plagues) (IFRC, 2015).

Trauma Psychology: The fields that examine people who have experienced a trauma in an effort to find ways to help them better cope with what happened to them or what they have witnessed (Psychology School Guide, 2015).

Assumptions

A primary assumption of this study was that tornadoes are a concern for a broad section of the population because of the devastation they can inflict and that a reduction

in this devastation is desired. Another assumption was that insights drawn from Joplin community leaders will be of benefit to communities that experience a destructive tornado or communities that want to prepare for such an event. It was also assumed that the views and perceptions concerning tornadoes that were held by community leaders had changed or evolved since the tornado occurred and that memories of the events were reliable nearly five years since the tornado event. The final assumption was that participants provided truthful, accurate, and unbiased reconstructions of their experiences (Moustakas, 1994). This assumption relates to the trustworthiness of the study and efforts to assure trustworthiness. These issues were detailed more completely in chapter three.

Scope and Delimitations

There are certain boundaries to be identified for this study. The study included persons of both sexes. It excluded persons from locations other than the Joplin area that were struck by tornadoes, and excluded persons in Joplin who were not considered community leaders. It also excluded those who were not fluent in English. Participants all had their leadership roles affected by the EF5 tornado which occurred on May 22, 2011 in the city of Joplin. As part of contacting organizations the degree of impact the tornado had on the organization and leadership was considered. All participation was voluntary; persons under 21 years of age were excluded. Participants were often professionals and either lived, worked, or volunteered within the Joplin community or area. The researcher functioned as an instrument for the study, using recorded interviews, and keeping a reflexive journal to document his experiences and those of participants during interviews. Member checking was utilized where participants reviewed their interview analysis and

provided input concerning the psychological descriptions. Each community is unique and therefore replication and generalizations were limited. However, results may be transferable if the same methodology is used with a similar population.

Limitations

Natural disasters are unpredictable and tornadoes are extremely unpredictable among natural disasters. Because of this reality baseline data is difficult to acquire. For example, there have only been 59 EF5 tornadoes since modern record keeping began in 1950 (SPC, 2012). Tornado paths vary greatly, the communities impacted are all different, and the area where a tornado may strike could be anywhere in the U.S. although primarily east of the Rocky Mountains (NOAA, 2012). Exact replication would not be possible although this methodology could be applied to other communities struck by a violent tornado. This study focused on the May 22, 2011 Joplin, Mo. EF5 tornado. It is anticipated that findings from this study may benefit other communities in tornado prone areas and help improve preparation and response and thus mitigate destruction and negative trauma related effects. There were specific steps taken to help assure trustworthiness which are detailed in chapter three such as audio recorded interviews with participants, journaling, and member checking. Participant bias was also a limitation of the study as participant views may have varied significantly from other individuals residing in the community. Limitations were recognized in this section and are acknowledged throughout this proposal. An honest effort was made to inform the reader of limitations and to frame this proposal within a proper context.

Significance

Natural disasters are an immense concern for the U.S in terms of fatalities, injuries, social disruptions, and physical damage. Natural disasters have cost the U.S. over 1 trillion dollars since 1980, representing a significant drain on the economy (NOAA, 2015a). Hurricane Katrina in 2005 cost about 105 billion dollars, resulting in 1,833 deaths, and was a more devastating disaster than the Joplin tornado (NOAA, 2015a). However, this hurricane has been significantly studied and additionally, hurricane standards currently exist nationally. In fact, Florida state standards preempt any local standards and many regard them as the strictest in the nation (Dixon, 2009; Kuligowski et al., 2014). Despite the enormity of hurricanes such as Katrina, the cost of hurricanes is now being approached by the cost of tornadoes and tornadoes kill more people on average according to long term studies (Lloyd's, 2013). The U.S. averages 1,200 tornadoes each year as compared to an average 17.7 hurricanes each decade (NOAA, 2015a).

Despite the growing concern regarding tornadoes there is a lack of nationally accepted guidelines, definitions, and standards regarding tornado preparedness and response. As an example the U.S. has national standards to protect against earthquakes, hurricanes, and floods, but not for tornadoes (Kuligowski et al., 2014; Prevatt et al., 2012). This problem has been touted by some researchers as a failure at various levels of government to provide guidance (Ablah, Konda, & Kelly, 2009; Fujikawa, 2013; Kuligowski et al., 2014; Melton & Sianko, 2010; Prevatt et al., 2012). This study examined the experiences of Joplin community leaders following an EF5 tornado to

improve tornado preparation and response for other communities and thus mitigate traumatic effects. Expanding the body of knowledge concerning tornado preparedness and response will assist communities in preparing for and responding to a violent tornado and thus reduce some part of the human suffering and trauma that might otherwise occur. This study provided information to assist decision makers, educators, and researchers which may result in mitigation of the harmful effects of tornadoes (Fujikawa, 2013; Kuligowski et al., 2014; Prevatt et al., 2012; Smith & Sutter, 2012; Yamashita, 2012). Effective guidance is needed at various levels of government and most importantly at the level of the federal government (Fujikawa, 2013; Kuligowski et al., 2014; Levitan, 2013; Melton & Sianko, 2010; Prevatt et al., 2012; Smith & Sutter, 2012). This will require consistent guidelines, definitions, standards, and policies from the federal government which will have an impact all the way down to local governments.

Most natural disaster cannot be prevented or often very well predicted. However, this study contended that significant mitigation of the negative effects of tornadoes can be achieved if positive actions are taken by individuals and governments at all levels. This action will result in reducing loss of life, injuries, improving emergency response plans, providing more effective trauma mental health services, and lend support for the adoption of national building standard for communities in tornado prone areas. A clear message from government will result in significant social change by improving the quality of life for communities in tornado prone areas and mitigate many negative effects that impact communities. Additionally, it will also reduce the burden placed on communities across the country in helping them prepare for and respond to a tornado. Better informed

community leaders will enhance a community's ability to effectively plan for a tornado event. This study will add to the body of knowledge available to communities in tornado prone areas. This is of particular importance for communities that desire immediate and accurate tornado information while national standards are in a slow and uncertain stage of development.

Summary

Tornadoes are now approaching the cost associated with hurricanes and yet there is little guidance from governments concerning tornadoes. The problem is that significant human suffering and psychological trauma occurs following a tornado and this trauma needs to be reduced by proper community preparation and planning. However, few national, state, or local tornado related definitions, standards, and codes are available to help communities prepare for tornadoes or to respond to them. While this qualitative study cannot establish standards and guidelines, it will indirectly contribute to them by illuminating the experiences of those responsible for rebuilding after such a disaster and thus emphasize the problems and solutions that were involved. Findings may serve as the springboard for subsequent quantitative research that may help establish the needed tornado definitions, standards, and codes. Critical areas include community tornado preparation, emergency response planning, providing mental health services related to trauma, and building standards to follow in the rebuilding process. This study will add to the body of knowledge regarding tornado preparedness and response. The examination of key issues regarding tornadoes provides information which may be of assistance to communities, decision makers, researchers, and educators.

In Chapter 2, I provided detailed information on the current literature regarding tornadoes and identified key concepts for consideration. The conceptual framework and methodology are examined and justification for this study is discussed. Key concepts are discussed in more detail within Chapter 3.

Chapter 2: Literature Review

Introduction

Natural disasters are a concern worldwide causing death and destruction for societies across the globe. According to the Centre for Research on the Epidemiology of Disasters (CRED) from1994-2013, 6873 natural disasters worldwide, causing 1.35 million deaths (on average of 68,000 each year). Earthquakes (including tsunamis) killed more people than all other types of natural disaster combined worldwide, killing 750,000 from 1994-2013 (CRED, 2015). From 2005-2014, the United States averaged 600 weather-related deaths each year, costing nearly $280 billion dollars for this time period (NWS, 2015a). Tornadoes are deadly and occur frequently. According to the NOAA, (2009), the United States averages about 1200 tornadoes every year. Tornadoes are so frequent in the United States that insurance claims are now approaching the cost associated with hurricanes (Lloyd's, 2013). However, what is often not measured concerning natural disasters including tornadoes is the impact of weather-induced trauma, the significant social and psychological effects that ensue, or the appropriate strategy to respond to differing types of trauma and traumatized special populations (Bassuk et al., 2016; Cook & Newman, 2014; North, 2010; Prevatt et al., 2012; Simiola et al., 2015; Stough & Mayhorn, 2013; Yamashita, 2012).

When a tornado occurs, there is great human suffering and psychological trauma. This trauma can be reduced through proper preparation and planning, but few national, state, or local definitions, standards, and codes are available to help communities prepare for tornadoes or to respond to them (Cook & Newman, 2014; Fujikawa, 2013; Gold,

2014; Guliver et al., 2014; Kuligowski et al., 2014; Prevatt et al., 2012; Yamashita, 2012). There is a concern among some researchers that tornado preparedness by individuals, households, and communities is dangerously inadequate *(*Ablah, Konda, & Kelly, 2009; Abrahamsson, Hassel, & Theler, 2010; Fujikawa, 2013; Kuligowski et al., 2014; Prevatt et al., 2012, Yamashita, 2012).

Community emergency response plans vary considerably across the United States and often do not address the emergency situations caused by tornadoes. Some researchers call for a systems-orientated framework to be used in community emergency response plans (Abrahamsson, Hassel, & Tehler, 2010; Subramaniam, 2014). These researchers argue that most plans are untested (Abrahamsson, Hassel, & Tehler, 2010; Subramaniam, 2014). Other researchers assert that developers of emergency response plans often do not regard special populations, thus rendering these plans sometimes ineffective (Dennison, McKernan, Cryan, & Dinan, 2012; Kuligowski et al., 2014; Melton & Sianko, 2010; Stough & Mayhorn, 2013). Examples of special populations include children, older adults, persons with disabilities, and those who do not speak English (Dennison, McKernan, Cryan, & Dinan, 2012; Stough & Mayhorn, 2013; Woolsey & Dracy, 2010).

Emergency response efforts following a tornado are often further complicated by the massive destruction of structures which could have been mitigated if more stringent building standards and codes had been adopted (Grande & Alldredge, 2014; Kuligowski et al. 2014, Prevatt et al., 2012). People are most often killed, injured, and traumatized during a tornado from blunt force trauma or from being crushed or trapped inside a demolished or collapsed structure (Kuligowski et al., 2014; Prevatt et al., 2012).This

failure of structures has been directly linked to long term trauma effects and social disruption (Adams et al., 2014; Houston et al., Prevatt et al., 2012; Stough & Mayhorn, 2013). During the Joplin tornado, 87% of all deaths occurred within structures that had collapsed (Kuligowski et al., 2014).

Mental health services are needed following a disaster as trauma is widely inflicted. Although a growing field, trauma psychology is still in its infancy, and there is a need for more professionals trained in trauma psychology (Bassuk et al., 2016; Gold, 2014; Gulliver et al., 2014). Additionally, there is a need for agreed-upon guidelines and increased training concerning best practices among mental health workers because the appropriate services required vary considerably following a disaster (Cook & Newman, 2014; Gold, 2014; Gulliver et al., 2014; Yamashita, 2012). Some services may be needed for a short period of time while other services may be needed for a long period of time (Cook & Newman, 2014; Guliver et al., 2014). Provision of these services will require trained professionals in the field of trauma psychology and an improved understanding of trauma principles (Allen, Wilson, & Armstrong, 2014; Bassuk et al., 2016; Cook & Newman, 2014; Gold, 2014; Gulliver et al., 2014; Yamashita, 2012).

The purpose of this study was to learn from the experiences of Joplin community leaders following an EF5 tornado to potentially improve tornado preparation and response for other communities and may mitigate social disruption and trauma effects. With more knowledge, community leaders and others may be better able to reduce property damage, improve emergency response, provide effective trauma mental health services to survivors, and reduce injuries and deaths following a tornado *(*Ablah, Konda,

& Kelly, 2009; Abrahamsson, Hassel, &Theler, 2010; Fujikawa, 2013; Kuligowski et al., 2014; Prevatt et al., 2012, Yamashita, 2012).

The following key concepts are addressed in this review: natural disaster and trauma effects, tornado impact on communities, Joplin tornado, and emergency response. The review includes the literature search strategy, literature regarding conceptual framework, analysis of key concepts, literature related to methodology, summary, and conclusions.

Literature Search Strategy

I began database research in January 2014 and continued through December 2016. The literature search strategy began with a number of topical areas that were reviewed. I conducted topical searches on the following: (a) the theoretical and conceptual basis for the study, (b) tornados and tornado-related activity, (c) man-made or natural disasters, (c) trauma psychology and mental health treatment, (d) emergency response, (e) individual and household tornado preparation, (f) structural standards and codes related to tornado safety. To locate literature, I used resources available through Walden University Library. I also used the search engine Google Scholar. The following databases were used to identify relevant research: Academic Search Complete, Academic Search Premier, Business Source Complete, ERIC, Political Source Complete, ProQuest Dissertations and Theses, PsycARTICLES, PsycINFO, and SocINDEX. In addition, U.S. government websites were used. These include the websites of the Centers for Disease Control (CDC), Federal Emergency Management Agency (FEMA), National Institute of Standards and Technology (NIST), National Oceanic and Atmospheric Administration

(NOAA), National Weather Service (NWS), and the Storm Prediction Center (SPC). In order to explore science databases, I became a member of the American Meteorological Society (AMS). Membership options chosen included online access to the AMS monthly bulletin, 12 AMS journals, monthly publication of Physics Today, access to Science Direct, Web of Science, Open Archives, reciprocity with other national meteorological societies, and a book titled *Deadly Season: Analyzing the 2011 Tornado Outbreaks*.

All these databases were critical in crafting effective search terms and combinations of terms. At first, the key terms, tornado and tornadoes seemed to garner few scholarly articles. As an example, the key terms tornado and tornadoes were searched in the ProQuest dissertation database and yielded two dissertations, one of which I considered pertinent to my research. These key terms when searched in PsycARTICLES produced three articles, none of which I considered relevant. PsycINFO yielded 46 articles, but only three were both current and relevant, in my opinion. Conversely, using just the key term tornado in the Business Source Complete database yielded 2,307 articles, dozens of which I considered relevant. A similar volume of articles were also available, using the key term tornado through U.S. government websites, and provided dozens of relevant articles.

The effectiveness of databases varied extensively by a key term or terms. ProQuest, PsycARTICLES, and PsycINFO, provided numerous relevant articles using key terms such as emergency response, trauma psychology, or disaster and natural disaster. I found various United States government websites and Business Source Complete website more helpful in defining the enormity of tornado related problems with

key terms such as tornado cost, tornado casualties, or building standards and codes. The following keywords were used searching all the previously mentioned databases: *tornado, tornado cost, tornado casualties, tornado myths, tornado preparedness, Joplin tornado (with date), disaster, natural disaster, emergency response, trauma psychology, building standards, building codes, phenomenology,* and *constructionism.*

The vast majority of articles chosen for this study were limited to the last 5 years except for a few original works that were deemed significant and relevant to the study. Thousands of articles were available for a cursory review. The numerous articles were reduced to those I considered current, relevant, and deserving more consideration for possible inclusion in the study.

The literature search strategy and record of search efforts required updates as the proposal progressed and approval to conduct the study was received. I continued to update my literature search records as more research was required to complete chapter 4 and 5 of the study. The literature review and search strategy continued until the completion of the entire dissertation in draft form as of March 3, 2017. At that time I completed an updated record of the literature search. In an effort to provide a visual summary of the literature research strategy I developed Table 1 that contains a review of the literature analyzed. The table separates the literature I found useful in developing this study by category, topic, and quantity of documents used in each category.

Table 1

Summary of Search Results by Categories

Topic	Peer-reviewed articles (includes U. S. Government studies)	Books	Other (governmental fact sheets, news articles, etc.)
Constructionism	6	4	0
Phenomenology	8	8	0
Natural disasters	7	0	14
Tornado	39	2	16
Trauma psychology	38	0	3
Emergency response	22	0	8
Buildings and structures	15	0	5
Total	135	14	46

Conceptual Framework

Social Constructionism

Social constructionism (hereafter constructionism) was the basis for the conceptual framework of this study. The conceptual framework was largely based on the work of Berger and Luckmann (1967) *The Social Construction of Reality*. However, many researchers contend their work was influenced by several historical thinkers and that the precise origin of constructionism is debatable. There are also experts that think constructionism remains in an evolutionary process (Andrews, 2012). Some research indicates the growth and emergence of constructionism in social theory occurred during the 1980s and 1990s (Hacking, 1999).

Fundamental tenets of constructionism, according to some scholars, can be found in the writings of Vico's*The New Science* first published in 1725 (Costelloe, 2014). Giambattista Vico lived from 1688-1744 and believed that reality was a process of construction of concepts derived from the culture. He opposed the dominant philosophy of his time, as taught by Descartes, who taught that all knowledge could be derived through deductive rules. Vico argued that such an approach rendered phenomena, which could not be expressed in logic or mathematics, as an illusion (Costelloe, 2014).

Constructionism is often confused with constructivism and sometimes the terms are used interchangeably (Andrews, 2012). There is an important distinction: constructivism is focused exclusively on the meaning making activity of the individual mind and contends that all personal experiences are valid and worthy of respect, placing emphasis on the individual. Constructionism emphasizes the influence that culture has upon individuals and thus shapes the way individuals view things, and even feel things (Patton, 2002). Constructionism represented the worldview for this study and provided a lens whereby this study can be understood (Creswell, 2009).

Constructionism is concerned with the nature of knowledge and the process of knowledge creation through individual interactions within society. Society exists in both objective and subjective reality where frequently repeated actions are cast into patterns requiring little effort for reproduction (Andrews, 2012). Individuals develop a number of varied meanings and seek out complexities of views rather than narrow meanings or ideas. Meaning is often forged through discussions and interactions with other persons.

Knowledge, concepts, and beliefs become woven into society, and reality is socially constructed (Berger & Luckmann, 1967).

This study used a qualitative phenomenological methodology and relied on open-ended questions. In qualitative studies, researchers will attend carefully to what people say and do in real life situations (Creswell, 2009). This study explored the lived experience of community leaders following the phenomena of an EF5 tornado which occurred on May 22, 2011 in Joplin, Mo. Given that constructionism emphasizes the influence of culture upon the individual, it follows that some assumptions are woven into the fabric of this study as related to the experiences of community leaders. One assumption was that people learn best through understanding the perceptions and lived experiences of individuals they encounter within society. Another assumption was that knowledge gained through social interactions within a culture shapes how individuals view their surroundings, and also shapes the feelings a person holds. This phenomenological study was intended to capture the essence of the experiences recalled by community leaders.

Based on tenets expressed by scholars as previously mentioned, constructionism was chosen as the world view for this proposal. It was deemed philosophically compatible and most beneficial concerning the framework of this study. The purpose of this study was to explore, document, and learn from the experiences of Joplin community leaders following an EF5 tornado. Understanding their experience will assist other communities in preparing for and responding to a violent tornado. This study documents their views and experiences concerning community preparedness, trauma psychology,

emergency response, and rebuilding their community in an effort to mitigate negative social and psychological effects.

Literature Review Related to Key Concepts

A number of researchers have produced studies that document that there are few national definitions, standards, and codes concerning community tornado preparedness and response (Ablah, Konda, & Kelly, 2009; Fujikawa, 2013; Kuligowski et al., 2014; Prevatt et al., 2012; Woolsey & Bracy, 2010; Yamashita, 2012). Key concepts for this study included natural disaster and trauma effects, tornado impact on communities, Joplin tornado event, and emergency response. Related studies were useful in defining the problem identified in this proposal and served as an impetus for developing the problem statement of this proposal.

Natural Disaster and Trauma Effects

Trauma following a natural disaster has garnered much attention among professionals, including researchers, especially since Hurricane Katrina in 2005. North (2010) acknowledges the significant accumulation of literature concerning mental health needs following a disaster. North's (2010) study contends that no single set of principles can outline mental health needs likely to be encountered. In the study, divergent types of disasters, affected populations, timing, and settings are examined. Results yielded multiple findings supporting the argument that no one disaster mental health model is adequate (North, 2010).

Another study following hurricane Katrina was conducted by Madrid & Grant (2008). The authors noted that mental health service following this disaster were not

adequate to meet immediate mental health needs or long term mental health needs. The writers indicated that short and long term goals should be adopted by city, state, and federal governments as well as the insurance industry to facilitate accessible care which includes parity between physical and mental health services. The researchers argued that mental health consideration are an import part of disaster preparedness, response, and recovery and should be sustainable over time (Madrid & Grant, 2008).

Mearidy-Bell (2013) considered the lived experience of 15 adolescents, ages ranging from 12 to 17, all who had survived a natural disaster. The study noted behavioral changes among the group which included isolation, social withdrawal, increased argument with family and friends, relationship avoidance, and over-protectiveness. The study was limited in terms of the small number of participants and that they did not experience the same disaster. It does lay a foundation for further research in terms of the effects that natural disaster can have upon human behavior and possible training needs for professionals in the field of trauma psychology.

Gulliver et al., (2014) conducted a study stating that other researchers acknowledge a number of disasters, including natural disasters, have occurred and been documented over time. However, they contend that the scientific study of disaster response is in its infancy and the approach for training professionals is in question. This study argued that no one model is adequate, lending support to North's 2010 findings. The study documented that rigorous inquiry has been limited by chaos and disruption, which is part of any disaster. The authors contended each disaster produces significant

differences in vulnerability concerning the development of mental health needs (Gulliver et al., 2014).

One recent study specifically considered the mental health effects caused by the Joplin tornado (Houston et al., 2015). The study found high rates of PTSD and depression prevalence among participants. The study conducted two cross-sectional assessments among Joplin adults following the tornado. The first was conducted six months post-disaster and the second conducted 2.5 years post-disaster. The first assessment found probable PTSD prevalence was 12.63% after six months and the second assessment found probable PTSD prevalence was 26.74% after 2.5 years. Current depression prevalence was 20.82% for the six month assessment and 13.33% following the second assessment. Overall findings indicated that various long term (multi-year) mental health services are needed following a disaster such as the 2011 Joplin EF5 tornado (Houston et al., 2015).

A broader related tornado study considered prevalence and predictors of PTSD and depression among adolescent victims regarding the 2011 spring outbreak of tornadoes (Adams et al., 2014). The study argued that there have been relatively few such studies examining PTSD and major depressive episodes among disaster affected adolescents. The study was conducted with 2000 participants from a population-based sample of adolescents and caregivers recruited randomly from tornado affected communities. Overall, 6.7% of adolescents experienced PTSD and 7.4% experienced a major depressive episode based on diagnostic criteria. Numerous factors were identified

which were associated with increased vulnerability for psychopathology and these factors can inform intervention efforts following a destructive tornado (Adams et al., 2014).

Yamashita (2012) argued that a holistic theoretical framework is needed in studying disaster mental health. Yamashita acknowledged that there is a relationship between exposure to a disaster and the development of various mental health problems. The author further stated that the numerous studies on the subject have yielded inconsistent results and lacked a replication capacity. According to Yamashita, a rigorous application of a heuristic framework should be utilized, along with selective psychosocial factors to address mental health needs. Yamashita indicated that there is a significant difference between disaster mental health studies and stress studies, especially concerning previous findings regarding theories of stress. The author further postulated that studies are needed to present findings from cross-sectional studies to move toward a holistic model.

Training of trauma psychologists. Professional psychologists have demonstrated an increased interest in trauma psychology (Gold, 2014). A survey conducted by the American Psychological Association Practice Organization investigated this interest in terms psychologists time spent treating trauma and interest in additional clinical training. Nearly 64% of survey respondents expressed interest in further training, including offerings of continuing education (Cook, Dinnen, Rehman, Bufka, & Courtois, 2011). Some experts believe the development of trauma psychology may be on a historical fast track. In February, 2006 the American Psychological Association (APA) formed the Trauma Psychology Division (56) to address membership interest. A key purpose of the

division is keeping its professional membership current, and well informed, concerning trauma psychology. The division underwrites a journal, and has a membership that has steadily increased since its inception. Every year the journal has had to implement steps to accommodate the growing flow of submissions, which continue to improve in both quality, and content (Gold, 2014).

The need for more training in trauma psychology was reinforced through a consensus statement developed at the New Haven Competency Conference. The statement acknowledged the growth of scientific literature concerning traumatic stress but contended that psychologists have only a cursory knowledge of this science. The researchers stated that there is a distinct need for development of trauma focused, scientifically informed, competencies. Sixty experts helped to develop five broad foundational competencies and eight cross-cutting competencies. They recommended that the trauma competencies could help provide a basis for future training in the field of trauma psychology (Cook & Newman, 2014).

***Working in the trauma field*.** Addressing the needs of those who work with trauma on a daily basis has also been researched as it relates to trauma psychology. A study by Gayton & Lovell (2012) examined resilience among paramedics to determine whether the paramedic field attracts persons of high resilience or if the time employed in service as a paramedic builds resiliency. Results indicated that experience in the field produced higher levels of resilient persons when compared to paramedic students entering the field. The study called for increased resiliency interventions for paramedics and paramedic students. The authors asserted that such efforts will help improve

emergency response through developing greater resiliency among professionals who work in the trauma environment.

One related study by Cohen & Collens (2013) considered those who worked with traumatized clients. It utilized a synthesis of 20 published qualitative articles. The study indicated that trauma work can increase long and short term distress on workers, and disrupt everyday routines. The authors found that workers benefitted by observing, and having exposure to a client's personal growth. Another study by Mailloux (2014) argued that there are inherent risks for both clients and practitioners in the provision of trauma counseling. The author contended that it was imperative for professionals to rely upon their professional code of ethics. This study specifically utilized the Canadian Code of Ethics for Psychologists. Mailloux (2014) stressed that adherence to ethical standards helps protect practitioners, as well as clients.

Aten, O'Grady, Boan, Smigelsky, Schruba, & Weaver (2015) argued that mental health professionals should understand that disaster trauma is different from other types of trauma, and it is a collective experience. The study noted an important goal of clinical intervention should be to enhance resiliency. Some research contends that in an effective system of care, agencies should have trauma informed personnel, including all professional, administrative, and secretarial staff (Berger & Quiros, 2014).

Tornado Impact on Communities

The vast majority of persons have never seen a tornado except on television especially if they live west of the Rocky Mountains (NWS, 2012). In order to appreciate the impact a tornado may have on a community it is important to gain some insights as to

the nature and power of this type of natural disaster. The U.S. government provides many important studies and reports regarding tornadoes including psychological and social effects. The National Oceanic Atmospheric Administration (NOAA), National Weather Service (NWS), and Storm Prediction Center (SPC) are used extensively by researchers to obtain tornado facts and information. The United States experiences the vast majority of tornadoes occurring in the world. Some experts consider the U.S. government to be the most complete source of information concerning tornadoes (Lloyd's, 2013; Prevatt et al., 2012). Any person interested in information concerning how tornadoes develop, how they are rated, what the impact of tornadoes is in the United States can benefit from consulting U.S. data bases.

