

Running head: TYPE 2 DIABETES, ELDERLY AND DISASTERS

The Rising Tide: The Increase in Elderly Population, Disasters and Type 2 Diabetes

by

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Abstract

The recent statistical data reveal that there are considerable changes in the growing elderly population, the rise in natural disasters, and the increased prevalence of Type 2 diabetes (T2DM). These trends are occurring globally that draw attention to the importance of recognizing this population's specific needs in the event of a disaster. Although Canada has suffered relatively few natural disasters, the occurrence of natural disaster worldwide is on the rise. Using a qualitative general research methodology, interviews were conducted with individuals over the age of 60 living with T2DM. The aim was to explore the participant's knowledge of chronic disease management and assess their ability to manage their disease during a disaster. A literature review identified gaps in knowledge in the management of chronic diseases during a disaster. The theory of vulnerability is used to explain that elderly people living with T2DM are at an increased risk of harm if a disaster was to occur. This study found that identifying and understanding the specific needs of this population is important in the development of disaster planning for emergency managers and first responders.

Keywords: elderly, disasters, chronic disease, Type 2 diabetes, vulnerability

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Terms of Reference

BG	Blood Glucose
CDRC	Center for Disease Control and Prevention
MMOLS	Millimoles Per Litre
OHA	Oral Antihyperglycemic Agents
RN	Registered Nurse
T2DM	Type 2 Diabetes Mellitus
UN	United Nations
UNISDR	United Nations International Strategy for Disaster Reduction

Chapter 1- Introduction

There are more disaster events today than 50 years ago and the number of people who are affected by the disaster are increasing (Barratt, 2007; Guha-Sapir, Hoyois, Wallemacq & Below, 2106; UNISDR Disaster Statistics, 2015). Vulnerable people will face longer recovery time, will remain susceptible to harm, and disasters will further produce conditions that may increase their vulnerability. The United Nations (UN) defines vulnerability as “the conditions determined by social, physical, economic, and environmental factors or processes which increases the susceptibility of an individual, a community, assets or systems to the impact of hazards.” (UN, n.d). Disasters will continue to affect vulnerable people if there are no effective strategies available for them to manage their disaster risk. In addition, the number of individuals living with T2DM (Type 2 Diabetes Mellitus) is becoming a global health challenge. Some of the concerns are: increased needs for healthcare services, increased rise in the risk of health complications, and increased mortality in those living with T2DM. The rise in disasters and increase in individuals living with T2DM may compound factors that may heighten the vulnerability of individuals in relation to disasters, if there are no effective actions taken to mitigate such trends.

Currently, in Canada there are more people alive over the age of 65 than under the age of 15 (Statistics Canada, 2015). This trend appears to be happening on a global scale. The UN (2015) has projected that by the year 2050, individuals over the age of 60 will for the first time in history equal that of persons younger than 16. In more developed countries the proportion of older persons already exceeds that of children and is forecasted to double by 2050 (United Nations, n.d.). Furthermore, there is predicted to be a 16% decrease in individuals under the age of 15 and a 56% increase in the population over the age of 60 in the next 30 years (United

Nations, n.d.). In parallel, in Canada persons over the age 60 are the largest group of individuals to be diagnosed with T2DM (Statistics Canada, 2015). Limited research exists examining the unique needs of individuals with T2DM who experience disasters.

In my 10 year nursing career it has become increasingly evident that for those who are living with T2DM, there is a wide variation in an individual's depth and breadth of knowledge pertaining to diabetes management. Based on my experience, I am concerned that some individuals are not aware and may not possess the necessary resources to care for themselves on a daily basis, let alone when there is a slight change in their life circumstances. Essentially, some elderly individuals are unaware of their vulnerabilities, and furthermore are naive to potential emergency situations that could increase their vulnerability. Many of the individuals I care for in the Emergency Department of the hospital are over the age of 60, and the majority of them live with one or more chronic diseases, such as T2DM. Those individuals may rely on the healthcare system believing that it will take care of them. I have witnessed a number of times, that elderly individuals come to the Emergency Department because they can either not cope on their own at home with their chronic disease or no one can manage taking care of them at home. A common perception among individuals I have observed, is the belief that the healthcare system will fix everything for them, and they do not have to do anything about caring for themselves. In many cases, an individual may believe that since they have paid into the healthcare system for their working years, that they can draw services now that should fully cover their needs. Such misconceptions could lead to a false sense of confidence that conceals their vulnerability and dismisses opportunities for prevention.

