AN EXPLORATORY STUDY OF THE COMPREHENSION, RETENTION AND ACTION OF THE DENTON COUNTY OLDER POPULATION IN REGARDS TO DISASTER PREPAREDNESS EDUCATION

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The purpose of this exploratory study was to operationalize the responses from a sample of the community dwelling older population from Denton County, Texas on disaster preparedness education given by Denton County Health Department (DCHD) personnel. The goals and objectives were drawn from the Texas Public Health and Medical Emergency Management 5-Year Strategic Plan 2012-2016. It was hypothesized that after the disaster preparedness education was received, then comprehension, retention, and application of the information would increase and the goals set forth by the DCHD would be reached.

Thirteen sites were used to educate the 224 participants between August 2011 and April 2012. The data were received using a pre-test survey before the training, a post-test immediately after the training, and a follow-up survey call approximately 30 days later. Using Cronbach’s alpha, logistic regression and regression analysis through SAS, the data revealed that all DCHD goals were met by this training method and outcome which include the sample population increasing comprehension, retention, and action on the information learned.
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CHAPTER 1

INTRODUCTION TO THE STUDY

This chapter introduces the study, explains the Texas Public Health and Medical Emergency Management 5-Year Strategic Plan 2012-2016, defines the research statement and the research questions, and gives the purpose, the rationale, and the assumptions for the study. It also discusses the theoretical framework, the definition of terms, the limitations and the delimitations.

The Older Americans Act (OAA) passed in 1965 was the first federal level initiative aimed at providing comprehensive services for older adults. It created the National Aging Network comprised of the Administration on Aging at the federal level, State Units on Aging at the state level, and Area Agencies on Aging at the local level.

The OAA network provides funding for many different services, but in times of disasters, OAA is required to provide additional funds to the programs to add further outreach counseling, extra meals and food, in-home cleanups, emergency transportation, and medications. Things changed drastically during the hurricane season of 2005. Hurricane Katrina was the one of the top deadliest hurricanes in America with over 1,800 people dying (FEMA, 2012). Brunkard, Namulanda, and Ratard (2008) estimated that 49% of the victims from Louisiana alone were age 75 or older and the causes of death included drowning (40%), injury and trauma (25%), and heart conditions (11%). It was also the most costly natural disaster in the history of America so far with over $81 billion in property damage alone (FEMA, 2012). These numbers could have been greatly reduced with increased disaster preparedness and evacuation procedures (Brunkard et al., 2008).
After Katrina, the OAA was reauthorized in 2006 and was strengthened in the disaster preparedness areas to include additional required preparedness planning and coordination with other local, regional, state, and federal agencies. These include, but are not limited to, state and local emergency response agencies; relief organizations; state, county, and local governments; and other organizations responsible for emergency preparedness for the older population. This recent 2006 OAA federal authorization is why many state health service department emergency preparedness and response plans are now the base of county and local government emergency preparedness planning (Elmore & Brown, 2007).

Texas is considered a home rule state, which mandates that the local level of government is responsible for all emergency preparedness, response, and recovery activities. Other levels of regional, state, and federal only provide support when requested (Texas Department of State Health Services, 2011). With this information in mind, it is important to note that as of September 2011, the state of Texas ranked highest in the number of federal disaster declarations in the United States with a total of 86 recorded since 1953. These have included floods, hurricanes, tropical storms, wildfires, droughts, and tornadoes all within the state’s borders (Insurance Information Institute, 2012).

Texas Public Health and Medical Emergency Management
5-Year Strategic Plan 2012-2016

In October 2010, the formal planning process was begun to create the first ever comprehensive public health and medical emergency management strategic plan for Texas. Over 150 departments and professionals including regional and local health departments, advisory councils, hospitals, council of governments, businesses, federal entities, schools and universities, non-profit organizations, and other state organizations contributed to the plan. The
goal was to bring state-wide collaboration and to ensure that the counties and local governments would be able to carry out the directives of mitigation, preparedness, response, and recovery that were set forth. The result is a strategic emergency management plan for the state of Texas called the Texas Public Health and Medical Emergency Management 5-Year Strategic Plan 2012-2016 (Texas Department of State Health Services, 2011).

This plan was formed around the priorities given by the Centers for Disease Control in combination with the gap analysis prepared showing the current strengths and weaknesses of public health emergency management in Texas. The result was a formal vision stating “A prepared Texas able to effectively respond to and recover from public health and medical disasters” (Texas Department of State Health Services, 2011, p. 19), and a mission statement proposing to “Lead Texas in building a robust public health and medical emergency management system in support of community efforts that foster resilience” (p. 19). Additionally, two major strategic goals, eight sub-goals, and 38 measurable outcomes and strategies form the basis of the plan. As mandated by the 5-year strategic plan (2012-2016), each county health department in the State of Texas must meet the goals set forth in the time frame indicated.

Denton County Health Department (DCHD) Health Emergency Alert Response Team (HEART) focused on the first goal to Build Community Resilience when they were designing the disaster preparedness education program to be used to educate various populations in Denton County. The goal states:

Community resilience is the sustained ability of communities to withstand and recover – in both the short and long terms – from adversity, such as an influenza pandemic or terrorist attack. Resilient communities are prepared to take deliberate, collective action in the face of an incident and have developed material, physical, social, and psychological
resources that function as a buffer to these incidents and help protect people’s health.

(Texas Department of State Health Services, 2011, p. 19)

Within this goal lie three strategic objectives:

1) To improve a community’s ability to mitigate and absorb health incidents
2) To enhance a community’s ability for recovery
3) To incorporate evaluation of post incident recover operations into preparedness

(Texas Department of State Health Services, 2011)

With these federal, state, and local laws and regulations in place to care for the older generation and with the programs and support personnel ready to educate them in regards to disaster preparedness, it can be assumed that disaster emergency preparedness education for the elderly is taking place. But the debate continues as to whether the disaster preparedness education currently being taught to this cohort is actually transferring into comprehension, retention, and actual action towards disaster preparedness.

Research Statement

This study examined a sample population of older adults’ comprehension and retention abilities as well as actions taken in regards to disaster preparedness education. This was done using three different survey instruments that measured disaster preparedness knowledge and action before and after the education training, as well as measuring plans to take action and actual actions taken after the training.

Research Questions

Answers to the research questions are being by the DCHD HEART team to support the state plan’s first goal and three objectives. (R1) First, when the HEART training materials, such
as the Disaster Preparedness Education Program, are used to educate the older residents of Denton County, is it known whether the materials are actually comprehended? (R2) Secondly, once the materials are presented to the older population, is there knowledge as to whether the materials are retained for any length of time? (R3) Finally, is there support to show that once the disaster preparation education materials are comprehended and retained, that there is actual action taken by the older population on the instructions given to increase their personal disaster preparedness? By including a pre-test, a post-test, and a 30-day follow up call in the disaster preparedness educational program, the HEART team received survey data that showed an increase of disaster preparedness. This data also shows support towards the first stated goal found.

Purpose for the Study

The first purpose of this exploratory study was to operationalize the responses of a sample population from the older population of Denton County, Texas before and after they are educated about disaster preparedness. This research strives to show support of the hypotheses that between the pre-test and the post-test, increased comprehension of the training material will be seen by the answers given on the post-test. It also strives to show increased retention of the training material because of the differentiation of answers between the post-test and the follow-up call. And finally, it strives to show an increase in the actual actions taken towards disaster preparedness on the follow-up call due to the disaster preparedness education previously received.

The second purpose of this study was to be able to give the DCHD HEART team viable and measurable outcomes data to use to show increased successes in utilizing state and federal grant dollars, which can translate into higher grant monies in the future. With these responses
received from the study, DCHD HEART team will have an increased understanding about how their training program was received and whether it was deemed successful in meeting the goals and objectives set forth. They will also be able to make qualified adjustments to increase the success of other training programs in the future.

Rationale for the Study

There are practical reasons for conducting this study. As noted, due to the current overall financial constraints in our federal, state, and local governments, program dollars for community education are at a minimum. Therefore, it is vital that the program directors and educators are good stewards of these limited funds and funnel the funds toward achieving the best outcomes.

With this study, sampling information received through the survey pre-test, post-test, and follow-up call should give the data support necessary showing that the monies being spent are successful in helping to achieve the county and state goals set forth. Furthermore, this exploratory study model can be replicated to other populations, as well as other training modules to show additional support of programs and program dollars. This replication can be continued within Denton County and other counties who also choose to use this research methodology.

Assumptions

The following assumptions made for this research study are:

- The Denton County Health Department non-identifiable secondary government data being used in this research will be true and correct.
- There will be an adequate number of participants willing to take both surveys and participate in the follow-up call approximately 30 days later.
• There will be an adequate number of qualified participants able to comprehend and respond to the disaster preparedness education surveys and understand the terminology used.

• There will continue to be sufficient funding for Denton County Health project through the allotted research project survey congregate date of April 2012.

Theoretical Framework

Breen et al. (2010) stated that theories can be tools used to explain why phenomena occur. For this dissertation, social theories were used to further explain the perceptions and actions of the participants before, during, and after the disaster preparedness education occurs. They were used to identify behavior observed in the research study. Second, social theories were used to identify and show what might be important to follow-up on after research was concluded. Finally, because theory is the “roadmap” to help explain and categorize the observed social behavior, this research study added additional credibility to the theories utilized in this study.

The relevant theories chosen to further explain senior adult behavior towards disaster preparedness education are information processing theory, socioemotional selectivity theory, and religious and faith coping theory.

Information Processing Theory

Information processing theory states that aging, cognitive, physical, and sensory losses begin to limit our ability to excel in the knowledge acquisition, comprehension, and retention component of new information or education (Sternberg, 1985). Blackburn (2007) tells us that Sternberg’s 1985 theory of information processing “views the older person as an active processor of information contained in a problem or in the real world. Individuals continually develop
logical operations and strategies by which to understand and analyze information presented to them” (p. 67).

In Sternberg’s (1985) theory, he continues to argue the thought that each piece of information must be processed and these processes include encoding, storage, retrieval, rule formation, and pattern analysis. For an aging adult, impairments may soon begin to be seen in the areas of speed or accuracy of performance when processing information (Schaie, 2005). Thus, the concern for an educator of the older population is how to better increase the retention rate of the material presented, as well as decrease the number of barriers that prevent senior adults to sufficiently learn, retain, and utilize the material given.

When information processing theory (IPT) is applied to disaster preparedness education and training for the older population in general, it becomes evident that the training may be influenced by a number of the factors and barriers listed previously. Before and during the survey process, the survey participants in the research project may have to decide whether they believe they will be able to understand, or comprehend the training material. They will also have to decide whether they believe they will be able to remember what they were taught because they are told there will be a test (post-test) right after the training, as well as a possible one approximately 30 days later (follow-up call survey). IPT may describe or explain some of the variations in outcomes of data from the disaster preparedness education surveys.

Socioemotional Selectivity Theory

Socioemotional selectivity theory (SST) originally was created as an alternative to disengagement theory, but they share similar framework. Carstensen, Mikels, and Mather state that there is a powerful connection between cognition and emotions for older persons and they
are extremely selective as to whom or to where they allocate their limited cognitive resources (as cited in Blackburn, 2007).

Cumming and Henry’s study further explains SST in noting that instead of withdrawing completely from social involvement and learning new things in later life, senior adults typically begin to narrow down or choose who they want to be with and what they want to learn (as cited in Blackburn, 2007). This information selectivity process states that greater attention is usually given to information that is more likely to have a positive affect or create positive emotions, whereas information that could cause negative emotions such as sadness or apprehension begins to be avoided if at all possible.

According to the theory, motivational shifts also influence the cognitive processing of attention and memory. For example, when young senior adults perceive their future as open ended, they tend to focus on future-oriented or knowledge-related goals. But as they increase in age and time is perceived to be running out, the focus tends to shift towards present-oriented/emotion-related goals (Blackburn, 2007).

With disaster preparedness education, the senior adult in the survey population must decide whether the training material is considered to be positive information (i.e., information that will be relevant and useful) and whether positive emotion will come of it, or whether it will be negative information (i.e., not needed or useful) and create negative emotion and/or stress. This theory helps explain the decision-making process the research sample population may undergo.

Religious Faith and Coping Theory

Religious faith and coping theory is clearly explained by Kimble et al., Koenig, and Levin (as cited in Atchley & Barusch, 2004). These researchers all agree that religion, or faith of
some kind, is a common theme or resource for coping with a disaster, a suffering, or a loss, at any age. They also agree that it also can be a large source of comfort, especially in later life. Koenig goes on to support the thought that religious coping is normally found being used by residents of the elderly population that had a previously established religious faith before an illness, an emergency, or an incident occurred (as cited in Atchley & Barusch, 2004). This theory is not usually found being practiced by those who were not religious before the need to prepare for disasters was presented.

Breznitz states that religious faith and coping theory “is in the gray area between the possible and the futile that the battle of coping with stress has to be fought” (as cited in Pargament, 1997, p. 9). He continues on to say that in times of stress, this theory is how people cope with what they can control in times of stress while also helping them to accept what they cannot control and look beyond themselves for help.

This sense of resolution or peace in regards to disaster preparedness education can be detrimental because it can cause seniors to choose not to prepare due to the mindset that God or someone else, such as the federal, state, or county government, is responsible and will care for them in times of disaster. The literature research and the survey instruments utilized in this study leave us in question as to whether this theory can be applicable to this particular study, but it may help explain some of why the elderly choose not to prepare before or even after the disaster preparedness education is presented.

Definition of Terms

The following are operational definitions for the study terms of this research:

Older adults: Individuals 61 years of age or older; also called senior adults, older population, or elderly population within this research.
Denton County residents: Only those citizens residing within the Denton County, Texas limits at the time of the surveys.

Denton County Health Department (DCHD) and the Denton County Health Emergency Alert Response Team (HEART): Both are programs funded and managed by the Texas State Department of Health Services.

Medical Reserve Corps (MRC): Volunteers under the U.S. Surgeon General federal MRC program that live within Denton County and are trained in areas such as educating the public about disaster preparedness and action.

Preparedness: A continuous cycle of activities and coordination to prevent, protect against, respond to, recover from, create resources, and mitigate the effects of natural disasters, acts of terrorism, and other man-made disasters.

Limitations

The following limitations are acknowledged for this research study:

The Hawthorne effect: An outcome that happens when people being studied change or modify their behavior because they know they are being studied and not because of a study implementation. This could affect the outcomes of the surveys.

Pygmalion effect: Also called the Rosenthal effect says that the higher the expectations that are placed upon someone, the higher they tend to perform. Expectations from the trainers may influence the survey participants because the participants know that a random 30-day call may be made to them.