Tornado property destruction, loss of life, injuries and long term social and psychological effects vary following a disaster but usually the higher the severity rating the greater the overall impact on a community. Tornado severity rating was originally developed by Dr. Theodore Fujita when he published and introduced the Fujita scale or F scale in February 1971. He sought to categorize each tornado by intensity and area of damage. He also wanted to estimate a wind speed associated with the damage caused by the tornado. The scale was divided into six categories that were F0 (Gale), F1 (Weak), F2 (Strong), F3 (Severe), F4 (Devastating), F5 (Incredible). Dr. Fujita applied his scale to a super outbreak of tornadoes of April 3-4, 1974. The Fujita scale since that time became the recognized tool for defining U.S. tornadoes. However, Fujita understood that improvements were necessary. The F-scale was based solely on the damage caused by a tornado despite differences in the construction of buildings. In addition, the scale was

subject to bias. Fujita's original scale or F-scale was based on the worst damage, even if only one structure was evaluated. It relied heavily on wind estimates and did not account for weak structures such as mobile homes and modified homes (SPC, 2014).

Fujita updated his scale in 1992 using a combination of F-scales, construction types, and types of structural damage. This work led to the formation of a committee to develop the Enhanced Fujita Scale that would continue to support and maintain the original tornado database. The enhanced scale provides more consistent assessment of damage as well as training materials, and more sophisticated data collection. The Enhanced Fujita Scale or EF-scale became officially operational on February 1, 2007 (SPC, 2012).

In order to grasp the extreme impact tornadoes can have on a community or communities it is necessary to revisit a tornado event which occurred before the advent of modern tornado record keeping. The deadliest, most destructive, and longest tracking tornado in the U.S. occurred on March 18, 1925. It is still a matter of dispute as to whether it was a single tornado or a family of tornadoes. The tornado began in Southeast Missouri, continued its path through Southern Illinois, and finally moved through Southwest Indiana, before dissipating. Devastation occurred in 13 counties and 19 communities along its record setting 219 mile path. The tornado plowed a three quarter mile to one mile path over a three and half hour period. It was considered an F5 on the Fujita scale, and at times traveled up to 73 mph, killing 695 persons, causing 2,927 injuries, and destroying 15,000 homes (NWS, 2015b). Among the 25 deadliest tornadoes of record since 1840, 20 occurred before the era of modern record keeping which began

in 1950 and five occurring since then. In terms of cost and death toll after 1950the Joplin, MO. May 22, 2011 tornado is the deadliest, killing 161 people, and costliest at over 2.8 billion. The second costliest tornado occurred the same year in Tuscaloosa, Alabama on April 27, 2011 at nearly 2.5 billion (SPC, 2015). These examples are based on single tornado events, not tornadoes throughout the year or single months of severe outbreaks. It is important to note that the number of tornadoes does not necessarily indicate the amount of deaths or damage. For example EF4 and EF5 tornadoes comprise only 2% of all tornadoes but produce 70% of all deaths. Weak tornadoes EF0 and EF1 make up 69% of all tornadoes but produce less than 5% of all deaths (NWS, 2009). Some factors can skew tornado statistics, 33% of all tornado fatalities occur in mobile homes and persons in mobile homes are 23 times more likely to be killed in a tornado than persons in permanent housing. A tornado striking a large mobile home complex could result in numerous deaths even if it a relatively weak tornado such as an EF1 or EF2 (NWS, 2009).

Joplin Tornado

Since modern record keeping, the deadliest and most costly single tornado occurred in Joplin, Missouri on May 22, 2011. According to the National Institute of Standards and Technology, this tornado was classified as EF5 on the Enhanced Fujita scale. It resulted in 161 deaths, over 1,000 injuries, damaged 553 business structures, and 7, 500 residences. Over 3,000 of these residences were heavily damaged or destroyed. The total cost of the tornado approached three billion dollars.

The National Institute of Standards and Technology (NIST) produced a final report concerning this tornado that was published in March of 2014 (Kuligowski et al., 2014). This report is an important work concerning the Joplin tornado, and serves as a source of numerous recommendations for tornado prone areas of the United States. Despite recommendations produced by the NIST these recommendations are not in effect at present, they may take years to be adopted, and some may never be adopted. A first step was achieved on one of 16 recommendations by the NIST concerning schools. The recommendations were adopted by the International Code Council (ICC) in December 2015 but are not scheduled for publishing until 2018 (Newman, 2015).

The process of adopting recommendation is very long and tedious as it often involves forging agreements among many interested parties around the nation and the world. Currently there are still no national tornado definitions, standards, and codes in effect concerning community preparedness, emergency response plans, trauma related mental health services, and the rebuilding of structures to assist community leaders following a tornado (Ablah, et al., 2009; Fujikawa, 2013; Kuligowski et al., 2014; Miehl, 2011; Prevatt et al., 2012; Woolsey & Bracy 2010; Yamashita, 2012). It should be understood that despite this lack of guidance community leaders are forced to face numerous issues immediately following a devastating tornado.

The NIST study was focused on the Joplin tornado and the information learned from this particular tornado is the basis for their16 recommendations regarding national tornado standards (Newman, 2015). Basing the 16 recommendations on the Joplin tornado findings is largely because this event was a rare occurrence as only 59 EF5

tornadoes have been documented since 1950, few of these are relatively current, and most did not strike a significantly populated area (SPC, 2012).

My study provides information gleaned from the Joplin tornado that may be useful to other communities and may be used to assist in preparation for and response to a violent tornado. In addition, this study contains information that goes beyond the broad scope of the NIST study in order to focus more narrowly on the experiences of community leaders in rebuilding the city of Joplin and addressing its needs. Communities may benefit from being provided current information concerning trauma services and emergency response plans from leaders who have been faced with addressing these needs as they relate to tornadoes. Studying the Joplin tornado provided a rare opportunity to analyze and learn from the experience of Joplin community leaders following an EF5 tornado that struck a significantly populated community.

Following the Joplin tornado the city of Joplin published a fact sheet (Onstot, 2013) that provided general information concerning the city as well as a chronology of recovery efforts and statistics following the tornado. This fact sheet is beneficial for researchers to help familiarize them with the community demographics and the unfolding events following the tornado. It provides a statistical breakdown in a number of important areas. This statistical information includes data concerning building permits, housing needs, structural damage, debris, volunteers, demolition, medical services, animal control, FEMA assistance, property damage, chamber of commerce information, and the cost of the disaster (Onstot, 2013).

Loss of a regional hospital. As a result of the Joplin tornado, one of its two hospitals, St. John's Regional Medical Center was destroyed. The hospital endured the brunt of the tornado, and five patients and one visitor were killed, co-workers manage to rescue 183 patients. Before the destruction of the hospital, it had become a part of Mercy Health **S**ystems in 2009. In a few days following the tornado Mercy Health Systems leadership promised to rebuild a new facility, staying with the devastated community (Duff &Dishman, 2014).

In relationship to the new hospital, Duff & Dishman (2014) studied the transformation of Joplin hospital leaders through the implementation of blended theory for organizational design. It was believed that this organizational design theory would benefit efforts to achieve the necessary health care reforms. According to the study it was decided early on that rebuilding as life had been would not work. A new approach was deemed necessary to develop the health systems structural organization as well as erecting a new hospital built with tornado specifications in mind.

The hospital, having been acquired two years before the tornado, already had a storyline of victimhood that was only reinforced by the storm. Before the destruction it was decided by the hospital's leadership that a new narrative would be adopted. A narrative where leaders would be empowered, expected to make decisions, lead their groups, and create conditions for cultural change. According to Duff & Dishman (2014) a complexity theory was adopted which in very simple terms suggests that organizations create order amid chaos. The leaders thought that something greater than the sum of parts would emerge if personnel were regularly placed in a room, given liberal guidelines, new

topics of discussion, and experiential learning conditions. The use of this theory was intended to influence the natural process of self-organization in a positive manner. Sessions were designed ahead of time, but were open to emergent concepts and discussion. It was decided that a "one size fits all" organizational design for all situation would not work. Leaders were allowed to work with new ideas, and utilize varying narratives in order to influence eventual outcomes. The methodology utilized by the hospital was considered situational. This approach was chosen because decision makers thought it would achieve the best outcomes for clients (Duff & Dishman, 2014).

Housing and restoration of services. Smith & Sutter (2013) conducted a case study concerning the response and recovery following the May 22, 2011 Joplin tornado as compared to Hurricane Katrina in 2005. They considered how the pace of recovery was impacted by the private and public sector when compared to Hurricane Katrina in New Orleans. The study found that the Joplin response worked much more efficiently with government agencies because these agencies did not try to micromanage the recovery actions taken by the private sector.

Additionally, Joplin officials were intent on allowing the private sector to lead the response and recovery. According to Smith & Sutter (2013) Joplin city government focused on dealing with entities of the U.S. government, other state government entities, removing debris, restoring utilities, demolition, and repairing infrastructure. National agencies such as the American Red Cross helped provide shelter immediately after the tornado struck as well as providing a resource center close to the damaged area. The Joplin community accommodated the majority of temporary housing, but it was

important that FEMA provided about 600 temporary housing units in coordination with Joplin city officials. As a result, the private sector accommodated about 90% of displaced households with FEMA providing the remainder. About 98% of displaced residents remained within 25 miles of Joplin helping keep the community largely intact. The study indicates that the cooperation between the public and private sector was primarily responsible for the robust response and recovery following the Joplin tornado (Smith & Sutter, 2013).

Emergency Response and Learning from the Joplin Tornado

Effective emergency response can be complicated because communication systems may break down, response may be uncoordinated, people are often unprepared and confused, disabled persons may be overlooked, and situations may not have been planned for which may lead to poor decision making (NWS, 2011; Kuligowski et al., 2014). In the case of the Joplin tornado trees were blocking streets, two fire stations were destroyed, one hospital moved off its foundation and unable to function, power lines were down, homes demolished, cell towers downed, cars thrown about, businesses demolished, and communications severally impaired (NWS, 2011). All these factors impact the functioning of emergency workers and the effectiveness of community emergency response plans.

Emergency response plans. Most state and federally funded facilities are required to develop an emergency response plan. Oklahoma is known for tornado activity and may serve as an example of a state promulgating guidelines, rules, and requirements for emergency response plans. In the state of Oklahoma requirements for mental health

facilities as an example are established by the Oklahoma Department of Mental Health and Substance Abuse Services (ODMHSAS). Education of employees and clients regarding a facility's emergency response plan are required. Acceptable emergency response plans would encompass various types of possible emergencies. Facilities are required to document a number of activities such as drills for fire, bomb threats, or tornado warnings. Most plans have some basic things in common. All requirements would include lighted exit signs with backup batteries, posted exit routes, fire extinguisher placed in required locations, sound alarms, light alarms (for hearing impaired), and designated gathering places during an emergency. In case of a tornado, the gathering place in Oklahoma is essentially deemed to be the safest area (ODMHSAS, 2014). However, gathering places are often not a FEMA standardized storm shelter or safe room, it is often simply the best place available. Many other types of facilities and households do not have required emergency response plans, pre-determined evacuation methods, storm shelters, or safe rooms. There are FEMA standards for quality construction of safe rooms and storm shelters; however installation in many cases is not required (Levitan, 2013).

Community emergency response plans are often required to receive funding but important inclusion of safety components may not be required (Miehl, 2011). They most often provide guidelines, duties, and responsibilities for those involved in emergency responses such as first responders, firefighters, and police. One study suggested that there should be a system-oriented framework for analyzing the effectiveness of community emergency response plans. The authors contend that such information could be used to

prevent or mitigate disaster effects and help prepare for various types of disasters (Abrahamsson, Hassel, &Theler, 2010). Another study argued that certain aspects and requirements should be mandatory in community response plans (Miehl, 2011). According to the author, requirements should include; designated responsibilities, specific information for evacuation, communications plan, coordination among fixed facilities (including businesses), and exercises between community entities and emergency response agencies.

Emergency response and special populations. Emergency responders encounter unique situations regarding the frail elderly, non-English speakers, mentally ill, children, and persons with disabilities (Kuligowski, et al., 2014; Melton & Sianko, 2010; Stough & Mayhorn, 2013). One researcher noted that children, who are especially vulnerable to trauma, are often overlooked entirely in emergency response plans (Woolsey & Bracy, 2010). Special care for children trapped in a traumatic situation may be of critical importance. Research suggested that children experiencing early trauma in childhood have a greater risk of exhibiting psychotic symptoms in later years (Allen et al., 2014; Dennison, McKernan, Cryan, & Dinan, 2012). One study advocates psychosocial emergency response teams should be dispatched following a natural or man-made disaster (Guthrie, 2012). Another study advocated the efficacy of implementing trauma and resiliency-focused treatment in a wide range of areas for children with symptoms of complex PTSD as a result of trauma (Kagan, Henry, Richardson, Trinkle, & LaFrenier, 2014). Mattar (2011) contends trauma psychology training at some basic level is

important for emergency responders because acute trauma is common in disaster situations.

Stough & Mayhorn (2013) noted that persons with disabilities are an important special population, the types of disabilities vary greatly, and many disabled persons may be hospitalized. According to their research some disabled persons may be in wheelchairs, require oxygen, suffer mental problems, be blind, or have low mental function. The authors argue that persons with disabilities are disproportionately affected by a disaster and that few empirical studies have been conducted on the effects disasters have upon disabled persons. The authors further contend that there are no published data on the effects tornados have on disabled persons. Another related study indicated that following a natural disaster, there is a spatial redistribution of socially vulnerable populations during a long-term recovery period (Elliott, 2010). Levitan (2013) stated that FEMA has guidelines concerning the disabled living in institutions. However, the author noted that not all persons with disabilities reside in institutions, and many live in their own homes. Levitan acknowledges that in-residence safe rooms, built in accordance with FEMA standards, would make for greater access, save time going to an outdoor community safe room, and avoid flying debris in the process of seeking shelter. However, the author indicates that in many cases, there are no requirements to install protective rooms even though the resident is disabled (Levitan, 2013).

Emergency response and communications. Community emergency response plans can be very complicated and highly dependent on effective communication and coordination. In the case of the May 22, 2011 Joplin, Missouri tornado, the Federal

Emergency Management Agency published an extensive report covering lessons learned. The report stated that over 400 public safety organizations throughout the United States responded with personnel, providing over 800 police cars, 400 fire trucks, 300 ambulances, and 1,100 first responders, all within 24 hours. The effort was a dramatic and successful deployment of critical assistance needed for this community. According to the report, there were lessons to be learned for future operations. Many responders self-dispatched and began working without contacting the local incident command. Other responders lacked the necessary equipment or training for sensitive operations, such as safely performing search and rescue. Some responders used various wrong search markings, some structures were searched multiple times because the markings were not recognized by other teams (FEMA, 2011).

The National Weather Service produced a study immediately following the Joplin 2011 tornado which was published in July, 2011, only two months after the tornado. The study dealt with persons who directly experienced this event. NWS conducted nearly 100 semi-structured interviews in person, over the phone, or in group settings. Key findings were related to societal aspects of warning response and risk perception in what was considered a "warned" event. The findings are useful in terms of understanding faulty risk perceptions, poor decision making, actions taken, and confusion by persons that survived the Joplin tornado (NWS, 2011).

Review of Literature Topics Organized by Methodology

In this section several articles were mentioned in order to display a variety of approaches for developing quantitative, qualitative, and mixed method research. The

literature search strategy revealed a general trend toward quantitative methods concerning the subject of tornadoes, few qualitative studies, and no qualitative studies regarding the experiences of Joplin community leaders related to the EF5 tornado of 2011. An EF5 tornado striking a significantly populated area is a rare event as only 59 have struck in any U. S. location (NOAA, 2009). Understanding the experience of leaders faced with making critical decision under these conditions represented an area which has not been studied and was intended to provide valuable information for other communities in tornado prone areas. When selecting the literature related to methodology for this section only peer reviewed studies were examined, most were cited within the topical discussion of this proposal, but a few were included to provide examples of varying approaches (Dawidowicz, 2010). Some studies discussed were part of a larger government report detailing a number of peer reviewed studies within the report. An analysis was conducted to help determine the methodology, what has been learned, and what has not been learned.

Quantitative Research

Lodico, Spalding, & Vogetel (2010) state that quantitative studies can generally be placed into categories of descriptive, experimental, causal comparative, or correlational research. An advantage of quantitative research is that these studies can accommodate large sample sizes, hundreds or even thousands, and may require researchers to spend little time with participants. Quantitative studies provide numerical analysis and most are descriptive or correlational. These types of quantitative studies will often use surveys to measure variables and determine what relationships may exist. A

descriptive survey will attempt to describe such things as behaviors, perceptions, opinions, beliefs, etc. The data is not gathered to test a hypothesis, but the findings from analyzing the data may lay a foundation for hypothesis development, and future testing of the hypothesis.

Experimental research will test hypotheses to determine cause and affect relationships. These studies will use random selection of participants from a population, use different treatments to create independent and dependent variables, and control extraneous variables (other than the independent variable) which might influence the dependent variable. Causal-comparative research seeks to explain differences between groups by exploring the differing experiences among the groups. Correlational research attempts to show the relationship between two or more variables but is non-experimental and does not seek to identify causality (Lodico et al., 2010). There are numerous quantitative studies regarding tornadoes relating to statistics or physics of the phenomena, but few scientific studies are relevant to the May 22, 2011 tornado in Joplin, Mo.

One quantitative study dealt with the issue of treating children from a trauma psychology perspective. Allen, Wilson, & Armstrong (2014) conducted an experimental study to determine if clinician beliefs about treatment concerning children having experienced trauma would change if the clinicians received intensive training in trauma focused cognitive behavioral therapy. Data collection was based on results from the participants who actively participated in and received the intensives training in trauma focused cognitive behavioral therapy. The study concerning clinician beliefs was tested and showed that clinicians receiving intensive training in trauma focused cognitive

behavioral therapy indicated a significant change in their approach to treatment and greater belief in the capacity of children to verbally describe traumatic experiences. Data analysis revealed no changes in beliefs reported by clinicians not receiving the training. The study identified a possible area of training needs for clinicians working in the emerging field of trauma psychology (Allen, Wilson, & Armstrong, 2014).

Another quantitative study indicated that the effective treatment of trauma victims requires education and competencies among mental health professionals tasked with treating survivors. Cook et al., (2011) developed a quantitative study focusing on the hours per month that practicing psychologists spent in treating trauma survivors, and their interest in additional clinical training in treating trauma. The method of data collection was based on surveys conducted by the American Psychological Association Practice Organization. Data analysis was statistically descriptive in nature, not qualitative, focusing on practitioner perception of level of training and beliefs concerning the need for more training in the field of trauma psychology. Through the study, it was learned that 64% of respondents would like to learn more concerning trauma related topics, receive more training, and would appreciate more ongoing continuing education being offered in the area of trauma psychology (Cook et al., 2011).

Qualitative Research

Qualitative findings, unlike quantitative findings, often involve exploring detailed, descriptive experiences from a much smaller participant group. Findings grow out of three kinds of data collection, (1) in-depth, open-ended interviews; (2) direct observations; and (3) written documents (Patton, 2002). Giorgi, (2014) contends that the

strength of a qualitative approach lies within its discovery orientation, often employed when little is known about a subject. Creswell, (2013) provides the basics for five approaches to qualitative research which are narrative, phenomenology, grounded theory, ethnography, and case study.

Narrative research will focus on the life of one or more individuals where their stories provide useful information related to a problem being explored. Phenomenology attempts to understand the essence of an experience, it will describe the lived phenomenon, and will study several individuals and their shared experience. Grounded theory takes place in the field and considers the views of participants, their actions and interactions, among many individuals in order to generate a theory. Ethnographic theory will focus on describing and interpreting a culture-sharing group in order to describe and interpret shared patterns within the group. This theory draws upon anthropology and sociology in order to understand a group that shares the same culture. Case study will implement an in-depth analysis of a case or multiple cases in order to provide a deeper understanding of an identified problem. A case study may examine an event, program, activity, or one or more individuals (Creswell, 2013).

Fujikawa (2013) produced a qualitative phenomenological study concerning the May 22, 2011 tornado occurring in Joplin, Mo. Data collection was produced through interviews with tornado survivors in order to understand the essence of their shared experiences. From the applied method the reader learns more concerning the experiences of household survivors, their confusion, and in some cases, lack of preparation for this tornado event. This study effectively illustrated that households and educators function

without published studies concerning household tornado preparation. It illuminated the lack of any accepted definitions concerning household preparation. In addition, the study documented the need to accurately measure household preparedness levels and the need to develop valid instruments for educators to utilize. The study dealt with six survivors of the tornado, detailing their experiences, none of the participants were tasked with the responsibility of rebuilding the city of Joplin. This study does not focus on community leaders responsible for rebuilding the community and does not provide insight concerning the decision making process necessary to accomplish the task before them.

Another qualitative study also focused exclusively on the May 22, 2011 Joplin tornado and was produced by the National Weather Service (NWS). It was published in July 2011 only two months following the Joplin tornado (NWS, 2011). The described methodology was ethnographic and chosen in an effort to describe the people and culture of residents in the Joplin community. Data collection methods were conducted through semi-structured interviews, in person, over the phone, or in group settings. An interview guide was utilized to provide consistency between interviewers. The guide provided a menu of questions or topics to be covered in the interview. Questions followed a particular order and were formulated in a manner to minimize the influence of the interviewer, allowing each person to define the content of the discussion they felt to be important. Data analysis focused on this population's societal response to the tornado warning in order to help identify trends from the participant sample. The study was conducted quickly after the Joplin tornado struck and provides insight concerning

warning systems, decision making actions, and response made by this population (NWS, 2011).

Mixed Method Research

Lodico, et al., (2010) indicated that is not unusual for quantitative and qualitative studies to be combined in a study which is referred to as a mixed method. For a period of time quantitative and qualitative researchers were somewhat isolated from each other and reported findings in separate conferences and journals. The authors elaborate on the aspects of mixed method and identify the characteristics of mixed-method research. According to the authors these studies tend to have a strong rationale for expressing findings from both methods, giving specifics on types of data collection for each method approach, sequences of data collection, description of how and when data is collected for the approaches and often utilizing visual aids to summarize the steps in conducting differing types of research. A researcher using a mixed method will determine the feasibility of using a mixed method, explain the rationale, establish a research designs and methods of data collection, develop research questions for both quantitative and qualitative approaches relative to data collection, gather both types of data, analyze data separately and concurrently, and develop a written report consistent with the mixed method design.

Among mixed method studies which directly apply to the Joplin tornado the National Institute of Standards and Technology (NIST) produced the most extensive studies found within the literature search strategy. Given the importance and detail of this report, considerable attention will be provided concerning NIST methods in this section.

The final report details several separate and distinct quantitative and qualitative studies and should not be understood as just one large study. However, in many instances the findings and recommendations of the final report were often based on data derived from both the quantitative and qualitative studies resulting in a mixed method (Kuligowski et al., 2014). It should be understood that while the NIST study contained both qualitative and quantitative components, it did not contain a qualitative study that was a phenomenological examination of the lived experiences of the community leaders in Joplin after the tornado.

In order to provide an overview it should be understood that the NIST report and methods of data collection were produced from a large number of documents, photographs, videos, and interviews. Data analysis was conducted by reviewing the videos, finding themes in interviews with survivors, and scrutinizing building plans. Analysis and data collection was primarily based on interviews, descriptive information, observations, and correlations discovered. Data analysis involved developing a computer model of the wind field created by the tornado, performance of a range of building types, consideration of life safety and functionality, and using survivor interviews to develop identified themes to produce an evidence-based explanation for decisions made and actions taken. The report often described observations, and correlations related to building codes and standards that were in effect at the time when various structures were built. The final report contains 47 findings and 16 recommendations which would not be possible to detail within this study. However, it is important to note that the multiple findings and recommendation are often based on a mixture of results from both the

quantitative and qualitative approaches utilized in the study. The finding and recommendation of the NIST final report were based on research conducted regarding the Joplin tornado (Kuligowski et al., 2014).

Among the strengths of the NIST report is that the six team authors are leading experts in the fields of science and technology, all holding PhD's and numerous professional credentials. In addition the team utilized a large number of technical staff, institutional support workers, approved contractors, a 15 member team of external peer reviewers, and a 12 member advisory committee to assure accuracy and validity.

NIST Study Concerning Public Response

The NIST (2014) study included an examination concerning public response by community residents. The NIST study differed from this study by method, by sample, and by data gathered; this study was strictly phenomenological, involved face to face, semi-structured interviews of community leaders only. The NIST study was primarily based on a large number of semi-structured qualitative interviews conducted in person and over the telephone by NIST researchers. The NIST researchers sought to gather data relative to how different individuals make decisions during a disaster, what information they had received, how they responded, and their level of situational awareness. Data collection was based on three sets of data gathering approaches. Data collections were derived from perceptions by the public concerning warning before the tornado, consequences resulting from the event such as casualties, injuries, death, and finally interviews with emergency response personnel to determine the existing pre-tornado emergency response plans and implementation. The interviews were described as a

convenience sample. Analysis of data included geographical location and physical settings. This included homes, businesses, events outdoors, or vehicles in order to limit the dataset. The study confirms several other findings (Fujikawa, 2013; Kuligowski et al., 2014; NWS, 2011; Prevatt et al., 2012) which all contended that most people in tornado prone areas are not prepared for a tornado disaster and most community structures are not built to resist an EF2 or higher rated tornado. The majority of property destruction in Joplin and the deaths that occurred would have happened in an EF2 or EF3 tornado event (Kuligowski et al., 2014). Survivors were not prepared for this tornado and buildings were not adequately built to withstand such tornado force. The study does not detail optimal methods for dissemination of tornado information to be used by other communities. Further, the recommendations do not alter the fact that requirements for building standards and codes for tornadoes do not exist on the national level, and in Missouri, these decisions are left to local government decision makers who must deal with the aftermath and destruction (Kuligowski et al., 2014).

NIST Study Concerning Emergency Response

The NIST study also considered the actions of emergency responders following the Joplin tornado. The Joplin tornado certainly tested the ability of emergency response teams. Communications were dramatically affected, two of the seven fire houses and their emergency vehicles were destroyed, roads were mostly blocked with trees, structures, electrical lines, cars, and numerous forms of debris. In addition, one of the two hospitals was decimated, needed evacuation, had loss of life, and unable to accommodate victims (Kuligowski et al., 2014). Data collection concerning emergency response was

extensive. Several qualitative interviews were conducted primarily in unstructured interviews. Analysis involved developing themes based on emergency response personnel comments when asked about the tornado emergency system, method of operation, protective actions, how many times the tornadoes warnings sounded, and the history of tornado soundings in the Joplin area. In addition there was a review of the Joplin and Jasper County emergency operation plans. The National Weather Service had already determined this tornado was considered a warned event (NWS, 2011). Unlike a hurricane, which may provide days of warning, the average warning time for a tornado is 11 minutes (NWS, 2011). The warning systems for this tornado event exceeded average warning time, but the question of where to go in such an event is important. Home basements, safe rooms, and storm shelters are excellent. However, the study revealed that 82% of Joplin homes in the May 22, 2011 tornado had none of these forms of protection (Levitan, 2013). This NIST study does not illuminate the decisions making process that community leaders experienced in order to protect citizens from another such disaster.