At present, in healthcare in many rural communities, there are minimal resources for healthcare services to support vulnerable people (Ford, 2016; Pong et al., 2011). The shortage of

resources may soon increase dramatically in response to the growing demands from the elderly population that are on the rise, and moreover, this population has the highest prevalence of T2DM (Diabetes Canada, n.d.; Meneilly & Tessier, 2011). Under such circumstances, if a disaster or emergency situation was to occur there would be added strain to the health care system. To mitigate the risk for individuals living with T2DM it is critical to provide emergency managers and first responders with the knowledge necessary to support them.

This thesis will be divided into six chapters. Chapter one, will provide the introduction, the rationale, the purpose, and the framework for the research. Following in the second chapter is a literature review examining vulnerability of particular groups of people in disasters. This chapter will also include definitions of terms, theories, existing studies, and gaps in literature. The third chapter will describe the research methodology used to guide my research. The fourth chapter will present my findings. Chapter five will be a discussion and analysis of my findings. The final chapter will discuss recommendations and a conclusion.

Research Problem/Problem Statement

Unless appropriate emergency management strategies are in place providing the required resources for the elderly living with T2DM, these people may experience adverse health consequences if they are affected by a disaster. Also, the UN has predicted that the number of individuals over the age of 60 is expected to increase by 56% between 2015 and 2030 (United Nations, 2015). Further, there is a 40% chance of developing diabetes over the age of 75. The risk of developing T2DM increases exponentially with age (Diabetes Canada, n.d.; Meneilly & Tessier, 2011). The reason for focusing on this age group in this study is due to T2DM being the most prevalent within this age group (Lau, 2016). According to Statistics Canada, “the aging

population is the most important demographic change affecting diabetes prevalence worldwide” (Statistics Canada, 2016).

A disaster situation may impede diabetes management and can contribute to the risk of diabetes related complications. There is little information available on disaster management practice that incorporates diabetes management. Individuals living with T2DM may also not have the appropriate supports in place to navigate through a disaster. Additionally, there may not be enough understanding and resources for disaster/emergency managers and healthcare professionals to assist elderly people living with T2DM. Therefore, without recognizing vulnerable conditions of elderly individuals living with T2DM, disaster management will be ineffective and may result in adverse consequences during the time of disasters. A central goal of this study is to improve knowledge about particular vulnerabilities of people living with diabetes and to recommend various ways to reduce specific risks faced by this population at the time of a disaster.

A fundamental assumption in this study addresses that the chance of vulnerable individuals’ survival in disasters is determined by their understanding of their own vulnerable health conditions. The elderly population living with T2DM may be in a high risk situation if they are unable to care for themselves or identify their specific needs during the first 72 hours of emergencies. During a disaster, there is potential for disruption in healthcare for everyone so people may not receive sufficient care. This could suggest that those living with T2DM may be at an increased risk of negative health outcomes.

Any disruption in healthcare provisions including medical care, food, and medication may have long and short- term consequences for individuals living with diabetes (Adams, Kaufman, van Hattum & Moody, 2011; Fonesca et al., 2009). For example, research from

Hurricane Katrina identified gaps in knowledge and practice of managing individuals with chronic diseases such as diabetes during a disaster (Cefalu, Smith, Blonde & Fonesca, 2006). Further, previous research indicated the effect stress has on exacerbating chronic disease and the vulnerabilities of the elderly population (Adams et al., 2009; Barratt, 2007; Fonesca et al., 2009; Deshpande, Harris-Hayes & Schootman, 2008). For example, Adams et al. (2011) addressed how living with chronic disease can be exacerbated by the heightened stress the elderly during and after Hurricane Katrina. Thus, people living with chronic disease may experience hardship during disaster events and may suffer severely if there is lack of adequate services.