Secondary data issues: Because of utilizing secondary data, some of the information needed for an in-depth study may not be a part of the Denton County Health Department survey instrument tools.
Total sample issue: There may not be enough total sample secondary non-identifiable government data to support or not support the hypotheses or research questions.

Time frame issue: In striving to meet the UNT Graduation dates, the surveys received from August 2011 to April 2012 may or may not be adequate to support the hypotheses and research questions of this study.

Follow-up issues: This is an exploratory study using non-identifiable information received from the DCHD HEART team, so follow-up or additional information needed is extremely limited.

Delimitations

The following are delimitations identified for this study:

Data were used from survey participants who were believed to be Denton County residents.

Data were used from Denton County Health Department HEART disaster preparedness education sessions held between August 2011 and April 2012.

This research focused on the outcomes of disaster preparedness education from the sample of Denton County older population and how their actions may or may not support the goals and objectives in the five-year plan previously explained.

No additional research was done in this dissertation on the training materials, the training techniques, the other areas of disaster (such as mitigation, response, or recovery), the other goals and objectives in the five-year plan, or any other surrounding relevant subjects. Additional research into these broader areas may be pursued in future research.
A literature search was conducted to review available information on educating the older population on the topic of disaster preparedness and how they might comprehend the information, how they may retain the materials, and how they might react to the instructions given to individually prepare for disasters. While there is extensive literature on the various topics of disaster mitigation, preparedness, response, and recovery, little is found on the process of how education of disaster preparedness information is received and processed by the older population. Even less is found on whether educating this population on disaster preparedness in turn motivates this population to take preparedness action for a disaster.

Individuals’ Perception of the Government’s Role

When a member of the current older generation is questioned about whose responsibility it is to prepare for disasters, their response may be “the government” (Drabek, 1986). Rarely is their response one of acknowledging individual responsibility to learn and prepare for emergencies or disasters. In his book, Human System Responses to Disaster, Drabek (1986) explains that although when surveyed, the general population accepts and appreciates disaster planning efforts, they still put the planning and preparedness responsibility squarely on the shoulders of government entities to implement the processes and procedures of such aforementioned education and preparedness.

This perception of public or government responsibility was reiterated in not only the education and preparedness cycle of dealing with disasters, but with the total response effort. Responses from the Golden generation (the oldest old) were slightly different because their era was rampant with wars and everyone was expected to contribute. The Baby Boomer generation
(the youngest old) however, does exude more of the thought that their taxes pay the government to protect and to serve the community. Survey outcomes showed that not only do some participants believe the entire disaster process is the government’s responsibility, but also believe that they should not be bothered with details (Drabek, 1986).

**Methods of Message Dissemination**

Unfortunately, even if multiple government agencies and departments continue to make plans and policies with updated information specifically designed for vulnerable populations, the information is of no use without adequate comprehensive dissemination of the messages. McClure, White and Sibley (2009) argue that within the disaster preparedness message, the framing of the message, whether put in a positive reference or a negative reference, affects the decision and/or intention to prepare. Generally speaking, positive framing describes positive outcomes from performing a specific behavior. Subsequently, negative framing describes negative outcomes from not performing a specific behavior. However, their research discovered that specifically with a disaster preparedness message framed in a more negative way, participants responded higher on both general and specific preparedness actions they would undertake. This could be attributed to fear of the negative factors as well as the possibility of the prospect theory (McClure et al., 2009).

Prospect theory supports the behavior previously mentioned in the fact that it suggests that losses loom larger than gains (McClure et al., 2009). In other words, people decide which outcomes they see as basically identical, they set a reference point, and then consider lower outcomes as losses and larger outcomes as gains. By framing the message as a negative, then failed actions (not preparing) would have a stronger effect on peoples’ intentions to prepare than preparing or completed actions. Subsequently, McClure et al. (2009) also described that
response with intention to take action does not always turn to action or behavior, but participants who were exposed to the negative outcome framework were more likely to perform the recommended behavior than those given the positive framework.

Influence of Community Experience Factors

Along with the finding previously mentioned, it was also questioned whether the variable of community experience with disasters was a factor that influenced positive outcome and positive preparedness action. McClure et al. (2009) also noted that when communities previously have had low involvement with disaster threats or disasters before taking a survey on disaster preparedness, then positive framing of the subject matter is more effective, whereas when people have previously had a higher involvement with disaster threats or disasters, then negative framing becomes more effective. This is in contrast to findings previously mentioned where negative framing appears to have better results when transferring information about emergencies and disasters. It would stand to reason that communities with a higher degree of involvement in disasters may also exude forms of apathy or possibly arrogance towards future disasters because of their past experiences and outcomes.

Additionally, Drabek (1999) also notes that when the population has an increase of experiences with disasters or predicted disasters, then the level of acceptance of disaster planning increases. This increased level of acceptance was also higher among men than women and varied directly, either positively or negatively with the participants’ socioeconomic status. Furthermore, he continues on to explain that also with the increase of experiences with disasters or predicted disasters, the level of preparatory actions before the next disaster tends to increase as well (Drabek, 1999). When warned about a coming disaster, married men with a higher
socioeconomic status were also found to make more preparations than men who are of lower socioeconomic status or men who are not married (Drabek, 1999).

In their research article, Sattler, Kaiser and Hittner (2000) explored the relationship between prior experiences with disasters and acknowledgement of the need to prepare for future disasters. Before they began their study on disaster preparedness as it relates to past experiences, they hypothesized that when confronted with a new disaster threat, populations with pre-disaster experiences (specifically ones with high amounts of physical loss and psychological stress) would be more likely to choose appropriate courses of disaster preparedness and follow through with the actions necessary to decrease future disaster loss and stress (Sattler et al., 2000).

Sattler et al. (2000) in fact found that disaster experience may also have a contradictory effect and cause an optimistic view of disasters instead of a more realistic view. Survivors of pre-disaster may not acknowledge the need to prepare for future disasters or may assume that future disasters will have the same outcome, thus discounting the need to prepare, evacuate, or take steps needed to prevent loss of life or property. As mentioned in the research previously, this experience with similar disasters in the past may cause populations to conclude that they are already prepared due to other disaster experiences, when in fact, no disaster is the same and the population has assumed in error.

This contradictory effect was apparent among the elderly population during Hurricane Katrina. With pre-disaster experience and minimal loss or psychological stress from other threats or disasters, older citizens alluded to the fact that their pre-experiences and knowledge of disasters had already adequately prepared them for future disasters and necessary interventions. In many cases, their choice not to evacuate was in error and many lost their lives due to this optimistic thought process. Much could have been prevented if in fact, there had been additional
disaster preparedness education and implementation for this particular population during Hurricane Katrina.

Effects of Demographic Variables

Additional variables besides age and disabilities that have been found to hinder disaster preparedness also include race, gender, dependents under 18 years of age, citizenship, education, annual income, and internet access (Eisenman et al., 2009). In his research study done in Los Angeles County on disaster preparedness, it was found that the three most important variables or characteristics that lead to individuals partaking in preparedness activities were citizenship, race, and income. (Age in regards to the population over age 65 was not separated as a variable characteristic in this study.)

First, more non-U.S.-born participants (35.3%) of the study reported that they had collected emergency supplies in preparedness of a disaster compared to U.S. born participants (23.4%). This was explained by the knowledge that many of the non-U.S.-born participants came from developing countries in Latin American and Asia and may have had either direct or indirect community experience with natural and man-made disasters. Eisenman et al. (2009) continues on to state that community experience and enhanced perception of vulnerability can be associated with increased protective behaviors; in this case disaster prevention and preparedness. But as seen in articles previously mentioned, Sattler et al. differ with this automatic assumption that disaster experience directly leads to increased disaster preparedness.

Secondly, the finding that the Latino population (37.1%) and African American population (31.0%) had prepared more for future disasters than the white population (21.3%) is a more surprising, but understandable statistic (Eisenman et al., 2009). The article explained that these particular population groups have a history of receiving less emergency and relief services
than white population groups in past disasters or emergencies. Thus, it stands to reason that possible racial discrimination on distributing relief efforts evenly have left these minorities with the understanding that they may or may not receive the help that they need and must take a more independent approach to disaster preparedness instead (Eisenman et al., 2009).

Finally, when the variable of income was addressed, it was noted that participants in the study that were 0-99% below the poverty level were the highest percentage reporting emergency preparedness (38.2%) compared to the inverse proportional percentages of those between 100-199% above the poverty level (31.7%), those between 200-299% above the poverty level (26.4%), and those above 300% of the poverty level (20.5%) (Eisenman et al., 2009).

Interestingly enough, the article was not extremely clear in its explanation of why these statistics were revealed within the variable of income, but it stands to reason that since research showed that those most poor in this study were also mostly non-white, then the reasons given for why the non-white populations chose to be more prepared than white populations could also apply here in the area of income and poverty level inversely proportionate to the amount of emergency or disaster preparedness (Eisenman et al., 2009).

Senior Adult Learning Styles, Barriers, and Principles

With the current shifting of demographics, the Baby Boomers are now joining the ranks of older senior adults at an alarming rate and this cannot be ignored when the topic of senior adult learning is approached. This reasoning being that the Baby Boomers learned differently in the past than the cohort of the Golden generation. When both groups are combined, the size of this increasing population makes them impossible to ignore when analyzing learning styles.

One of the main differences lies in the fact that the methods used to educate the Golden generation growing up are vastly different from the methods used to teach Baby Boomers. At a
young age, the Golden generation learned like their parents before them, and as they became older, utilized methods that included not only books, but other sources such as magazines, radio, articles, photos, telephones, audiocassette, seminars, method demonstrations, tours, games, networking, role play, posters, speakers, meetings, and the like. The Baby Boomers, on the other hand, not only utilized all of the sources listed, but have had the privilege of increasing their methods of learning as they age to include sources such as videocassettes, faxes, software programs, teleconferencing, satellite conferencing, television, CDs, DVDs, cable, movies, digital photography, AIM messaging, text messaging, smart mobile phones, and the World Wide Web (Crocoll, 2001). This vast availability of information at one’s fingertips has changed the way Baby Boomers learn compared to their parents and must be taken into account when discussing current methods to use to increase retention versus methods used in the past.

The three basic learning styles that apply to all other ages still apply to senior adults as well. These styles include auditory learners, visual learners, and hands-on learners. An auditory learner who is a senior adult learns best by hearing the educator give the information, and the learning is then re-enforced by spoken feedback to either the educator or other learners in discussion of the material presented. Their retention is highest on what they have heard. For senior adult learners, this can propose a dilemma due to physical and/or environmental factors that may be barriers during the learning time. A physical barrier for an auditory learner may be the learner’s hearing disability that prevents the learner from hearing the information as clearly as needed and thus, decreasing the learning curve dramatically, not to mention decreasing the retention and future action rates. Solutions to this physical barrier are individualistic and must be brought to the attention of the learner if they have not discovered it themselves.
An environmental barrier for an auditory learner could be the site in which the educational training was taking place. Other noise than the speaker, distance between the speaker and the learner, and the sound level of the speaker may all exacerbate the situation for an auditory learner as well. Solutions to these barriers are easier to dispense and may include, but are not limited to: being sensitive to the site and all of the surrounding noise sources and eliminating as many as possible, helping auditory learners move as close to the learning source as possible, using extra voice and media amplification when needed to clarify the message, and repeating the information many times to ensure all auditory learners are understanding and processing the information correctly (Crocoll, 2001).

A visual learner who is a senior adult learns best through seeing the material presented in a variety of forms. Seeing key points written down on handouts and using various types of visual communication reinforcement work best for visual learners. Again, similar barriers found in auditory learners can prevent visual learners from being educated on the material, as well as retention and future action. Physical barriers for visual learners usually include common visual disabilities that limit the learning experience from being complete. Solutions may include retrieving eyewear not currently being utilized or getting medical care to help increase eye sight (Crocoll, 2001).

Environmental barriers may include the actual lighting at the educational site, the room changing from light to dark during the educational time, barriers of people or objects in the line of vision for the learner, and too little contrast or too small of print size on the material or handouts. All of these are easily remedied and include: allowing time for eye adjustments when going from light to dark within a seminar, ensuring adequate lighting is present when information needs to be read, reducing glare or sunlight directly on the learners, using high
contrast and bold print on the hand-outs and all materials utilized, and removing all
environmental barriers within the line of vision for the learners (Crocoll, 2001).

For senior adult hands-on learners, the methods are somewhat less dramatic and detailed.
Hands-on learners learn through applying the spoken or written information into practice. They
also learn better by using some or all of their senses during the educational learning process. The
best methods for this group of learners is moving from theory to application, small group role
play and exercises, and applying the information into actual practice (Crocoll, 2001).

Barriers for senior adult hands-on learners primarily come from the lack of being able to
apply the information by example during learning. Listening and reading the information does
not always educate this group. It must be applied through the senses for it to be retained.
Removing this barrier can be done primarily by utilizing the senses of movement, touch, smell,
taste, sight, and sound together to form application examples that are retained better by a hands-
on learner. This must be taken into account for them to learn, retain, and utilize the material
(Crocoll, 2001).

As described previously, senior adults learning styles continue to be similar throughout
life despite their age. But additional principles that must be utilized for senior adults to process
information efficiently are very different from the educational principles that are used for other
age cohorts. These unique differences cannot be ignored when designing an educational training
for senior adult learners or the message and the presenter may be discounted and ignored as well.
Educational learning barriers for the older generation are not limited to physical or
environmental barriers, but also include social forces, peer pressure, life experiences, relevancy,
self-esteem, emotional upheaval, spiritual changes, and many other areas that are not easily seen
or taken into account (Lieb, 1991).
Most importantly, empirical research shows that seniors prefer to be taught by other seniors. They identify with each other better and teach each other in non-condescending ways without having to use the young “experts” that may or may not respect the senior audience (Galusha, 1998). Businesses of training companies where the material is dedicated to the senior adult population and is taught solely by senior adult educators have increased greatly because of this primary identity principle. It is irrelevant that a younger trainer may be better educated or more skilled in presenting the information. Studies show that senior adult learners learn better and retain more when taught by someone closer to their age and life experience level (Galusha, 1998).

Another unique learning principle that needs to be remembered is that when it comes to senior adults, learning technologies do not always increase their learning or the retention rate. As mentioned previously, in the later years, senior adults have been exposed to vast amounts of new technology in the last few decades. But this does not mean that they have embraced each and every new method that has arisen to increase their education and retention rates. In fact, most of the time, the opposite is true (Baker, 2002).

What is true is that senior adults are very slowly utilizing the newest technologies available. Not so much for learning and education just yet, but more for enjoyment and communication. As far as learning and retention, face-to-face learning is still shown to be the best method for education and retention of material when teaching the senior adult population (Baker, 2002).