Summary and Conclusions

Most studies found in the literature research strategy were quantitative or mixed method, only a few were strictly qualitative. Most quantitative studies were descriptive, observational, casual comparative, or correlational and often utilized surveys. Most qualitative studies utilized interviews but only one was phenomenological and it concerned household survivors of the Joplin tornado (Fujikawa, 2013). No studies were found concerning the experiences of Joplin community leaders following the EF5 tornado.

It was revealed that community emergency response plans vary greatly and are often inadequate, untested, and fail to address special populations. Mental health effects following a tornado are best addressed by professionals trained in the field of trauma psychology. However, the field is in its infancy, there is a need for increased training, and an agreement on approaches for treating disaster victims is without consensus (Yamashita, 2012). The studies examined in this chapter are helpful to gain insight regarding issues surrounding tornadoes and the methodologies utilized by researchers to analyze these issues. Social disruptions and long term psychological effects are linked to violent tornadoes. Negative effects are often caused by confusing warning systems, break downs in communication systems, and the collapse of structures thus causing death, injuries, and wide spread traumatic effects (Houston et al., 2015; Kuligowski et al., 2014; NWS, 2011; Prevatt et al., 2012).

This chapter presented an introduction defining the scope of the problem, a literature search strategy, identified the conceptual framework, revealed key concepts, discussed literature related to methodology, and provided a summary with conclusions. Chapter three provided more detailed information related to the methodology for this study.

Chapter 3: Research Method

Introduction

The purpose of this study was to explore, document, and learn from the experiences of Joplin community leaders following an EF5 tornado to potentially improve tornado preparation and response for other communities and may mitigate traumatic effects. Trauma from disasters is often a response to loss of lives, injuries, permanent disabilities, significant social disruptions, fearfulness, and posttraumatic stress (Houston et al., 2015; Kuligowski et al., 2014; Miehl, 2011; Prevatt et al., 2012; Stough & Mayhorn, 2013). National, state, and local tornado definitions, standards, and codes regarding tornadoes need to be developed (Fujikawa 2013; Kuligowski et al., 2014).Knowledge of the experiences of Joplin community leaders post tornado may assist others in developing and implementing these documents.

Areas of concern for this study included community tornado preparation, emergency response plans, trauma mental health services, and identifying the best approach for rebuilding tornado-prone communities. These key areas have been linked to social disruptions and long term mental health needs (Adams et al., 2014, Houston et al., 2015; Prevatt et al., 2012; Zimmermann, 2015). To research these areas, I conducted a qualitative, phenomenological study to explore the lived experiences of Joplin community leaders who were faced with numerous critical decisions following the EF5 tornado in 2011. These decisions were required of the leaders despite the lack of nationally accepted definitions, guidelines, standards, and codes regarding tornadoes (Fujikawa, 2013; Kuligowski et al., 2014; Prevatt et al., 2012).Making informed

decisions is a responsibility placed upon community leaders following a disaster which requires immediate decision making during a time of confusion and often leads to enormous pressure and demands on community leaders (Courright, Colbert, & Choi, 2014; Figley & Kurzweg, 2016; Kapucu & Quian, 2016).

In this chapter, I describe the methodology chosen to address the identified problem, purpose, and research questions of this study. In-depth information is provided to clarify the research design and rationale. In this section I present the research question with subquestions and the rationale for using a qualitative approach following Giorgi's 2009 modified Husserlian methodology. The role of the researcher is described including any potential bias such as my living near the tornado path when it occurred. I explain the process and details concerning the selection of participants, data collection and analysis procedures, and instrumentation. Specific steps are presented to help assure ethical protections, trustworthiness, and dissemination of findings. This chapter concludes with a summary of key points made in it.

Research Design and Rationale

The following sections are presented to clarify how this study was designed in order to answer the research question and describe my role as the researcher.

Research Questions

The primary research question for this study was as follows: What were the experiences of community leaders in Joplin, Missouri, following an EF5 tornado concerning efforts to improve community preparedness, emergency response plans,

trauma mental health treatment, and rebuilding of community structures following an EF5 tornado? The sub-questions were as follows:

RQ1. According to Joplin community leaders, what obstacles, opportunities, and solutions resulted from the tornado?

RQ2. Have participants' understanding and perceptions of tornado preparedness, emergency response plans, trauma mental health services, and the rebuilding of community structures changed? If so, how have perceptions changed?

Rationale for Qualitative Approach

It is intended that this qualitative study will indirectly contribute to the formulation of nationally accepted definitions, guidelines, and codes through the examination of the lived experiences of Joplin community leaders in dealing with the impact and aftermath of an EF5 tornado. Additionally, I hope that my research may serve as an impetus for subsequent quantitative research which can more directly contribute to the formulation of national definitions, standards, and codes regarding tornadoes having the information gained from Joplin community leaders.

In the absence of national direction, studies have linked factors such as confusing warning systems and the collapse of structures to social disruption and long term psychological effects (Houston et al., 2015; Kuligowski et al., 2014; Prevatt et al., 2012). NIST researchers have conducted several quantitative studies of the Joplin tornado that are contained in the 2014 NIST final report on the Joplin tornado (Kuligowski et al., 2014). A few qualitative studies of the tornado are also included in the organization's

final report published in 2014. These qualitative studies, however, do not focus on the experiences of Joplin community leaders following the tornado.

According to Giorgi (2014), the strength of a qualitative approach lies within its discovery orientation. Creswell (2013) noted that qualitative studies are often used when little is known about a subject and exploration is required. He further contends that qualitative studies are valuable among a group or population when identified variables are not easily measured and silent voices are often not heard. Creswell identified five popular designs for qualitative inquiry. The five approaches he identified were narrative, phenomenology, case study, grounded theory, and ethnography. All of these designs as well as a few other ones were considered for the methodology of this study.

According to Creswell (2013), researchers using narrative designs will utilize a chronology of events based on the stories of one person or a very small group. The story will be co-constructed between researcher and participant with the researcher often helping to shape the chronology (Creswell, 2013). Narrative was not chosen because I wanted to include a broader spectrum of experiences from unrelated persons who shared the one characteristic of being a recognized community leader when the tornado event occurred. I did not want to influence participants' development of their chronologies or help them to shape responses as with a co constructed narrative. I wanted capture the essence of their experiences without any outside influence. Grounded theory was not selected because my intention was not to generate a theory or a unified theoretical explanation, both of which are important attributes of grounded theory (Creswell, 2013). Creswell indicates that the ethnographic approach will focus on culture in terms of

patterns, rituals, and customary social behaviors; use of this design in many cases requires extensive field work. This design did not fit the purpose of the study as I was not looking for shared rituals of customs and not seeking to be embedded in the culture for broad observations.

Case study was considered as a way to analyze my study population, which constituted a bounded system comprised of first responders. However, the focus of this study was not meant to conclude with an overall meaning from such a limited type of group. This study was conducted to understand the experiences of a very diverse group of community leaders with varied responsibilities depending on the nature of the organization represented. The study was designed to better understand these leaders' unique experiences, perceptions, and responses in light of their varied responsibilities. I considered it important to document what participants thought and felt and how they made decisions based on their unique perspectives following the devastation of May 22, 2011. In doing so it was hoped that insights might emerge concerning each person's individual experiences.

I examined the five popular qualitative approaches as described by Creswell as well as others and I deemed a phenomenological approach to be appropriate for this study. After careful scrutiny, I decided that Giorgi's (2009) modified Husserlian methodology was best suited for this study. Giorgi identified basic steps for doing scientific psychological research. The steps identified by Giorgi (2009) provided a structure that I followed in this study. The identified steps are, as follows:

1. assume the attitude of phenomenological reduction,

2. obtain a description of the phenomenon and read the entire written account for a sense of the whole,
3. delineate meaning units,
4. transform the descriptions into meaning units which are psychologically pertinent expressions, and
5. synthesize a general psychological structure of the experience.

The five steps are an important part of this research design and help to express Giorgi's process of reduction as it relates to research design.

The phenomenological methodology helped describe the experiences of several individuals concerning a shared phenomenon (Creswell, 2013). Phenomenology helps us to better understand how human beings make sense of experiences. Interviews helped identify how they described a phenomenon from a first person perspective. Their perceptions, memories, feelings, judgments, and how they share and make sense of the phenomenon was revealed in a full, rich text (Patton, 2002).

Role of the Researcher

In developing this phenomenological study it was of primary importance to minimize any influences I might have on the participants. Researchers have noted that a qualitative observer, if not careful, can have an effect on the participants (Lincoln & Guba, 1985). However, as the researcher I functioned as the primary instrument for data collection and had the advantage of processing data immediately (Creswell, 2013). Data collection for this study was acquired by my conducting interviews, journaling, observation, and member checking. My close proximity and familiarity to the Joplin area,

including knowledge of some community leaders, enhanced my ability to devote significant time and access to participants. Although I am aware of the roles some community leaders serve due to the media, no person selected as a participant was someone I knew on a personal level. As the researcher I recruited, selected, and interviewed participants, gathered and analyzed the data, and wrote up the results. Additionally, as the primary instrument I had several advantages including quick processing of data, enhanced flexibility, ability to make adjustments during interviews, and the capacity to seek out clarification when helpful (Lincoln & Guba, 1985). These actions enhanced theoretical sensitivity as remained actively engaged while diligently documenting participant behaviors, reactions, and statements (Janesick, 1998). It is thought that my enhanced role resulted in a richer, truer, understanding and analysis of the conveyed experiences by participants.

Researcher Bias

All researchers will have unique experiences and personalities of which they must be aware as their own personal biases or personality types may influence participants. I presently live only six miles from the Joplin tornado path and lived at this location when the tornado occurred. My upbringing was in Jasper County, Mo. where Joplin is located, and I am quite familiar with the area and the community of interest. In 1971 I attended college in Joplin and volunteered for clean-up efforts following a tornado strike that year. My experiences included being exposed to the threat of tornadoes over many years and I maintain a distinct personal viewpoint concerning living through tornado outbreaks. Joplin, Mo. is somewhat central in the United States and it lies in an area known as the

Ozark Mountains. Many residents have been exposed to tornadoes and tornado warnings over multiple years. I was at my home only about 6 miles from the tornado path when it occurred. I was aware that my experiences while living in this area and culture could influence my objectivity but there are also advantages to having an insider status. A significant safeguard to reduce bias on my part was to keep a personal journal of my experiences for careful reflection. Concerns regarding insertion of the researcher into the study were outweighed by the advantages for this study. Further precautions were taken to mitigate researcher bias through receiving feedback by third parties including my dissertation chair, dissertation committee, IRB, and URR. This researcher made considerable effort to keep the focus of the study on the participant's experiences and not my own.

I have significant experience working with the disabled, elderly, and mentally ill populations. These experiences influence my perspective and motivated me to understand the events following the Joplin tornado. However, I remained aware of my background and functioned only as an instrument to facilitate this study. As a researcher I was committed to a self examination process, known as *reflexivity*. In this process I challenged my own assumptions, beliefs, and principles (Willig & Rogers, 2008).A personal journal was kept where I recorded my reactions as data gathering and analysis proceeded. The journal was intended to enhance self awareness and objectivity by sharpening reflection, thinking, communications, and writing quality (Janesick, 1998). I had no supervisory or instructor role in the community, past or present, and currently am a doctoral student only. An important goal for me was to produce a scholarly study

worthy of consideration by scholars and researchers. It was necessary that I remained objective, transparent, and willing to examine myself to remain true to scholarly principles.

Methodology

Participant Selection and Criteria

Participant selection was purposeful and limited to community leaders as defined in chapter one of the definition section and stated the following, *Community Leader:* A person recognized and empowered by an organization to make decisions, speak on behalf of the organization, direct, delegate, provide information, and who is looked to by members for guidance in time of crisis.

All participants were volunteers for the study and have either lived, worked, or done volunteer work in the Joplin, Mo. community at the time of the tornado. Additionally, they needed to be 21 years of age at the time of study, be recognized by a community organization as a leader, able to communicate in English, and have had their organization impacted by the tornado. For the purposes of this proposal a community leader will be defined as follows: A person recognized and empowered by an organization to make decisions, speak on behalf of the organization, direct, delegate, provide information, and who is looked to by members for guidance in time of crisis. Being recognized within their community organization as a leader enhanced their ability to share insights concerning problems encountered by the organization after the tornado and decisions and actions taken. Participants did not need to be survivors within a household, business, or other domain which was struck by the tornado. However,

community leadership was a necessary criterion for participants as an effort was made to gain insight regarding the tornado's impact upon them and the organizations they represent.

Organizations contacted included Joplin city government, Joplin area chamber of commerce, Freeman hospital, Mercy hospital, Joplin police department, Joplin fire department, Jasper county sheriff department, Joplin area agency on aging, American red cross southwest Mo. region, Habitat for humanity, Catholic charities, Missouri southern state university, Joplin area ministerial alliance, Joplin globe, Joplin television, Ozark Christian college, Home depot, Walmart, and Joplin schools. Organizations were only asked to forward the invitation for research volunteer form (appendix A) to a select few persons that the organization regarded as a leader within the organization. No information or resources were received from any the organizations and no research conducted in an organization's facility. After the study was completed a 1-2 page summary of the study was sent to all organizations contacted.

Sampling

Unlike most quantitative studies which often use random sampling among large populations, this qualitative study utilized purposeful criterion sampling in order to obtain information rich text and observations. This sampling approach allowed for a more rich, full, and detailed text to help illuminate issues of central importance (Patton, 2002). It was reasoned that the purpose of this study was best achieved, and more valuable information learned, by using a small number of carefully selected participants than by gathering information from a large, randomized, statistically representative sample

(Patton, 2002). Community leaders were chosen as the participants because they were decision makers having differing perceptions of this shared event, differing responsibilities to the community at large, and represented a broad spectrum of the community.

Establishing the optimal number of participants and determining the point where data saturation occurred was an important considerations for this qualitative, phenomenological study. Creswell (2013) states that a heterogeneous group for a phenomenological study will vary in size from as few as 3-4 individuals up to 10-15. This study was projected to use 10-15 individuals and saturation was reached with 12 participants. According to Creswell (2013) this participant number is appropriate for a qualitative study however, if it had been necessary to enlist more participants, if some should drop out, the cooperating organizations would have been revisited to gain new participants. Data was considered saturated when no new perspectives, insights, or information occurred and data began to overlap (Creswell, 2013).

Instrumentation and Data Collection

Instrumentation

As the researcher I initiated contact with community organizations in an effort to gain their assistance. No organization contacted was asked to provide information or resources, and no research was conducted at any organization's facility. The community organizations were asked to forward information about the study to potential participants and the need for volunteers (see Appendix A).

With the organizations help, participants were identified that indicated a willingness to volunteer for the study and provided an interview guide by the researcher (see Appendix B). The interview guide detailed where the in-depth interview was to take place, expected length of time for the interview, requested demographic information, questions to be asked during the interview, estimated time for follow up and member checking, and a general overview of the interview protocol.

Participants were provided a copy of the consent form prior to the interview. Before the interview began the consent form was explained to the participants and signed before the interview proceeded. The consent form was previously approved by the Walden University Institutional Review Board. This form helped provide a context for the study and included an introduction of the researcher, background information, procedures, sample questions, voluntary nature of the study, risks and benefits, compensation, privacy, contact and questions, and proof of consent through signatures located at the bottom of the form. Scheduling of interview times were conducted over the phone or by e-mail, and arranged for the convenience of the participants. Interviews were held at the Joplin public library and conducted in a comfortable, quiet, and private room which was free from observation

As previously stated an interview guide was developed (see Appendix B). However, before a final version was included in the study it was reviewed by an expert panel. The panel consisted of experts in qualitative methods who examined the interview guide to provide feedback concerning structure, wording, quality, and order of questions. A final version of the interview guide was incorporated using panel comments and

feedback. The interview guide identified one primary research question coded as RQ and two sub-questions coded SQ1, and SQ2. The applicable codes followed the interview questions indicating the research question or interview questions with which they corresponded (see Appendix B).

Data Collection

Perhaps the most important aspect of data collection for this study was the utilization of participant interviews to gain quality information. Interviews were digitally recorded and transcribed by myself with the assistance of voice activated software. No outside person was involved in the development of transcripts. One interview of about an hour was conducted with each participant. I had determined that if initial recruitment of participants fell below expectations I would again contact community organizations and resume recruitment until the participant number was sufficient. Twelve participants were interviewed and made up the final participant pool because at this point saturation had been achieved.

The importance of interviews for this study dictated that interview questions were crafted carefully. According to Creswell (2013) interview questions in a dissertation should be distinct and clearly separated from the research purpose. Additionally, he explains the research questions should be open-ended, evolving, and non-directional.

Giorgi (2009) indicates that a good interview will have a spontaneous quality based on a complete description (as much as possible) concerning the lived experiences of participants. The researcher needs to distinguish between “directing” and “leading” the participants. Leading a participant is an attempt to coax the participant to say specific

things that the researcher wants to find in the data and is inappropriate. Directing is having the participants speak to the phenomenon of interest without influence. In conducting the interview Giorgi's style often involves starting a question with "tell me about [fill in the blank]; and finishing with a [what or how] question." The researcher will have no concerns regarding the specific details or content that the participant provides (Giorgi, 2009).

Giorgi (2009) writes that establishing rapport with the participant is critical for a good qualitative interview and at times this is not achieved by the researcher due to a misconception of how to be neutral. The concept of being neutral is often interpreted as the researcher being distant or uncaring which inhibits the interview. The opposite extreme is also undesirable such as having only intimate conversations with participants. The ordinary societal practices of conversation should be observed throughout the interview. Additionally, a sense of proportion relative to the phenomenon studied is important so that the interview is not too long but is long enough to adequately gather a complete picture of experiences (Giorgi, 2009).

It is important that data collected in any study helps to measure what is intended to be measured and as such acts as an indicator of validity (Lincoln & Guba, 1985). An advantage of qualitative research concerning validity is that it can be effective when it is difficult to evaluate a phenomena or outcomes when no acceptable, valid, and reliable measurement exist (Patton, 2002). Using the information contained in the literature review helped assure greater validity by gaining current, relative, and scholarly information for this study.

As part of my effort to triangulate data and ensure data trustworthiness I kept notes during the interview as deemed helpful but as not to distract from listening to participants. The journal notes contained limited observations of participant behaviors, emotions, and vocal inflections. I also kept a personal journal where I noted my own feelings and thoughts experienced during this study's development. These efforts were helpful in establishing consistency and greater accuracy through reflecting on events concerning participants and myself. Additionally, each participant was invited to review an analyzed summary of their own interview at an agreed upon time following the interview. This member checking procedure helped to assure that I accurately captured the meanings intended by the participant and helped identify any participant perceptions that may have been overlooked.

Data Analysis

Assuming the Phenomenological Attitude of Reduction

This section broke data analysis into steps which essentially provided a data analysis plan or process which I performed manually. I have previously discussed the foundational step one of Giorgi's modified Husserlian method of "assuming the phenomenological attitude". This first step required me to examine objects from the perspective of how the objects were experienced by the participant. This attitude was adopted and followed during data analysis as I began to scrutinize interview recordings and transcripts. It was helpful for me to be able to recall and grasp the liveliness of the original interview (Giorgi, 2009). Journal notes from the interview were helpful in

capturing the nature of the interview and documenting participant behavior as I began to breaks down the transcripts of the interview.

Read for a Sense of the Whole

Data that was transcribed from the interviews was then read in its entirety to formulate a sense of the whole. This is the second step in Giorgi's modified Husserlian method and required me to have already assumed the attitude of phenomenological reduction. This is a critical step because meanings within descriptions may have forward or backward references. For example, as the researcher I will have incomplete insight while I analyze the first descriptions without knowledge of the last descriptions. It was also necessary to document descriptions of intentional objects that the participants provided in the interviews (Giorgi, 2009).

Determine Meaning Units

Phenomenological analysis according to Giorgi (2009) requires the determination of meaning units which is the third step in his modified Husserlian methodology. Descriptions occurring in the interview were of necessity broken into parts or meaning units to make them manageable and to do justice to them. The researcher should be constantly aware that the ultimate goal of analysis is the meaning of the experience. These meaning units must be identified and considered from a phenomenological psychological perspective. In doing so, as the researcher I was able to make them immediately relevant and helpful in obtaining the goal of capturing the meaning of experiences (Giorgi, 2009). In this step I read the narrative again carefully, several times, with the purpose of finding places where meaning shifts occurred and then marked where

the shifts occurred. To distinguish shifts in meaning units I used a forward slash (/) at the cleavage between the two meaning units (Broome, 2011). Meaning units were then given a numerical label at the beginning point which acted as an identifier. However, where the meaning units were delineated was not absolute and better places of demarcations did occur as familiarity with the data provided added clarity (Giorgi, 2009).

Transform Participant Natural Expressions into Phenomenological and Psychological Sensitive Expressions

According to Giorgi this fourth step is at the heart of the modified method and it is the most laborious. To clarify how to accomplish this task, Giorgi (2009) provides examples of this reductive process in his modified Husserlian method. Results from this step reflect precise descriptions of the experienced phenomenon which occurred in the consciousness of the researcher and were not pre-conceived such as a hypothesis or theory. I wrote these descriptive summarizations as a word or phrase which were assigned to meaning shifts in the transcript. These descriptions functioned as codes and were intended to capture a datum's primary content and essence (Saldana, 2013).

Giorgi explains that psychological experience and dimensions must be drawn out and detected as they are difficult to ascertain. I converted dimensions into more concrete experiences that offer developmental potential. These dimensions were pushed to a level of generality so that data could be generalized. This process enabled me to develop psychological meanings to be expressed in a way that allows for integrating of data from several participants. In this process the facts may differ but the psychological meanings

can be identical. I analyzed data gathered from several participants and placed the data into themes or a general structure (Giorgi, 2009).

In describing Husserl's theory of meaning Giorgi identifies a schema that Husserl employed where consciousness enacts a signifying act which includes a meaning to be fulfilled. The search continues until an object is found that fulfills the empty meaning to a point where there is precise satisfaction (Giorgi, 2009). Finally, having achieved precise satisfaction, an act of identification ensues. When these parts of the schema all occur the seeking out ceases. This represents the process of transforming meaning units into psychological expressions assisted by the method of free imaginative variation (Giorgi, 2009). In this step I took the phenomenon from a philosophical level to a psychological level to practice science. During this step I re-expressed the meaning units in the third person without changing the meaning content (Broome, 2011).

Synthesize a General Psychological Structure of the Experience

The fifth step of the modified Husserlian method is drawn from the psychological constituents of the experience. Constituents are context dependent or parts of the whole, therefore they are not independent of each other unlike the concept of elements. The contention is that the value of the whole is greater than the sum of its parts and not reducible to its parts (Broome, 2011). The parts referred to in this context are moments which of their nature are dependent upon the whole. Only in this relationship do their essential identities exist and this interdependency helps form a general psychological structure. Pieces or elements that can subsist on their own are not considered moments, and as such, are not constituent. Using imaginative variation I looked for shared

meanings leading to a general psychological consistency and applied a descriptive phrase or word which served as a title of the constituent. I then placed constituents together in a descriptive paragraph, forming a psychological structure that expresses results of the analysis (Broome, 2011). According to Giorgi (2009) it is through imaginative variation that the eidetic nature of the data is brought forth. I used explicit data to reveal the existence of implicit meaning despite it not being concretely expressed by participants within the data.

During this transformation I maintained a sense of the whole because one cannot see an object all at once but only through the aspect which is facing the viewer. In synthesizing the general structure some constituents are implicit just as viewing the front of a person implies there is a back side of the person which is not seen. It is in this way that the descriptive phenomenological approach may be considered more comprehensive than an empirical approach taken in the natural attitude.

Implicit or absent essential qualities are logical inferences and are supported through its explicit presence in the data retrieved from other participants having the same type of experience (Giorgi, 2009). According to Giorgi (2014) the strength of qualitative phenomenological method lies within its discovery orientation. This study was not based on a particular hypothesis to be proven or disproven but rather to gain knowledge concerning a subject where little is known, which is a fitting use of qualitative studies (Creswell, 2013). The goal of this study is not validation and therefore the emergence of more than one general structure was considered in a positive manner. My analysis involved logical inferences based on implicit and absent essentials. I identified the same

types of experiences of participants which produced identifiable patterns or themes that helped answer the research question and subquestions. Any discrepant data that emerged was reexamined to see if it fits a broader, more encompassing area. Discrepancies were resolved but it was always assumed that unresolved discrepancies would have prompted developing a specific section regarding discrepant data.

Issues of Trustworthiness

It is not possible for a study to create positive social change if the study itself is not considered trustworthy. There are protections that can be taken in a qualitative study to assure trustworthiness and general acceptance among scholarly critics. Concepts for this section were derived from various experts in qualitative research resulting in a blend of concepts that are particularly relevant to this study.

Trustworthiness is largely the responsibility of the researcher and requires hard work and intellectual rigor. As a qualitative analyst I returned to the data on multiple occasions to assure that constructs, categories, explanations, and interpretations made sense and accurately reflected the nature of the phenomenon (Patton, 2002).

Credibility requires rigorous adherence to the methodology I selected with the knowledge that this methodology is recognized by experts in the field. This study utilized a qualitative approach based on Giorgi's phenomenological methodology primarily found in his modified Husserlian methodology (Giorgi, 2009). It was necessary that I, as the researcher, skillfully applied this methodology with rigor and honesty during all phases of the study including the fieldwork, collecting data, analyzing data, and sharing findings.

It is also important that any qualitative researcher maintains a philosophical belief in the value of qualitative inquiry (Patton, 2002).

Yin (2011) indentifies three objectives for building trustworthiness which are transparency, methodic-ness, and adherence to evidence. His identified objectives and application to this study were adhered to and are as follows:

Transparency. Procedures in qualitative research should be publicly accessible, adequately described, and well documented. The final study should be able to withstand the close scrutiny by others to evaluate the evidence, findings, and conclusions (Yin, 2011). This study was scrutinized by my dissertation committee chair, second committee person, and a member representing the University. After approval by the dissertation committee the study proposal was submitted to the Institutional Review Board (IRB). The study proposal received IRB approval to conduct research before activities began. The completed study required approval of committee members, IRB, and department head. This approved dissertation will be printed and publicly displayed by Walden University using ProQuest dissertations. During development of this study I enlisted an expert panel to evaluate research questions and make recommendations for improvement.