Purpose of Study

The purpose of this study is to explore people's perceptions of their challenges and capacities living with T2DM in the event of a disaster. The results of the research aim to help individuals over the age of 60 living with T2DM to prepare for a disaster through identifying their vulnerability, understanding their needs, providing information, and assisting in being prepared. To better utilize the results, the information for assisting this vulnerable group will be shared with health professionals and emergency managers, so that they can plan for the particular needs of this population and help create a greater awareness for this specific population.

The preface for this study is the desire to listen to what the users of healthcare services need and learn how to assist in caring for them to be able to maintain their health. The majority of individuals that utilize healthcare services, such as the emergency department, are a vulnerable population (Asplin et al., 2003). Understanding the needs of the elderly living with T2DM in the aftermath of a disaster can potentially aid healthcare providers and emergency managers in preparing for and responding to the needs of this population, and thus supporting

their healthcare during a disaster. Furthermore, knowledge gained from this study may assist in decreasing this particular population's vulnerability to disaster.

Research Questions

The following two questions and sub questions are the inquiries that guided my research.

- 1) What do the elderly individuals with T2DM know about their disaster vulnerability and risks?
 - a. How do they cope with their vulnerability in day-to-day basis?
 - b. How do they expect disaster risks to affect them?
 - c. How do they plan to manage if they are impacted by a disaster?
- 2) What do the elderly individuals with T2DM expect from healthcare workers, emergency managers, and first responders?
 - a. What information or tools would be useful for healthcare workers, first responders, and emergency managers in order to assist the elderly individuals with T2DM?

These questions assisted in applying the theory of vulnerability to better understand needs of this specific population.

Theoretical Background and Conceptual Framework

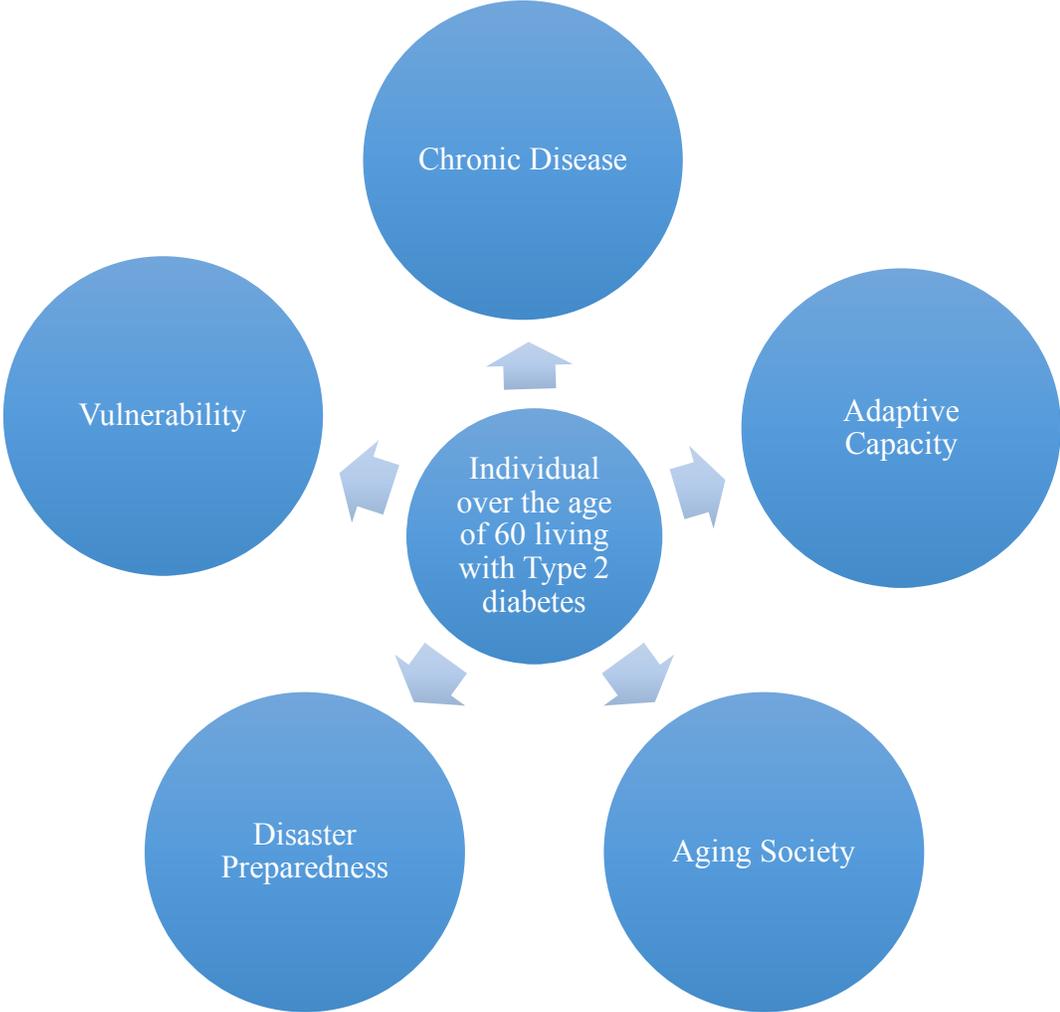
A framework informing this research is the theory of vulnerability, which claims that a disaster may occur where vulnerable populations are exposed to hazards (Hewitt, 1998; Wisner, Blaikie, Cannon & Davis, 2004). Disaster vulnerability theorists regard natural disasters as complex interactions between human systems and natural events. Additionally, the impacts of such events are unevenly distributed to those who are most prone to adverse consequences, such