Additional learning principles that are important to remember when trying to provide optimal learning and retention are that seniors are goal-oriented, relevancy-oriented, and very practical. These three principles go hand-in-hand in learning because seniors have years of life
experiences and knowledge, so they believe there is less for them to learn. Also, there is less
time for them to learn it due to their age, so the information must be very important to them, it
must be relevant to their stage in life, and it must be practical. Again, their social status and
increased age limit their days of frivolous behavior, so the information must be considered a
necessity for them to become engaged in the learning process (Lieb, 1991).

Other learning principles that are relevant include the principle that senior adults fare
better with immediate feedback. This is a self-esteem issue due to their age and desire to be on
the right track when learning new information at their age. Along with this lies a similar
principle which reveals that senior adults try to avoid failure if possible. They are less open to
the trial-and-error approach due to their age and social status, so risk is not something they enjoy
because of the possible repercussions on social, emotional, and psychological levels (Crocoll,
2001). These principle areas should be taken into account when trying to increase learning and
retention in senior adult populations and directly relate to the socioemotional selectivity theory.

Factors Involved in Education Retention

In 2003, Douglas Paton published his article on “Disaster Preparedness: A Social-
Cognitive Perspective” which cited information pointing to the assumption that once the public
is educated and informed on the possible various hazards and disasters, then preparedness is
encouraged. Additionally, the thought was that this encouraged preparedness would typically
lead to action. Paton (2003) argues that not only might disaster education programs not lead to
action, but might reduce perceived risk and levels of preparedness by the transference of
responsibility from the individual over to others such as government entities that deal with said
disasters as seen previously.
In his proposed social-cognitive preparedness model, Paton (2003) says that three factors or motivators must be present at some cognitive level to have a person move from being motivated to formulating an intention. Critical awareness of hazard, risk perception, and hazard anxiety are needed to push, psychologically, the person to the next level of intention to prepare. For an intention to prepare to form, outcome expectancy and self-efficacy must be present at the next level of consciousness. The perception of whether community actions will actually lessen or solve a problem is vitally important, as well as the belief that one can actually act effectively enough to help the situation.

Once these two variables are apparent, then problem-focused coping (a way one chooses actions directing at changing the situation) and response efficacy (perception of the availability of resources needed to make the change) will come into play to again move the thought process forward towards change. Once the intention has been formulated, the person can move on to the next step in the process, which is the action of preparedness.

In the process of linking intentions to preparedness, other variables or challenges must be met or understood before action can be started. Perceived responsibility is the issue that Paton (2003) argues in the previous paragraphs stating that if disaster preparedness is not perceived to be the individual’s responsibility, then no further preparedness is seen as necessary or needed, so no actions are taken. Sense of community (feeling attachment for people and places), timing of hazard activity (unpredictable and infrequent), response efficacy as previously mentioned, and trust or empowerment of information sources are all additional factors that can hinder good intentions to prepare from actually taking action (Paton, 2003).

Mileti and Peek (2002) explain in their writings that hazards education can be considered a form of social marketing because the goal is to try to increase individual disaster protection
actions through educating about hazards and the risks that they pose for the individuals of that population. By educating properly, people should foster discussions and questions about the information and subsequent behavior that has been proposed, as well as about the surrounding environment and the possibilities of future disasters. Mileti and Peek (2002) also discussed who prepares and who does not and came to similar conclusions that Eisenman et al. (2006) noted about the different variables that contribute to whether an individual prepares for disasters or not.

Mileti and Peek (2002) emphasize that in their findings, the variables of pre-experience with a natural disaster, higher levels of formal education, middle age, and having family who live in the same area are the primary variables that influence one taking disaster preparedness actions. But, as seen previously in other research, Mileti and Peek (2002) agree that perceived risk does not always transfer into taking protective action towards disaster management. They summarize that along with the education and explanation of risk probability, when other information, beliefs, and experiences are added in, then the likelihood of action towards disaster preparedness increases. Additionally, it was shown that people will be more likely to make a behavioral change when they perceive it is more their idea than someone else’s (Mileti & Peek, 2002).

The window of opportunity is also mentioned as part of the ideal situation and timing to educate the population (Sattler et al., 2000). Once a disaster has occurred, those who received losses or know someone who did are much more receptive to minimizing future losses, but only for a short amount of time. Sattler et al. (2000) also mentioned the very important time frame to which an educator must be aware of because once enough time has passed after the disaster, then the populations’ memory of the distressed situation begins to fade as well as the conversations of and actions from the disaster. Once other vitally important social situations have begun to
become a priority in the community, then the losses, as well as the social and emotional impact of the losses become less important in the minds of the community.

If physical losses and the social and emotional impact of a disaster fade in the minds of the community, then it stands to reason that public disaster education would begin to fade as well. Even though substantial funds are spent annually on disaster education and risk prevention, the level of preparedness among individuals and communities still fall short of the ideal level of expected actions and outcomes (Paton & Johnston, 2001). And as shown in the literature review, one cannot assume that the knowledge of preparedness information on disasters and risk will transfer to the adoption of or preparedness for future disasters.

Responses Influencing Preparedness and Actions

Paton and Johnston (2001) noted that even with providing the disaster education, a number of outcomes could happen. Participants could hear the messages and take steps to prepare for future disasters, or participants could hear the messages and feel less concerned about hazards because they inferred that they believe the source of the information would be the responsible party. This again allowed the participant to transfer all responsibility for preparedness and safety to the source, which allowed the participant to reduce the importance of the message and the actions necessary to be prepared.

Paton and Johnston (2001) discuss two other important reasons for limited disaster prevention adoption and action that are consistent with the literature discussed. Optimum bias has been noted to be found when surveying community members in regards to disaster education and action. As individuals describe themselves and their preparedness level, they compare themselves with others and note that they believe they are more prepared to deal with future disasters than most of the community. This optimum bias allows them to mentally disregard the
need for any further education or application of the messages being given even though they fully support the information suggested to them.

A second common issue that Paton and Johnston (2001) noted about those surveyed, was the perception that community members who had existing knowledge and education about disasters felt they could exclude themselves from further education, despite the fact that mental retrieval of said information was sometimes shown to be a challenge. Even though they could not always retrieve the disaster preparedness information they had previously heard, respondents used this knowledge of the information as an excuse for not needing to learn more, or prepare more.

When the challenges of special needs or vulnerable populations are added to the mix along with the excuses for lack of disaster education and application, then it shows that this area is a challenging problem for those who are responsible for educating various populations about disaster prevention and application. Pekovic, Seff, and Rothman (2007) argue that the obvious risk factors of age, decreased sensory awareness, impaired physical and mental ability, chronic health conditions, and social and economic limitations already push the elderly into higher vulnerability. However, to mitigate this challenge overall, additional response and recovery effects should be noted and changes should be made to better serve this population despite the perceptions.

In the aftermath of a natural disaster, older adults are less likely to have their immediate needs met because they are reluctant to use public resources in the thoughts that they might be taking away resources from one less fortunate than they. Furthermore, even in cases of obvious need, most seniors want to avoid the issue of handouts due the fact that to others, it may turn into a welfare image. And finally, by contacting the government and asking for disaster relief
assistance, other negative health, financial, or psychological issues may be noticed by government entities, which the senior adults believes could put them at risk for losing their independent decision-making (Pekovic et al., 2007).

Another look at the elderly in regards to disaster preparedness and education shows that a community strategy for transferring the education into action is vital (Fernandez, Byard, Lin, Benson, & Barbera, 2002). Self-preparedness allows the elderly population to better mitigate all of the unique individual chronic and/or acute needs that may arise during a disaster. Education, including checklists and other materials that are able to be explained, as well as the implementation thereof will help sustain the elderly individual until further help arrives.

Additionally, Fernandez et al. (2002) continued and added that after community preparedness is taught, disaster preparedness training agencies should also seek out and network with agencies from existing organizations that already serve the senior adult population in other capacities. Existing services that historically support the elderly are more likely to be more successful at also supporting disaster education and follow-up more than the common disaster prevention programs that serve the community as a whole. Again, this thought is consistent throughout the literature and enforces the further need for adaptive disaster education for specific vulnerable populations such as the elderly.

It is vitally important to educate the older population of the real possibility that limited or no immediate organized emergency response during a disaster may be a reality. The need for preparedness and the reasons supporting preparedness must be explained and understood first before any processes or procedures are given to follow. Perhaps by incorporating this area of need into a holistic perspective of vulnerability (McEntire, Crocker, & Peters, 2010), disaster
education and prevention for the elderly will result in an increase of individual productive measures that will result in more positive outcomes during the next disaster.
CHAPTER 3

METHODS

The collection of data and treatment of data are presented in this chapter. Descriptions are provided regarding the (a) sample, (b) instruments (c) pilot study, (d) protection of human subjects, (e) variables, (f) hypotheses, and (g) data collection.

Sample

The study utilized non-identifiable secondary government survey data received from the disaster preparedness education training given to a sample of the Denton County older population between August 2011 and April 2012. This time frame presents enough survey information to have quantifiable sample sizes to be able to generalize the findings from the sample to the Denton County population as a whole. The ultimate goal was to collect approximately 300 completed pre-tests, post-tests, and follow-up surveys from qualified Denton County residents during the time frame allotted.

Volunteer educators were chosen from the Medical Reserve Corps of Denton County (MRC) because they have other experience in similar trainings, they have education on disasters, and they can utilize this additional knowledge when teaching disaster preparedness seminars (Appendix A). The MRC volunteers were trained on the material before being sent to pre-arranged meeting settings to present the information.

The survey population sample that qualified were Denton County residents who choose to participate in the 2011-2012 Denton County Health Department (DCHD) Health Emergency Alert Response Team (HEART) disaster preparedness education classes offered around the county between August 2011 and April 2012 (Appendix B). Only completed pre-test/post-test
surveys and follow-up phone surveys data from those participants who qualified were submitted into the study.

Instruments

Before each disaster education seminar was presented, a pre-test was given by the MRC volunteer educator to each qualified participant. It was used to identify personal demographic data, levels of independence, amount of previous knowledge and experience in disaster preparedness, and the preparedness confidence levels the participants self-report before the seminar was held (Appendix C). Subsequently, once the seminar was taught, a post-test was given to survey the participants’ knowledge and understanding of the material. Retention of the received information was also surveyed and comparison questions similar to the pre-test should show new learning. Finally, questions about taking future action on the information learned were asked (Appendix D). The comparisons between the similar pre-tests and the post-tests questions should show support or non-support for the hypotheses of this dissertation research.

Additionally, at approximately 30 days after the education course was given, a follow-up random survey call (Appendix E) was given to about 10% of the participants who participated in the educational seminars and who completed a pre-test and a post-test. This was utilized as a way to research how many participants of the seminars not only retained the information from the seminar, but also put their new knowledge of disaster preparedness into action between the dates of education to approximately 30 days later. The survey call assessed the percentages of application to non-application of the disaster knowledge, which should also show support or non-support for the hypotheses.
Pilot Study

Because this particular research was based on data from an ongoing DCHD HEART project, no pilot was needed. Furthermore, the data being analyzed in this research study was secondary non-identifiable government data, so research was done on whatever data were received (Appendix F). The data may or may not be comprehensive enough to support the hypotheses created or the research questions in this study.

Protection of Human Subjects

A proposal with research was submitted to the University of North Texas Institutional Review Board for the Protection of Human Subjects in Research to ensure the protection of the rights of the surveyed participants. The proposal was approved by the Institutional Review Board on February 15, 2012 (Appendix G). Permission to conduct this exploratory study was also requested from the Toulouse Graduate School, the Department of Sociology - Applied Gerontology at the University of North Texas and from the dissertation committee. When the survey information was received from the Denton County Health Department educators, there was no identifying information on the self-administered survey instruments in order to protect the identity and maintain confidentiality of the participants. This data were then coded into the SAS program and the outcomes were analyzed using cross-tabulation, Cronbach’s alpha, logistic regression and regression analysis.

Variables

The following are the dependent variables, independent variables and the pre-conditions for this study:

Dependent: Comprehension of disaster preparedness education, retention of disaster preparedness education, and actions taken towards disaster preparedness.
Independent: Disaster preparedness education received.

Pre-conditions (control): Age, gender, disability, reading ability, and pre-test disaster experiences (Appendix C).

Hypotheses

DCHD HEART program set several goals and objectives to be met by the completion of their ongoing disaster preparation education program. Four of these objectives were measured with this research study and were considered specific hypotheses. Two additional goals were also developed to measure overall increases in retention and action and were considered general hypotheses.

H1) By the completion of each presentation, 50% of participants will indicate they “feel more prepared” for emergencies.

H2) By the completion of each presentation, 70% of participants will be able to define “shelter in place.”

H3) By the completion of each presentation, 70% of participants will be able to identify at least three items needed to have in a “stay at home” kit.

H4) By the completion of each presentation, 70% of participants will be able to identify at least three items needed to have in a “to go” kit.

H5) After disaster preparedness education is given to the sample participants from the older population of Denton County, knowledge and retention of the information learned will increase.

H6) After disaster preparedness education is given to the sample participants from the older population of Denton County, actions of disaster preparedness will increase.
Data Collection

The survey data were extracted from a resident sample population located in Denton County in the State of Texas. Denton County Health Department had assessed the population of Denton County and focused on contacting for-profit groups, not-for-profit groups, faith-based groups, educational groups, and other emergent groups that have older populations as members or participants. The groups that were asked to participate in the disaster preparedness education included, but were not limited to senior center groups, independent senior adult housing groups, faith-based groups, political and military groups, support groups, intervention program groups, and others.
CHAPTER 4
RESULTS

The statistical software program SAS version 9.2 was used to analyze the data and to identify the relationships between the independent and dependent variables. It was also used to provide a clear foundation of the values that confirmed the strengths and weaknesses of the relationships. The results were broken down into five areas: descriptive data, cross tabulation, Cronbach’s alpha, linear regression, and regression analysis. Descriptive data tables were used to summarize the results of the three surveys and break down the results into personal demographic data, level of independence data, disaster preparedness knowledge data, and action results data. Cross tabulation tables gave a basic picture of how two or more of the variables inter-relate within the surveys. Cronbach’s alpha was used to measure the internal consistence and reliability of the composite measures. Logistic regression tables show the predictions that were made about the variables and whether there was a statistically significant correlation. Regression analysis analyzed the variables and focused on the relationship between the dependent variable and one or more independent variables.

Descriptive Data

Pre-Test Results

From the ongoing Denton County Health Department (DCHD) Health Emergency Alert Response Team (HEART) team disaster preparedness education project, 224 completed pre-tests, 224 completed post-tests, and 31 completed follow-up surveys received from the trainings between August 2011 and April 2012 were used for this sample. The personal demographic data in Table 1 for the 224 participants who completed the pre-tests showed that mostly females (over
70%) participated and were age 61 or older (71%). These participants received the disaster preparedness education training in a number of different facility types across Denton County including resource centers (3), community centers (1), senior centers (4), adult day care centers (1), residential care homes (2), and senior adult apartments/independent living (2) (see Appendix H).