Methodic-ness. It is important in any study that an orderly set of research procedures are followed which allows adequate room for discovery and unanticipated events. Deliberate distortions or unexplained bias have no place in carrying out research. As the researcher I was methodic, used cross checking procedures, and strived to lead the reader to a sense of completeness concerning the research effort. My relationship with participants was established in a self-reflexive manner (Yin, 2011). According to Giorgi

(2014) qualitative studies have a discovery nature and as such they do not present a hypothesis to be tested or preconceptions. Every effort was made by me to reflect the essence of the participant's responses through recordings, transcripts, journaling, and observation. I asked open ended questions and did not lead participants, and utilized member checking to gain participant input concerning reductions and findings. I made efforts to be aware of my own body language and voice tone so as not to influence participant responses. I have previously discussed any biases and influences that I may have under the "researcher bias" section of the study and I made sincere efforts to put aside my personal views. This included revealing any bias I had to participants and readers and to not allow bias to influence any direction of the study. A personal journal was kept in order to improve self reflection. The journal assisted me in recalling my experiences, ideas, mistakes, fears, confusion, problems, or breakthroughs which occurred during the study (Yin, 2011).

Adherence to evidence. This final objective identified by Yin (2011) contends that qualitative research must be based on an explicit set of evidence. Evidence should be based within the context and with the language as it is expressed by participants. Participants words are considered as self reports and conclusions are based on the various forms of data collected and then analyzed. In the reduction process I developed words or phrases which accurately expressed the thoughts and feelings of the participants. These words or phrases were compared to other participant words and phrases. It is at this point that synthesized a general psychological structure of the experience based on the constituents of the experience. This important step reflected a consideration of the whole

data to determine essential aspects that were present in data of other participants but absent in one participant's data. A deliberate effort was made to seek out similar and contrary cases in order to strengthen findings (Yin, 2011). It should be recalled that individual participant views are only part of the entire whole and that the whole is considered greater than the sum of the parts (Giorgi, 2009).

Creswell (2013) also addresses issues of trustworthiness which he refers to as validation strategies. He discusses eight strategies which a researcher may want to consider and three of these strategies are important to emphasize for this proposal. The three strategies are as follows:

Triangulation. One strategy to enhance trustworthiness was to use multiple and different sources to corroborate the evidence which helped to document a code or theme (Creswell, 2013). This study used multiple sources including evidence found in the literature, participant interviews, member checking, and journaling. Through a reductive process codes were developed to help form a general psychological structure.

Member checking. This source of corroboration was previously mentioned but deserves more discussion as it is an important element in establishing trustworthiness. In this process I solicited participant views concerning the credibility of interviews conducted (Creswell, 2013). I met with participants to go over their interviews concerning analysis, reductions, and findings. This allowed the participant to judge the accuracy and credibility of my overall findings as reflected in psychological terms. The participants were given an opportunity to provide alternative language which they thought was a more accurate description of experiences (Creswell, 2013).

Rich, thick, description. The researcher in providing detailed descriptions will enable the reader to consider information when applied to different settings and determine if the findings can be transferred based on identification of shared characteristics (Creswell, 2013). In developing this study I wanted to provide a rich, full text to assist the reader in understanding the entirety of the event from the eyes of the participants. It is expected many findings in this study may be transferable to similar populations when the same methodology is utilized. The Joplin tornado, while very destructive, does provide a rare opportunity for researchers. For example, only 59 tornadoes have been classified as EF5 or F5 tornadoes since official record keeping began in 1950 (NWS, 2012). However, death, destruction, and injuries from less powerful tornadoes have been documented in numerous communities since 1950 (NOAA, 2009).These destructive events are something many communities have in common and many persons have experienced.

Ethical Procedures

In this study I recruited leaders from various community organizations. All IRB approved methods for recruitment were strictly followed. A description of the study and the IRB approval number were shared with each organization contacted when I inquired if they would forward the invitation to participate to a select few members. Following all ethical procedures was considered essential and a critical concern for conducting the study. In this effort I completed the National Institutes of Health training titled "Protecting Human Research Participants". This certification course was completed 10/02/2015 and the certification number is 1879950. Assuming an ethical attitude was an

important cornerstone for assuring the quality and integrity of this study. I perceived that embracing ethical procedures provided protection beneficial to me, associated organizations, and participants.

Protection of Human Subjects

There are some slight variances among IRBs but according to Yin (2011) there are four main procedures that research submissions must address and which this study followed. The procedures are as follows:

1. Obtain voluntary informed consent which includes a written statement indicating that participants clearly understand the nature and purpose of the study.
2. Assess and clarify the potential harm, risks and benefits of the research, and make efforts to minimize any potential harm to participants. Potential harm would include economic, social, legal, psychological, physical, and dignitary harm to participants.
3. Assure equitable selection of participants in a manner that assures no group is unfairly included or excluded from the research.
4. Identities of participants must be kept confidential as requested including all forms of data such as computer records, journals, videotapes, or audio recordings.

These procedures were addressed with the consent form and providing an interview guide (see Appendix B). The consent form was reviewed with participants before the interview and any remaining question were answered. In signing the consent

form participants demonstrated that they understood what they were agreeing to do (Yin, 2011).

Ethical Examination, Protection, and Access to Data

All data was stored in a manner to protect confidentiality. This included any printed documents, audio recordings, signed consent forms, or any data which might contain identifying information. I worked on this study only in a private office within my home and data is kept under a double lock and key system of which only I have access. Interviews were conducted in a secure private setting provided by the Joplin public library where no one could hear or observe any portion of the interview.

After conducting an interview I placed all data in a locked storage box and then locked the box in the trunk of my car during transport. After transport all data was secured under double lock and key, safe from fire or water damage. Access to computerized data is protected under a password code. No person other than the researcher is authorized to gain access to this information or have knowledge of the password. Identities of participants were not revealed with a name but were assigned a number 1-12 which was used for all data collection and analysis. No identifiable information regarding participants was included in any written documents.

The researcher, dissertation committee members, university authorized officials, and the IRB may have access to raw data following procedures prescribed by university guidelines. Raw data including audio recordings are kept under lock and key and will remain secured for a minimum of five years and then purged including all electronic

storage systems. Paper documents will be shredded and burned. This final approved dissertation is considered a public document and accessible to the public at large.

Summary

This chapter described the procedures used to help achieve the purpose as defined in the study. The purpose was to explore the experiences of Joplin community leaders following an EF5 tornado in order to improve future tornado preparedness and response by other communities and thus mitigate traumatic effects. The research design and rationale were explained and followed Giorgi's descriptive phenomenological methodology with particular use of his 2009 modified Husserlian approach. In order to accomplish the purpose of the study in depth interviews were conducted with Joplin, Mo. community leaders who experienced the May 22, 2011 EF5 tornado. I described my role as the researcher and addressed the protocol to be followed to assure trustworthiness and high ethical standards. The presentation of results follows in Chapter 4.

Chapter 4: Results

Introduction

The purpose of this study was to examine the experiences of Joplin community leaders following an EF5 tornado in order to improve tornado preparation and response for other communities and potentially mitigate traumatic effects. A phenomenological design was used to examine the meaning of experiences that community leaders lived through due to this tornado. I studied descriptions given by community leaders within the framework of constructionism. Using this theory, the following research question was answered: What were the experiences of community leaders in Joplin, Missouri, following an EF5 tornado concerning efforts to improve community preparedness, emergency response plans, trauma mental health treatment, and rebuilding of community structures following an EF5 tornado. In this chapter I present results using participant statements, tables, and analysis. The study setting including the location of the interview setting is described. Specific information is provided concerning participant demographics, data collection, data analysis, and evidence of trustworthiness. I identify and discuss the major themes and subthemes that emerged from analysis of interview.

Setting

Data were collected from 12 participants. I conducted one interview with each participant which lasted about an hour. I arranged interviews times and dates based on participants' schedules and the availability of rooms in the Joplin public library. A private room was reserved at the library from September 26 through October 3, 2016, to conduct

interviews. Participants were provided an interview guide (see Appendix B) prior to the interviews. Before interviews were conducted, the consent form was reviewed with each participant, and any remaining questions were answered. Following this review, each participant signed the consent form before interviews were conducted. All participants were informed that they had the right to leave the study at any time and for any reason. No participant expressed any discomfort. However, I provided information on counseling services they might seek in the future. No unexpected events occurred during the interviews that might have influenced results. Several participants commented after their interviews that the experience provided a personal sense of relief to them.

Demographics

Participants were all volunteers. They were required to meet the following criteria: (a) were aged 21 years and older, (b) lived, worked, or volunteered in the Joplin area at the time of the tornado, and (c) were recognized as a community leader by an area organization (see the Definitions section of Chapter 1). The average age of participants was 51 years old, with the youngest participant 35 years old and the oldest participant 75 years old. Within the sample 11 of 12 participants reported identifying as Caucasian while one participant identified as Native American. There were four females and eight males, all of whom had attended college. One participant reported attending college for 2 years. Four participants had bachelor's degrees, five had master's degrees, and two had doctoral degrees. The average amount of time spent living in the Joplin area was 31.5 years, and all but one reported living in a tornado-prone area for their entire lifetime. (The participant who was an exception did report living for 30 years in a tornado-prone

area, however.) Demographic information on all participants is provided in Table 2. No names are given to participants and because of the high profile of the participants within the community; I opted against providing a more extended profile to prevent inadvertent identification. Participants are numbered P1-P12 in the table.

Table 2

Participant Demographics

Participant	Age	Ethnicity	Highest education	Gender	Years in area
P1	63	Caucasian	Bachelor's degree	Male	63
P2	53	Caucasian	Master's degree	Male	11
P3	43	Caucasian	Master's degree	Female	16
P4	62	Caucasian	Master's degree	Male	30
P5	35	Native American	Master's degree	Female	11
P6	42	Caucasian	Bachelor's degree	Female	32
P7	47	Caucasian	Doctorate degree	Male	47
P8	52	Caucasian	Bachelor's degree	Female	28
P9	50	Caucasian	Bachelor's degree	Male	8
P10	42	Caucasian	Master's degree	Male	42
P11	46	Caucasian	Doctorate degree	Male	30
P12	75	Caucasian	2 year college	Male	60

Data Collection

Participants represented organizations such as leadership in education, media, charities, city government, businesses, clergy, mental health, and social work. Interviews were held in a private conference room at the Joplin public library. I administered one interview to each participant. Interviews lasted between 45-75 minutes depending on each participant's level of response. Interviews were recorded electronically by using the Olympus Note Corder DP-201. I developed transcripts with the assistance of the voice activated software Dragon Naturally Speaking 13. No outside individual was used in the development of transcripts. The data collection procedures as detailed in Chapter 3 were followed and no unusual circumstances were encountered. Walden University's Institutional Review Board issued the approval number (07-13-16-0152732) before I proceeded with data collection.

Data Analysis

Upon completion of each interview I followed Giorgi's (2009) descriptive phenomenological method in psychology. I began the analysis process by assuming the phenomenological attitude of reduction. During this step I examined objects of thought, such as the devastation, from the perspective of how the objects were experienced by the participants. It was helpful to refer back to the audio recordings and my journal notes to recall the liveliness of each individual interview.

This second step required listening to the recordings and scrutinizing the transcripts to breakdown the interview transcripts into meaning units. It was important that I listened to each recording in its entirety as well as reading each interview in its

entirety to gain a sense of the whole. In this way I was able to compare descriptions within the interview text and determine their relationship to one another

The third step I followed was that of determining meaning units. Descriptions within each interview were broken down at points where meaning shifts occurred. This was necessary in order to focus on the separate meaning units and to make the information manageable. Meaning units were given a numerical label at the beginning point which acted as an identifier.

The fourth step of the process required that I transform the meaning units into more precise descriptions of the participant's natural expressions. This is part of the reductive process emphasized in Giorgi's (2009) modified Husserlian method. These descriptions were written summarizations in a word or phrase without the influences of pre-conception or hypothesis on my part.

The final step was a further synthesis of the transcripts in order to create a psychological structure of the experience. As part of the reductive process I needed to develop a synthesis. This step required using imaginative variation in which I looked for shared meanings. Once I identified the same types of experiences of participants I manually utilized emergent coding in which I was able to distinguish patterns or themes which helped to answer the research question and sub-questions.

Using the reductive methodology allowed me to identify the following themes: (a) community preparation, (b) emergency response, (c) trauma and mental health (d) rebuilding of structures. Each theme had related sub-themes with participant quotations provided. Table 3 provides a display of themes, subthemes, and sub-subthemes.

Table 3

Themes and Subthemes

Themes	Subthemes	Sub-subthemes
Community preparation	Insurance	Homeowner's and renter's insurance Auto insurance Mental health insurance
	Planning	Household disaster planning Organizational disaster planning
Emergency response	EF5 tornado power	None
	Restoration of basic services	Clearing debris from streets Marking and identifying streets Communication services
	Coordinating efforts	Preexisting networks Utilizing and managing volunteers
Trauma/mental health	Mental health symptoms	Survivor's guilt Compassion fatigue Post-traumatic stress
	Coping mechanisms	None
Building of structures	New homes	In home safe rooms Hurricane anchors and clamps
	Public and business construction	None

Note. Additional findings include the following: tracking technology, flying debris, leadership support, and home safe rooms support mental health.

Evidence of Trustworthiness

Data trustworthiness was of particular concern while performing data collection and data analysis. As the researcher I wanted to be methodical and go through the processes with an orderly set of research procedures. I found it necessary to return to the data on multiple occasions to assure that interpretations made sense and accurately reflected the participant's experiences and the nature of the phenomenon. The following techniques were used to help verify trustworthiness during this process: prolonged engagement with participants, reflective journaling, member checking, and triangulation.

The process of identifying participants for this study was challenging because community leaders often have very busy schedules and I needed time to help them understand the nature of the study and its importance to their organization. When a volunteer responded to my invitation to participate (see Appendix A) I would follow up with him or her either with phone calls, emails, or both. There was a period of about five weeks between initial contact and conducting an interview. During this time several conversations ensued with each participant, questions were answered, and I was able to develop a trust relationship through this prolonged engagement with each participant.

During the process of data collection and analysis I would take time after conducting an interview, reading text, or listening to the interview to write down my personal thoughts or feelings. I often used the journal to just summarize my weekly activities during this prolonged process. I compared my thoughts throughout the process

to the themes which emerged and whether the research question was adequately answered.

After conducting all the interviews and conducting analysis I provided each participant a copy of their individual transcript text as synthesized into a psychological structure of their experience. Each participant was encouraged to check for accuracy, thoroughness, and to provide any comments they might wish to provide during this process of member checking.

I was able to perform triangulation of the data for consistency by comparing conversations held during the prolonged engagement period, journal notes, and member checking. I did not find any discrepant data in email records, my journal, or in the reviews provided during member checking.

Results

During this study I explored the experiences of community leaders following a devastating EF5 tornado. The interview questions created for this study were all intended to help answer specific parts of the single research question: What were the experiences of community leaders in Joplin, Mo. following an EF5 tornado concerning efforts to improve community preparedness, emergency response plans, trauma mental health treatment, and rebuilding of community structures following an EF5 tornado? The losses that individuals endured were numerous and in many cases represented very emotional experiences. Participants discussed observing individuals going back and forth to damaged or destroyed homes to retrieve important documents such as marriage licenses or birth certificates. Many participants discussed the need to keep a lockbox for

keepsakes and family photos. Participant 10 noted with the loss of homes, schools, and churches many found their life experiences and memories were affected or gone. These types of stories are a common feature of disaster and recovery but few such stories were shared in the interviews because of the nature and design of this study. The focus of the interview questions dealt with re-building the social and physical structure of the city and on the civic, public role of the participants, not on personal stories. An excellent study which dealt with the experiences of household survivors of the Joplin tornado can be found in Fujikawa, (2013).

Participants had their own perspectives and there were numerous factors that influenced how they experienced the tornado event. Conversations were naturally more centered on the concerns of the organization each participant represented such as churches, city government, charities, media, schools etc. To varied extents all participants felt that their community could have been better prepared as well as their organizations, and their own households. All the participants felt the community was now better prepared if such an event were to occur again as well as their individual households and organizations with one exception regarding an organization. By using the reductive process I was able to synthesize the interviews into themes and subthemes. Subthemes include quotes from participants which were deemed relevant to the subtheme and main theme.

Theme 1: Community Preparation

At the beginning of each interview I asked the participants to compare the level of preparation individually, by their organization, and the community before the tornado in

general and more specifically after the tornado. All participants thought the level of preparation was inadequate before the tornado concerning their homes, their organization, and the community. All the participants noted significant improvements in the level of preparation by their community, all but one of their organizations, and their households after the tornado. Certain areas of preparation are discussed separately because of their significance as noted by participant responses in the interviews. For example, emergency planning at the community level is discussed under the theme titled emergency response. In home safe rooms and community safe rooms are addressed under the theme titled rebuilding of structures. Mental health symptoms and treatment are also discussed as a separate theme.

Subtheme 1: Insurance. Eight of the participants (P1, P3, P4, P6, P7, P9, P10, and P12) specifically mentioned insurance as an important factor in community preparation. Each of the eight participants thought insurance coverage was inadequate before the tornado and thought they were now better prepared having obtained higher insurance limits for themselves and for their organization. There were concerns regarding coverage within the community although they thought it was better than before the tornado.

Homeowner's or renter's insurance. All of the eight participants who specified insurance discussed the fact that a few homeowners were uninsured but most were underinsured. Uninsured homeowner's in this context included renters who didn't own their homes but lost their possessions in their dwelling. Four of the eight participants were specific concerning the need for renter's insurance.

"So many didn't have insurance and yet they may have lost everything, a loved one, their home, or even their place of employment. The losses in Joplin were tremendous and as a community we were terribly underinsured or uninsured in many cases." (P1)

"One thing that we really encourage is for other communities to evaluate their homeowner's insurance and renter's insurance. The people that had the best experience had insurance. Just like one person was on Medicaid and maybe had $800 a month to live on. But he had made that small renter's insurance payment every month and within 24 hours of the tornado he received help from his insurance and was able to have everything replaced. I also worked with a retired minister including his wife. Now his wife was significantly disabled and he was her caregiver but even though their house was paid for they had let their insurance lapse on the home. Even though they owned the home they ended up losing it."(P3)

"Some of our members were underinsured but we were fortunate because we had several people attend the Ramsey program and they had already set money aside for difficult situations. So you know you really have to set aside savings and get better financial management for yourself and your family." (P4)

"One thing that I think impacted a number of people was homeowner's insurance. I mean you know you feel for people who didn't have homeowner's insurance but that's a basic responsibility to carry renters or homeowner's insurance. We had a lot of people who didn't have insurance or were underinsured, a surprising number. I think there was a little bit of the divide concerning this. I think everyone wanted to be charitable but at

same time I'm sure there were some people wondering why they didn't just have insurance. Insurance will save you a lot of grief including renter's insurance. In our own company one reporter had renter's insurance and this guy got his car replaced, he got anything he needed to replace, all his clothing." (P6)

"People have to look at their insurance policies. That was huge and it would be good if people were aware concerning how affordable renter's insurance is. A lot of people think they cannot afford it but it can literally be only eight or nine dollars a month for just a small policy. So, we encourage people to get renters' insurance." (P7)

"Our biggest issue was with people being underinsured. Just about everybody in our church had the insurance but some were underinsured and of course they didn't know that until after the tornado hit. So when the money came back it wasn't enough to replace their losses. I know my wife and I decided to up our insurance after the tornado, on our dwelling, possessions, and our car. If you want more coverage you have to specify that because some standard policies won't replace all your possessions." (P9)

"You should have a response plan and make sure you have all your insurance up to date and at high enough levels, not just your home." (P10)

"A lot of people just simply didn't have renter's insurance and I'm sure it's because most people who rent may already be on a very tight budget and they may feel they're lucky just to have furniture let alone renter's insurance. For some people they think it's a choice between eating and renter's insurance and they're going to buy food. However, I think most people really do need to have insurance when they rent but for some it's a difficult." (P12)

Auto insurance. I assumed that participants who thought all insurance should be obtained or levels increased were also thinking of auto insurance. However, two participants specified the need for auto insurance.

"Fortunately, if people only had liability insurance on their car but they had insurance FEMA would pay to help replace their car. But if they had no insurance they were just out of luck." (P7)

"Cars were impossible to get; you just couldn't get a car that was under five thousand dollars. People that had only liability insurance often tried to buy a car that was around a thousand dollars but those cars were almost impossible to get." (P9)

Mental health insurance. I assumed that participants who thought all types of insurance should be obtained included medical insurance. I also assumed that people who were insured for mental health symptom would primarily be covered under their medical insurance plans. However, two participants specified mental health insurance.

"Concerning mental health, many people were without this type of insurance and didn't know what to do." (P1)

"I think that most insurance doesn't provide mental health coverage in a lot of cases and so it's an out-of-pocket expense. We had one couple that lost their house, both their cars, and they were underinsured. He lost his job right after that, so they've really struggled. They've been through a lot and the business where he worked was destroyed. So all of a sudden they are without so much and it's hard to recover from that financially. So the thought of them spending scarce money on mental health just really didn't make sense." (P9)

Subtheme 2: Planning. All the participants discussed planning for a disaster as part of preparation. The following discussion involves planning for their homes and their organizations. Considerable discussion involved community wide disaster planning but this is discussed under the theme titled emergency response.

Household disaster planning. Eight of the participants (P1, P2, P3, P4, P6, P9, P10, and P12) discussed household preparation for their homes including recommendations for other households.

"My planning primarily consists of being very weather aware, monitoring the weather, watching the weather channel, listening to systems to warn me, especially anything that has to do with my job. I have to be prepared in both settings. I utilize what you call a 'Fraidy Cat' which is a hole I can enter under the house." (P1)

"Now at my home, I had a basement. Before the tornado the alarm would go off and we would take note of it but nothing like at this point. Today if it goes off we pay attention, we don't take it for granted. I think we took it for granted. Now if we hear the alarm we assume there is an imminent threat. It's not just to warn you, and you need to get your family or your church somewhere safe, we play no games." (P2)

"Of course you don't want to become complacent afterwards, and don't assume it's never going to happen again. Remember your going to need a lot of things set aside as resources." (P3)

"I think you should do some water, do some basic medical supplies, plastic totes and tarps, and blankets. That's about all I would stock up on." (P4)

"I know my sister gave us a generator so at least we have a generator now as a backup system. My husband started buying some things, like we have a propane stove, and we started to stockpile some things in case we are without power again, so we can survive." (P6)

"Now I think if my house is destroyed and I dig myself out of the rubble I think I should leave something behind so when people get to that location they would know you were okay, they know you got out." (P9)

"Everyone needs to have a go bag, make sure you have things like shoes because you will need a good pair of shoes when you're walking out over all the debris. The debris will be everywhere, nails in boards, things you step on like glass is everywhere. You know there were some people walking barefoot after the tornado. So, make sure you have good shoes, some water, granola bars, that sort of thing." (P9)

"We have a lockbox that has all the things we want to keep safe, you know, things you just can't afford to lose. We have the deed to our house, titles to our cars, backup keys for the cars and the house in this lockbox. Anything you think you might need in an emergency like birth certificates you should keep in a fireproof heavy duty lockbox." (P9)

"After that date my family decided to have a meeting place where all my family members would come together and meet after a disaster. We have a rendezvous point where they can come from college or wherever because you may not be able to talk on the phone." (P9)

"We will watch the weather in detail now and that includes me and my children too. I have three young boys who were very young following the tornado but they still remember what they saw. So I think when we hear of a tornado or warnings, I think our background and understanding after that devastation has caused us to be a lot more aware. You need to have a plan with your family where you know where you're going to go. If you have anything that's important make sure it's in a safe secure location make sure you have delicate information in a safe place." (P10)

"It would be best if they have some emergency things, water, toiletries and such, stored and ready to go. We as a church have always encouraged people to keep a little extra water a little extra food more than what you may use in 30 days perhaps up 60 or 90 days." (P12)

Organizational disaster planning. Nine of the participants (P3, P4, P6, P7, P8, P9, P10, P11, and P12) discussed disaster planning as it related to their organization. One participant noted no changes but the other eight participants provided details of changes within their organizations since the tornado. Some changes were considered positive outcomes brought about by the tornado.

"We had a person come into our organization and actually conduct an assessment and we found that our facility really wasn't a very safe place. Many organizations like ours have since applied for funding to make an area inside building which is much safer. Many of our area agencies and organizations had worked really hard since the tornado on making sure we are prepared for and have a good plan having learned from this experience." (P3)

"You better have some concrete plans and clearly more people in our church are aware of the plan for a tornado. At the church, we always had one person who knew the plan and now it may be far more likely we have 100 times the number of people who know the plan." (P4)

"Our main station in Kansas is now currently adding a storm shelter because we always have someone there working. Some of the things they have changed or modified since the tornado we now have stockpiles of food, blankets, and pillows, and we have a cupboard full of things for emergency only. Because there are going to be times when we get stuck there you know. If your house gets blown away or messed up you can stay at the station while you're trying to do your work or can't get back and forth to work." (P6)

"As far as disaster preparedness we haven't done much, you would think we would have, but we haven't. We don't have a safe room at our offices, we have kind of figured out where we would go, but there is nothing in place, there's no policy, there is no real disaster plan. Really that's actually kind of irritating because you would think we would have a plan. But you know we have a high turnover and that affects us as an organization." (P7)

"At that time our small staff was overwhelmed. It's important to update things. I've been redoing a lot of our policies and procedures so we have clear direction in the future concerning disaster response. You have to pretend like it can happen again and very soon." (P8)

"As a pastor we have a plan at the church with a list of people who were in the building so we would know if somebody was missing to check and see if they were still

alive you know or if they could walk out on their own two feet. At our church, we keep all our important paper in a lockbox at the bank. Before the tornado these things might've been in a storage cabinet in the office or wherever. You know I tell people an ounce of prevention is worth about 100 pounds of cure." (P9)

"Post tornado we are now located in several locations and we've added a lot of people to our staff and to our program. Now we've come here to this new facility and so we've done a type of resiliency training. This is where we have disaster scenarios so if a disaster happens here's what you do. We've had this training and we have emergency cards with number information. We know who's in charge if something happens or if that person's not here we still know where to go and where will be the meeting place. We received a grant which helped us to put in a storm shelter it's in the back with a capacity of 50 people. Of course, that was never going to be a reality before the tornado because we really didn't have funds available for that. So we were able to add a few things which helped us to feel more prepared." (P10)

"We didn't have a server before the tornado we just had our computers. We had insurance you know but probably not enough. So after that we got a server and we have off-site data memory. So we've really made it so if something were to happen here we have off-site capacity with all our information so that in case of a disaster we could get started quickly. I would say our planning has improved, and our own emergency planning is in place. So we have a lot more stuff in place than before the day of the tornado." (P10)

"In terms of starting the initial recovery process at bright futures we were working with about six communities. Before the tornado hit it was just these local communities

planning together and helping each other. At present we are working with 50 communities in eight states and growing." (P11)

"We came such a long way, we're not quite at 100% yet, but were getting close. We're getting the infrastructure back in place and planning for the future. The new Mercy hospital has to be commended, especially with the rebuilding. They did a good job of keeping their staff in place after the tornado. Much of their staff was on call even though they didn't have a facility because of the tornado. Now they're working with us helping us to try and get a medical school located here, they're working with the University. So the tornado caused some positive things to emerge from this tremendous hurt. There are things we wouldn't have acquired otherwise, some places came in and opened an office during the emergency and they're still here. From that tremendous storm we have new schools, new business, a new hospital and many new things we didn't have before." (P12)

"I think we have all worked together as a community realizing that it's not just the schools, or the business, or the homes, but that we are all together as a community. We have tried to work together and plan together as a community. So we've put money toward the improving things for school system, we've opened a training center to help people gain new skills and improve their ability to be employed. When you have that community mindfulness it does help." (P12)

Theme 2: Emergency Response

Joplin first responders were placed in real life and death situations and forced to deal with traumatic injuries, death, and body parts. The flood of volunteers that came to

Joplin presented a significant management and coordination challenge. Emergency response also required the restoration of basic services so medical services could be provided and transportation could take place. Seven of the participants indicated that they relied upon preexisting networks to facilitate the response by their organizations during this critical time and were not going to wait for the government to arrive.