as death, injury, economic disruption, property damage, opportunity loss, and long term emotional, and physical disturbance (Bolin, 2007; Hewitt, 1998; Wisner et al., 2004).

Vulnerability analysis shows that particular characteristics of individuals such as age, gender, race/ethnicity, socioeconomic status, and physical/mental disability are the most influential determinants of vulnerability (Hewitt, 1998; Wisner et al., 2004). The theory of vulnerability offers an explanation of how the root causes of disaster vulnerability are embedded in social, economic, political, cultural structures, and systems in society. For example, people's vulnerability is generated through social stratification, economic inequality, limited access to political power, cultural stereotypes, and prejudice as part of everyday life. This underlying cause is further progressed through existing social as well as physical factors that are translated into unsafe conditions, where vulnerable people are exposed to hazards (Cutter, Boruff & Shirley, 2003; Wisner et al., 2004). Further details of vulnerability theory are discussed in the literature review chapter.

For this study, vulnerability analysis is used as a framework to achieve better understanding of the populations who are at high risk of disasters. Relevant theories and concepts are identified to explore new insights and emerging ideas that can provide answers to the research questions. The following concepts are chosen for this framework to elaborate the study of elderly individuals living with T2DM in the context of disaster management: vulnerability, chronic disease, aging society, disaster preparedness, and adaptive capacity (see Figure 1). These concepts and terms are used to examine the existing literature as well as the interview data in order to answer the research questions. Utilizing this framework of vulnerability through this research provides a lens to understand the vulnerability specific to people over the age of 60 living with T2DM.

Figure 1: Conceptual Framework



Chapter 2- Literature Review

This section discusses the literature reviewed to support the research questions previously mentioned. This literature review focused on (a) T2DM as a particular type of chronic disease, (b) disaster vulnerability of people with T2DM, (c) aging society as a prevailing trend that generates emerging social conditions, (d) adaptive capacity as an ability to affect vulnerability and resilience, and (e) disaster preparedness as a means to meet the needs of vulnerable groups. Examining these topics individually provides the rationale for the research that was conducted and informs the interpretation of the findings. This literature review provides what is known in relation to each of these core concepts associated with this study. Furthermore, this literature review identifies gaps in the knowledge regarding individuals over the age of 60 living with T2DM and the need to develop research in this area.

Type 2 Diabetes as a Particular Type of Chronic Disease

Chronic disease is the leading cause of death in North America. In the United States, 133 million adults live with at least one chronic disease (Center for Disease Control and Prevention, n.d.). According to the Center for Disease Control and Prevention (CDCP) chronic disease can be defined as a disease persisting for three months or longer. Chronic diseases are not cured by vaccines or medication (CDCP, n.d.). Some examples of common chronic diseases are asthma, chronic obstructive pulmonary disease, diabetes, and cardiac disease (CDCP, n.d.). Diabetes is one of the prevalent chronic diseases (CDCP, n.d.). Worldwide, 6.4 % of adults live with diabetes (Nolan, Damm & Prentki, 2011). In developed countries the highest prevalence of T2DM is in individuals over the age of 60 (Lau, 2016; Nolan et al., 2011). In Canada, 3.9 million adults live with diabetes (Public Health Agency of Canada, 2011), in the United States, 20 million adults live with diabetes (CDCP, n.d.). O'Brien, Patrick and Cora