Table 1

Frequency and Percentage of Personal Demographic Data from Pre-test

<table>
<thead>
<tr>
<th>Pre-test</th>
<th>Personal Demographic Data</th>
<th>Pre-Test</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Frequency (N)</td>
<td>Percentage</td>
</tr>
<tr>
<td>01</td>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0-18 Years Old</td>
<td>3</td>
<td>1.3</td>
</tr>
<tr>
<td></td>
<td>19-40 Years Old</td>
<td>29</td>
<td>13.0</td>
</tr>
<tr>
<td></td>
<td>41-60 Years Old</td>
<td>33</td>
<td>14.7</td>
</tr>
<tr>
<td></td>
<td>61+ Years Old</td>
<td>159</td>
<td>71.0</td>
</tr>
<tr>
<td>02</td>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>158</td>
<td>70.5</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>66</td>
<td>29.5</td>
</tr>
<tr>
<td></td>
<td>Do not want to answer</td>
<td>0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Note: (N = 224)

The survey answers for three pre-test questions regarding level of independence are shown in Table 2. These questions were included to help identify the levels of personal physical independence found among the participants. This will assist in assessing whether the participant might be able to either shelter in place independently or evacuate independently in case of an emergency.

Of the 221 participants who answered Question 3, over one-third (34%) self-reported a physical disability that affected their activities of daily living. DCHD did not ask additional
survey questions to further reveal the disability or whether it was temporary or permanent. The second of the three levels of independence data questions showed that 29 of the 223 (13%) participants who answered Question 4 acknowledged they have trouble reading. This question was asked in the context of reading skills/education to bring insight to whether the participant will be able to comprehend the disaster preparation education materials and training effectively.

The question about transportation revealed almost 73% (161/221) reported they own a car at the time of the survey. Again, without additional follow-up questions, it is not known whether the participant actively drives the owned vehicle or is still capable of driving safely. This is an important factor to note because some of the older generation chooses to continue to own a car even though they do not drive. Of the 27% that did not report owning a car, approximately 12% say they have access to a car, 7% say they use SPAN, and 7% say they use public transportation.

Table 2

*Frequency and Percentage of Level of Independence Data from Pre-test*

<table>
<thead>
<tr>
<th>Pre-test</th>
<th>Level of “Independence” Data</th>
<th>Frequency (N)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>03</td>
<td>Physical Disability (£ = 221)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>77</td>
<td>34.8</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>144</td>
<td>65.2</td>
</tr>
<tr>
<td>04</td>
<td>Trouble Reading (£ = 223)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>29</td>
<td>13.0</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>194</td>
<td>87.0</td>
</tr>
<tr>
<td>05</td>
<td>Transportation (£ = 221)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Own car</td>
<td>161</td>
<td>72.9</td>
</tr>
<tr>
<td></td>
<td>Have access to a car</td>
<td>27</td>
<td>12.2</td>
</tr>
<tr>
<td></td>
<td>Use SPAN</td>
<td>16</td>
<td>7.2</td>
</tr>
<tr>
<td></td>
<td>Use public transportation</td>
<td>17</td>
<td>7.7</td>
</tr>
</tbody>
</table>
This question was added to reveal whether the participants surveyed would be able to self-evacuate in the face of an immediate danger. Even with 73% reporting owning a car, the data given does not show that the participants would be able to drive themselves to safety because no follow-up questions were asked concerning whether their driver’s license was active, whether the car was in good running order, and whether the participant could still drive safely. The other 60 participants revealed that they did not own a car, but had access to other means of transportation. Without further follow-up questions, it is not known whether these participants would have this transportation access in an emergency. It is doubtful that the participants that use SPAN or public transportation would have immediate access during a true emergency or evacuation at the actual time that it was needed.

The four survey questions asking about previous education information of disaster preparedness are shown in Table 3. The first question allowed DCHD personnel to establish a baseline of previous information and action taken about comprehending and preparing an individual emergency plan. Over one-third (37%) reported having a disaster plan while less than two-thirds (63%) did not. Additionally, whether the participant stated they would make a plan is asked in the post-test survey and finally, if they did indeed make a plan is queried in the follow-up survey.

The second question in Table 3 was asked to establish whether the participant has confidence in their current preparation for an emergency. This question is supportive of the state plan’s goal of building community resilience. Only a little over one-half (51%) reported confidence in their current preparations that they had done before the training. The post-test and follow-up survey questions in the following sections showed increased support for this goal as well.
Question 12 allowed DCHD personnel to record previous disaster history information in regards to a common emergency in the North Texas area. By continuing the theme of an emergency in the following question, DCHD personnel were able to not only find out that 76% of the participants had reported being in an ice storm previously, but had also reported that the majority of them (76%) stated that they had everything that they needed during this emergency. This shows a disaster preparedness understanding before the training began as well as support for Objective 3 stated earlier.

Table 3

*Frequency and Percentage of Pre-Test Disaster Preparedness Education Information Data*

<table>
<thead>
<tr>
<th>Pre-test</th>
<th>Disaster Preparedness Education “Information” Data</th>
<th>Pre-test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Frequency (N)</td>
</tr>
<tr>
<td>06</td>
<td>Emergency Plan Right Now (N = 216)</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No</td>
</tr>
<tr>
<td>09</td>
<td>Feel prepared for an Emergency (N = 200)</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No</td>
</tr>
<tr>
<td>12</td>
<td>Been in an Ice Storm (N = 221)</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No</td>
</tr>
<tr>
<td>16</td>
<td>If Yes, Did You Have Everything (N = 167)</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No</td>
</tr>
</tbody>
</table>

*Post-Test Results*

The final questions of the pre-test surveyed the disaster preparedness knowledge that the participants had before the training was held. By asking Questions 7, 8, 10, and 11, a baseline of
knowledge about disaster preparation was found by the self-reported responses in regards to what an emergency might be in Denton County, what “shelter in place” means to do, what items are needed at home in an emergency, and what items should be ready to go in an emergency. These results are shown in Columns 1 and 2 respectively in Table 4. Post-test Questions 1, 2, 3, and 4 were similar to the four questions asked in the pre-test, so comparison data was able to be run on these questions to see how the answers changed as a result of the training. The results are shown in Columns 3 and 4 respectively in Table 4. The increase in knowledge from before the training to after the training can be seen in the increase in percentages for each question. These four questions are the only questions asked on all four surveys that have a possible correct answer or answers. The correct answers and numbers are in bold in Table 4.

Table 4

*Frequency and Percentage of Disaster Preparedness Education Knowledge Data from Pre-Test and Post-Test*

<table>
<thead>
<tr>
<th>Disaster Prep Education “Knowledge” Data</th>
<th>Column 1</th>
<th>Column 2</th>
<th>Column 3</th>
<th>Column 4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Freq (N)</td>
<td>%</td>
<td>Freq (N)</td>
<td>%</td>
</tr>
<tr>
<td>Pre-test</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post-test</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>07 01 Emergency in Denton County</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flu</td>
<td>22</td>
<td>10.0</td>
<td>17</td>
<td>7.8</td>
</tr>
<tr>
<td>Tornado</td>
<td>14</td>
<td>6.4</td>
<td>13</td>
<td>6.0</td>
</tr>
<tr>
<td>Flood</td>
<td>1</td>
<td>0.5</td>
<td>5</td>
<td>2.3</td>
</tr>
<tr>
<td>All of the Above</td>
<td>183</td>
<td>83.0</td>
<td>183</td>
<td>84.0</td>
</tr>
<tr>
<td>(n = 220)</td>
<td></td>
<td></td>
<td>(n = 218)</td>
<td></td>
</tr>
</tbody>
</table>

*(table continues)*
Table 4 (continued).

<table>
<thead>
<tr>
<th>Disaster Prep Education “Knowledge”</th>
<th>Column 1</th>
<th>Column 2</th>
<th>Column 3</th>
<th>Column 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data</td>
<td>Pre-test</td>
<td>Post-test</td>
<td>Pre-test</td>
<td>Post-test</td>
</tr>
<tr>
<td>08 02</td>
<td>Shelter in Place Knowledge</td>
<td>159</td>
<td>74.7</td>
<td>186</td>
</tr>
<tr>
<td>To Stay Where You Are</td>
<td>0</td>
<td>0.0</td>
<td>2</td>
<td>.09</td>
</tr>
<tr>
<td>To Go Out and Get a Haircut</td>
<td>199</td>
<td>89.6</td>
<td>203</td>
<td>91.0</td>
</tr>
<tr>
<td>Flashlight</td>
<td>23</td>
<td>10.4</td>
<td>20</td>
<td>9.0</td>
</tr>
<tr>
<td></td>
<td>44</td>
<td>19.8</td>
<td>30</td>
<td>13.5</td>
</tr>
<tr>
<td></td>
<td>208</td>
<td>93.7</td>
<td>208</td>
<td>93.3</td>
</tr>
<tr>
<td>(n = 222)</td>
<td>(n = 223)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11 04</td>
<td>Items Ready to Go in Emergency</td>
<td>153</td>
<td>68.9</td>
<td>177</td>
</tr>
<tr>
<td>Clothes</td>
<td>69</td>
<td>31.1</td>
<td>46</td>
<td>20.6</td>
</tr>
<tr>
<td>Blanket</td>
<td>161</td>
<td>72.5</td>
<td>177</td>
<td>79.4</td>
</tr>
<tr>
<td></td>
<td>61</td>
<td>27.5</td>
<td>46</td>
<td>20.6</td>
</tr>
<tr>
<td>Paperclips</td>
<td>4</td>
<td>1.8</td>
<td>8</td>
<td>3.6</td>
</tr>
<tr>
<td></td>
<td>218</td>
<td>98.2</td>
<td>215</td>
<td>96.4</td>
</tr>
<tr>
<td>Medicine</td>
<td>204</td>
<td>91.9</td>
<td>201</td>
<td>90.1</td>
</tr>
<tr>
<td></td>
<td>18</td>
<td>8.1</td>
<td>22</td>
<td>9.8</td>
</tr>
<tr>
<td>Flowerpot</td>
<td>2</td>
<td>0.9</td>
<td>2</td>
<td>0.9</td>
</tr>
<tr>
<td></td>
<td>220</td>
<td>99.1</td>
<td>221</td>
<td>99.1</td>
</tr>
<tr>
<td>Food</td>
<td>165</td>
<td>74.3</td>
<td>192</td>
<td>86.1</td>
</tr>
<tr>
<td></td>
<td>57</td>
<td>25.7</td>
<td>31</td>
<td>13.9</td>
</tr>
<tr>
<td>Necklace</td>
<td>2</td>
<td>0.9</td>
<td>3</td>
<td>1.3</td>
</tr>
<tr>
<td></td>
<td>220</td>
<td>99.1</td>
<td>220</td>
<td>98.7</td>
</tr>
<tr>
<td>(n = 222)</td>
<td>(n = 223)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
By offering the post-test, DCHD personnel were able to compile information that was comprehended and retained from the training based on asking the same general type of knowledge data questions afterwards. This gave them an overall picture of the educational training that the participants not only comprehended, but retained afterwards. Post-test Questions 1, 2, 3, and 4 were placed in Table 4 for ease of comparison with the similar pre-test questions. Post-test Question 11 was about whether the participant felt more prepared after the training which was similar to pre-test Question 9 and so the percentage of 96% answering yes was considered important to support the first hypothesis.

Table 5

Frequency and Percentage of Disaster Preparedness Education Knowledge Data from Post-Test

<table>
<thead>
<tr>
<th>Post-test</th>
<th>Disaster Preparedness Education “Knowledge” Data</th>
<th>Frequency (N)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>06</td>
<td>Know How to Prepare for Emergency (N = 219)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>215</td>
<td>98.2</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>4</td>
<td>1.8</td>
</tr>
<tr>
<td>07</td>
<td>Can You Use Info. from Today (N = 222)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>222</td>
<td>100.0</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>12</td>
<td>Enjoyed Presentation (N = 222)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>217</td>
<td>97.8</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>5</td>
<td>2.2</td>
</tr>
<tr>
<td>13</td>
<td>Learned Something New from Presentation (N = 219)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>208</td>
<td>95.0</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>11</td>
<td>5.0</td>
</tr>
</tbody>
</table>

Post-test Questions 6, 7, 12, and 13 (Table 5) were also knowledge data and were not similar to any found in the pre-test but did give insight as to whether the participants reported
that they now know how to prepare for an emergency (98%), whether they could use the
information that they learned from the training (100%), whether they enjoyed the presentation
(98%), and whether they learned something new from the training (95%). These questions and
subsequent answers were important to DCHD personnel to further support whether the trainings
were deemed successful.

Follow-Up Results

The questions found in Table 6 were designed specifically to seek answers on whether or
not participants were willing to complete the future actions requested on the post-test questions
within a 30-day timeframe. By educating the participants during the training about what
preparations needed to be made, making a family disaster plan, making emergency kits, and
making a communication plan, DCHD personnel could then ask who was willing to complete the
actions within the next 30 days. Not surprisingly, 92% reported they will be making
preparations in the next 30 days, 94% claimed they will make a family disaster plan, 96% stated
that they will make emergency kits, and 99% declared they will make a communication plan (see
Table 6).