Subtheme 1: EF5 Tornado Power. All of the participants had lived in tornado prone areas but none had ever experienced an EF5 tornado. Each participant indicated his or her organization was not prepared for such a tornado or did not understand how powerful and devastating an EF5 tornado could be. Eight of the twelve participants (P1, P4, P5, P7, P9, P10, P11, and P12) offered descriptions of the immediate aftermath following this powerful tornado.

"You don't have a lot of EF5 tornadoes but they can be very destructive and Joplin provided an opportunity to determine what an EF5 does in terms of impaction on various types of construction and what we can do to lessen the impact if possible. I don't think most people understood just how powerful an EF5 tornado is and that most people really don't understand how to prepare for this type of tornado. The Joplin tornado just like the 1925 tornado was a historical event and a record which shows how violent a tornado can actually be and it can happen again as it did in Joplin." (P1)

"We walked up the hill headed south to the top of the hill, and I'm saying to myself this is really bad tornado damage, this is about as bad of tornado damage as I've ever seen. But, I still thought it was just really bad tornado damage. Now when we came over the top of that hill there is really no way for me to describe the emotion of that

moment. When I came over that hill that's when it really hit me. I could see a mile wide and 13 miles long. I mean you had no idea of the 13 miles but as far as you could look left or right and a mile across it was gone." (P4)

"We really didn't understand the magnitude of what had happened at that point because this would've been just minutes after. We knew something had gone on and the word was starting to get out and then of course I learned it was a lot worse than we first knew. I had been around tornadoes where you have a small path of destruction but nothing like this." (P5)

"When I finally left the school I knew things were bad because those coming in were so badly hurt, but when I actually saw it, I was floored. I had no idea of the magnitude, so that was my early experience." (P7)

"At that time we didn't have any idea of how bad it could become. I think our preparation before was terrible in fact I would say almost embarrassing. We didn't take heed to the cautions and no one had a plan for what would happen. I mean when I arrived at Walmart everyone was dazed and confused; it was mass confusion. It looked like a bomb went off, it was a complete disaster and it looked like a war zone. Everybody was hurrying, looking for survivors, trying to save people before they died." (P9)

"I couldn't really tell the devastation that was happening in Joplin from where I was. I mean I knew the wind got a little sideways, it got dark, but nothing compared to what was actually occurring in Joplin. When I think back, I remember it was all so overwhelming right at the beginning." (P10)

"What we have learned is that an EF five tornado is just really a different animal altogether. We had done typical drills that can cover the average sort of thing but I can't even imagine what the loss of life or injuries would have been had it hit during the school day. We had operation plans for major emergencies during the school day but in this case you could almost probably throw the plans away. In this case you could throw out the playbook for the most part because you would have had a lot of fatalities and a lot of the people responsible for oversight could have been hurt, killed, or incapacitated so that they couldn't support the plans implementation. I really don't have a good answer for that, just thank God it didn't happen during school hours." (P11)

"I remember the morning after the tornado the city manager sent a police car over to get me to take me out and to get me through all the debris. We had everything pretty well shut down, just trying to get things under control and figure out what we were going to do. It was just over whelming and there were parts of the city where you didn't even know where you were. It looked like you were out in some no man's land. For those (first responders) that dealt directly with those things I guess it might be described as a soldier at war. You really don't know what you're getting into but you just have to jump into it and do what needs to be done." (P12)

Subtheme 2: Restoration of Basic Services. One hospital had to be evacuated and the remaining hospital was functional but had to receive the massive influx of those needing emergency medical services. People had to be transported to the hospital, emergency workers had to navigate to homes without street signs, and communicate when towers were down. In this section I looked at the most basic of services, clearing

debris from streets, marking streets, and restoring communication for first responders conducting search and rescue.

Clearing debris from streets. People in need of critical medical services must be reached and transported to an emergency care facility. Transportation is often not possible when trees block the streets, houses are on roads, power lines are down, and numerous objects block emergency vehicles. Volunteers had to clear a path for the emergency responder to get to a victim and then clear a path to get the victims to an emergency medical facility. Seven of the twelve participants (P1, P2, P3, P6, P8, P9, and P12) discussed the critical need for clearing debris from the streets.

"Then you have all this debris which was created by these un-tethered buildings which becomes a destructive force of itself. I mean concerning debris they just had to step in and do it because nobody else was going to do it. It was the people of Joplin, and those in the area, we had to do it ourselves. If you were on one side of the tornado zone you couldn't get to the other side, you had to make a way." (P1)

"Before the tornado I knew this chainsaw crew, like with the Southern Baptists, and friends that were part of that storm response teams. I saw their equipment and looked at what they were doing. They were prepared and already responding in many cases in Joplin. When the roads were beginning to be clear people of faith didn't wait for the government to show up. When FEMA arrived to take action, we had already cleared many of the roads and streets before FEMA had arrived." (P2)

"When FEMA came to town they said they were surprised that the streets were mostly cleared, and remember, we had houses in the middle of some streets. But we had

our cleanup crews that stepped up with so many volunteers. We had taken care of a lot before FEMA arrived at the community. We were proactive not waiting for the government." (P3)

"I think Joplin was a good example of a lot of people stepping up to help themselves like clearing debris. We were willing to try to solve most of the problems ourselves." (P6)

"When we pulled up they had chainsaws going and they were clearing trees and things. So it took a while before they even realized that we had shown up. There were so many people working that they were all just too busy to notice us. Once they realized that we arrived with help some of them broke down in tears because they really hadn't expected help." (P8)

"We didn't wait for people to come and help from the outside we just started doing whatever we could do, clearing debris from the streets, digging out people, we just said 'we can do this'." (P9)

"Then we would tell people to get your debris together and bring it to the curb. A lot of people were able to move things to the curb and of course a lot of volunteers came in to help with that bringing all this debris to the curb. I think the key was we just went in as soon as possible and began to clear those streets. We had so many crews and I forget how many millions of tons of debris they removed but it was a tremendous amount of total debris." (P12)

Marking and identifying streets. Many people entering the storm affected area became disoriented because street signs were gone, familiar landmarks were gone, and

houses with their numbers were destroyed over a vast area. To find survivors and conduct transport it was necessary for responders to navigate and know where to go to reach victims. Three of the participants discussed the need for street signs to help orient people.

"And so by the next morning when volunteers would come the first thing was to send them out to put up homemade signs for the streets because we knew from the night before you couldn't tell where you were. People were sent out putting up signs for the streets by five thirty or six the next morning." (P4)

"I had been living near the area for the majority of my life but still had absolutely no idea where I was because all the landmarks and street signs, that sort of thing were no longer there." (P8)

"One of the things that our team did from the outset was to start with the streets because they were unrecognizable after the tornado, so they would mark the streets with identification. Of course there weren't any street signs, they were all gone. So they would paint and identify where the streets actually were and mark them appropriately." (P12)

Communication services. Effective emergency response required first responders to be able to communicate to know where to go, relay medical information, and coordinate efforts. Texting became an important method of communications for many people. Power was out and radios that ran on batteries provided emergency information when televisions could not operate. Emergency responders were fortunate that their contracted cell phone provider replaced downed towers that very night after the tornado.

Seven of the participants discussed their experiences concerning communications following the tornado.

"We could have had better communications, people really hadn't been talking to each other, couldn't talk with each other. We had people here who wanted to help but they didn't know where to go to go, what to do." (P1)

"Of course there were the telephone lines and electric lines that went down and our organization was without power for several days. We couldn't call and check on people and we were without a real plan as to how to verify where our staff was. So we were texting and we indicated what we could bring to the table and what they needed us to do, what they were doing." (P3)

"There was no cell phone service but a few texts were going through, but really for three days we had almost no text capability let alone being able to make a phone call. So we would send some out to be a runner and to tell us what they found. If they found a family they would send a runner back and tell us what they found. If that family was not there you just started at the neighbors to see what you could find out. So we had addresses of our 300 member families and then we had all the neighbors that were gathering addresses on each other. We were sending out volunteer runners to all these locations and in about three days you had full text capacity so you could communicate more efficiently." (P4)

"You couldn't get a cell phone signal to talk so you had to text because all the cell phone coverage was out. I was supposed to try and do a live shot from somewhere near range-line and our bureau was without power so the biggest thing that came up was what

do you do without power? Fortunately we had a guy who figured out to how to run our live truck through a phone line. The truck ran on gasoline but to get the actual connection they ran it through a phone line and I ended up doing a live shot talking but I couldn't see myself because there were no monitors. In terms of emergency response oddly enough it was easier to listen to a radio than it was to have your TV on because most people don't have battery operated TVs." (P6)

"Everybody was confused trying to check on each other, to just let mom and dad know that you're okay. You couldn't really talk on a cell phone, the towers were down. They have apps that you can use in these situations and I think they are really valuable if there is a disaster." (P7)

"At first I couldn't text and when we did search and rescue I had just gotten some texting capabilities back. There were other responders who could talk on their phones and I asked how are you doing that? 'Sprint they said, Sprint put up a new tower right over there. Sprint had the contract with the firemen and policemen in Joplin to provide the cell phones.' So, the very first towers to be rebuilt were built by Sprint. In fact, the first night right after the tornado they were out putting towers up. All of our emergency personnel carried Sprint phones so here I am out doing search and rescue and I can hardly text but the others are talking on their phones." (P9)

"Work with your television stations, your radio stations, that sort of thing. They can help keep the people informed as to what they can do and educate the population because education is the biggest thing. People need to know what they can do." (P12)

Subtheme 3: Coordinating Efforts. All of the participants discussed the challenge of managing the response network that was primarily made up of volunteers from within the community and the area.

Preexisting networks. Seven participants referred to having a solid preexisting network prior to the tornado. Each participant thought these networks were a critical factor in coordinating an effective emergency response.

"Many of our spiritual leaders prior to the tornado were already building relationships with other organizations in the community. So there was this network that already existed prior to the tornado. We had charity tracking established by the minister alliance which was already providing resources pre-tornado. We were able to track individuals using this system, provide money for groceries, transportation, flights, heating and whatever." (P2)

"I was a member of our disaster preparedness organization before the tornado struck. We were having regular meetings before the tornado. That was very beneficial because we had already been going to meetings, we knew each other, so we knew a lot of the players and we had developed some relationships before the tornado." (P3)

"Everything in life follows relationship threads, and because we had previously gone to the city and the county, long before this, we had contacts and knew where to go. We were already sending sometimes 80 to 100 people to work with them and to help people. You know, cleanup the yards, take care of brush, repair a porch. So we had established a long-term pattern of working with the city and the county. You just can't prepare for everything all at once, it's just not possible." (P4)

"Prior to the tornado we had launched a networking tool in our community to bring nonprofits together and that was something we started out of this ministry 10 plus years ago. So we already had scores of organizations that were networking together and talking, working together and so when that happened we were already used to collaborative efforts. So, we were prepared more than most." (P5)

"I was on what they call the pandemic flu committee a number of years ago but I think things like that did help prepare the city of Joplin and Jasper County to be able to work together. These organizations had meetings throughout the year and I think ours was every two weeks or once a month. They would plan for a disaster and we had planned various disasters and planning with different organizations. Maybe not on this magnitude but the planning meetings were helpful to have procedures in place for setting up emergency shelters, deciding where people would go. A lot of the response happened fairly quickly after the tornado because there was some practice and organizations were already working with each other and dealing with these things." (P6)

"I was very heavily involved in a lot of the emergency planning before the tornado. We had CERT training, I think it stands for certified emergency readiness training and we did a lot of work with local law enforcement. So we had some relationships there and beyond that we had also started an initiative. I would say about nine months prior to the tornado or maybe a little over a year before, about April 2010 we began what is called the Bright Futures initiative. This was really all about building relationships in the community, creating partnerships with the faith community, the

business community, and different services. So we had a lot of phone numbers on file, a lot of contacts and relationships that we had developed through all that." (P11)

"It's interesting that probably about a year or two years ago I'm not sure, the city council was required to take a course by the federal government in order for us to qualify for federal funds. These courses were not on tornadoes necessarily but just any disaster. We were trained on what you would go through in a disaster. One of the things that they did was to prepare you was to talk about responsibilities, who would take authority, and who would take charge in a time of disaster. I think the fact that we had a number of the emergency management personnel in place. Our fire department and our police department were well trained and able to coordinate together. So I think we were moderately ready for that type of thing but I think the degree of the tornado we suffered was beyond description, it really was." (P12)

Utilizing and managing volunteers. The overall emergency response was directed and coordinated by the National Guard, police, fire, and federal emergency agencies. However, the use of volunteers was critical in search and rescue, transportation of the injured, identifying bodies and body parts, clearing debris, and feeding of volunteers by volunteers. Every participant indicated that volunteers were a critical component of the emergency response efforts.

"It was the native population that was doing most of the rescue work. I know that because there were people in pickup trucks, people being carried in on doors where the front doors were turned into stretchers. One of the most striking images to me were all those nurses and volunteers coming in from all over the area to help, and I was one of

those people. The fact is that there were hundreds of people needing help. In their words there was just not enough help to help them all, and they ran out of space inside the emergency room and out in the waiting area. I had to carry people into the ER and we had to place them against the wall and then outside where they had to be placed on the sidewalks, and all the time helicopters kept coming in and out and hover over us, I just kept hearing the blades overhead." (P1)

"People from everywhere had provided transportation, I mean volunteers from Carthage, Lamar, Neosho, Tulsa, Springfield, just people from everywhere. It was so overwhelming and there were hundreds and hundreds of people that were transported off-site to other facilities. I mean it had to be done they were going to die if not, we couldn't wait for emergency crews in many cases." (P1)

"I think about how many meals we served to people we never had met. One of the churches came up from Arkansas and they were there for over a month helping out. We worked together serving hamburgers, chicken, pork chops, really whatever was being donated. We cooked lunches and two suppers every day. You saw volunteers from the Jewish disaster relief, Catholic charities, Methodists, Baptist, Presbyterian, heathens, and so on. All of them were standing in line, talking about what they had experienced that day. There was one thing these volunteers all had in common and that was the compassion that they all had. You know we served 184,000 meals and we served 10,000 families with different projects like cleanup, helping repair houses, or providing temporary housing." (P2)

"The next day I think was one of our busiest days. We were running, I don't know, about 5,000 volunteers a day. We would bring them in and had the whole building full. Sometimes it took as many as 1,500 volunteers a day just to run the supplies because you were constantly unloading, organizing, and coordinating the supplies. Between the two groups we had about 5,000 volunteers." (P4)

"The day that we were sending out people as runners we would have volunteers lined up and we had about 200; we would do about 20 minutes of orientation with them. We would explain this is what you do if you find the body part, or if you find someone deceased this is what you do, and this is what you don't say." (P4)

"After some days the number of meals fed began to slow down. It seems like the number 16,000 was the highest number of meals fed in one setting. So you know you had people who would come in to help with meals, they were people who did like chili cook off competitions, they would bring their equipment and those things." (P4)

"People from our shelter would go and help as volunteers and so our folks in the mission were involved in cleanup immediately after the tornado." (P5)

"I have to say the students were phenomenal at the school. They volunteered and worked 24/7 because we became a pop up shelter. The cafeteria was the triage center and the gymnasium was a shelter for the kids. The kids had gotten there early and they stayed probably a whole two weeks. Initially they would sleep in shifts and the trucks were just constantly pulling up with supplies. The kids would help unload the trucks so they were phenomenal, I mean they were really good." (P7)

"Everybody wants to come and help at a time like this, and nonprofits get reimbursed from FEMA for those volunteer hours. So the nonprofits are really grabbing up those volunteers, but unfortunately sometimes they don't even know what the volunteers are doing. There's so much damage done to people's homes and unfortunately some volunteers did overly shoddy work, so I mean it's okay to screen them and ask their skill level before sending them out." (P7)

"Of course eventually thousands and thousands of people came from all around. They came from churches and different places, from all over the country and just filled our city with people wanting to help." (P9)

"One of our members was a sergeant in the Army and he was in charge our search and rescue. He recruited me as a volunteer and told that I needed to be a part of the team. He assigned me to search and rescue and so for the first week all I did was search and rescue. I know for me I was so busy digging out people, putting people in body bags, separating body parts, doing search and rescue I didn't have time to think about myself. Once we found that body we went to the next assignment and looked for the next person. You don't take time to process because you had to go to the next assignment on to the next and to the next. It was just a one after another situation like that. You know it is what they call an urgent need and it just had to be done now." (P9)

"Whether it's the spirit of the people or the nature of the people here or what, I don't know. The people just jumped in and started helping and it was an amazing thing. We had a dentist who was on the Council and his wife was a nurse and he went to the hospital to see what he could. A lot of the surgeons were performing surgeries and so

they would do the surgery and passed them over to him to sew them up. It was that type of thing and it was that way at all levels." (P12)

"We had as many as 70 truckloads come to our church in one day. We were blessed because we had a fellow contact us and he was a construction man from North Carolina. He had a ministry where he would go into disaster areas and he knew how to organize such things. He showed us how to organize boxes with all these essentials and have them ready for people. The people didn't come in and just shop because we had boxes ready and they drove through our lot and our volunteers would just put the boxes in their vehicles and they kept going." (P12)

Theme 3: Trauma and Mental Health

The traumatic impact of this disaster resulted in thousands of persons in need of varied types of mental health services and a need for linkage to mental health services. The losses rippled throughout the community and among every social and economic level. People lost loved ones and thousands were injured or disabled. Others lost jobs, homes, cars, and possessions. Memories were taken from some with the loss of family keepsakes, their old school, church, or a favorite meeting place.

Subtheme 1: Mental Health Symptoms. All of the participants discussed the mental health needs they recognized within themselves, members of their organization, and the community. Three different types of mental health symptoms were described by the participants. The three symptoms were survivor's guilt, compassion fatigue, and post-traumatic stress. A variety of coping mechanisms were discussed. Many people were

referred for services and others choose to cope on their own, often with negative results including suicide.

Survivor's guilt. Seven of the participants discussed feeling they should have done more, or wondering why they were spared, and the impact of survivor's guilt.

"Speaking for myself, I realized that survivor's guilt can be a powerful thing. I just kept thinking I could have done more, but it was also a motivating thing," (P1)

"To help others you've got to have a certain level of empathy and you have to really pay attention to what people are telling you. This empathy is needed to find the best way to help them. So you naturally get involved with their situation and then you have to find a way to decompress, become untaxed, while working with people." (P2)

"You know you go through a lot but I thought I'm so thankful it wasn't me. I mean we also had a lot of people who had like a survivor's guilt you know. They wondered why they didn't lose that much, my home was there, my job was there. I wondered why I was so lucky and so many others lost so much." (P3)

"On a personal note anytime you do anything like this, or something substantive, afterwards you always feel like you've failed. Survivor's guilt was not so much a feeling of I'm alive and someone else is dead. Survivor's guilt was really more like I haven't done enough, I should do more, or I could have done more." (P4)

"A person from FEMA spoke to me and said you know I've done this for 20 years I've never seen a more efficient, a more compassionate, a more humane, and a finer response to a crisis than what I saw this morning. He said I want you to know in 20 years

this is the best I've ever seen and he said I figured you needed to know. Well I slumped down against the wall and began crying because you feel like you're always failing." (P4)

"I went over to one volunteer and I kind of got his arm and his shoulder and he just started sobbing. I mean he was just sobbing and I couldn't really understand him for a while. He had found multiple bodies that day and I just thought to myself, just go home, back to North Carolina, you've done a lot of work you can go home now. He had the most guilt about going home. I told him it was okay you're not less of a man. You've done good work, so just go home and you know he finally did go, but I remember he felt so guilty. That was sad and was difficult to watch and I guess yeah, that was survivor's guilt." (P7)

"You see a lot of survivor's guilt there, and I know my wife probably has some of that survivor's guilt. She was in Walmart when they heard the storm. They began praying together as the storm was coming through and this man was standing by her praying when he was sucked out of the building, right in front of her. I mean she was thinking it could've been me or maybe it should've been me. I know she said 'that could've been me', 'I could have been dead', or 'why them and not me'." (P9)

"You only have two choices, work hard or work harder. That just seemed like the only thing we could do or should do at the time. I personally just think I can always do better, I can do more and I think we've done a lot but I don't think we should ever be satisfied." (P10)

Compassion fatigue. Nine of the participants discussed feeling very fatigued, tired, or exhausted from all the work they had to do which included long hours, stress,

and the sorrow they encountered. Some indicated that the whole experience was draining and others indicated it changed their interests and their focus concerning the future.

"I decided after covering so much of the devastation for so long that I would retire, I was just tired. A friend said I know how this tornado has impacted you. You've seen so much grief and sorrow and it has taken its toll. You know she was right on the money. I was the primary writer covering this tornado and had written all these articles. Now, five years later, I told them I just don't want to do them anymore, I'm going to retire." (P1)

"People involved with the emergency effort and recovery have experienced I guess what is called compassion fatigue. They have labored so long and experienced the adrenaline while providing help. In their efforts to provide help under stress and over time it takes a toll. I found within my own self that I had been physically exhausted. You know we served 184,000 meals and we served 10,000 families with different projects like cleanup, helping repair houses, or providing temporary housing. Working with so many volunteers and just to provide case management can be exhausting." (P2)

"In the beginning a lot of people were helping people. We were especially busy for quite some time following the tornado and we were so busy that I think a lot of the caregivers didn't have time to let up or process experiences. They had all seen things, heard stories while helping people and eventually that weighed on a lot on them." (P3)

"As a minister you know people come to you and want your help. But you've got to talk with someone yourself about your experiences. If you don't, your story will start unpacking you. Somehow in talking about it with others, I don't know, secrets lose their

power, scary little things lose their power. I mean you have to talk about it, but you also have to be willing to step away from all of it." (P4)

"This experience did impact me, no doubt about it. I was so deep into this thing for about eight months that it made me a little less likely to want to be in meetings, or to work with so many organizations. It altered me in the sense of what I enjoyed. You know, before that I didn't maybe enjoy meetings but I didn't mind them. Now rather than overseeing budgets and all these things I think I'd rather just like to help young people prepare for the ministry and mentor them. I think the tornado played a role and was a factor in my making the decision to join the college and to make that job change." (P4)

"I think there were a lot of other stressors besides just the storm itself, I mean just the drudgery of trying to rebuild. You know there was so much to do after the tornado. I think that takes a toll on people and I think for a number of us the tornado changed our perspective on how you look at things." (P6)

"I remember after that was all over in August, I just said were going to take a weekend, a long weekend and were going to go to Branson. We are not going to serve anybody, were not going to call anybody. We decided to spend three days together by ourselves. So we left on a Thursday, went to Branson and checked into a hotel. We really didn't tell anybody where we were and we didn't answer our cell phones. So we went to bed around 5 o'clock Thursday afternoon because we were so exhausted." (P9)

"When I look back on it, you know we did three years of what I would say was hard steady ongoing effort. There were some vacations in there but for the first six months to a year I was thinking nonstop. You know it affected my sleeping patterns and

it affected my quality time with my family. In fact, because I was wanting to make sure everybody had what they needed, that our volunteers had the experience we were looking for, or a sponsor had everything they wanted, I personally became very, very, tired." (P10)

"I can tell you at the end of this I had no gas left in the tank, I gained weight, the stress and anxiety levels were constant for lack of a better term. I can't imagine I was the only one impacted like that. Those that served in a leadership roles were impacted and for me just trying to deal with taking care of the family, taking care of the community, taking care of the kids in the schools, my employees. It was a pressing situation and so taking care of my own self was placed on the back burner, actually it wasn't even on the stove. So I didn't do a very good job of taking care of myself." (P11)

Post traumatic stress. Ten of the participants discussed observing post-traumatic stress among survivors and their own experiences with this mental health symptom.