(2003) argue the complications of diabetes can be life threatening and incapacitating. In Canada at least 5,000 deaths a year are a direct result of diabetes, and the number of death increases to approximately 25,000 if deaths from complications are included (O'Brien et al., 2003). Lau (2016) contends that according to the International Federation of Diabetes (IDF), "diabetes is one of the largest global health emergencies of the 21st century" (p.1).

Diabetes mellitus is defined as a group of related conditions that affect how the human body uses glucose (Childs, Cypress & Spollett, 2005; Collazo-Clavell, 2006). The definition of diabetes according to Diabetes Canada (n.d.) is "diabetes mellitus is a metabolic syndrome characterized by the presence of hyperglycemia due to defective insulin secretion, defective insulin action or both". Chen and Fantus (2005) define T2DM as the pancreas' decreased ability to secrete insulin and the inability of various muscle, liver, and adipose tissue to support the action of insulin which "results in impaired glucose uptake" (p.213). Scheen (2003) suggests there is evidence linking beta cell function and insulin resistance in the pathogenesis of T2DM. Moreover, T2DM affects several systems in the human body (Deshpande et al., 2008). For example, hyperglycemia is directly related to an increase in hepatic glucose production; the pancreas is unable to secrete enough insulin to combat the increase in glucose production from the liver. As a result, there is increased stress on the kidneys and glucose does not spill into the urine until the blood glucose (BG) level is too high (Chen & Fantus 2005; Diabetes Canada, n.d.; Inzucchi et al., 2012; Scheen, 2003).

With T2DM, the pancreas does secrete enough insulin but it is not of good quality and cannot complete the transfer of glucose into the cell (Inzucchi et al., 2012). Individuals without the ability to produce or secrete enough good quality insulin must take insulin or Oral Anti-Hyperglycemic Agents (OHA). Insulin assists in the increase of the glucose disposal and

decrease of hepatic glucose production (Inzucchi et al., 2012). Oral Anti-Hyperglycemic Agents assists to increase insulin secretion, decrease the intestinal carbohydrate absorption, increase satiety, and decelerate gastric emptying (Inzucchi et al., 2012). The most common forms of diabetes are Type 1, Type 2, and gestational. Type 1 diabetes is a result of a complete deficiency of insulin secretion from the islet cells, whereas T2DM is a result of the pancreas not secreting quality insulin therefore impairing glucose uptake. Gestational diabetes mellitus (GDM) has common features of T2DM, and first diagnosed during pregnancy (Childs et al., 2005). For the purposes of understanding chronic disease associated with age, T2DM is the focus of this study.

Although there is a genetic component to T2DM, the increase in obesity and decrease of physical activity has significantly increased the numbers of individuals living with T2DM (DeFronzo, Eldoe & Abdul-Ghani, 2013). Individuals who have family members with T2DM and themselves are overweight, physically inactive, and have poor nutrition, are at an increased risk of developing T2DM. With T2DM it is important to slow the rate of progression of the disease through the use of a combination of medications that target the specific pathogen of the disease. The pathogen is different in each individual (DeFronzo et al., 2013). Treatment of T2DM should not rely on medications alone. A combination of medications that treat the pathogenic abnormalities, physical activity, and diet can assist in decreasing the progression of T2DM (DeFronzo et al., 2013). T2DM is controlled with OHAs or a combination of OHA and insulin. Other medications such as anti-hypertensive to treat blood pressure and anti-lipid medications to treat cholesterol may be prescribed in combination with insulin and OHAs to offer protective benefits from possible complications from T2DM. Individuals with T2DM may not have high blood pressure or high cholesterol, however taking these types of medications can assist in protecting vital organs and reduce complications from T2DM (Inzucchi et al., 2012).

All individuals living with diabetes can experience similar health complications that may be a result of uncontrolled BG.