These follow-up survey questions were similar to the four previously asked post-test
action questions, so Table 7 shows specific increases or decreases in percentages. These
questions are related to specific “actions” that the participants had been educated on during the
training and also had been asked to achieve in the 30-day window between the conclusion of the
educational training and the follow-up call. The results of these follow-up questions were very
positive and in support of the first hypothesis.
Table 6

**Frequency and Percentage of Future Action Questions Data from Post-Test and Follow-Up**

<table>
<thead>
<tr>
<th>Future “Action” Questions Data</th>
<th>Column 1</th>
<th>Column 2</th>
<th>Column 3</th>
<th>Column 4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Post-test</td>
<td>Follow-up</td>
<td>Post-test</td>
<td>Follow-up</td>
</tr>
<tr>
<td>05 04 Making Preparations in the Next 30 Days and Did Take Steps to Prepare</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>200</td>
<td>92.2</td>
<td>21</td>
<td>67.7</td>
</tr>
<tr>
<td>No</td>
<td>17</td>
<td>7.8</td>
<td>10</td>
<td>32.3</td>
</tr>
<tr>
<td>(n = 217)</td>
<td></td>
<td></td>
<td>(n = 31)</td>
<td></td>
</tr>
<tr>
<td>08 05 Making a Family Disaster Plan and Have a Plan</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>205</td>
<td>94.0</td>
<td>20</td>
<td>64.5</td>
</tr>
<tr>
<td>No</td>
<td>13</td>
<td>6.0</td>
<td>11</td>
<td>35.5</td>
</tr>
<tr>
<td>(n = 218)</td>
<td></td>
<td></td>
<td>(n = 31)</td>
<td></td>
</tr>
<tr>
<td>09 06 Making Emerg Kits and Have a 10-day Kit</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>207</td>
<td>95.8</td>
<td>16</td>
<td>51.6</td>
</tr>
<tr>
<td>No</td>
<td>9</td>
<td>4.2</td>
<td>15</td>
<td>48.4</td>
</tr>
<tr>
<td>(n = 216)</td>
<td></td>
<td></td>
<td>(n = 31)</td>
<td></td>
</tr>
<tr>
<td>09 07 Making Emerg Kits and Have a 3-day To Go Kit</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>207</td>
<td>95.8</td>
<td>27</td>
<td>87.1</td>
</tr>
<tr>
<td>No</td>
<td>9</td>
<td>4.2</td>
<td>4</td>
<td>12.9</td>
</tr>
<tr>
<td>(n = 216)</td>
<td></td>
<td></td>
<td>(n = 31)</td>
<td></td>
</tr>
<tr>
<td>10 08 Making a Commun Plan and Have a Commun Plan</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>216</td>
<td>99.5</td>
<td>15</td>
<td>48.4</td>
</tr>
<tr>
<td>No</td>
<td>1</td>
<td>0.5</td>
<td>16</td>
<td>51.6</td>
</tr>
<tr>
<td>(n = 217)</td>
<td></td>
<td></td>
<td>(n = 31)</td>
<td></td>
</tr>
</tbody>
</table>
Participants reported that 68% had taken steps to prepare their household for emergencies, 65% now had a disaster plan, 52% had made a 10-day emergency kit for their home and 87% also had a 3-day emergency kit ready to go in case of an evacuation. Only 48% reporting that they had taken action to prepare a communication plan.

Interestingly enough, follow-up question nine wanted to know if they had taken time to write down a personal support network as part of the communication plan in question eight and as instructed in the educational training 30-days before. Only 22% had a personal support network written down at follow-up even though almost half reported in the pre-test question that they had a communication plan and the network is part of the entire plan. Five of the 7 at follow-up had written one network person’s information down (71%), 1 of the 7 had written two persons (14%), none of the 7 had written down three persons (0%), and the final one of the 7 had written down four or more people as their support network (14%).

Of all of the survey questions asked, these action questions show the most support for the disaster preparedness training and its success. Table 6 gives specific statistical results that reveal these action areas were not only comprehended at the time of the training, but retained and acted upon within 30 days of the training.

Denton County Health Department personnel’s plan was to follow-up on approximately 10% of the 224 total completed post-test surveys from each training site. This would mean approximately 23 participants were to be chosen at random from their sites to be the recipient of a follow-up call approximately 30 days after their training. Due to these follow-up survey calls being made by DCHD volunteers, the “10% calls from each site” goal was not completely understood and one training site received many more than 10% of their allotted follow-up calls.
Although 31 completed follow-up surveys was higher than the original 10% needed \((N = 224)\), they were not spread evenly across the sites as originally planned.

Due to the small number of calls made for Denton County Health Department personnel to meet their goal and the fact that each site was not represented evenly, the follow-up survey data were not acceptable enough to use for analytical research purposes. However, for the Denton County Health Department personnel’s use, the data were still viable and revealed outcomes needed for their purpose. Most of the participants surveyed in the follow-up were over the age of 61 (81%), were female (77%), and due to the unbalance of the follow-up calls, were from Site 10 (54%) in the town of The Colony (Table 7).

Table 7

*Frequency and Percentage of Personal Demographic Data from Follow-Up Survey*

<table>
<thead>
<tr>
<th>Personal Demographic Data (Follow-Up)</th>
<th>Frequency ((N))</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age ((N = 31))</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-18 Years Old</td>
<td>1</td>
<td>3.2</td>
</tr>
<tr>
<td>19-49 Years Old</td>
<td>1</td>
<td>3.2</td>
</tr>
<tr>
<td>41-60 Years Old</td>
<td>4</td>
<td>12.9</td>
</tr>
<tr>
<td>61+ Years Old</td>
<td>25</td>
<td>80.6</td>
</tr>
<tr>
<td>Gender ((N = 31))</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>24</td>
<td>77.4</td>
</tr>
<tr>
<td>Male</td>
<td>7</td>
<td>22.6</td>
</tr>
</tbody>
</table>

Table 8 shows the knowledge data information received from the follow-up survey questions help support the hypothesis of comprehension and retention because this information was gathered approximately 30 days after each of the trainings. Asking whether the participants felt more prepared since receiving the education is once again DCHD personnel’s way of gathering support for the education. The same question is also asked in the pre-test and the post-test and is cross-tabbed in the data analysis section.
Follow-up Question 2 was asked because the five-year plan as described previously is specific about gathering follow-up data post-disaster to record whether participants of the educational trainings were able to use the materials they had previously learned. In Question 2, only 3 participants out of the 31 had been in an emergency in the 30 days since the training. They self-reported that they had been prepared, they had recovered, they could have been better prepared, and the training helped (see Appendix E). Further comparisons of similar pre-test questions can be found in the cross tabulation and the data analysis sections.

Table 8

*Frequency and Percentage of Disaster Preparedness Education Knowledge Data from Follow-Up*

<table>
<thead>
<tr>
<th>Disaster Preparedness Education “Knowledge Data”</th>
<th>Frequency (N)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>01 Feel More Prepared Since Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>29</td>
<td>93.6</td>
</tr>
<tr>
<td>No</td>
<td>2</td>
<td>6.4</td>
</tr>
<tr>
<td>02 Been in Emergency Since Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>3</td>
<td>9.7</td>
</tr>
<tr>
<td>No</td>
<td>28</td>
<td>90.3</td>
</tr>
<tr>
<td>03 Know What Medications to Take</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>30</td>
<td>96.8</td>
</tr>
<tr>
<td>No</td>
<td>1</td>
<td>3.2</td>
</tr>
<tr>
<td>10 Go for Information in Emergency</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Television news</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>11</td>
<td>35.5</td>
</tr>
<tr>
<td>No</td>
<td>20</td>
<td>64.5</td>
</tr>
<tr>
<td>B. Radio</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>6</td>
<td>19.4</td>
</tr>
<tr>
<td>No</td>
<td>25</td>
<td>80.6</td>
</tr>
</tbody>
</table>

*(table continues)*
Table 8 (continued)

<table>
<thead>
<tr>
<th>Disaster Preparedness Education “Knowledge Data Frequency (N) Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Follow-up</td>
</tr>
<tr>
<td>10 (con’t) Go for Information in Emergency</td>
</tr>
<tr>
<td>C. Someone You Live With</td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>No</td>
</tr>
<tr>
<td>D. Community Leader</td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>No</td>
</tr>
<tr>
<td>E. Friend</td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>No</td>
</tr>
<tr>
<td>F. Church or Faith Leader</td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>No</td>
</tr>
<tr>
<td>G. Other (Internet, Phone, etc.)</td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>No</td>
</tr>
<tr>
<td>11 Know Who to Call for Assistance</td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>No</td>
</tr>
<tr>
<td>12 Could you Recover Without Emergency Workers</td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>No</td>
</tr>
<tr>
<td>13 Information from Class Help You Become Prepared Community Member</td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>No</td>
</tr>
</tbody>
</table>

Note: N = 31

Follow-up Questions 3, 10, 11, and 12 were all questions on topics discussed in the educational training. The results show that 97% of the participants report they now know what
medications to take with them during an evacuation. Of the seven choices given on Question 10 about where the participants go to for information in an emergency, the results were 35% reported television news, 19% for radio, 3% for someone they lived with, none for a community leader, 32% for a friend, none for a church or faith leader, and 87% for other (Internet, phone, etc.). This question reveals vital data to DCHD personnel because it allows them to see what avenues this population utilizes to find current disaster and emergency information. DCHD personnel can then focus their resources on the highest reported areas and achieve better results in disseminating information.

In asking if the participants knew who to call for assistance, 97% self-report they now do. Additionally, 87% feel they could recover without assistance from emergency workers. The final question asked on the follow-up survey was if the information from the class has helped them become a better prepared community member and the response was unanimous at 100%. This question also gives DCHD personnel support in striving to meet their goals and objectives.

Cross-Tabulation of Survey Questions

Cross-tabulation reveals how the variables are inter-related within the three surveys and shows support as to whether the educational training given after the pre-test (but before the post-test and the follow-up) increases comprehension, retention and action on the materials learned.

*What Kind of Emergencies Could Happen in Denton County?*

This pre-test knowledge question gave DCHD personnel a baseline of how much the participants knew about disasters that have happened or might happen in Denton County. The correct response to this question both times was (d) All of the above, because the flu (a), tornado (b), and flood (c) have all happened in Denton County. When cross-tabbing the pre-test answers
with the post-test answers, 163 of 216 (91%) participants answered correctly both times on pre-test and post-test. Additionally, 19 other participants changed their mind on the post-test and chose (d), which shows a slight increase in retention of this knowledge question.

*What Does the Term “Shelter in Place Mean”?*

Of the 204 participants who responded to this knowledge question, 95% of them answered the correct answer of (a) “To stay where you are” on both on the pre-test and the post-test. Of those who answered incorrectly on the pre-test, 67% changed their answers to the correct answer of (a), thus supporting an increase of knowledge retention from pre-test to post-test.

*Circle the Items That You Would Need to Have at Home in Case of an Emergency*

This was a seven-part question with seven suggestions of various emergency items to have at home. Medicines was answered correctly (96%) on both the pre-test and the post-test, but 15 additional participants of the 222 total responses changed to the correct answer, so a slight increase of knowledge was seen. Additionally, batteries began with a 94% retention rate from pre-test to post-test then added an increase of 25 to the total 222 responses changing to the correct answer after the educational training. And finally, water also began with a very positive show of the correct answer on the pre-test and the post-test (95%) but also increased slightly with 19 of the 222 changing their mind at post-test to the correct answer. The other choices of flashlight, box of dirt, snowflakes, and tire had insignificant or no countable increase in knowledge comprehension or retention between the pre-test and the post-test because the original answers on pre-test were very high percentages.
Circle the Items that You Need to Have Ready To Go in Case You Have to Leave Home

This was also a seven-part question with three of the suggestions having slight to moderate movement from the incorrect answers in pre-test to correct answers at post-test. Change of clothes showed a 93% correct answer rate on pre-test but increased by 24 participants on the post-test, thus showing moderate movement. Additionally, blanket also had 94% correct response rate at pre-test with an additional 16 moving, which showed a slight positive directional movement. Finally, the answer food showed positive movement as well with an increase of 27 on top of the original 95% who answered correctly on both pre-test- and post-test. The other four parts of the question showed a highly positive knowledge base to begin with showing paperclips at 97%, medicine at 93%, flowerpot at 99% and necklace at 99%, but showed little to no significant positive movement to indicate additional comprehension or retention.

Do You Have an Emergency Plan Right Now? Do You Have a Disaster Plan?

Survey answers to pre-test Question 6 revealed that 14 of the 31 participants stated that they had a disaster plan, but on the follow-up, four of these changed and said they did not have one. This could be because after the training, they realized that what they had was not a qualified emergency plan and needed to change or improve what they had. Of the 17 participants that said they did not have a plan at pre-test, 10 of them changed their answer to yes at follow-up. This could be because the educational training that they had received prompted them to action to create a disaster plan, which supports the first hypothesis.

Are You Going to Make a Family Disaster Plan? Do You Have a Disaster Plan?

Although everyone (31/31) self-reported that they were going to make a disaster plan in the next 30 days like the training had said to, it was unlikely that they were all going to follow through. However, because 65% of them had a plan by the 30-day follow up survey, support for
not only comprehension and retention was seen, but also action taken on the disaster preparation education learned was also shown.

*Will You be Making Any Preparations in the Next 30 Days for Emergencies? Have You Taken Any Steps in Preparing Your Household for Emergencies Since You Have Hone Through the Prepare Denton County Program?*

In the post-test 5 question, of the 30 who responded to this question on both post-test and follow-up survey, 29 claimed that they would make preparations in the next 30 days for emergencies. The follow-up survey however, revealed that two-thirds (19) of that 29 self-report that they had actually taken steps to prepare, which shows a strong movement to action and supports the research hypothesis.

*Are You Going to Make Emergency Kits? Do You Have an Emergency Kit at Home That Would Help You Stay at Home If You Needed to for Up to 10 days?*

Almost all (29/30) of those who answered Question 9 on the post-test said they were going to make emergency kits in the next 30 days and a little over half reported that they did indeed make a 10-day stay-at-home kit within the 30-day follow-up time frame. Again, this shows moderate movement due to the disaster preparedness educational training.

*Are You Going to Make Emergency Kits? Do You Have a 3-Day Emergency Kit Ready to Go If You Needed to Leave Your Home Very Quickly?*

Of the 29 that again said they are going to make kits in Question 9, almost 90% actually did make a 3-day to-go kit in case of an evacuation situation. Additionally, the one person who said they were not going to make a kit on the post-test did not make a 10-day stay at home kit, but did report that they made a 3-day to go kit. These cross-tabs show us that more participants took action to make a 3-day kit (90%) than did to make a 10-day stay at home kit (50%), so it
can be suggested that a 3-day kit is easier to make than a 10-day kit or that participants deemed the 3-day kit more important to have than the 10-day stay at home kit.

Every participant self-reported that they had at least one of the kits they were requested to make or had both kits they learned about in the educational training 30 days before. Twelve of the participants claimed they had both the 10-day stay at home kit and the 3-day evacuation kit. Another 15 reported that they had made the 3-day kit, but not the 10-day kit. Finally, four responded noting that they had made the 10-day kit only and not the 3-day kit. Each group had made either one or both kits which reveal a strong correlation to support the hypothesis of comprehension, retention, and action on the learned disaster preparedness education training.


Every participant (31) stated that they were going to make a communication plan when asked on the post-test. When asked again 30 days later on the follow-up, 48% did actually make a communication plan of some sort, so this is a positive shift of movement towards disaster preparedness action after the training. But there seems to be some confusion on the part of the participants of the definitions and terminology in this area of communication plans and personal support networks.