"I think the focus needs to be on individuals that suffer from PTSD but I think an argument can be made that a whole community can suffer from the same PTSD symptoms and this community continue to experience PTSD symptoms. I mean the psychological, social and economic impact is still ongoing. I've covered a number of situations concerning loss but there's so much that is not covered, can't be put into words." (P1)

"All of a sudden the roof came off their house and the wife went up in the air and he grabbed hold of her, then he went in the air and just prayed God would hold on to him. Miraculously they were not sucked out of the house even though he could see the blue

sky above because the roof was gone. They collapsed to the ground as the backside of the tornado passed by. The debris fell on them; they were completely covered. After the tornado they took their new vehicle to the car wash, and as they got into the car wash they would have an episodic recall because of the brush and dryer noise reminded them of the sound from the tornado. In this type of instance I would say they were re-traumatized. It's been difficult for them to develop a happy ongoing attitude toward life, but they've been able to do that. They survived but there still are those moments for people who have lived through this experience that have certain triggers that bring them back to the tornado." (P2)

"I remember when the first tornado alarm went off after the tornado and how it was just palpable. I remember when the tornado sirens would be going off on a very clear day and how I felt. Those early first alarms were anxious. I mean everyone would be talking about what happened. They were asking things like 'did you hear the sirens go off?' because it wasn't supposed to go off on that day. You start to wonder when the clouds roll up, you see bad weather, or hail starts coming down, it affects you." (P2)

"We also provided increased mental health counseling and authorized a lot of these services for our staff during that time. Even I would go see a therapist during that time even though I hadn't seen anyone before, but I felt that I really needed to talk to somebody that was objective. Somewhere that I could just go and talk to and we really encouraged this among our staff. Our workers experienced lot of the posttraumatic stress months after the tornado." (P3)

"It was dark when we arrived and I know it isn't true but I would've told you at that time there was no sound. Then suddenly it became very noisy; honestly the voices began to rise with yells and some began to swear, some began to shout, there began to be all kinds of noise. But you know there had been just silence before that for a good 30 minutes. It was just a community in shock an experience many won't forget and then there came the screaming, shouting, and wailing. So, we began to dig people out." (P4)

"It might be good now five years later to see how many people have PTSD as kind of a follow-up study or a follow-up story. It would be good to find out how people are coping. Now, for the emergency workers I understand that's part of their job but I know some of those that had a lot of stress. These were the people that were first responders, people who found bodies and body parts. That had to be traumatic for them." (P6)

"I had only been there about 10 minutes when I had to go home because I was feeling broken up again. I was fine after that, but it was weird, because you know Joplin never had that effect on me, but the situation at Moore, Oklahoma did. Perhaps it was because I did talk to more parents in Oklahoma who had children. I don't think I have PTSD or anything, but for whatever reason, that one guy acted like a trigger for me. It all came flooding out." (P7)

"My mother-in-law was on the eighth floor at St. John's because she was an OB nurse. She was fine but she said that the wind nearly took her out of the window. They had to push things up against that window in the patient room that they were in, but she

was fine. However, she never went back to work at the hospital, she tried to, but she ended up retiring because she could not function in that environment." (P8)

"About 3 o'clock in the morning a train came near where we were staying and we both jumped out of bed. My wife is screaming she was running in circles. In her mind, it was all happening again. You begin to recognize we still haven't fully recovered from the tornado. I don't know that I have still fully recovered from the tornado." (P9)

"Among people I know or worked with you know some homeowner's that went through this, where that lost everything, and they have kids. So, when a storm comes in it affects them. Maybe they have an increased anxiety level which they never had before." (P10)

"I think the biggest area of concern, right now, has to be that of people's emotions. People are still tremendously hurt, there are people that you can talk to and all you have to do is bring it up and they will start crying." (12)

Subtheme 2: Coping Mechanisms. Ten of the participants discussed coping mechanisms. Many people were referred to mental health professionals, case managers, or social workers. Others choose to cope on their own, often with negative results including suicide.

"The mental health toll really bothered me. I went home and on the way, I stopped at a little convenience store where I live. I went in there to pick up something and I noticed the entire liquor shelf was cleared out, even the good stuff." (P1)

"I went in the next day to talk with my producers and editors and see what was going on concerning the mental health impact. Their reaction was that something more

was going on and I might want to check into this. So I made a phone call to a friend who works in mental health and I said how bad is it, what are you seeing, has anyone committed suicide? She said 'yes, we've had 13 so far'." (P1)

"We had this particular seminar intended to help people who were in different services, such as medical care, emergency workers, mental health profession. We didn't want to lose any of those pastors and others in helping services. There have been several who have said they were on the verge of exhaustion. These types of seminars can help some that want to get some relief, come in and find new skills to process and live with the whole experience." (P2)

"We had chaplains who were there to do ongoing talk with them. You know I have a dog and a lot of times people would just stop, pet the dog, and start talking about their pets they had at home, or had lost. I think that kind of helped to promote the healing. I guess the dog was the invitation to talk and it was amazing to me how that dog opened conversations." (P2)

"You're also impacted maybe some employees lost their homes, lost their car and have to get to work or whatever. So we provided some kind of group workshops around the needs of the staff. We also provided increased mental health counseling and authorized a lot of these services for our staff during that time." (P3)

"At College Heights we have a counseling program and we ran from 4 to 6 counselors that were there all day long. And people would come to visit, people we would recommend to go visit with counselors. The counselors as you probably could

guess primarily just asked people to tell their stories, visited with them, prayed with them, and maybe set up follow up things with them or another agency." (P4)

"In terms of people that experienced trauma we did a lot of referrals for them. You know Ozark Center had their trauma teams and they wore blue shirts. So, you could just pickup a phone and asked for a blue shirt to come out and help somebody that was clearly traumatized. So, you would have one blue shirt come to your office to meet with that person within about 20 minutes. That was nice, and they were really a good group of professional people." (P7)

"Getting people linked to a disaster case manager is important. These are people who understand FEMA and the process for receiving services. They can help a person to navigate FEMA and help optimize the resources, or make appeals for more funding if it's necessary, especially if there is a need that can't be met. So that takes a lot of pressure off the homeowner." (P7)

"On the tribal side we didn't really provide a whole lot of mental health services. We were more there just to make sure everyone was stable had their basic needs met, somewhere to stay, food to eat. So once we did this immediate type of work we then made referrals for counseling services. For the most part the tribal families are of the mind-set that we take care of each other and that is with the family and the parents, that is their role." (P8)

"Most of the people in the church fared better than others because they had an anchor. They had their family and church support. One thing I know, within our church

some people will come and go but we have this core group of people that aren't going anywhere." (P9)

"So, after the debris and cleanup is done and you can see the difference. So, we did a lot of things after the tornado with others that was more fun and entertaining with different people. These were people that we worked with or our associates. I think that brings people back together and it was a big part of working through all this." (P10)

"I think as far as the children or students we had to refer many to counseling. I believe the number was around 1,500 at one point among our 7,700 kids, and it may have been a little higher than that I'm not sure. I know there are still a number of students still receiving some help in counseling with issues directly related to the disaster. I think when I left we still had about 600 or so students receiving some counseling." (P11)

"Concerning mental health too often people don't have insurance for long-term problems. I don't know, but I think perhaps some people turn to other things to find some relief. You know we now have gambling in this area as an example and I think sometimes they'll just start searching to fill a void. I don't know for sure but people deal with things in different ways." (P12)

Theme 4: Building of Structures

The collapse of structures was the prime source for the trauma inflicted on the citizens of Joplin. Many lost loved ones, were injured, disabled, lost their homes, or their workplace due to the collapse of structures. City officials and the community wanted to determine how to better protect citizens in their homes, businesses, and public facilities. I will discuss structures in two categories, new homes, and public and business facilities.

Subtheme 1: New Homes. Thousands of homes were destroyed in the Joplin tornado and some building codes were upgraded by the city. In home safe rooms were not required but strongly promoted by city officials.

In home safe rooms. All the participants discussed the rebuilding of new homes and eight participants referred to in home safe rooms or shelters.

"I carried out a windshield survey of how they were building new homes with shelters as part of the construction and about 75% of the new homes were adding a shelter. In addition, people who saw what happened as a result of the tornado put in storm shelters. I think if storm shelters are placed underground in their homes they are much safer." (P1)

"I know now many of the homes were inadequate and now when they're being rebuilt they are making sure they have safe rooms or underground shelters, many more than before. People are planning some type of safe facility in their new construction and that's because they lived through this tragedy." (P2)

"Our habitat for humanity here in Joplin made a commitment that when they build a house they would all include a storm shelter. So all the homes they build have storm shelters, and a lot of the new apartments that are coming up all have accessible shelters. I think in general, even as individuals building new homes we've really improved, especially adding storm shelters." (P3)

"I think it would have been nice to have required new construction to have a safe room. A tornado shelter may affect affordability but all the structures like those built by habitat for humanity include storm shelters or safe rooms. We didn't legislate that but in a

way it would be nice for the next generation because that way they would be ready and protected in their house." (P6)

"I think if the state would've given us a rebate there would've been more of an incentive to build the storm shelter inside the homes. We repaired our house but you know if a tax credit or something were available we might have put a shelter in. Insurance basically brought our house back to what it was. Our insurance didn't provide money to make it safer." (P6)

"If there are two homes, one has a safe room and one doesn't. I'll take the one that has a safe room and I really prefer it to be underground. There was a gentleman in the Oklahoma tornado that came home and his safe room which was above ground was gone when he got home." (P7)

"I think another industry that made a lot of money was the storm room industry, those with safe shelters. Most houses being built around here today have a safe room in them. We moved into a brand-new home in Webb City. Our master bedroom closet is a safe room; it's built into the house and that was a selling feature of the house. The fact that it had a built-in storm room with concrete walls on the outside, surrounded with brick reinforced walls, and an extra heavy steel door was a selling point." (P9)

"We were able to add shelters as a budget item which of course adds to the cost of building a house but we put those in all our homes. I think it's especially appreciated by families who have little children. It's a relief for people and for the children knowing that they have that place to go to in case there's a tornado or a disaster." (P10)

"We did not pass an ordinance that stated you had to have tornado shelters but we strongly recommend it. We realized it would be a hardship for some people if we had to enforce that. We did a number of things to encourage putting in storm shelters in homes." (P12)

Hurricane anchors and clamps. Seven of the participants discussed new building codes which were adopted to meet standards tested in hurricane prone states such a Florida.

"They now require hurricane anchors when they build homes and structures. They are the types that go all the way from the ceiling joists all the way to the floor. The kind that straps the roof to the framing is much stronger than it used to be. Everything is now bolted down to the foundation and that was one of the big problems before the tornado." (P1)

"I don't want to see rigid rules for construction but I would love to see people think in terms of better construction when they're building a new home. I hope people will ask how can I make it safer and use such things as hurricane anchors and safe rooms." (P2)

"Now as far as building standards and codes, to my knowledge the city now requires that you anchor your houses differently, you know all the rafters anchored to the foundation. I believe the city code is now designed so that the roof cannot come up as easily as before. This is also meant to prevent the walls from collapsing so easily." (P4)

"I see the new construction and the new building standards here in Joplin. I've heard they have adopted using those hurricane clips to secure the roof to the walls. I

know I don't have hurricane clips for my house but it's good to know that you can go back and put the hurricane clips in your house retroactively. It would be good for people to know that because not everybody is building a new house." (P7)

"I don't have the professional knowledge to talk about the new building standards and codes or regulations. I know we have an employee right now who built a lot of homes who is from Florida. He understands a lot about this in the sense of what hurricanes can do. The knowledge I gained from him was that he didn't feel like our homes were as safe as they could be and we could have stronger codes like they have in Florida which includes hurricane anchors." (P8)

"I know we follow the building standards and codes that were adopted which includes hurricane anchors." (P10)

"Prior to the tornado we had already upgraded a lot of our codes to meet national standards. We did learn after the tornado various things where we could improve. We now have more tie-ins such as hurricane clamps, hurricane anchors that are attached to the trusses and down to the foundation. All those things will be helpful because we are just trying to make a home more of a solid unit, tied together. So, they did that by connecting everything, putting rebar down into the concrete, tying things up to the walls and roof." (P12)

Subtheme 2: Public and Business Construction. Eight of the participants discussed the construction of public facilities which include business facilities.

"Then you have to look at the larger picture, the schools all now have tornado shelters or bunkers have been designed in the new buildings. The library has a bunker in

it so it has changed our level of preparation as compared to the type of tornadoes that we were familiar with which was EF0, EF1, or EF2. We are now prepared for a tornado closer to EF4." (P1)

"The new hospital has fortified glass and the whole facility has been reinforced to protect you from breaking glass and debris. When the tornado blew through it just blew out all the windows so they learned from that." (P1)

"I think that it's important for Walmart, Home Depot, Pizza Hut, and all these places where people died to think in terms of what to do with these facilities located in tornado alley. I mean the manager at Pizza Hut here died because there was no more room in the walk-in cooler. I think it's important for all companies to take in consideration how in such an event they are going to provide safe places. It is certainly important when a new school is being constructed that it is built in a way where people will survive." (P2)

"That's something that they've done with the schools also and now those kids are all going to be safe while they're in school. If it's after school hours there is also a safe place to go at the school. The city emergency manager has helped to ensure that such places exist for after hours. Then there are the businesses such as Home Depot which now has a specific shelter area facility within the building. So, companies have met they've made storm safe area as a part of their company building plans in tornado areas." (P3)

"I think what was a disappointment to me was that the state of Missouri had an option to allocate money to individuals to help people by their own little shelters but

instead the governor pushed for them to do these community shelters. I thought that was odd because your local emergency officials will tell you stay in shelter, or to shelter in place rather than travel. Especially if you have to travel very far to the community shelter and even if it's pretty close you have to hope that someone will be there to open it." (P6)

"I know our hospitals and our schools have made a lot of the improvements in terms of construction standards. Even in Webb City where I live now, they didn't have to rebuild the school, but they did build large safe rooms at the schools. It's a place where the kids can go that's big enough to hold every student in the school. So, the kids in Webb City, Carl Junction, Carthage, and Joplin now all have a place for the kids to go where they'll be safe." (P9)

"Joplin has the community shelters now because not everybody has the money to put in a home shelter. But of course, there's the travel time that's involved with that." (P10)

"The schools would be much safer now no question, because hypothetically, an EF5 could blow through their now and if they were in the shelters an EF5 would not affect them too much. They should be able to walk out of that and it shouldn't be a problem surviving. So having these hardened shells is the main thing, we got creative in doing that. Our schools function as community shelters also. It was really important being able to provide safe locations for the community, we can house about 15,000 people fully occupied if they want to come and seek shelter at the schools." (P11)

"I went into Mercy Hospital two or three times during the rebuilding and my golly it was impressive, it was amazing. I forget how many million miles of wire there is in that

facility, the tornado proof glass, and the underground generator systems. From that tremendous storm we have new schools, new businesses, a new hospital and many new things we didn't have before. A lot of the schools now provide community shelters and I'm sure there'll be a shelter at the new library we are building and at the new senior citizen center we are getting ready to build. I think you'll see this type of construction really encouraged and a lot of support for that sort of construction." (P12)

Additional Findings

There were some additional findings which were meaningful to a few of the participants but did not fit the experiences of community leaders as a whole. These additional findings may be useful to some organizations within other communities depending on the type of services they might provide following a disaster. Additional findings dealt with tracking technology, flying debris, leadership support, safe rooms as support for mental health, and suggestions for households and organizations.

Tracking technology. Two participants reported using tracking systems to help reduce duplication of services. However, tracking software was not used by many organizations. For example, not all churches are members of the ministerial alliance which had a tracking system. Most organizations reported to FEMA to track volunteer hours and services they provided but information was not necessarily shared with other organizations because many did not use the same software or any tracking software.

"We had charity tracking established by the minister alliance which was already providing resources pre-tornado. We were able to track individuals using this system, provide money for groceries, transportation, flights, heating and whatever." (P2)

"Just to know who was doing what, why, and where they were doing it that was really helpful. In fact, the tool that we use in our city came up out as a result of hurricane Katrina and information from that massive resource distribution. In that event people came in from out-of-state just you know to gather stuff. So we implemented that software to help us screen and track." (P5)

Flying debris. Death and injury from tornadoes is often caused by flying debris during a tornado and one participant discussed this as a major concern. While it is assumed that the other participants had knowledge concerning the destructive force of flying debris it was not mentioned as a matter of concern.

"Then you have all this debris which was created by these un-tethered buildings which becomes a destructive force of itself. When you look at the Joplin tornado, I mean the flying debris did an extraordinary amount of damage to structures. Most of the damage and death was from debris flying around." (P1)

Leadership support. Two participants expressed concerns that leaders are often kept so busy responding to a disaster that they receive little mental health support and when they seek support months later, funding is gone.

"Priority should go to people like my wife, she watched people die, had to put sheets over bodies and she was a victim herself. She's the kind of person that was traumatized. She didn't receive services because she's a pastor's wife and she was busy helping to serve meals, make a place for others, that sort of thing. She was immediately busy so she got lost in the shuffle because she was busy serving others. I got lost in the shuffle serving others, and my kids got lost serving others. So we all were missed being

served ourselves. Of course, later on, all the money is gone for mental health services." (P9)

"That would probably be one recommendation I would give to others when we talk to communities and emergency plans. When they put that together people also need to have a plan on how to support the leadership in a way that helps them to sustain that recovery effort which is a marathon."(P11)

Home safe rooms support mental health. One participant thought providing a safe room in all their new homes was a noticeable source of comfort for those that experienced the tornado and supported mental health.

"In terms of mental health needs I would say in general everybody we have built a habitat house for has really liked the fact that we had added a storm shelter to all our houses. It's been a relief and a real comfort to them. I think it's especially appreciated by families who have little children. It's a relief for people and for the children knowing that they have that place to go to in case there's a tornado or a disaster."

Suggestions for households and organizations. Several suggestions were offered by participants and were interspersed across 120 pages of interviews. Not all the suggestions were discussed in the themes developed for this study but are informative. I developed two tables to help summarize these suggestions for households and organizations that are as follows:

Household preparation

1. Have basics: bottled water, first aid kit, plastic totes, tarps, blankets, food, good shoes, and toiletries.

2. Be weather aware: have electronic devices working to report emergency weather conditions.
3. Have a family disaster plan: include a designated meeting place, leave a sign that indicates you are safe if the house is damaged or destroyed.
4. Have a fireproof lockbox: keep in a safe place and include all valuable papers, keys, and keepsakes.
5. Have a safe room: keep basic supplies in the safe room.

Organizational preparation

1. Add storm shelters or safe areas which include stockpiles of emergency items
2. Update organizational policies and procedures for emergencies
3. Upgrade and improve the organizations emergency response plan, review and update the plan every year
4. Provide ongoing training and education for emergency action and resiliency.
5. Maintain a list of persons in the organization, persons in the facility, and emergency cards with contact information
6. Keep important papers in a bank lock box
7. Pursue grant funding for emergency needs such as safe rooms and training, keep current on funding opportunities

After carefully reviewing the themes that emerged based on participant interviews the following summation is provided concerning the experiences of community leaders following the EF5 tornado. The participant's descriptions provided answers to the

research question: What were the experiences of community leaders in Joplin, Mo. following an EF5 tornado concerning efforts to improve community preparedness, emergency response plans, trauma mental health treatment, and rebuilding of community structures following an EF5 tornado?

Essence of the EF5 Tornado Experience

The participants were all upbeat and expressed a genuine interest in providing their views in the face to face interviews. As the interviews progressed some were noticeably touched at times and stopped for a period of reflection before moving forward. This was particularly evident when they reflected on the non-stop effort that was demanded of them in responding to this disaster and when reflecting on the overwhelming devastation of the event. It was apparent that all the participants felt a sense of relief in sharing their experiences and some mentioned that the interview was cathartic.

Several themes emerged that indicated the commonalities of the experience that all the participants shared. Because each participant represented a particular organization, the focus of discussion often revolved around his or her role within the organization. However, all the participants reflected on their individual experiences and experiences that included their families. In many cases participants reflected on how their experiences drew them closer to their families and their community.

This participant group was well educated and highly informed concerning the needs of the community as related to the devastation that resulted from the tornado. They all expressed a strong sense of responsibility toward the well-being of their organizations

and the community at large. Some expressed feelings of fatigue while trying to keep control over their responsibilities but also expressed thinking they could have done more. These experiences were often described in terms of compassion fatigue and survivor's guilt which was a shared experience of the participants.

While discussing planning, some common concerns emerged and among them was the need for insurance. The discussions involved homeowner's, renters, and mental health insurance.

Most of the participants owned their homes and the tornado experience focused their concerns regarding homeowner's insurance and the problem of being underinsured. Participant four acknowledged that most members in his organization had homeowner's insurance but many were underinsured. He thought that this didn't impact his membership as much because many had savings set aside for emergencies. All the participants had charitable attitudes toward those who lost homes but it was tempered with believing in personal responsibility to carry adequate insurance and having emergency savings.

Three of the participants discussed the affordability of renter's insurance. There were shared concerns that renters might be on a tight budget and not buy renter's insurance. Most of the participants said they didn't realize how affordable renter's insurance was and they thought people need to be informed concerning affordability. Participants indicated an increased appreciation regarding the value of renter's insurance.

Two participants specifically discussed automobile insurance but from different perspectives. Participant seven said FEMA would not help drivers with car replacement if

they had no liability insurance. Participant nine thought the main problem was a shortage of replacement cars for those with insurance.

There was a general sense that long term mental health needs were most often not going to be met. Some thought the mental health system was unfair to those who were busy helping others because by the time they sought help the government money was gone. Many of the participants thought cost would prevent most people from receiving needed help. None of the participants thought that mental health stigma prevented many people from receiving mental health services.

Household planning focused on the need to store basic supplies, being weather aware, and having a safe place to go. Underlying all the planning for the households was a strong sense that being prepared at home was paramount and a sense of urgency was felt by all the participants. It was evident that this experience had shaped their views concerning the seriousness of planning for a disaster. In general the sense was that one must believe it can happen and if it happens, but you are not prepared, you risk your life and the lives of your family.

Organizational planning was extremely important to the participants but there was a feeling that some did not have the authority to make sure all the needed changes would occur. This was different from their households where they felt they had more authority. Planning was improved with one exception, participant seven was frustrated because she felt her organization had done very little and it still didn't have a good safe area. Improved organizational planning mainly centered on the organizations updating policies and procedures for emergencies, providing safe areas with supplies, better emergency

training, and knowledge of who is in the facility. Improved awareness of members was perhaps best expressed by participant four who thought that probably 100 times more members knew what was in the disaster plan post tornado. There was a general sense of confidence concerning the effectiveness of their emergency response plans with the one exception.

Concerning emergency response most of the participants had trouble describing just how powerful the tornado was. Various words or phrases were used to describe the destruction such as: magnitude, overwhelming, a different animal, like a war zone, or like a huge bomb went off. All the participants described a community that was in shock and a personal sense of being left empty when viewing the devastation.

There was a consensus that removing debris blocking the streets was a matter of life and death because reaching the injured and getting them to emergency care required transportation. Some of the participants indicated a sense of pride regarding how volunteers immediately pitched in and removed debris and took it upon themselves to transport victims, not waiting on the government.

As the emergency response developed some of the participants were involved in marking streets. Many of the participants recalled being disoriented and seeking out street signs or land marks that were no longer there. Others recalled the frustration on not being able to use cell phones especially when trying to assist those hurt. One participant expressed respect for the cell provider that went out the night of the tornado and erected new towers which relieved pressure on search and rescue teams.

Perhaps no task was more daunting than trying to coordinate the massive number of volunteers that wanted to help. Participants indicated that volunteers were willing to do whatever needed to be done regardless of their skill set or social status. Some of the volunteers were assigned to search and rescue which included finding bodies and body parts, something most had not done before. According to most participants, it didn't matter what the tasks, volunteers went to work without second thought. There was a feeling of pride when participants spoke about the actions of volunteers.

As the emergency response developed it became necessary to feed the volunteers and various participants discussed how their organizations took it upon themselves to serve thousands of meals for the volunteers and victims. All the participants felt they were navigating in uncharted waters but concentrated on organizing an effective system of volunteer management. It was apparent that all the participants felt the emergency response was mainly successful because of the effective use of volunteers.

Following a disaster one of the effects that a community endures is the ensuing trauma. Three primary mental health symptoms emerged from the interviews. They were; survivor's guilt, compassion fatigue, and post-traumatic stress.

There were different descriptions of survivor's guilt; some participants questioned why they were spared death and others were not. The "others" in many cases were people that died right in front of them or a close family member. The most common descriptions regarding survivor's guilt were "I could have done more" or "I should have done more."

Descriptions of compassion fatigue were specifically discussed by some of the participants but it was evident that all the participants experienced a certain amount of

compassion fatigue. This sense of fatigue was the product of the constant intensity and demands that followed the tornado. Fatigue was expressed in terms such as feeling very tired, exhausted, out of gas, no time to process, or no time to grieve. Fatigue also affected some of the participants in terms of their career paths. Participants one and four each discussed how the tornado disaster had caused them to reassess their values and interests, which led to career changes.

Post-traumatic stress was specifically mentioned by ten of the participants as a concern for themselves, family members, or others they had observed. Post-traumatic stress triggers were often described as happening when going into a car wash, hearing a loud train at night, a tornado siren, seeing a storm move in, being around someone that lost a loved one, going back to where they were when the tornado struck, or when someone brought up the tornado subject.

Participants described various coping methods they used or observed being used by others. Most of the participants thought that the church offered help with coping as well as receiving professional counseling services. Thousands of referrals were made for professional counseling according to participants. One participant thought it was important to link victims to a FEMA disaster case manager to effectively navigate the system of services available. Many indicated that families and neighborhoods were a primary source of support and this was emphasized by a participant working with tribal members in the Joplin community. One participant discussed sponsoring various seminars to help people develop coping skills and to vent their feelings.

Not all the coping mechanisms that participants observed were positive. One participant noticed signs of increased alcohol consumption when seeing the liquor area cleaned out at a local store. Another Participant noticed more people going to the casinos that were now open in the area. Perhaps the most negative coping method surrounded suicide. Most participants were shocked to find out how many people had taken their own lives. Shortly after the tornado participant one asked a friend who worked in mental health if she had seen an increase in suicide and she responded “we have 13 so far”. This participant was so moved by this information that he changed and focused his writing on mental health. In addition, a concerted effort was made throughout the Joplin school system to address the development of risky behaviors including suicide. Participant eleven indicated that efforts to support the students were broad based and that more than 1,500 of the 7,700 students received counseling. He thought as many as 600 were still receiving help and let out a sigh of relief because the Joplin schools had not lost any child to suicide.

Theme four dealt with the rebuilding of structures following the tornado. Thousands of homes, businesses, and public facilities were destroyed or left unusable. Feelings expressed by the participants concerning the massive rebuilding needs were optimistic but couched with a clear desire for safe homes and safe facilities in the community. Most thought there was a significant effort to build safer structures.

Regarding new homes, two construction needs were pointed out by participants. They wanted homes to have safe rooms and use hurricane anchors and clamps to secure the roof to the walls and the foundation.

Eight of the participants specifically discussed the need for home safe rooms. Most of the participants thought it was best to have a safe room in the house to shelter in place and not take the time to seek shelter outside of the home. A few of the participants thought safe rooms underground were more effective. It was clear that all the participants thought safe rooms were important and supported mental health for those traumatized. Seven of the participants emphasized the need for hurricane anchors or straps to increase the safety and survivability of the home. Participant 12 thought the primary emphasis by the city was to require builders to tie the whole building together as a single unit from the roof to the foundation. It was noticeable that the participants were now more aware regarding the need for safe home construction.

All of the participants thought that there was a significant effort to improve the safety and survivability of public and business facilities in the community. Most of the participants referred to improved safety in public structures, specifically the schools, hospital, and new library. It was generally felt by all the participants that people should feel they can be safe when they enter any facility, public or private. There was a shared thinking that safe facilities would be a source of comfort for a traumatized community.

According to participant one, all the schools now have safe areas which also serves the communities and can house up to 15,000 people. He was confident that students would remain safe even if another EF5 tornado hit the schools. Several of the participants expressed admiration for how the new hospital was constructed and that they would feel much safer in the new facility if a tornado were to strike. It was also noted by a few of the participants that the new library being constructed would have a hardened

safe area. Participant twelve thought the disaster in Joplin positively changed construction in the community because of the emphasis on safety.

Three businesses, Walmart, Home Depot, and Pizza Hut were singled out in the discussion because these three businesses suffered numerous fatalities during the disaster. In general, participants thought that new business construction was now including safe areas for customers and employees. Some of the participants had seen deaths that occurred at various businesses and most thought the loss of life was preventable. All the participants wanted to feel safe when visiting a business or public facility and some would hesitate to visit a facility that had no safe area.