A normal BG is four to seven millimoles per litre (mmol/L). A BG lower than four mmol/L is considered hypoglycemic and a BG above seven mmol/L pre-meal, is considered hyperglycemic (Childs et al., 2005). Individuals living with diabetes use medications including insulin and non- insulin injectables, attention to diet, and exercise to assist in controlling their blood glucose. Hypoglycemia is when an individual's BG falls below four mmol/L. Signs of hypoglycemia are drowsiness, diaphoresis, confusion, dizziness, and shakiness; if left untreated, loss of consciousness or seizures can occur. Contributing factors to hypoglycemia may be too much insulin, a delayed meal, too little carbohydrates, an OHA like sulfonylurea, and too much activity (Childs et al., 2005). Initial treatment for hypoglycemia is ingesting glucose. Eating or drinking glucose is preferred, such as eating honey or drinking orange juice. If people are too drowsy, glucagon can be given by injection or D50W intravenously (Childs et al., 2005).

Hyperglycemia is common in people with T2DM.

Hyperglycemia occurs when an individual's BG is above 10 mmol/L. Very elevated BG levels can have severe consequences. It is extremely rare for someone to die of hyperglycemia. It is more common to have adverse events with hypoglycemia. The common signs and symptoms of hyperglycemia are increased thirst, vomiting, polyuria, and blurred vision (Childs et al., 2005). Treatment for hyperglycemia may vary and individuals should seek medical attention if their signs and symptoms persist. The most common form of diabetes mellitus is Type 2. Of those individuals diagnosed with diabetes, 90% are diagnosed with T2DM and 10% are diagnosed with Type 1 diabetes (Diabetes Canada, n.d.). Additionally, having increased BG levels over time can lead to complications of diabetes (Childs et al., 2005).

People living with T2DM may also have many complications. Documented associated complications can be divided into two categories: microvascular and macrovascular (Deshpande et al., 2008). Complications of microvascular include renal system (nephropathy), nervous system (neuropathy), eye damage (retinopathy), and erectile dysfunction (Deshpande et al., 2008). Complications of macrovascular include cardiovascular disease, cerebralvascular disease, and peripheral vascular disease, (Deshpande et al., 2008). Diabetes may have several comorbidities, thus leading to increases health related emergencies, decreased individual lifespan, increased utilization of routine and urgent healthcare services and varied impact on the quality of life. These comorbidities may increase the vulnerability of an elderly individual.

According to research, the elderly demonstrates an increase prevalence of T2DM (Deshpande et al., 2008; Diabetes Canada, n.d.; Lau, 2016; Meneilly & Tessier, 2011; Meneilly, Shefifali & Tessier, 2015; Nolan et al., 2011). The increase can be attributed to genetics, ethnicity, age related changes, and lifestyle choices (Deshpande et al., 2008; Diabetes Canada, n.d.; Meneilly & Tessier, 2011; Meneilly et al., 2015; Nolan et al., 2011). The risk of T2DM increases when individuals adopt a lifestyle of inactivity and poor diet. Therefore, understanding what choices the elderly living with T2DM make for their everyday living becomes essential so that they can refrain from any unwanted lifestyle habits. Lifestyle choices can be made by the preference of individuals, but many of them may not have a choice. For example, they may be constrained with selecting certain types of foods as a result of accessible food options and/or financial resources. Other potential constraints may include having opportunities for physical exercise, securing optimal hours for better sleep, accessing healthcare, and maintaining overall better quality of health. These choices and constrains are often influenced by the complex interactions among root causes consisting of genetics, ethnicity, age, gender, and socio-economic

status, which differentiate the level of vulnerability (Wisner et al., 2004) for the elderly living with T2DM as a result.

While recognizing the dynamic lifestyle options and choices, and underlying root causes, current healthcare services encourage patients to make better decisions to improve their health. The Diabetes Canada Clinical Practice Guidelines offer a self-management strategy to empower patients to educate themselves about the medications and healthy lifestyle approaches (Diabetes Canada, n.d.). The challenge is that there are certain groups of people who do not receive adequate supports and services due to the limited resources in the healthcare system (Pong et al., 2011). There is uneven distribution of resources between urban and rural healthcare (Pong et al., 2011), so that patients in rural communities may face a lack of support that generate an increased vulnerability in emergency situations. Healthcare service providers in rural settings are often under-resourced, which limits their ability to provide a wide range of services to meet the specific needs and preferences of individuals (Ford, 2016; Pong et al., 2011).