Of the 15 that had reported that they now had a communication plan at the 30-day follow-up survey, only one-third of them (5) had written down their personal support network information, which is also part of a communications plan. Additionally, of the 16 who reported that they did not have a communications plan at the follow-up survey, two of them reported that they had written down personal support information on family and friends.
Also, when comparing the people who had reported having a communication plan to the number of people in your network, it is interesting to find confusion here as well. At follow-up, one person stated to have four people in their network and reported that they had a communication plan. The person who responded to have two people in their network did not know that they already had part of a communication plan started because they answered that they did not have a plan. Of the five people who had one person in their communication plan, four of those did also acknowledge that they had a communications plan, but one person who stated they had one person in their personal network did not know they also had part of a communication plan started. Even though these are very small sample numbers, it reveals some confusion in the educational training as far as terminology of communication plans and personal networks and may need to be re-written or taught a different way to make this area more clear.

Cronbach’s Alpha

The composite measures for disaster preparedness included eight items measuring disaster preparedness preparation at home and were correlated at .648, which is a low, but acceptable level (see Table 9). The mean levels were somewhat high, ranging from .80 to .98, showing a good understanding of the correct items needed to have at home in an emergency. If variable tire was removed, the alpha would increase from .648 to .699. By removing box of dirt, the alpha would increase slightly from .648 to .677, but all other variables have a negative correlation or do not relate or scale effectively.

In measuring the items that the pre-test survey suggested the participants may need to have ready to go in case they need to leave home very quickly, the coefficient alpha measuring disaster preparedness preparation in an evacuation was .630. The mean levels ranged from .69 to .99 on this question, which is a wider range than the previous question. This would suggest that
on the pre-test survey, participants had a slightly higher knowledge of what to have at home in case of an emergency than what they needed to take with them in an evacuation.

Table 9

**Coefficient Alphas**

<table>
<thead>
<tr>
<th>Factor</th>
<th>Timing</th>
<th>N of Items</th>
<th>Coefficient Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Items needed at home(^1)</td>
<td>Pre-Test</td>
<td>7</td>
<td>0.616</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.648</td>
</tr>
<tr>
<td>Items needed at home(^1)</td>
<td>Post-Test</td>
<td>7</td>
<td>0.686</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.714</td>
</tr>
<tr>
<td>Items needed to go(^2)</td>
<td>Pre-Test</td>
<td>7</td>
<td>0.589</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.630</td>
</tr>
<tr>
<td>Items needed to go(^2)</td>
<td>Post-Test</td>
<td>7</td>
<td>0.626</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.628</td>
</tr>
</tbody>
</table>

*Note:*  
\(^1\) – Items needed to be ready at home in case of an emergency  
\(^2\) – Items needed to be ready to go in case of an emergency

Additionally, the difference between the Raw coefficient alpha (.630) and the Standardized coefficient alpha (.589) was minimal, suggesting there were few items that if deleted, would increase the coefficient alpha overall. The number for variable paperclips shows the highest increase overall (.658) if this item was deleted from the scale for items to take with you if you need to evacuate. Both variables flowerpot and necklace also showed a very slight increase of .648 and .638 respectively if deleted. The other variables showed slight to moderate negative correlation if removed from the scale.

In measuring the post-test correlation of the items suggested that the participants would need to have at home in case of an emergency, the coefficient of alpha revealed that these were correlated at .714, which is an acceptable level. The mean levels were high, ranging from .86 to .98, showing a high understanding of the correct items needed to have at home in an emergency.

Upon comparing the similar pre-test survey question to the post-test survey question, the alpha
reveals an increase from .648 on pre-test to .714 on post-test. This would suggest an increase in disaster preparedness understanding from before the training to after the training and supports the hypothesis of comprehension and retention.

On the post-test question, if the variable box of dirt were removed, the alpha would increase from .714 to .739. Additionally, by removing the variable tire, the alpha would increase even more from .714 to .756 showing a higher correlation on the scaled items needed at home in an emergency.

In measuring the items that the post-test survey suggested the participants may need to have ready to go in case they need to leave home very quickly, the coefficient alpha measuring disaster preparedness preparation in an evacuation was .628. This is slightly lower than the same pre-test survey question alpha results of .630. This would suggest a slight decrease in understanding from pre-test to post-test about what needed to be ready to go in case of an emergency.

This alpha was also lower than when we scaled the items needed to have at home in case of an emergency (.714). The mean scores also started lower (.794) showing there was less understanding about what the participants needed to take with them in an evacuation. Additionally, the difference between the raw coefficient alpha and the standardized coefficient alpha was marginal, suggesting there were very few items that if deleted, would increase the coefficient alpha overall.

For variable flowerpot, the results show an increase overall (.643) if this item was deleted from the scale for items to take with you if you need to evacuate. Both variables paperclips and necklace also showed a very slight increase of .628 and .628 respectively if deleted. The other variables showed negative correlation if removed from the scale.
When the two pre-test survey questions are run together, the coefficient alpha increases to .757, which is higher than these two individual coefficient alpha scores of .648 and .630 respectively (see Table 9). This suggests that if no attention was paid to the difference between home items and away items on the pre-test, it would still be a good scale. The two pre-test surveys mean scores on the 14 total items range from .72 to .99, showing a wide range of knowledge on what to have at home and what to have ready to take with you. As expected, when correlating the two tables, the variables that would increase the raw coefficient alpha if deleted were the same variables shown previously with the exception of the variable (e) snowflakes.

From the post-test, if the two questions of items to have at home and items to have ready to leave are run together, then the individual coefficients of .714 and .628 greatly increase to .803. This shows a high correlation on the post-test survey answers and how the items are needed regardless of whether it is for at home or to take in case of an emergency. The mean scores for these 14 items ranged from .79 to .99, which is slightly higher than the survey combination scores on the pre-test question. This also shows a very slight comprehension and retention of the disaster preparedness materials from pre-test to post-test. Additionally, the same variables that increased the scores when run individually would also increase the combination coefficient alpha slightly if removed with the exception of variable necklace.

If the four scales are correlated together, the results show that the scales correlate well with each other and are significant (Table 10). When looking at the relationship between the pre-test and post-test questions on what the participant needs to have at home in case of an emergency, the correlation is significant. Additionally, when looking at the relationship between the pre-test and post-test questions for what the participant needs to take with them in an
evacuation, the numbers also show good correlation. The strongest correlation comes on running the two post-test questions which showed that after the disaster preparedness education, the numbers were highly correlated.

Table 10

*Correlation Coefficients between Pre-Test Questions 10 and 11 and Post-Test Questions 3 and 4*

<table>
<thead>
<tr>
<th></th>
<th>Pre-Test</th>
<th>Post-Test</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>10 - What to</strong></td>
<td><strong>11 - What to</strong></td>
<td><strong>03 - What to</strong></td>
</tr>
<tr>
<td><strong>have at home</strong></td>
<td><strong>have to go</strong></td>
<td><strong>have at home</strong></td>
</tr>
<tr>
<td><strong>Pre-Test</strong></td>
<td><strong>10 - What to have at home</strong></td>
<td>1.00000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.52612</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt;.0001</td>
</tr>
<tr>
<td></td>
<td></td>
<td>222</td>
</tr>
<tr>
<td><strong>Pre-Test</strong></td>
<td><strong>11 - What to have to go</strong></td>
<td>1.00000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.38470</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt;.0001</td>
</tr>
<tr>
<td></td>
<td></td>
<td>222</td>
</tr>
<tr>
<td><strong>Post-Test</strong></td>
<td><strong>03 - What to have at home</strong></td>
<td>1.00000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt;.0001</td>
</tr>
<tr>
<td><strong>Post-Test</strong></td>
<td><strong>04 - What to have to go</strong></td>
<td>1.00000</td>
</tr>
</tbody>
</table>

By combining the two pre-test questions into one scale and combining the two post-test questions into one scale, the results show they are highly correlated at .67 and are highly
significant at .0001. This supports the reasoning that those who did better on the pre-test also did better on the post-test in terms of what items they should have whether at home or away. As expected, those who better prepared for emergencies before coming to the training also did better after the training.

Logistic Regression

On the pre-test, when the participant was asked whether they had an emergency plan or not, logistical regression (Table 11) shows that being female and being prepared for an emergency predicts that the participant was more likely to have an emergency plan. In fact, females are over two and one-half times more likely to plan for a disaster when compared to males. However, when the variable, Prepared for an Emergency, is omitted (total DF = 7), then the variable Female continues to be very significant at the .01 level, but surprisingly the variable, Age 40 and Up, becomes significant as well at the .05 level. Without that variable, Prepared for an Emergency, the results show that women age 40 and up are more likely to also have a disaster plan at pre-test.

Additionally, when the variables, Know what to have at home, and Know what to take with you, are combined but the variable, Prepared for an Emergency, is still removed (total DF = 6), the results do not change and the variables of Women and Over Age 40 are still the variables that remain significant at their respective levels.

When Table 11 was run with the variable, Have Car, added (total 9 DF), the results showed significance with the variable Female, and Prepared for an emergency, both significant at less than .01. The variable, Have Car, however did not change the significance of any of the relationships. Even when the first two variables are combined to create a scale, the numbers do
not change significantly and the variables Female and Prepared for an emergency are the only ones who are also more likely to have an emergency plan at pre-test.

The Wald Chi-Square in Table 12 shows that there is not a significant prediction on the variable question post-test 08 that asks “Are you going to make a disaster plan?” The only scale scoring was found in the variable, Prepare a 10-day kit to stay at home, which showed that knowing the items needed to stay at home in an emergency predicted the participant making a disaster plan at post-test as well. In fact, those who did better on the at home kits were up to three and one-half more likely to say they would do a disaster plan at post-test. None of the other variables predicted question post-test 08.

Table 11

*Logistic Regression Analysis for Pre-Test Question 06 – Do you have a Disaster Plan right now?*

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Odds Ratio</th>
<th>Lower Bound</th>
<th>Upper Bound</th>
<th>Odds Ratio</th>
<th>Lower Bound</th>
<th>Upper Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Test 10-day kit to stay at home</td>
<td>0.99</td>
<td>0.64</td>
<td>1.53</td>
<td>1.01</td>
<td>0.75</td>
<td>1.36</td>
</tr>
<tr>
<td>Pre-Test 3-day kit to leave home</td>
<td>1.02</td>
<td>0.68</td>
<td>1.52</td>
<td>0.95</td>
<td>0.72</td>
<td>1.26</td>
</tr>
<tr>
<td>Age 40 and up</td>
<td>4.61</td>
<td>0.90</td>
<td>23.72</td>
<td>5.86</td>
<td>1.44</td>
<td>23.82</td>
</tr>
<tr>
<td>Age 60 and up</td>
<td>1.01</td>
<td>0.35</td>
<td>2.93</td>
<td>1.11</td>
<td>0.50</td>
<td>2.48</td>
</tr>
<tr>
<td>Female</td>
<td>3.65</td>
<td>1.48</td>
<td>9.02</td>
<td>2.45</td>
<td>1.22</td>
<td>4.93</td>
</tr>
<tr>
<td>Physical disability</td>
<td>1.57</td>
<td>0.63</td>
<td>3.91</td>
<td>1.30</td>
<td>0.65</td>
<td>2.60</td>
</tr>
<tr>
<td>Trouble Reading</td>
<td>1.25</td>
<td>0.32</td>
<td>4.81</td>
<td>1.00</td>
<td>0.36</td>
<td>2.77</td>
</tr>
<tr>
<td>Prepared for an emergency</td>
<td>1.45</td>
<td>8.32</td>
<td>49.32</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

N = 189 210
Degrees of Freedom = 8 7
Model Chi-Squared = 50.44 15.41

*Note.* Bolded ratios are significant at the .05 level and underlined at the .01 level
When question post-test 08 was also run with both variables, Items to have at home and Items to leave home with, combined then it became no longer significant, so this shows that only the variable, Items to have at home, makes it significant and more likely predict whether the participant will also make a disaster plan.

Table 12

*Logistic Regression Analysis for Post-Test Question 08 – Are you going to make a Disaster Plan?*

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Odds Ratio</th>
<th>Lower Bound</th>
<th>Upper Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prepare 10-day kit to stay at home</td>
<td><strong>1.90</strong></td>
<td>1.01</td>
<td>3.57</td>
</tr>
<tr>
<td>Prepare 3-day kit to leave home</td>
<td>0.69</td>
<td>0.34</td>
<td>1.41</td>
</tr>
<tr>
<td>Age 40 and up</td>
<td>1.08</td>
<td>0.12</td>
<td>9.67</td>
</tr>
<tr>
<td>Age 60 and up</td>
<td>1.22</td>
<td>0.22</td>
<td>6.67</td>
</tr>
<tr>
<td>Female</td>
<td>1.13</td>
<td>0.267</td>
<td>4.80</td>
</tr>
<tr>
<td>Physical disability</td>
<td>0.40</td>
<td>0.09</td>
<td>1.84</td>
</tr>
<tr>
<td>Trouble Reading</td>
<td>1.82</td>
<td>0.12</td>
<td>5.79</td>
</tr>
<tr>
<td>Have emergency plan</td>
<td>1.05</td>
<td>0.15</td>
<td>7.16</td>
</tr>
<tr>
<td>Prepared for an emergency</td>
<td>1.45</td>
<td>0.25</td>
<td>8.32</td>
</tr>
</tbody>
</table>

N = 188

Degrees of Freedom = 9

Model Chi-Squared = 7.36

*Note.* Bolded Ratios are significant at the .05 level and underlined at the .01 level

Regression Analysis

Table 13 shows a fairly good prediction and explains almost 29% of the variance in the post-test scale of questions. This also shows that those who did better at the pre-test at home
question also did much better at the post-test at home question. Additionally, those who are age 60 and over were better at knowing what to have at home after the training, which is a change measure. This was done with a predictor from the pre-test. The change showed at the post-test, which is a positive sign of comprehension and retention of the educational training.