Summary

In chapter 4, I described the findings from this phenomenological study of community leaders following an EF5 tornado. After analyzing the experiences of community leaders as found in their interview transcripts, four themes emerged: (a) community preparation, (b) emergency response, (c) trauma and mental health, and (d) building of structures. Within the main themes, 9 subthemes and 15 sub-subthemes emerged (see Table 3). Chapter 5 provides an interpretation of findings.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

The purpose of this chapter is to discuss and summarize findings contained in Chapter 4 concerning the experiences of community leaders following an EF5 tornado that occurred on May 22, 2011, in Joplin, Missouri. In my review of the literature in Chapter 2, I found no studies concerning the experiences of Joplin community leaders following this tornado or any other communities and their leaders following a violent tornado. This lack of research represents a gap in the literature, which is surprising to me because the Joplin tornado was the deadliest and costliest since modern record keeping began in 1950 (SPC, 2012).

A better understanding of what community leaders experienced following this tornado may be of value to other communities in tornado-prone areas in their efforts to prepare for a similar tornado event. Improved understanding represents a significant need because the United States averages 1,200 tornadoes each year, with the majority occurring east of the Rocky Mountains (NOAA, 2009). The numerous tornadoes that occur annually represent significant social and economic disruptions. Findings from this study may also assist policy makers, researchers, educators, and the public in efforts to improve tornado preparation. Between September 26, 2016, and October 3, 2016, I conducted individual interviews with 12 Joplin community leaders, four females and eight males. All of those interviewed were actively involved with the recovery efforts following the tornado. Participants represented various organizations which included government, education, ministerial alliance, business, housing, charities, first response,

medicine, and media. Interviews were conducted in person in a private room within the Joplin public library, free of any disruptions. I used a phenomenological research design in order to provide a rich, thick description of participants' experiences as individuals and as community leaders dealing with hundreds or thousands of people throughout the community and the area.

Criterion sampling was used to recruit the 12 participants, all of whom were recognized as community leaders by organizations that provide services in the Joplin area. Data were collected through face-to-face interviews which I conducted with each participant. I used an interview guide that I sent to participants prior to their interviews. The data analysis revealed four themes and nine subthemes. The four themes consist of participants' description of experiences related to(a) community preparation, (b) emergency response, (c) trauma and mental health, and (d) building of structures. Table 3 presents a complete representation of the themes and subthemes that emerged during data analysis.

To understand the experiences of these community leaders, it is important to understand that individual moments of the participants' experiences are part of a greater whole. To achieve an explicit understanding, I made a conscious effort to view each moment in a larger context (Giorgi, 2009). The experiences of community leaders post event were synthesized into reifying speech which follows the conceptual framework discussed in Chapters 1and 2: constructionism and phenomenology. Constructionist theorists contend that individuals learn from one another (Andrews, 2012; Berger

&Luckmann, 1967). Theorists emphasize how culture shapes the way that individuals view and feel about things (Patton, 2002).

The remainder of this chapter provides an interpretation of findings by themes and subthemes, the limitations of the study, recommendation for future research and policy, implications for social change, and the study conclusions. This chapter identifies areas where positive change is recommended and the need to develop a sense of urgency.

Interpretation of Findings

The described experiences of the 12 participants sampled provided information which may be of benefit to individuals and communities in tornado-prone areas through its specific insights about how to improve tornado preparation and protections. Various factors such as culture, education, values, career, or where they were at the time of the tornado influenced each participant's experiences following the tornado and thus influenced how he or she viewed aspects of the event including the recovery. The following four themes were identified: (a) community preparation, (b) emergency response, (c) trauma and mental health, and (d) building of structures. Within these four themes, nine subthemes emerged (see Table 3). In the following section, a detailed discussion is presented regarding the themes and subthemes through the lens of constructionism.

Theme 1: Community Preparation

Research indicates that most U.S. households and communities are not prepared for a powerful tornado. There are few national, state, or local, tornado related definitions, standards, and codes available to help communities prepare or respond to such an event

(Ablah, Konda, & Kelly, 2009; Fujikawa, 2013; Kuligowski et al.,2014; Prevatt et al., 2012; Yamashita, 2012). All 12 participants said that the level of preparation for a powerful tornado in their community was inadequate before the tornado. Participant interviews revealed concerns in two distinct areas within the main theme of community preparation. These concerns are Subtheme 1: Insurance and Subtheme 2: Planning. Community shelters and in-home safe rooms which are related to preparation are discussed under Theme 4: Building of Structures.

Subtheme 1: Insurance. Eight of the participants specifically mentioned insurance as an important factor in community preparation. Most participants thought that many homeowners were underinsured and that most renters had no insurance. Auto insurance was important because so many cars needed to be replaced or repaired. A few of the participants thought most people had little or no coverage for mental health services especially long term mental insurance. Lack of insurance was a concern for all the participants including the future cost of insurance. A related study indicates that some insurance providers are evaluating whether to offer various types of insurance in some disaster-prone areas (Born & Klimaszewski, 2013). In researching I found that the U.S. insurance industry reported business losses of $25 billion in 2011 due to natural disasters and insurance companies were going to re-assess coverage and pricing concerning natural disaster claims (Cronin, 2012).According to E-insurance (2014) a homeowner's policy may not cover all the losses from a tornado and homeowners would be well advised to review their policies. I found no current studies that indicated insurance companies were not providing tornado coverage in tornado prone areas. However, until recently standard

plans covered just about any “act of nature” but now insurance companies have eliminated flood coverage and only 12% of homes in flood prone areas are covered. Similarly, only 10% of homes in California are covered for earthquakes (Insurance Companies, 2016). Historically insurance companies have made decisions to not provide certain types of coverage in disaster prone areas. It should also be remembered that tornadoes are now approaching the cost of hurricanes (Lloyd’s, 2013). Another study blames some of the rising costs on fraudulent activities in states such as Florida and Texas which are more frequently exposed to catastrophic weather events (Brewer, 2016). Within Subtheme 1: Insurance, are the following subthemes: homeowner’s and renter’s insurance, auto insurance, and mental health insurance.

Homeowner’s and renter’s insurance. Eight participants specified the need to have insurance which included homeowner’s insurance and renter’s insurance. Participants indicated that most homeowners had insurance but the coverage was inadequate. In addition, participants thought most renters probably didn’t have renter’s insurance and renter’s needed education regarding affordability. While discussing homeowner’s insurance participant nine said “Our biggest issue was people [homeowner’s] that were underinsured.” This statement was representative of most participants’ thinking and is supported by some insurance studies. USA Today looked at the finding from the Insurance Research Council and found that 64% of U.S. homes are undervalued (Schmit, 2011). A more recent study by the Insurance Information Institute (III) found that 95% of homeowners in 2015 had homeowner insurance (III, 2016a).

However, according to other research almost two-thirds of homes are under-insured for disasters (Lewis, 2011).

Regarding renter's insurance participants thought that most renters were uninsured and there should be more education regarding the affordability of renter's insurance. Participant twelve stated "A lot of people just simply didn't have renter's insurance and I'm sure it's because most people who rent are already on a very tight budget." Participant seven focused on educating renters, "It would be good if people were more aware concerning how affordable renter's insurance is."

The thinking of participants was supported by findings of the Insurance Information Institute. The institute found that only 40% of people who rented had renter's insurance and this was up from 2011 when only 29% of renters reported having renter's insurance (III, 2016a). Affordability of renter's insurance and the need for more education was also supported by the insurance industry. According to McGrath (2014) based on findings of the insurance industry most people underestimate the value of their possessions and how low the cost actually is. The author states that the average cost of renter's insurance is about $15 per month for coverage ranging from $30,000 to $50,000 depending on where a person lives (McGrath, 2014).

Auto insurance. Two of the participants specified the need for auto insurance and how difficult it was to replace a car if a person did not have full coverage and in some cases liability insurance. Participant nine commented "Cars were impossible to get; you just couldn't get a car that was under five thousand dollars." The participant indicated that most people would not have the cash needed to replace a car without full coverage.

Regarding liability insurance participant seven said “FEMA would help replace their car, but if they had no insurance they were just out of luck.”

According to the Insurance Information Institute auto liability insurance is compulsory in all the states including the District of Columbia except in the state of New Hampshire (III, 2016b). However, the Insurance Research Council (IRC) reports that $2.6 billion was paid in the U.S. on 2012 uninsured motorists claims and in the same year 29.7 million drivers were uninsured (IRC, 2014). These costs stand in contrast to trends that indicate personal auto insurance has become more affordable for all income groups over time (IRC, 2015). One study considered states which now have laws that prevent uninsured motorists from collecting compensation for noneconomic damages or “no pay, no play laws”. A multivariate model based on ten states found a reduction in the uninsured motorist rate of 1.6% in these states but diverse factors may decrease the ability to generalize (Schmid, 2013).

Mental health insurance. Mental health and trauma related symptoms are covered under a separate theme in this study. However, the issue of not having insurance for mental health services and the impact of cost was discussed by participants one and nine. Participant one noted “Concerning mental health, many people were without this type of insurance and didn’t know what to do.” Participant nine thought mental health services would generally be an out-of-pocket expense.

Not having insurance that covers mental health, especially long term mental health, can be a problem for victims following a disaster. Many people who experience a disaster will be traumatized and seek help with their mental health concerns. In 2004

nearly half of American households regardless of a disaster had someone seek mental health treatment according to an American Psychological Association survey conducted in 2004 (APA, 2004). This survey was not a post disaster survey but rather a random survey of 1,000 Americans between ages 18-64. In this survey 87% of participants pointed to a lack of insurance as a barrier to seeking treatment and 81% pointed to costs as a barrier (APA, 2004). A more recent study conducted from 2009-2010 found that the cost of mental health treatment has increased among the uninsured and the privately insured (Rowan, McAlpine & Blewett, 2013). Despite expanded mental health coverage under the Affordable Care Act, 50% of adults that have untreated needs didn't receive services because of costs (MHA, 2016). Reasons that drive costs for individuals are high deductibles and co-pays, fewer providers that accept low reimbursement, dwindling number of clinics and hospitals that provide treatment (especially in rural areas), and increased cost of care (Ehley, 2016). Not having mental health insurance or high out of pocket expense exacerbates problems in receiving mental health treatment following a disaster.

Subtheme 2: Planning. Planning for disaster is something done by individuals, organizations, communities, states, and the federal government. Community emergency response requires extensive planning to be effective and because of its importance, this subject is discussed under a separate theme titled emergency response. For the scope of this section participants discussed planning in terms of their households and their organizations. Within Subtheme 2: Planning, are the following subthemes: household disaster planning and organizational disaster planning.

Household disaster planning. All of the study participants discussed disaster planning and nine participants specifically discussed planning for their households. There is scant research concerning household preparation regarding tornadoes or tornadoes in general as related to psychology. However, one study examined household preparation concerning survivors of the 2011 Joplin tornado. This study found that having a tornado shelter, shoes, and preserving treasured items were of the highest priority among participants (Fujikawa, 2013). These priorities were also important to the participants of this study however, participant suggestions were more diverse and are summarized in a list presented in chapter 4 titled "household preparation". The participants had many concrete suggestions which dealt primarily with basic needs that will exist following a devastating tornado. Participants all expressed hope that other households in tornado prone area would benefit from their tornado experience.

Organizational disaster planning. As previously stated, all participants in this study thought their organizations and the community were not prepared for this disaster. It has also been noted that an EF5 tornado is rare. In fact, of the 1,200 tornadoes that occur in the U.S. each year only 2% are rated as EF4 or EF5 but they cause more than 70% of all deaths by tornadoes (NWS, 2012). Given this, it is not surprising that most communities and organizations are simply not prepared for a violent tornado. All the participants of this study thought communities need to take this risk more seriously and take steps now to prepare their communities. The need to remain prepared after this tornado was echoed by participant three who stressed it can easily happen again.

Participants provided a variety of changes that have occurred within their organizations because of the tornado. Actions which other organization might consider are listed in chapter 4 and titled “organizational preparation”. This list summarizes suggestions that were not encompassed within the themes and subthemes. The suggestions are serious conclusions that the participants developed after experiencing this devastating tornado. All the participants were hopeful that their suggestions would benefit other organizations and assist communities to be better prepared for a violent tornado. Participants thought that their suggestions, if followed, would save lives and prevent injuries if a violent tornado strikes another community.

Theme 2: Emergency Response

All twelve participants thought responding to the disaster must have been overwhelming for first responders. However, they all thought the actions of first responders were heroic, especially those conducting search and rescue. Participants felt first responders were placed in real life and death situations while dealing with traumatic injuries, death, and body parts. They also thought the flood of volunteers that came to Joplin were a critical component of the emergency response efforts but also presented a significant management and coordination challenge.

Subtheme 1: EF5 tornado power. All the participants in this study found it difficult to describe the power and devastation of this killer tornado. The tornado was at times nearly a mile wide and was on the ground for 22 miles (Kuligowski, 2014). The vastness and magnitude of the destruction was described by participant four “As far as you could look left or right and a mile across, it was gone.” Similarly, participant seven

said “I had no idea of the magnitude” and participant eleven exclaimed “What we have learned is that an EF five tornado is just really a different animal altogether.”

There have only been 59 EF5 tornadoes since modern record keeping began in 1950 and most did not strike a significantly populated area (SPC, 2012). It is not surprising that most people have little understanding concerning the power of an EF5 tornado. Some researchers have tried to compare nature’s energy to man-made energy. One author considering alternative energy states that a large hurricane can exceed the energy consumption of humans for a year and a tornado has power comparable to a large power station (Michaud, 2005). In fact, there is a current effort to harness tornado power through man-made vortexes. The article contends that the power of such a system would be greater than that of nuclear and fossil fuels and could utilize waste energy from power plants (Matthews, 2013). As previously noted the power generated from an EF5 tornado is something that even those who have experienced it, find difficult to describe.

Subtheme 2: Restoration of Basic Services. All the participants thought restoring basic services was an important aspect of effectively responding to the tornado disaster. In the interview process three actions were primarily discussed by participants regarding the efforts to restore basic services. Within Subtheme 2: Restoration of basic services are the following subthemes: clearing debris from streets, marking streets, and restoring communication.

Clearing debris from streets. According to the U.S. Environmental Protection Agency (EPA) every community should have a disaster debris management plan (EPA, 2016). Following the Joplin tornado, it was critical to reach victims and to transport

victims. This life saving activity was significantly hampered by debris which blocked the streets. Seven of the participants discussed the critical need to clear the streets so emergency workers would have access to victims. It was evident that the participants thought there was no time to wait for outside help and they all said the initial debris removal was primarily accomplished by volunteers within the community. Participant one spoke of this volunteer action "It was the people of Joplin, and those in the area, we had to do it ourselves." Participant six said "I think Joplin was a good example of a lot of people stepping up to help themselves like clearing debris." There was a sense of pride that participants felt by not waiting for the government to arrive. Participant three stated "We had taken care of a lot [debris removal] before FEMA arrived…we were proactive not waiting for the government."

Marking and identifying streets. It is not easy to have a community disaster plan that includes all the possible problems encountered. I used several search engines including the Walden library using terms such as disaster, tornado damage, street identification, disaster logistics etc. and found nothing on street identification following a disaster. I only found an unrelated article by the Kansas Historical Society regarding various street signs they kept following an EF5 tornado. Perhaps this serves as an example of how a disaster presents unexpected problems.

In the Joplin disaster city signs and markers were stripped away. The Joplin tornado was on the ground for 22 miles and 6 miles of its track was within the city limits (Kuligowski et al., 2014). Something as simple as street signs became an important factor in locating and transporting victims. Participants four discussed how they reacted to the

street sign problem “the first thing was to send them [volunteers] out to put up homemade signs… we knew from the night before you couldn’t tell where you were.” Participant twelve speaking about the city personnel said “Of course there weren’t any street signs, they were all gone. So they would paint and identify where the streets actually were and mark them appropriately.”

Communication services. Communication regarding a disaster is a critical component of emergency response. The Joplin reverse 911 was not used due to the systems inability to disseminate timely information. In addition, many people were confused about the true hazard which existed despite the alerting sirens (Kuligowski et al., 2014). Emergency responders and members of search and rescue included a large section of civilian volunteers. To locate and assist victims they were dependent on working communication devices; at times it was a matter of life and death.

All the participants indicated they could not use their cell phones immediately after the tornado, some could text and others could not. Participant four was involved in locating victims immediately following the disaster and reported that volunteers were without texting capability in their area. He said this required sending out runners who would report findings “If they found a family they would send a runner back and tell us what they found… we were sending out volunteer runners to all these locations… in about three days you had full text capacity.”

Perhaps one of the bright spots concerning cell phone communications was the immediate replacing of cell towers by the emergency services contracted provider. Participant nine served on an organized search and rescue team and said “the first night

right after the tornado they [service provider] were out putting towers up." This participant expressed how critical this was and that restoring services relieved some of the pressure already felt by the search and rescue team.

Subtheme 3: Coordinating Efforts. A recent study looked at the multiple relationships among organizations concerning emergency management. The report indicated that friendship networks are important for encouraging various organizations to be involved in disaster preparedness by forming collaborative relationships (Kapucu & Hu, 2016). The ability to effectively respond to a disaster will require any community to coordinate efforts among numerous organizations within the community.

Preexisting networks. Various types of preexisting networks were discussed by seven of the participants who thought such networks were an important part of the community emergency response efforts. Participants thought preexisting networks helped each organization to understand the various roles each played, improved tracking, communications, and assisted in providing a rapid response. Social network sites have grown substantially with the popularity of Facebook, Twitter, and Linkedin in the last decade (Ainsworth &Baumeister, 2016). Using community based networks can have a positive impact if utilized following a disaster. According to FEMA (2016a) emergency response can be more effective if diverse organizations and community leaders are included in overall disaster planning. The planning process should include organizations that serve vulnerable populations such as children, single-parent families, ethnic minorities, low income, elderly and disabled (FEMA, 2016a). A recent study concerning trauma exposed Latina immigrants indicated that social support networks can buffer the

impact of trauma on mental health (Hurtado-de-Mendoza, Serrano, Gonzales, Fernandez, Cabling & Kaltman, 2016). Many of the Joplin networks combined faith based organizations working with more secular service organizations. Participants all thought this networking and cooperation enhanced recovery. According to one study there are common threads of disaster recovery shared by organizations that should be employed to enhance emotional and spiritual health efforts by the community (Ellor & Dolan, 2016). More research is needed to determine how to effectively build community networks that can assist following a disaster.

Utilizing and managing volunteers. According to FEMA (2016b) managing spontaneous or unaffiliated volunteers continues to be a challenge following any disaster. In this recent report, FEMA indicated that too often these volunteers are underutilized or can be problematic to professional responders (FEMA, 2016b). FEMA released a report in December, 2011 which identified lessons learned from the Joplin tornado. They found that volunteer responders came into the area and often self-dispatched, failing to coordinate with incident command (FEMA, 2011). According to the NIST this resulted in the use of various search markings that other teams did not recognize and some structures being searched multiple times (Kuligowski et al., 2014). Current FEMA guidelines include using a volunteer reception center and providing a volunteer "Go Kit" and then referring volunteers to organizations where their skills are needed and can used more effectively (FEMA, 2016).

All the participants thought the community could effectively manage and use volunteers and this assisted the recovery. However, participants did acknowledge the use

of volunteers presented some problems. Participant seven stated “nonprofits get reimbursed from FEMA for volunteer hours…some volunteers did overly shoddy work, so I mean it’s okay to screen them and ask their skill level before sending them out.” One organization spent their initial efforts in sending volunteers to the best suited organizations by considering a volunteer’s skill set. Participant ten said “we were just slammed with people that wanted to help… I think initially we just did our best to help direct people as to where to go.”

Theme 3: Trauma and Mental Health

According to Mental Health America (MHA) 59% of adults with a mental health problem did not receive any treatment (MHA, 2016). One of the reasons for the low treatment figures is because it often takes time for people to become aware of mental health symptoms. According to this report 84% of the time between first symptoms and first treatment is spent in non-treatment because individuals do not recognize their symptoms as a mental illness (MHA, 2016). Following a disaster such as the Joplin tornado thousands may be traumatized and need services. Participant one described this community trauma “I think an argument can be made that a whole community can suffer from the same PTSD symptoms and this community continues to experience PTSD symptoms.” This comment was significant because this participant reported extensively on the tornado and five years later he still recognized trauma related symptoms in the community.

Subtheme 1: Mental Health Symptoms. There are several mental health problems that victims may experience after a disaster. The American Psychiatric

Association has included a new chapter in the DSM-5 that deals with trauma and stressor-related disorders which provides detailed information concerning trauma symptoms (APA, 2016). All participants discussed mental health symptoms they had experienced in themselves or observed in others. Within Subtheme 1: mental health symptoms are the following subthemes: survivor's guilt, compassion fatigue, and post- traumatic stress.

Survivor's guilt. A recent study on survivor's guilt indicates that the concept increasingly appears in literature but has rarely been defined and is often described poorly (Hutson, Hall, & Pack, 2015). The authors offer a definition of survivor's guilt and state some of the consequences of survivor's guilt may include physical and mental health problems, alterations in identity and interpersonal relationships. They also contended that survivor's guilt is highly-individualized and involves being spared from harm that others incurred (Hutson, Hall, & Pack, 2015).

Seven of the participants discussed survivor's guilt regarding its impact on themselves or others. It was obvious in the interviews that some of the participants had strong feelings of guilt, had trouble letting go, or felt their efforts to help others was inadequate. Some participants acknowledged experiencing survivor's guilt but spoke in more detail concerning the guilt they observed in others close to them. Participant nine talked about his wife's experience in Walmart where several people were killed "this man was standing by her praying when he was sucked out of the building, right in front of her… she said that could've been me, I could have been dead." Participant three spoke about observing survivor's guilt in some close friends "They [friends] wondered why they didn't lose that much, [friend stated] my home was there, my job was there… why

was I so lucky." Other participants thought they should have done more despite working tirelessly through the ordeal. Participant four said "Survivor's guilt was really more like I haven't done enough, I should do more, or I could have done more."

Compassion fatigue. Tulane University sponsors a compassion fatigue awareness project which is intended to educate caregivers and help them recognize and manage symptoms. According to their research, compassion fatigue is experienced by those caring for distressed people or animals and is an extreme state of tension and preoccupation with the suffering of others. This intense state can lead to secondary trauma experienced by the caregiver (Figley & Kurzweg, 2015).

People who work with trauma victims in a professional capacity will be exposed to stressors on a constant basis. One study has called for a supervision model to reduce compassion fatigue among clinicians. Some researchers contend that expecting clinicians to recover during off duty hours is ineffective (Miller & Sprang, 2016). The authors argue that using the model for enhancing clinician engagement and reducing trauma (CE-CERT) would help to address the experiences of clinicians concurrent with the treatment encounters. According to this study using informed strategies would allow clinicians to regulate emotions during treatment and reduce compassion fatigue. The authors indicated efforts need to be made to demonstrate the effectiveness of the model which may help to define an evidenced informed model for reducing compassion fatigue (Miller & Sprang, 2016).

All the participants expressed an abiding concern for the welfare of others and some spoke of dedicating their lives and professional choices to this endeavor. They all

felt a strong sense of responsibility to meet the challenges of this disaster. None of the participants indicated that maintaining their job, or job security, motivated them to respond to the challenges but often expressed altruistic motivations. This strong sense of responsibility coupled with deep felt compassion may have led some of the participants to experience compassion fatigue.

The experience of compassion fatigue directly impacted some of the participants in terms of their career paths. Participant one said "I decided after covering so much of the devastation for so long that I would retire, I was just tired." Similarly, participant four made a career decision "This experience did impact me, no doubt about it. I was so deep into this thing… It altered me in the sense of what I enjoyed. I think the tornado played a role… in my making that job change."

Other participants discussed some of the symptoms they recognized in themselves. Participant ten said "When I look back on it you know we did three years of what I would say was hard steady ongoing effort… it affected my sleeping patterns and it affected my quality time with my family…I personally became very, very, tired." Participant eleven described the effects "I can tell you at the end of this I had no gas left in the tank, I gained weight and the stress and anxiety levels were constant, for lack of a better term."

According to one study secondary trauma can be experienced by people working closely with trauma victims due to working in stressful conditions that may lead to compassion fatigue (Campbell, 2013). The author of this study found that professional burnout, secondary trauma, and compassion fatigue can be reduced by making supportive

changes in the work environment which will also improve retention of employees (Campbell, 2013). Participant eleven echoed similar advice. “Don’t forget to have support for your leadership because they will be so busy and at times overwhelmed. You can help them to maintain…take care of themselves…and they can continue to support the people.”

Post-traumatic stress. According to a recent study, retention of disaster and emergency volunteers is a problem and 33% of workers that volunteer in one year will not volunteer the next year (Moravick, 2016). This author contended that there is a need to identify effective methods for dealing with post-traumatic stress and promoting post-traumatic growth to enhance retention of volunteers. During the study an Independent-groups t-test produced a significant mean difference in retention when *debriefing at the disaster location was conducted* (Moravick, 2016).

Post-traumatic growth is often associated with religiosity, optimism, spirituality, or other methods of psychological well-being but according to one study this association is not well supported by research (Cesar, 2014). Another study found that post-traumatic growth is a complex process and many factors are involved in its development. The authors found that contrary to expectations, post-traumatic growth was not related to attachment or social support (Volgin & Bates, 2016). Management of post-traumatic stress according to some experts necessitates improved classification of this group of illnesses and using syndrome-specific subjects to resolve controversies regarding the efficacy of interventions (Pearn, 2000).

During interviews, post-traumatic stress triggers were identified by all the participants that included storm sirens, different loud sounds, or just having the subject of the tornado come up in a conversation. Ten of the participants discussed post-traumatic stress which they had experienced or they had observed among others. Participants expressed concern for those who saw people die during the tornado and were especially concerned for search and rescue teams that had to deal with critical injuries, death, and body parts. As stated previously two participants indicated that they made career changes because of the tornado. Participant eight talked about a family member who could not return to work "My mother-in-law was on the eighth floor at St. John's because she was an OB nurse…she never went back to work at the hospital, she tried to, but she ended up retiring because she could not function in that environment." It was evident that the participants' experiences concerning post-traumatic stress were complex and in some cases life changing.

Participant one thought the Joplin community was still exhibiting the effects of post-traumatic stress. "I think an argument can be made that a whole community can suffer from the same PTSD symptoms and this community continues to experience PTSD symptoms." This observation was supported by a study published in 2015. A cross sectional study discussed in chapter 2 was conducted within the Joplin community regarding prevalence of PTSD. This study examined two groups of over 300 persons, the first, six months post-tornado and the second, 2.5 years post-tornado. The findings found that PTSD prevalence more than doubled from 12.65% after six months to 26.74% after 2.5 years (Houston et al., 2015).