There may be a reduced opportunity for some of these patients living in rural communities to become self-sufficient and knowledgeable about their disease. If these individuals can gain knowledge and communicate with healthcare providers and emergency managers in preparing for and responding to their healthcare needs, they may significantly reduce their level of vulnerability during and after a disaster. More studies are needed to develop ways to support independence of vulnerable groups, such as elderly individuals living with T2DM.

Disaster Related Vulnerabilities of People with Type 2 Diabetes

Disasters can be defined as an event interrupting the social functioning of a community and posing an increased risk to the vulnerable population of the community (Quarantelli, 2005a).

Bolin (2007) refers to vulnerability as the reflection of the complexity of social, economic, and political considerations in which people's everyday lives are embedded, and the choices and options they have in the face of disasters. Often the most vulnerable are typically people with the fewest choices and access to resources (Bolin, 2007). Further to Bolin's (2007) definition of vulnerability, Wisner et al., (2004) define vulnerability as the "Characteristics of a person or a group and their situation that influences their capacity to anticipate, cope with, resist and recover from the impact of a natural hazard" (p.115). Theorists argue that vulnerability is rooted in social, economic, political, and cultural development process embedded in everyday life to cause particular groups of people to be at higher risk. This underlying cause is further progressed through existing various social, as well as physical factors that are translated into unsafe conditions (Wisner et al., 2004). Social factors that can influence a person's vulnerability can include being older, living with chronic disease, being financially unstable, living in isolation, lacking resources, and lacking essential skills or knowledge. Further, vulnerable populations living with prior health inequalities due to socioeconomic status, gender, and culture are often at an increased risk following a disaster (Fordham, Lovekamp, Thomas & Philips, 2013). Unsafe conditions are created when individuals live in a dangerous location, with inadequate public health services, without locally developed disaster preparedness, or in a community where there is lack of acknowledgment of vulnerable groups. This can make particular individuals and groups vulnerable to disasters.

Many individuals living with chronic disease may already be socially vulnerable (Thomas, Newell & Kreisberg, 2013). For example, an elderly individual living with T2DM may not have the ability to access healthcare due to living in isolation, living without comprehensive health coverage, having a limited social support group, or having a fixed income.

Furthermore, in the event of a disaster, the risk for an individual's lack of access to healthcare increases significantly because of the possible disruption in healthcare services (Runkle, Brock-Martin, Karnaas, Zhang & Svednsen, 2012). Such factors can place these vulnerable individuals in stressful situations and may contribute to complications from diabetes not being treated. Stress and lack of access to healthcare may contribute to complications from diabetes not being treated during a disaster (Eisenman, Coradasco, Asch, Golden & Glik, 2007).

Stress refers to the body's biological response to environmental demands that the body does not have the means to deal with. The particular role of stress in human disease is not known. However, it is known that stress can contribute to certain diseases by hindering certain components of the immune system. Furthermore, it has been identified that individuals under stress are at an increased risk of developing and exacerbating chronic diseases (Tortora & Derrickson, 2012). The autonomic nervous system is responsible for dealing with stress response while the hypothalamus, located in the brain, is responsible for the stress response itself. When the hypothalamus receives the message that there is stress, a signal is sent to the pituitary gland, as well as the adrenal medulla. The pituitary gland secretes the hormone adrenocorticotrophic (ACTH) (Tortora & Derrickson, 2012). The hormone ACTH stimulates the adrenal glands to produce the hormone corticosteroid which enables the body to maintain an adequate blood sugar level during periods of stress and assists in returning the body to a normal state (Tortora & Derrickson, 2012). The ability to maintain a low threshold of stress for individuals, in particular elderly people living with T2DM, assists in their ability to care for their own health. Disasters may increase an individual's stress which can lead to an increased risk of complications from T2DM. Two examples of how disasters have impacted people with T2DM will now be offered.