Table 13

*Predictor of Post-Test Scale for Questions 03 – What do you need at home in an emergency*

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Coefficient/(t-score)</th>
<th>Coefficient/(t-score)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Test Question 10 (Items needed at Home)</td>
<td><strong>.500</strong></td>
<td><strong>0.454</strong></td>
</tr>
<tr>
<td>Combined Scales of Pre-Test 10 and 11 (Items needed to have at home and Items needed to go in an emergency)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age 40 and up</td>
<td>-0.238</td>
<td>-0.095</td>
</tr>
<tr>
<td></td>
<td>(1.000)</td>
<td>(-0.400)</td>
</tr>
<tr>
<td>Age 60 and up</td>
<td><strong>0.373</strong></td>
<td><strong>0.327</strong></td>
</tr>
<tr>
<td></td>
<td>(2.030)</td>
<td>(1.800)</td>
</tr>
<tr>
<td>Female</td>
<td>-0.033</td>
<td>-0.102</td>
</tr>
<tr>
<td></td>
<td>(-0.220)</td>
<td>(-0.710)</td>
</tr>
<tr>
<td>Physical disability</td>
<td>0.158</td>
<td>-0.357</td>
</tr>
<tr>
<td></td>
<td>(1.020)</td>
<td>(-0.240)</td>
</tr>
<tr>
<td>Trouble Reading</td>
<td>0.002</td>
<td>0.094</td>
</tr>
<tr>
<td></td>
<td>(0.010)</td>
<td>(0.440)</td>
</tr>
<tr>
<td>Have emergency plan</td>
<td>-0.069</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-0.400)</td>
<td></td>
</tr>
<tr>
<td>Prepared for an emergency</td>
<td>0.037</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.230)</td>
<td></td>
</tr>
<tr>
<td>Degrees of Freedom =</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>N =</td>
<td>188</td>
<td>218</td>
</tr>
<tr>
<td>Model Chi-Squared =</td>
<td>0.287</td>
<td>0.266</td>
</tr>
</tbody>
</table>

*Note. Bolded Coefficients are significant at the .05 level and underlined at the .01 level*
By leaving out specific measures of pre-test 06 (Have an Emergency Plan) and pre-test 09 (Prepared for an Emergency), the significance of Age 60 and Older becomes less important. But combining the scales of the pre-test Questions 10 and 11 (what to have at home and what to take with you) allows the combination to become significant as well. However, the most significant measure is again the pre-test question which shows those who did better on the pre-test question of knowing what to have at home in case of an emergency also did well on the same question in the post-test.

As seen on Table 14, the answers on the pre-test Question 11 also predict post-test question 04, what to take with you in an emergency. This shows that for every one point higher on the pre-test questions of what to have at home and what to take with you, then the participant also scored about one-half of a point higher on the same questions on the post-test. When Table 14 is run again for predicting question post-test 4 but variable 7 (Have an emergency plan) and variable 8 (Prepared for an emergency) are removed, the pre-test 11 question is still significant with a score of 0.489 (t-score of 9.42), but no other changes are found.

Table 15 shows that when a joint scale is created combining variables What you need at home and What you need to take with you, those who did well at pre-test, did almost .6 higher at post-test as well, which is significant. Those who are Age 60 and up also did better overall which was not surprising, because they had already done better on the Items needed at Home. The Items Needed to Take with You on Table 14 was positive as well, but not quite as significant, so when the scales of questions post-test 3 and 4 were combined, it becomes a fairly strong relationship.

When the two variables of pre-test Question 6 (Have an Emergency Plan) and pre-test Question 9 (Prepared for an Emergency) were removed, the combined scales of pre-test
Questions 10 and 11 (Know what to have and know what to take) are still the most significant with 0.559 (t-score of 10.56). This means the pre-test scores on Questions 10 and 11 also predicted doing well on both post-test Questions 3 and 4. Additionally, those at age 60 and above did better on the post-test and had a significant relationship of 0.65 while those Age 40 and up went down.

Table 14

*Predictor of Post-Test Scale for Question 4 – What to take when you leave home in an emergency?*

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Coefficient/(t-score)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Test Question 11 (Items needed to take with you in an emergency)</td>
<td><strong>.494</strong> (8.310)</td>
</tr>
<tr>
<td>Age 40 and up</td>
<td>-0.366 (-1.410)</td>
</tr>
<tr>
<td>Age 60 and up</td>
<td>0.351 (1.750)</td>
</tr>
<tr>
<td>Female</td>
<td>0.029 (0.170)</td>
</tr>
<tr>
<td>Physical disability</td>
<td>0.084 (0.490)</td>
</tr>
<tr>
<td>Trouble Reading</td>
<td>-0.086 (-0.360)</td>
</tr>
<tr>
<td>Have emergency plan</td>
<td>-0.208 (-1.110)</td>
</tr>
<tr>
<td>Prepared for an emergency</td>
<td>0.024 (0.140)</td>
</tr>
</tbody>
</table>

Degrees of Freedom = 8
N = 189
Model Chi-Squared = 0.302

*Note. Bolded Coefficients are significant at the .05 level and underlined at the .01 level*
Table 15

**Predictor of Combined Scales of Post-Test Questions 3 And 4 – What to have at home and what to take when you leave home in an emergency.**

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Coefficient/(t-score)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Combined Scales of Pre-Test 10 and 11 (Items needed to have at home and take with you in an emergency)</td>
<td><strong>0.592</strong> (9.850)</td>
</tr>
<tr>
<td>Age 40 and up</td>
<td>-0.562 (-1.300)</td>
</tr>
<tr>
<td>Age 60 and up</td>
<td><strong>0.733</strong> (2.200)</td>
</tr>
<tr>
<td>Female</td>
<td>0.006 (0.020)</td>
</tr>
<tr>
<td>Physical disability</td>
<td>0.226 (0.800)</td>
</tr>
<tr>
<td>Trouble Reading</td>
<td>-0.018 (-0.040)</td>
</tr>
<tr>
<td>Have emergency plan</td>
<td>-0.266 (-0.850)</td>
</tr>
<tr>
<td>Prepared for an emergency</td>
<td>0.064 (0.220)</td>
</tr>
</tbody>
</table>

Degrees of Freedom = 8

N = 189

Model Chi-Squared = 0.369

*Note.* Bolded Coefficient ratios are significant at the .05 level and underlined at the .01 level.
CHAPTER 5
DISCUSSION OF FINDINGS

By breaking down the data received in the four areas of descriptive data, cross-tabulation of survey questions, Cronbach’s alpha, logistic regression and regression analysis, different outcomes were able to be extracted and used in support of the research questions and hypotheses.

The purpose of the pre-test given before the training began was to glean information about what the participant’s demographical data was, what their disabilities were, and whether or not they had transportation. It was also to measure the previous education, experience, and knowledge the participants had about disaster preparedness before any training was offered.

The descriptive data revealed that of the 224 viable pre-tests and post-tests received, mostly females over the age of 61 participated in the educational training given by DCHD’s personnel. Additionally, one-third of these women reported a physical disability that affected their activities of daily living (ADL) and a smaller percentage (13%) also acknowledged trouble with reading. Approximately three-fourths of the sample population also acknowledged owning a car. Without additional clarifying questions, it was not known whether the answers received inhibited the participants’ abilities to care for themselves and/or evacuate independently in the event of an emergency.

On the questions asked to establish a baseline of the participants’ previous knowledge, over one-third reported already having a disaster plan. Of those that did not have one, 94% of them said on the post-test that they will be making one and almost two-thirds of those (65%) did report at the 30-day follow up actually making one. On the question related to Hypothesis 1, over half of the participants self-reported that they already felt prepared for an emergency before the training began. That percentage passed the initial goal of 50% even before the training and
increased to 96% on the post-test when asked after the training. It then decreased to 93% when asked on the follow-up survey. In retrospect, it is possible that as the participants actually began to take action to prepare, they may have realized they were not as prepared as originally thought.

When asked if the participants had been in an ice storm before the training, 76% reported they had and 77% of those said they had everything that they needed at the time. When this same question was asked at follow-up, it was to show support of Objective #3 of the state emergency plan. Of the three participants that had been in an emergency since the training, all three reported that they were prepared.

On the question about emergencies in Denton County, 83% answered correctly at pre-test. With this also being a post-test question, the percentage was seen to slightly increase to 84%. With the Hypothesis 2 question of sheltering in place, there was a more significant rise in knowledge from before the training (75%) to after the training (88%), which far exceeded the 70% goal and expectation set forth by DCHD HEART team. These answers also provided support for the Hypothesis 5 statement that participants will increase knowledge and retention of disaster preparedness information.

When comparing the two hypotheses questions asked on both pre-test and post-test of what supplies are needed at home in an emergency and what supplies are needed to go in an emergency, both questions saw original scores and increases exceeding the goals of 70% that the DCHD HEART team set forth. High percentages showed in the results for flashlights (90% to 91%), medicines (89% to 92%), batteries (80% to 87%), and water (87% to 92%) as items to have at home in an emergency. Additionally, clothes (69% to 79%), blankets (73% to 69%), and food (74% to 86%) numbers all increased as items ready to go in case of an evacuation. The
only item that decreased was medicines (92% to 90%) to have ready to go and it was surmised that possibly participants thought they could be purchased as they evacuated.

The composite measures for disaster preparedness of items needed at home were correlated at .648 for the pre-test and .714 for the post test which showed a significant increase in understanding before and after the training. Surprisingly, the measures for disaster preparedness of items needed to go in case of an emergency was .630 on the pre-test survey, but only .628 on the post-test which shows a slight decrease in participants’ knowledge of what to take with them in an emergency.

When the two pre-test questions of items needed at home and items needed to go in an emergency were run together, the coefficient alpha increases to .757 which is higher than run separately. This suggests that if no attention was paid to the difference between at home items and away items on the pre-test, it would still be a good scale. From the post-test, if both similar questions were run together, the coefficient increased from .714 and .628 respectively up to .803 suggesting a high correlation on the two questions regardless of whether the items are needed at home or to take with the participant on the go in case of an emergency. When the four questions are run together, the results show that the questions correlate well with each other and are significant. Also, when looking at the relationship between the pre-test and post-test questions on what the participant needs to have at home in case of an emergency, the correlation is significant. Additionally, when looking at the relationship between the pre-test and post-test questions for what the participant needs to take with them in an evacuation, the numbers also show good correlation. The strongest correlation comes on running the two post-test questions which showed that after the disaster preparedness education, the numbers were highly correlated.
By combining the two pre-test questions into one scale and combining the two post-test questions into one scale, the results show they are highly correlated at .67 and are highly significant at .0001. This supports the reasoning that those who did better on the pre-test also did better on the post-test in terms of what items they should have whether at home or away. As expected, those who better prepared for emergencies before coming to the training also did better after the training.

The score of 98% or higher were the results from the three additional post-test questions of if the participants now know how to prepare for an emergency, did they learn from the training, if they enjoyed the presentation, and if they learned something new. When comparing the post-test questions asking if the participants would take action to the follow-up questions of did they take action, it is shown that of the 92% that said they would take steps to prepare for disasters, 68% self-report they did. Also, 65% of the 94% that reported on post-test that they will make a disaster plan reported on the follow-up survey that they actually did. Surprisingly, of the 96% that stated they will make emergency kits, every one of them did make either a 10-day stay at home kit or a 3-day to go kit or both. These results also show support for Hypothesis 6 statement declaring that after disaster preparedness education is given, that actions of disaster preparedness will increase.

Forty-eight percent did report on the follow-up survey actually making a communication plan out of the 96% that claimed they would on the post-test. But there seemed to be some confusion on definitions about communication plans because some participants who said they had made a communication plan also reported not having a personal network written down, which is part of the communication plan. And some who reported having a personal network
(22%) said they did not have a communication plan, which in fact they had a part of one by having the personal network already written down.

The final follow-up questions gave the DCHD HEART team further information about whether participants now knew which medications to take in an emergency (97%), who to call for assistance (97%), whether the participants could recover without assistance (87%), and whether the class had helped them become a better “community member” (100%). When asked where they would go for information in case of an emergency, the DCHD HEART team was given very important answers of 35% to television news, 19% to radio, 3% to someone they live with, 0% to a community leader, 32% to a friend, 0% to a church leader, and 87% to other avenues such as internet, phone, etc. This gives DCHD personnel knowledge where and how to disseminate emergency information.

Logistic regression showed that being female and being prepared for an emergency predicted that the participant was two and one-half times more likely to have an emergency plan than a male. However, when the variable, Prepared for an emergency is omitted, then the variable Female continues to be significant but the variable, Age 40 and up, also becomes significant. The Wald Chi-Square showed there was no significant prediction on the variable post-test question “Are you going to make a disaster plan?” Only the variable of Knowing the items needed to stay at home predicted that the participant would make a disaster plan at post-test. In fact, those who did better on the At home kits were up to three and one-half more likely to say they would do a disaster plan at post-test.

Regression analysis showed that those who did better at the Hypothesis 3 pre-test question, Items needed at home, also did much better on the post-test question, Items needed at home. Additionally, those who are age 60 and over were better at knowing what to have at home.
after the training which was a change measure and a positive sign of comprehension and retention of the educational training. The answers on the Hypothesis 4 pre-test Question 11 also predicted post-test question 04, What to take with you in an emergency. This showed that for every one point higher on the pre-test questions of what to have at home and what to take with you, then the participant also scored about one-half of a point higher on the same questions on the post-test.

Combining the scales of the pre-test Hypotheses 3 and 4 questions (what to have at home and what to take with you) shows the combination to be significant as well. However, the strongest predictor is again the pre-test question which shows those who did better on the pre-test question of knowing what to have at home in case of an emergency also did well on the same question in the post-test.

When a joint scale was created combining the two hypotheses questions, What you need at home, and What you need to take with you, those who did well at pre-test, did almost .6 higher at post-test as well, which is significant. Those who had variable, Age 60 and up also did better overall, which is not surprising because they already did better on the variable, Items needed at Home. The variable, Items needed to take with you, was positive as well, but not quite as significant, so when the scales of post-test Questions 3 and 4 are combined, it becomes a fairly strong relationship.

When the two variables of pre-test Question 6 (Have an Emergency Plan) and pre-test Question 9 (Prepared for an Emergency) were removed, the combined scales of pre-test Questions 10 and 11 are still the most significant with 0.559 (t-score of 10.56). This means the pre-test scores on Questions 10 and 11 also predicted doing well on both post-test Questions 3
and 4. Additionally, those at age 60 and above did better on post-test and had a significant relationship of 0.65 while those Age 40 and up went down.

By using the data received from the descriptive data results, cross-tabulation, Cronbach’s alpha, logistic regression, and regression analysis, different outcomes were able to be extracted to support all three of the research questions and all six of the hypotheses in this research.
CHAPTER 6
CONCLUSION

To summarize the research project, the Conclusion chapter is broken down into three areas: Summary of Findings, Implications for Practice, and Recommendations for Future Research.

Summary of Findings

Listed are the research questions asked by the DCHD HEART team to find support for the 5-year state plan’s first goal and three objectives.

(R1) When the HEART training materials, such as the Disaster Preparedness Education Program, are used to educate the older residents of Denton County, is it known whether the materials are actually comprehended?

(R2) Once the materials are presented to the older population, is there knowledge as to whether the materials are retained for any length of time?

(R3) Is there support to show that once the disaster preparation education materials are comprehended and retained, that there is actual action taken by the older population on the instructions given to increase their personal disaster preparedness?

The data received from the surveys and hypotheses affirmed all three of the research questions. Listed are the six hypotheses statements and the support from the data analysis.

H1) By the completion of each presentation, 50% of participants will indicate they feel more prepared for emergencies.