Subtheme 2: Coping mechanisms. One study dealt with coping mechanisms in terms of family function and post traumatic growth. The study was conducted among 50 parent youth dyads who had been removed from their residences because wild fires had damaged or destroyed their homes. For both parents and youth using positive reappraisal or reframing was the most effective coping skill (Felix, Afifi, Keating, Brown, Afifi & Reyes, 2015).

Some of the participants had children still within the household and seemed particularly sensitive when discussing their children or the children of tornado victims. Participant seven discussed visiting tornado survivors in another state and how it upset her. She said "It was weird, because you know Joplin never had that effect on me, but the situation at Moore, Oklahoma did. Perhaps it was because I did talk to more parents in Oklahoma who had children… but for whatever reason… it all came flooding out."

All the participants discussed methods of coping which they used or observed. Several people were referred to counseling services including 1,700 students according to participant eleven. Participants also turned to the family, neighbors, or the church as a coping resource. Others described offering coping seminars or linking survivors to disaster case managers to help victims navigate the system. Not all the coping methods observed by participants were positive. Alcohol and drug abuse, gambling, and even suicide were discussed by participants as problems for some in the community.

Theme 4: Building of Structures

The failure of structures during the Joplin tornado was the primary reason for the high death and injury numbers (Kuligowski et al., 2014). All the participants in this study

were concerned with having safe structures at home and in the community. Most participants thought that knowing buildings are safer would provide relief for traumatized citizens and they noted that Joplin residents commonly discuss the need for safe buildings. Such conversations can affect how people think and feel. These types of interactions and the impact of such conversations on individuals is an example of constructionism (Patton, 2002).

Some experts think the myth that "nothing can survive an EF5" is a detriment to policies regarding improved building construction. They contend that of the 5,000 buildings that were destroyed in Joplin, most of the damage was done by winds at the EF2 level (Wertz, 2013). An EF5 tornado classification occurs when there are 3 seconds of sustained gusts of winds over 200 mph (SPC, 2014). However, winds will vary considerably during a tornado and most of the destruction in Joplin was caused by winds much less powerful, most around 135 mph or lower (Wertz, 2013).

Subtheme 1: New Homes. Only 13% of homes in Joplin had a basement for people to enter during a tornado. However, no fatalities occurred even in demolished or detached homes when people took refuge in a basement during the tornado (Kuligowski et al., 2014). Within Subtheme 1: New homes are the following subthemes: in-home safe rooms and hurricane anchors and clamps.

In-home safe rooms. All the participants emphasized the need for home safe rooms. It was apparent from the interviews that most participants felt having a safe room was a personal responsibility, and necessary for the protection of their families and a sense of well-being. Participant ten thought the safe rooms they included in all new

homes enhanced good mental health for many new occupants “It’s a relief for people and for the children knowing that they have that place to go.” Fujikawa (2013) listed safe rooms as one of three priorities among survivors she interviewed following the Joplin tornado. The fact is that many people in the Joplin tornado were killed, injured, disabled, or significantly traumatized because they were in homes that provided little or no protection (Kuligowski et al., 2014).

Hurricane anchors and clamps. According to the NIST many homes in Joplin were not designed to withstand even EF2 or EF3 wind speeds (Kuligowski et al., 2014). Their investigation of the Joplin tornado described the collapse of many homes as a progression of events. The roof is lifted off the walls, the walls are lifted off the foundation, and the home collapses (Kuligowski et al., 2014). The roof has the greatest risk of being damaged first by high wind and Installing hurricane anchors and clamps can serve to tie a house together (Lewis, 2011).

Seven of the participants discussed the need to use hurricane anchors and clamps. Participant twelve discussed the implementation of new building codes in the city and focused on improved home construction. “We now have more tie-ins such as hurricane clamps, hurricane anchors that are attached to the trusses and down to the foundation. All those things will be helpful because we are just trying to make a home more of a solid unit, tied together.”

Subtheme 2: Public and Business Construction. NIST representatives extensively studied public and commercial facilities that did not experience structural collapse even if located in the tornado damage area. They found those engineered

buildings that had redundant lateral load capacity, and were not dependent on bracing from the roof for lateral stability, withstood the tornado. Buildings which relied on bracing from a less robust roof system for lateral support were prone to structural collapse (Kuligowski et al., 2014). It was evident from their final report that public and commercial building can be built to better withstand a tornado and provide a safe area.

All the participants were concerned with construction standards used in erecting public or business facilities. Three facilities most often mentioned were schools, hospitals, and high volume shopping centers. All the participants felt that these types of facilities would be safer.

Several of the participants were especially proud concerning the construction of Joplin public schools and the new hospital. Speaking of the public schools participant eleven stated “The schools would be much safer now no question, because hypothetically, an EF5 could blow through their now and if they were in the shelters… it would not affect them too much, they should be able to walk out.” In addition, all the schools now have safe areas, not just those newly constructed. Concerning the new Mercy hospital participant one said “The new hospital has fortified glass and the whole facility has been reinforced to protect you from breaking glass and debris.” Participant twelve thought the entire effort in building the new hospital was amazing “I went into Mercy Hospital two or three times during the rebuilding and my golly it was impressive, it was amazing. I forget how many million miles of wire there is in that facility, the tornado proof glass and the underground generator systems.”

Several people died at one Walmart and a Home Depot which are high volume shopping centers. Participant nine said his wife was in Walmart when it was struck by the tornado. Although the facility was destroyed and several people died he was thankful they did have a safe area. “You know Walmart actually had a safe area in the store and they used it so, it did end up saving a lot of lives.” Participant three thought most businesses were now seriously considering providing safe areas. “There are the businesses such as Home Depot which now has a specific shelter area facility within the building. So companies have met and they’ve made storm safe area as a part of their company building plans in tornado areas.”

It is good that some business facilities are adding safe areas where consumers can go and receive protection. However, according to the NIST, the vast majority of public and private facilities can build safe structures that will survive a violent tornado and not collapse (Kuligowski et al., 2014).

Additional Findings

As previously stated, I identified some additional findings that were of importance to some participants but not specifically mentioned by others. Although these comments may not represent the group as a whole, they are poignant and help to further capture the essence of the tornado experience of community leaders. Additional findings include tracking technology (P2, P5), flying debris (P1), leadership support (P9, P11), and home safe rooms support mental health (P10).

Tracking technology. Participant one thought that the software utilized by the Joplin ministerial alliance was a significant tool to help with responding to the needs of

victims following the tornado. Speaking of this preexisting tracking system he commented “We were able to track individuals using this system, provide money for groceries, transportation, flights, heating and whatever.” Participant five discussed using software developed from the massive response to hurricane Katrina “In fact the tool that we use in our city came up out as a result of hurricane Katrina… so we implemented that software to help us screen and track.” These were two examples of using tracking technology to help victims of the tornado and both participants represented faith based organizations. One study found that linking service providers to the faith based community can help expand the service delivery network, reach more people in need, and provide respite for care givers (Iris, Berman, & Stein, 2014). Another study found tracking systems need to be used and further refined to help track difficult populations such as the homeless (North, Black, & Pollio, 2012).

Flying debris. Perhaps the impact of flying debris was so obvious that most participants did not focus their discussion on the subject. Participant one did specify the destructive effects of flying debris as a source of most deaths and injuries. “When you look at the Joplin tornado, I mean the flying debris did an extraordinary amount of damage to structures. Most of the damage and death was from debris flying around.” The Centers of Disease Control (CDC) studied a five-state tornado event April 25-28, 2011 and found flying debris was the prime factor in morbidity rates. The study documented that 324 of the 338 deaths were caused by flying debris producing lethal effects such as traumatic brain injury, broken bones, and deep lacerations (CDC, 2012).

Leadership support. Two participants thought communities need to be aware of the demands that are placed on leaders following a disaster and include support for leaders in terms of planning and mental health support. Participant eleven spoke of planning to support leaders "That would probably be one recommendation I would give to others when we talk to communities regarding emergency plans… have a plan on how to support the leadership in a way that helps them to sustain that recovery effort which is a marathon." One study indicated that leadership self-efficacy can act as a moderator of certain negative developmental effects such as emotional exhaustion (Courtright, Colbert, & Choi, 2014). Participant nine was concerned with a lack of mental health services for those actively involved in recovery efforts. "I got lost in the shuffle serving others, and my kids got lost serving others… of course, later on, all the money is gone for mental health services." Both participants thought planning to support leadership should be part of disaster planning by organizations.

Home safe rooms support mental health. Eight of the participants discussed the need for safe rooms in the home but participant ten, a home builder, thought safe rooms were a source of comfort especially for families with children. "In terms of mental health needs… we had added a storm shelter to all our houses. It's been a relief and a real comfort to them… especially appreciated by families… knowing that they have that place to go to in case there's a tornado or a disaster." Fujikawa (2013) found that survivors of the Joplin tornado listed safe rooms as one of their top three priorities. It was important to participants that families and citizens could feel safe at home and in the community.

Limitations of the Study

The contributions of participants provided insights that will add to the literature regarding experiences of community leaders following a tornado. However, there are certain limitations to this study which are recognized and discussed in this section. The sample was selected from organizations that choose to respond to my invitation to participate and many organizations did not respond. Because all the participants had an interest in being a part of this study they may not reflect the perceptions of those who did not choose to participate or displayed little interest. The sample was mostly Caucasian and well educated with all but one participant having college degrees or graduate degrees. As such the results of the study may not be extended to non-Caucasian communities or communities with a less formally educated leadership. Another limitation of this study is the potential for personal bias. I have lived in this area for most of my life, have experienced other tornadoes, and was living about six miles from the path of the May 22, 2011 Joplin tornado. I tried to diminish this limitation through rigorous self-assessment and maintaining a journal about my opinions and experiences so I could reflect and separate them from the data. It was important that I only captured the emotions and experiences of the participants and not my own. Also, Joplin is in the Midwest of the United States in the Ozark Mountain area and has certain unique social influences. Triangulation was achieved through collecting data from interviews, member checking, and keeping my personal journal.

Recommendations for Future Research

After thoroughly analyzing participant interviews and establishing themes, it became evident that there were many issues deserving further research. These issues include: (a) Perceived Safety as a moderator of post-traumatic stress symptoms, (b) Role of insurance in communities following a disaster (c) Marking and identifying streets following a disaster (d) Providing long term mental health treatment following a disaster.

Perceived Safety as a Moderator of Post-Traumatic Stress Symptoms

All the participants of this study discussed specific actions they had taken which made them feel safe should another tornado strike. These actions included having at hand the basics such as food, water, and good shoes. Installing in home safe rooms and using hurricane anchors and clamps was a priority. In terms of the community, all the participants indicated that providing safe areas in public and private facilities was important to them. All these issues were directly related to the need to feel safe at home and in the community. All the participants were acutely aware of the lethal effects of flying debris and collapsing structures. This fear seemed to be moderated by having a safe room in the home or safe areas inside public and private facilities. Participant ten, a home builder, thought that in home safe rooms had a positive effect on the mental health of families who had experienced the tornado. I found one study concerning perceived safety and whether it might play a moderating role in terms of post-traumatic symptoms. This 2014 study, according to the authors, was the first to their knowledge to investigate the influence of perceived safety on the effects of social support on PTSD symptoms following a natural disaster. The authors found that perceived safety plays a moderating

role in different areas that included the tendency to re-experience trauma and hyper-arousal (Cai, Ding, Tang, Wu & Yang, 2014). Further research concerning perceived safety and post-traumatic stress should be conducted to improve treatment for post-traumatic symptoms.

Role of Insurance in Communities

Massive losses can be incurred by tornado victims and they may include loss of home, automobile, personal possessions, and employment. Victims that cannot readily replace these losses may turn to charitable and governmental resources. Participants thought most homeowners were underinsured and most renters did not have renter's insurance. This study found that 95% of homeowners were insured but two of three homes were under-valued (III, 2016; Lewis, 2011). Additionally, only 40% of renters had renter's insurance which was an 11% increase from 2011, a year of significant tornado outbreaks (III, 2016). Further research is needed to determine why most homes are underinsured and why most renters do not carry renter's insurance. Some participants thought people were simply unaware of the amount of coverage they carried on their homes. Other participants thought renters were not aware concerning the affordability of renter's insurance. More research could answer questions regarding homeowner's and renter's insurance and identify effective actions which could increase the numbers of those covered and thus reduce demands on the public and private sectors following a disaster.

Marking and Identifying Streets Following a Disaster

Following a natural disaster such as a powerful tornado a community will have significant destruction of various aspects of infrastructure. Certainly, the loss of hospitals, police stations, fire stations, utilities, or communications systems are important. Most cities have a plan to restore such services as soon as possible. One issue that several participants discussed was how difficult it was to navigate and remain oriented following the tornado due to the loss of street signs and land marks used to find direction. In searching the literature, I could not find any studies regarding replacing street signs following a disaster to assist first responders in search and rescue. Participants discussed taking it upon themselves to mark streets where they were searching for victims. One participant noted that the city had some crews marking and identifying streets but there was no indication that a system was already in place for this response. Perhaps some type of permanent identification system could be developed which would not be susceptible to tornado winds? This however, would require significant research to determine the most effective system that would not be cost prohibitive and acceptable to city officials.

Providing Long Term Mental Health Services

Thousands of persons may need mental health service following a disaster and several participants indicated that short term mental health services were available especially if the need could be tied to the tornado. However, some of the participants stated they were kept busy early in the recovery, helping others, and when they needed help with mental health concerns the funding had been used up. It was also noted that mental health needs will be somewhat different for differing roles such as a first

responders, community leaders, or the general population. Treatment may need to vary accordingly and more research is needed to determine the best method for developing individual treatment plans following such a disaster. One of the barriers that was mentioned by participants and supported by the literature was the cost of long term mental health services which continues to rise (APA, 2004; Rowan, McAlpine, & Blewett, 2013). Participant eleven stated that nearly 1,700 students received counseling services and at the time of the interview around 600 students continued to receive services. It was not clear how these long-term services were being paid for and if there was special funding for school children following a disaster. It would be good if all the aspects of meeting long term mental health were further explored especially with so many people reporting cost as a barrier.

In addition more research is needed to help determine why persons refuse to leave their homes during times of warned danger such as a hurricane or remaining in a mobile home park with a tornado on the ground. Researchers have noted that communities are largely unprepared for a natural disaster and future research is needed to determine how best to build a greater sense of urgency.

Dissemination of Findings

I have made plans to disseminate the findings of this study in several ways. First, the results will be shared with participants who have indicated an interest via the internet through individual emails. This is in addition to the draft of the identified themes they received for comments as part of member checking. Second I plan to present findings to appropriate conferences. I have already presented the study in a condensed

form at the 97th Annual American Meteorological Conference held in Seattle Jan 22-27, 2017. Third, I plan on submitting a condensed form of this study to scholarly journals for publication where professionals can utilize the information for practice and further research. Finally, I will build upon the findings and conduct further research to help other communities prepare and respond to violent tornadoes.

Implications for Social Change

The results of this study will contribute to positive social change through expanding existing research that will assist communities to prepare for or respond to a violent tornado. Based on the findings of this study, individuals, families, and communities can find guidance to improve household preparation, emergency response plans, mental health treatment for tornado victims, and building tornado resistant structures.

Studies revealed that two out of three homes are underinsured and 60% of renters have no renter's insurance (Lewis, 2011; III, 2016a). Further research is recommended to help improve homeowner's insurance levels by assuring coverage is appropriate for the value of the home and also to raise the number of renters that maintain renter's insurance. These improvements have implications which may help to reduce the need for charitable and government assistance following a disaster.

The results of this study indicated that participants thought receiving long term mental health services is a difficult need to meet. The Affordable Care Act expanded insurance coverage for millions but despite increased coverage researchers found that 50% of adults with mental illness went untreated because of cost (MHA, 2016). The cost

of mental health treatment is increasing for insured and uninsured and care is expensive, even for people who are covered (Ehley, 2016; MHA, 2016; Rowan, McAlpine & Blewett, 2013). How to address the problems associated with receiving long term mental health services is an area which requires further research and policy considerations. According to the Substance Abuse and Mental Health Services Administration mental health problems can negatively affect all areas of a person's life and still many Americans go without mental health services (SAMHSA, 2015). The implications for society are numerous such as maintaining a stable family unit, maintaining employment, and even maintaining health.

Feeling safe in the home and the community may have positive benefits for mental health especially individuals that experience post-traumatic stress following a natural disaster. All the participants in this study thought that there was a clear need for homes to have safe rooms and for public and private facilities to maintain safe areas. One study found that perception of safety can play a moderating role concerning re-experiencing trauma and episodes of hyper-arousal (Cai, Ding, Tang, Wu, & Yang, 2014). The authors of this study state they could find no other research regarding perception of safety as it relates to moderating post-traumatic stress. Other research found the prevalence of PTSD doubled following the Joplin tornado from 12.65% to 26.74% over a 2.5 year period (Houston et al., 2015). Constructing safer buildings will have social implications by saving lives and reducing injuries but perhaps also by promoting improved mental health following a disaster (Cai, Ding, Tang, Wu & Yang, 2014).

One of the problems that participants of this study identified concerned becoming disoriented following the tornado due to the loss of street signs and landmarks. This problem directly impacted search and rescue efforts which included providing emergency medical treatment. I was unable to find any research regarding this subject and think it would be valuable for future research. Studies might consider how to maintain some permanent street identification which would be able to stay intact during a tornado. In the case of Joplin volunteers went out and marked the streets so they could send search and rescue teams to various locations where they had identified victims.

Conclusions

Although the United States experiences more than 1,200 tornadoes each year most tornado prone communities are not prepared for a violent tornado (Ablah, Konda, & Kelly, 2009; Fujikawa, 2013; Kuligowski et al., 2014; Prevatt et al., 2012). Representatives of NIST did an extensive study of the Joplin tornado and published a final report in 2014. The report acknowledged that previously the institute provided standards for earthquakes, hurricanes, and floods but not for tornadoes (Kuligowski et al., 2014). This report made 16 recommendations for communities in tornado prone areas. One recommendation regarding school construction has been adopted by the International Code Council and will be published in 2018 (Newman, 2015). If, and when, the other recommendation will be adopted and codified is uncertain.

All the participants of this study thought the time to make tornado preparation is now and that communities cannot afford to wait for direct government interventions or for NIST recommendations to be adopted by codifying bodies. All the participants were

proactive in improving family safety in their homes and strongly support in home safe rooms and hurricane anchors. It should be noted that no one in the tornado path died if they had underground protection (Kuligowski et al., 2014). Joplin does not require new homebuilders to install safe rooms but according to participants most new homes are including in-home safe rooms. Joplin has adopted new standards which require new homes to install hurricane anchor and clamps. Communities in tornado prone area can adopt similar standards which will assure a solid home unit, tied together, from the roof to the walls and to the foundation.

All the participants thought Joplin was now significantly better equipped to deal with another tornado disaster. However, it may have required living through the deadliest and costliest tornado since modern record keeping began to move the community into action. Many people in Joplin still wonder what would have happened if schools had been in session when six schools were destroyed. Joplin has moved quickly to make the schools capable of keeping children safe even if another EF5 tornado strikes. Other communities can learn from the Joplin experience and protect school children before a disaster strikes. Tornado prone communities across the country need to examine their community structures to determine deficits in safe construction and find a mechanism for upgrading facilities with stronger codes and community grants. Although only one of the NIST recommendations has been adopted by a codifying body, communities can be proactive, and follow the recommendations when feasible or necessary. It is important that communities understand that most of the destruction, loss of life, and injuries could have been prevented in Joplin (Kuligowski et al., 2014).An EF5 tornado is rated when

wind gusts achieve sustained 200 mph for three seconds (SPC, 2014). Most of the damage that occurred in Joplin was done by EF2 winds of 135 mph or less (Wertz, 2013).

Emergency response plans across the country vary significantly and many do not include the needs of special populations such as frail elderly, mentally ill, and disabled persons (Kuligowski et al., 2014; Stough & Mayhorn, 2013; Woolsey & Bracy, 2010). In addition, policy makers need to consider requiring accessible safe areas in facilities that house special populations because, depending on the type of facility, safe areas are not mandatory in many areas of the country (Levitan, 2013). More training in basic trauma psychology is needed for emergency workers and treatment should be trauma and resiliency focused (Kagan et al., 2014; Mattar, 2011). The elderly were more impacted in the Joplin tornado when compared to the general population (Kuligowski et al., 2014). Communities need to assess how well protected special populations would be in a disaster and assure that facilities are safe for all residents.

A campaign to build a greater sense of urgency for communities to be prepared and equipped to respond to a violent tornado is needed. Such a campaign is consistent with constructionism which emphasizes the role of interactions in shaping how people view and even feel concerning social issues (Patton, 2002).The positive steps Joplin has taken can be emulated and improved upon by tornado prone communities throughout the country. Information is now available to more effectively treat trauma victims, meet the needs of special populations, provide coordinated emergency services, improve emergency communications, and safeguard public facilities including critical medical services during a disaster. Much of the available information will only be acted upon

when communities feel a sense of urgency because many of the safeguards and improved treatment approaches are not required by law. Information in this study will be useful to communities in tornado prone areas. Preparation taken now can save lives, prevent injuries, and reduce property damage. The final responsibility for taking action will rest with each community and its leaders.

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Appendix A: Invitation for Research Volunteers

Greetings to everyone!

My name is Tom Orr and I am a doctoral student at Walden University (http://www.WaldenU.Edu).

This invitation is being forwarded to you through (name or organization) of which you are a member or associate. If you are age 21 or older, lived, worked, or volunteered in the Joplin, Mo. area when an EF5 tornado struck Joplin on May 22, 2011 and have leadership responsibilities with this organization, then you are invited to participate in a research study. The study involves community leaders in the Joplin area that experienced the EF5 tornado. I am seeking 10-15 volunteers to participate in this study.

A potential benefit for participants is the opportunity to share their experiences concerning the May 22, 2011 Joplin tornado with the general public, professionals, and law makers. Your real names will not be known or used in this study. If you are interested in participating please respond by email at [redacted] or by phone at [redacted] or cell # [redacted].

If you think you may wish to participate please contact me and I will provide you a consent form for you to read. If after reading the consent form you are still interested in participating we will establish a date and time for your individual interview in a private location.

Participation in this study is strictly voluntary and you may withdraw at anytime without explanation. Your personal identity will not be disclosed throughout this study and you will not meet or be given the identification of other participants in this study.

I look forward in hearing from those of you who are interested in participating in this study.

Warm regards,

Tom

Appendix B: Interview Guide

Introductory Script:

Welcome to this interview and thank you for your participation. This interview will take approximately one hour or one hour and a half but may be terminated by you at any time. As you can see this is a private room and please feel free to take a beverage or glass of water before the interview begins. My name is Thomas Orr, a doctoral candidate, and I am conducting this study to learn more concerning the experiences of community leaders following the EF5 tornado that occurred in Joplin on May 22, 2011. You have been selected because of your role as a community leader in Joplin and because you were a recognized decision maker following the Joplin tornado.

I am going to ask you some questions which relate to your experiences relative to tornado preparation, emergency response, mental health services, and building standards and codes. If you feel that any questions causes discomfort you may take a break or not answer the question. If any question does not seem applicable please let me know and share your thoughts as to whether the question is appropriate.

All of your information will be kept confidential and you will be provided a copy of your interview as analyzed in order to receive your input. Your comments during this interview will be recorded, you may withdraw from this study at any time, and all data will be securely stored for your protection.

Before we begin, do you have any questions for me? The first few questions will be demographic in nature.

Demographic Information:

What is your ethnicity? (e.g., Caucasian, Hispanic, African American, Asian/Pacific Islander, Native American, East Indian, Middle Eastern, Other).

What is your age?

What is the highest education level you have achieved? (e.g., Attended some high school, GED, High school graduate, Technical school graduate, Some college, Associates degree, College graduate, Master's degree, Doctoral degree, Other/please specify).

How long have your lived or worked in the Joplin, Mo. area?

How many years total have you lived in what you consider a tornado prone area?

Interview Questions:

Tornado Preparation

Tell me about your personal experiences regarding tornado preparation before and after the Joplin tornado? (RQ, SQ2)

What is your sense of how well prepared Joplin was for the tornado before it occurred? (RQ, SQ1)

What are your thoughts on how well Joplin is prepared for a tornado now? (RQ SQ2)

Possible follow- up questions

How has the tornado influenced your thinking regarding the use of safe rooms, tornado shelters, or survival gear? (RQ, SQ1, SQ2)

What were some obstacles your organization encountered concerning improved tornado preparation and describe any solutions that have been developed? (RQ, SQ1)

Emergency Response

Tell me about your personal experiences regarding emergency response before and after the Joplin tornado? (RQ, SQ2)

What were your experiences regarding the Joplin area emergency response efforts before having experienced the tornado and how would you describe its effectiveness? (RQ, SQ1)

How would you describe the current status of Joplin area emergency response and do you feel it will be more effective if another tornado occurs? (RQ, SQ2)

Possible follow-up questions

What obstacles do you think communities face in establishing effective emergency response and what possible solutions do you recognize? (RQ, SQ1)

What changes have been made in your organization concerning emergency response and how would you describe this process? (RQ, SQ1, SQ2)

Mental Health Services

Tell me about your personal views regarding mental health services before and after the Joplin tornado? (RQ, SQ2)

What is your sense regarding the utilization of mental health services by members of your organization before the tornado occurred? (RQ, SQ1, SQ2)

How has the utilization of mental health services by your members changed since the Joplin tornado including the types of services being sought and frequency of services? (RQ, SQ2)

Possible follow-up questions

How has the tornado affected your member's willingness to seek out mental health services and affected any stigma attached to seeking mental health services? (RQ, SQ1, SQ2)

What mental health resources were available through your organization prior to the tornado and have these resources changed since the tornado? (RQ, SQ1, SQ2)

Building Standards and Codes

Tell me about your personal experiences while working with building standards and codes before and after the Joplin tornado? (RQ, SQ2)

What problems did your organization face concerning the adoption of building standards and codes to follow during rebuilding after the Joplin tornado? (RQ, SQ1)

How has your personal thinking changed regarding the adoption of building standards and codes since the tornado occurred and what do regard as most important? (RQ, SQ1, SQ2)

Possible follow-up questions

How were the members of your organization affected in terms of property damage or destruction of their homes and what were their concerns? (RQ, SQ1, SQ2)

What are some of the main differences you can describe concerning the erection of more tornado resistant structures by your organization and members following the tornado? (RQ, SQ2)

Final Question

What advice would you offer to other communities concerning how to best prepare for and respond to a violent tornado? (RQ, SQ1, SQ2

Would you like to review the analysis of this interview within two weeks to make sure everything is correct? Please note that you are not obliged to review the interview analysis. I want you to know how much your participation has been appreciated. After the study has been completed would you like a copy of the results?