Results: Increase from 51% to 96%

H2) By the completion of each presentation, 70% of participants will be able to define “Shelter in place.”
H3) By the completion of each presentation, 70% of participants will be able to identify at least three items needed to have in a 10-day Stay at Home kit.

Results: Flashlight – 90% to 91%
Medicines – 89% to 92%
Batteries – 80% to 87%
Water – 87% to 92%

H4) By the completion of each presentation, 70% of participants will be able to identify at least three items needed to have in a 3-day To Go kit.

Results: Clothes – 69% to 79%
Blankets – 73% to 79%
Medicines – 92% to 90%
Food – 74% to 86%

H5) After disaster preparedness education is given to the sample participants from the older population of Denton County, knowledge and retention of the information learned will increase.

Examples of increase in knowledge:
What kinds of emergencies happen often in Denton County?
83% to 84%
Do you know how to prepare for an emergency? 75% to 98%
Do you know what “Shelter in Place” means? 75% to 88%

H6) After disaster preparedness education is given to the sample participants from the older population of Denton County, actions of disaster preparedness will increase.
Samples of increase in actions:

Do you have an emergency plan? – 37% to 64%

Do you plan to make an emergency kit? – 96% to 100%*

(*Actually made either a 3-day kit or 10-day kit or both)

All six hypotheses were supported by the data in this dissertation.

Implications for Practice

The Denton County Health Department HEART team collaborated on this disaster preparedness survey research dissertation to not only find support of the effectiveness of the training they were providing, but to also find areas of improvement needed in their training, their marketing, and their overall understanding of this older population to better serve them in the future. As noted earlier, local health departments are responsible for the overall task of disaster preparedness for their city or county and only supported by their state departments and federal departments in cases of declared disasters. The health departments are also supported by the local Emergency Management offices that help with community preparedness. Due to the current overall financial constraints in our federal, state, and local governments, program dollars for community education are at a minimum. Therefore, it is vital that the program directors and educators are good stewards of these limited monies and funnel the funds towards achieving the best outcomes.

With this study, sampling information received through the survey pre-test, post-test, and follow-up call should give the data support necessary showing that the monies being spent are successful in helping to achieve the county and state goals set forth. Furthermore, this exploratory study can be replicated to other populations, as well as other training modules such as nutrition care or dental care to also show support of programs and program grant dollars. This
replication can be continued within Denton County and others who also choose to use this research methodology.

Recommendations for Future Research

Because this is such a large and complex subject matter, it is understood that the further research recommendations can be endless. Listed are a few of the changes that could increase the quantifiable outcomes in this area of research for the future.

Without additional clarifying survey questions for this research project, it is not fully known whether the barriers noted in the descriptive data will inhibit the participants’ abilities to shelter in place and/or evacuate independently in the event of an emergency. Future research using increased complex surveys that include additional qualitative questions may better establish clarity on these needs and any additional reasons for non-compliance of the disaster preparedness materials within the sample population. This will reveal a clearer picture of their disabilities, as well as their abilities to be able to comprehend, retain, and take action on disaster preparation information.

Larger research projects including increased sample population sizes of not only the older population, but in combination with other age cohorts would allow researchers to further understand if non-compliance towards disaster preparation is an older generation related issue or an issue for other ages as well. Additionally, running the studies in different parts of the country would give additional understanding as to whether the lack of importance of preparing for disasters might be a geographical issue depending on where the participant lived or a seasonal issue depending on what season the surveys were disseminated in. Both of these variables would be likely to affect the data received because of different situations causing different disasters as well as different experiences and understandings of disasters. A longevity study model with
additional follow-up calls at various intervals after the training may also show further comprehension, retention, and action past the current 30-day window on the present study.

No other subjects except the community dwelling mobile population were used in this study, thus leaving out the entire vulnerable community dwelling homebound population. They are a most vital part of the older population that cannot be forgotten when planning for disaster preparedness education. Also, those of the older population who had vision or hearing barriers may not have been reached because of not being able to drive to the classes or not being able to effectively hear well enough or see well enough to feel confident in attending the classes. A similar barrier can also be noted in the older population who may not have had enough education to read effectively, thus self-elimination from the training was also possible. For studies to be most representative of the entire older population, these additional cohorts must be a priority in future research of developing education specifically designed for their unique needs and barriers. Finding unique and individualistic ways to reach these populations and deliver the materials effectively is a future research challenge that must be addressed.

The disaster preparedness educational classes were promoted through Denton County Health Department using posters, flyers, and advertisements written in English. Additionally, the educational materials at the classes were only offered in English and the instructors only used English to communicate. This must be noted because by promoting and educating only in English, the study did not effectively reach those in the older population who did not read or speak English fluently enough to feel comfortable attending the educational trainings. These barriers must be addressed when organizing the marketing and the writing of the disaster preparedness materials for the future.
It is vital to educate the entire older population of the real possibility that limited, or even no immediate action from first responders during a disaster may happen due to resources being unavailable or extremely limited because of devastation during an emergency. As shown in the low numbers of actual preparation that was self-reported, this need for self-preparation must continue to be explained and be understood before any disaster preparation processes or procedures become important enough to this population to take action. Disaster theory states that more preparedness leads to increased resilience and this must continue to be taught to this vulnerable population to help decrease unnecessary injuries and deaths (McEntire, 2004).

More needs to be done in the customizing and design of training and education of this vulnerable elderly population that can be shown to lead to effective implementation of preparation practices for disaster. An increase in understanding why some people prepare for disasters more than others (either with or without disaster preparation education) would be extremely helpful to be able to further allocate resource dollars. Also, better coordination with already established groups such as faith-based groups or civic groups frequented by this older population could be better integrated into not only the training, but in the dissemination of real-time emergency information. By incorporating these areas of needs into a more holistic perspective of vulnerability (McEntire et al., 2010) disaster education and prevention for the elderly should result in an increase of individual productive measures that may result in more positive outcomes during the next disaster.
APPENDIX A

TRAIN THE TRAINER FLYER
This course will discuss the importance of preparing for emergencies prior to an event occurring. It will be a training to prepare volunteers to provide personal preparedness information to people with disabilities and their caregivers. The Prepare Denton County: People with Disabilities program needs volunteers who are willing to help assist in implementing the program by teaching pre-designed information to pre-established audiences. By attending this training, you would help strengthen our community by increasing the number of people prepared when disaster strikes Denton County!
APPENDIX B

SAMPLE FLYER – DISASTER PREPAREDNESS EDUCATION TRAINING
Prepare Denton County

An education program to help Denton County residents prepare for emergencies

Date: August 17, 2011

Time: 1:00 p.m. to 2:00 p.m.

Location: REACH of Denton, 405 S. Elm St., #202, Denton

Emergencies, whether man-made or natural, often occur without warning. While officials are responding to the larger event they may not be able to respond to individual needs. You may be required to shelter in place or even evacuate. The key to managing yourself in an emergency is to have a plan and prepare yourself and your family for emergencies that may occur. Your family will cope best by preparing for disaster before it strikes. Once disaster hits, you will not have time to shop or search for supplies. By gathering supplies and making plans in advance, you can endure an evacuation or shelter in place situation better.

Those present for the program will receive a free 3-day emergency kit to help them start preparing.

Program brought to you by the Denton County Health Department’s Health Emergency Alert Response Team
APPENDIX C

DISASTER PREPAREDNESS EDUCATION PRE-TEST
We need to know if we are doing a good job! Please help us by answering the questions below. The results of this test will help us check our program. Please do not put your name on this test.

Please circle the one that applies to you:

1. Age:
   a. 0-18
   b. 19-40
   c. 41-60
   d. 61+

2. Gender:
   a. Female
   b. Male
   c. Do Not Want To Answer

3. Do you have a physical disability that affects your activities of daily living?
   Yes  No

4. Do you have trouble reading?
   Yes  No

5. What do you use as transportation?
   a. I own a car.
   b. I have access to a car.
   c. I use SPAN.
   d. I use public transportation.

6. Do you have an emergency plan right now?
   Yes  No
7. What kinds of emergencies could happen in Denton County?
   a. Flu outbreak
   b. Tornado
   c. Flood
   d. All of the above

8. What does the term “Shelter-in-Place” mean?
   a. To stay where you are
   b. To go out to get a haircut
   c. To leave your current location and go to a shelter.

9. Do you feel Prepared for an emergency? (circle one)
   Yes   No

10. Circle the items you would need to have at home in case of an emergency.
    Flashlight  Medicines  Batteries  Box of dirt
    Snowflakes  Water  Tire

11. Circle the items that you need to have ready to go in case you need to leave home very quickly.
    Change of clothes  Blanket  Paperclips  Medicine
    Flowerpot  Food  Necklace

12. Have you ever been in an ice storm?
    Yes   No

13. If you have been in an ice storm, did you have everything you needed during the ice storm?
    Yes   No

Thank you!
APPENDIX D

DISASTER PREPAREDNESS EDUCATION POST-TEST
We need to know if we did our job by teaching you something new today! Please help us by answering these questions. Please do not put your name on this test.

1. What kinds of emergencies could happen in Denton County?
   a. Flu outbreak
   b. Tornado
   c. Flood
   d. All of the above

2. What does the term “Shelter-in-Place” mean?
   a. To stay where you are
   b. To go out to get a haircut
   c. To leave your current location and go to a shelter.

3. Circle the items you would need to have at home in case of an emergency.
   Flashlight  Medicine  Batteries  Box of dirt
   Snowflakes  Water  Tire

4. Circle the items that you need to have ready to go in case you need to leave home very quickly.
   Change of clothes  Blanket  Paperclips  Medicine
   Flowerpot  Food  Necklace

5. Will you be making any preparations in the next 30 days for emergencies?
   Yes  No

6. Do you know what you need to do to prepare yourself for an emergency?
   Yes  No

7. Can you use the information that we talked about today?
   Yes  No
8. Are you going to make a Family Disaster Plan?
   Yes    No

9. Are you going to make emergency kits?
   Yes    No

10. Are you going to make a Communication Plan?
    Yes    No

11. Do you feel more prepared for an emergency after this presentation? (circle one)
    Yes    No

12. Did you enjoy this presentation?
    Yes    No

13. Did you learn something new at this presentation?
    Yes    No

Prepare Denton County Program participants may be chosen (at random) for a follow-up phone
call in about 30 days. The phone call will be our way of seeing if we were able to help you
prepare for emergencies. By participating in the program, you are granting Denton County
Health Department permission to contact you within 30 days for a follow-up evaluation.

Thank you!
APPENDIX E

DISASTER PREPAREDNESS EDUCATION 30-DAY FOLLOW-UP SURVEY
PREPARE DENTON COUNTY 30-DAY EVALUATION

Telephone Survey Questions

Which educational session was this participant randomly drawn from?

____________________________________

1. As a community member, do you feel more Prepared for a disaster or emergency since you went through the Prepare Denton County program?
   YES ______
   NO ______

2. Have you been in an emergency since you participated in the Prepare Denton County program?
   YES ______ NO ______
   a. Were you prepared?  YES ______ NO ______
   b. Were you able to recover?  YES ______ NO ______
   c. Do you feel you could have been better prepared?  YES ______ NO ______
   d. Did taking the class help you in this emergency?  YES _____ NO_____

3. Do you feel like you can take care of yourself longer, without emergency assistance, in an emergency since you have gone through the Prepare Denton County program?
   YES _____
   NO _____

4. If you had to leave your home, do you know what medications you need to take with you?
   YES _____
   NO _____

5. Have you taken any steps in preparing your household for emergencies since you have gone through the Prepare Denton County program?
   YES _____
   NO _____
6. Do you have a disaster plan?
   YES _____
   NO _____

7. Do you have an emergency kit at home that would help you stay at home if you needed to for up to 10 days?
   YES _____
   NO _____

8. Do you have a 3-day emergency kit ready to go if you needed to leave your home very quickly?
   YES _____
   NO _____

9. Do you have a communications plan?
   YES _____
   NO _____

10. Have you written down a community support network?
    YES _____ NO _____
    a. If so, how many people are in your community support network?
       1 ____
       2 ____
       3 ____
       4 or more _____

11. Where would you go for information if an emergency happened?
    a. Television news
    b. Radio
    c. Someone you live with
    d. Community leader
    e. Friend
    f. Church or faith leader
    g. Other: ___________________________
12. During an emergency, do you know who to call for assistance?
   YES _____  
   NO _____

13. Do you feel like you could recover from an emergency without help from emergency workers, if they were not able to help you?
   YES _____  
   NO _____

14. Did the information you learned in the class help you become a more Prepared community member on how to recover in the case of a disaster or emergency?
   YES _____  
   NO _____

Thank you so much for your time!
APPENDIX F

RELEASE OF DATA LETTER FROM DCHD HEART TEAM
Denton County Health Department  
Health Emergency Alert Response Team

October 08, 2012

In Re: Knight, Rebekah – Dissertation Data Release

Dear Institutional Review Board,

Please accept this letter of release as permission for Rebekah P. Knight to use survey data we received from participants we educated from August, 2011 to May, 2012 about our Disaster Preparedness Education Program. It will be used solely for her dissertation as part of her PhD degree from the Department of Gerontology at the University of North Texas.

The program was organized and run by our Health Emergency Alert Response Team (HEART) employees as well as Medical Reserve Corp (MRC) volunteers. Once the surveys were received by our office and our volunteers, it was then transferred into non-identifiable secondary government survey data using only numerical organization for matching of the surveys. This allowed us to continue confidentiality for our participants within the educational programs.

Please contact me if you have any questions on this matter.

Thank you,

Bob Martinez, MPH
Emergency Preparedness Coordinator
Denton County Health Department
APPENDIX G

IRB APPROVAL EMAIL FROM UNT
RE: Minimal Review Application “A Study of Building Community Resilience through Disaster Preparedness Education Among the Older Population of Denton County

UNT IRB

untirb@unt.edu

Feb 15

Dr. Swan,

The UNT Institutional Review Board has jurisdiction to review proposed “research” with “human subjects” as those terms are defined in the federal IRB regulations. The phrase “human subjects” is defined as follows: “A living individual about whom an investigator (whether professional or student) conducting research obtains (1) Data through intervention or interaction with the individual, or (2) Identifiable private information.

Since the data you will be obtaining from Denton County has been totally de-identified, then your use of that data falls outside the scope of the “human subjects” definition and UNT IRB review and approval is not required.

We appreciate your efforts, however, to comply with the federal regulations and sincerely thank you for your IRB application submission!

Thank You,

Jordan Harmon

Research Compliance Analyst

University of North Texas
APPENDIX H

SITE INFORMATION FOR DISASTER PREPAREDNESS EDUCATION
## Site Information for Disaster Preparedness Education
### 2011-2012

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<td>09/15/11</td>
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**Total Completed Pre-Test/Post-test Surveys** 224
REFERENCES