Elderly people living with T2DM were at an increased risk of complications during the European Heat Wave of 2003 (Kenny, Yardley, Brown, Sigal & Jay, 2010). Heat waves can occur with little or no warning. Individuals over the age of 60 living with T2DM are at an increased risk of heat related illness due to the inability to physiologically regulate their body's core temperature (Kenny et al., 2010). During the European Heat Wave of 2003, access to clean and potable water was limited therefore people became dehydrated and those with living with chronic disease (Barratt, 2007), such as T2DM, became ill. Research demonstrates that people over the age of 60 are among the most affected during a heat wave and in combination with living with T2DM, the risk of complications during a heat wave increases by 30% (Kenny et al., 2010).

Research related to hurricane Katrina also provides a good example of the harmful effects a person living with a chronic disease may encounter when a disaster occurs. In the aftermath of Hurricane Katrina there was an urgent call to include chronic disease prevention planning in disaster preparedness (Berggen & Curiel, 2005; Eisenman et al., 2007; Few, 2007; Mokdad et al., 2005; Runkle et al., 2012). Approximately 100,000 individuals living with diabetes needed treatment and care for their diabetes after Hurricane Katrina (Cefalu et al., 2006). Some of the concerns raised were lack of access to insulin and insulin devices, safe disposal for syringes, oral glyceamic medication, proper nutrition and medical records (Cefalu et al., 2006; Eisenman et al., 2007). One person refused to evacuate for fear of not having access to their usual healthcare providers for their diabetes (Eisenman et al., 2007). Additionally, three hospitals, several physicians' offices and wellness centers were closed for months as a result of damage from Hurricane Katrina (Cefalu et al., 2006; Eisenman et al., 2007). One particular challenge that arose from individuals with T2DM, was not being able to have access to necessary treatment

(Cefalu et al., 2006). Adams et al., (2011) emphasized that many elderly individuals living with a chronic disease did not receive treatment or were able to receive regular checkups and medication due to the collapse of the infrastructure.

The literature also suggests that some of these disaster impacts can be mitigated. For example, Cefalu et al. (2006) praised the diabetic education that had been performed in communities prior to hurricane Katrina. Many individuals that had evacuated from their own home were autonomous in their diabetic care having adequate supplies, however there were some individuals left unprepared. Mokdad et al. (2005) emphasize the importance of developing policies and training material for health and disaster professionals so these professionals can assist and care for individuals living with chronic disease.

Disaster related vulnerabilities such as the disruption in healthcare services, the increase in stress levels, and the increase risk of complications from T2DM may affect elderly individuals living with T2DM. There are few studies addressing the compounded vulnerability of elderly, chronic disease, stress, and aging of population. The literature discussed in this section highlights the adverse effects disasters may have on elderly populations living with T2DM, while in contrast, the article by Cefalu et al. (2006) demonstrates the positive results of education to this specific population. Additionally, the research identified people who experience stress may exacerbate or develop a chronic disease (Torota & Derrickson, 2012). However, the current literature does not offer much direction how to adopt planning practices for this particular vulnerable group. Age can be a factor contributing to vulnerability, more studies are needed to identify the effects the aging population will have on society and emerging social conditions.

Aging Society as a Prevailing Trend that Generates Emerging Social Conditions

The “grey tsunami” refers to the increase in number of individuals over the age of 65. In July, 2015, there were more individuals over the age of 65 than under the age of 15 (Statistics Canada, 2015) living in Canada. The number is expected to grow steadily in the next 30 years. The same trend is expected globally (United Nations, 2015). According to Barratt (2007), one in every 10 people is over the age of 60, and by 2050, one in every five people will be over the age of 60. This trend may have already become a new normal. The changing population demographics globally highlights the necessity to address the age group over the age of 60 when addressing disaster planning. In developed countries such as Canada, the number of deaths attributed to disasters in the elderly population tend to be lower, however, the economic impacts of these events are greater (Barratt, 2007; Shenk, Ramos, Kalaw & Tufan, 2009). For example, the Ice Storm in 1998 in Ontario and Quebec affected 4.7 million people, contributed to 30 deaths, and cost the government and private sector over \$4.7 billion (Chang, McDaniels, Mikawroz & Peterson, 2005). Further to the economic impact of disasters, current research demonstrates that individuals over the age of 60 are more vulnerable to the impact of disasters than any other age groups (Adams et al., 2011; Barratt, 2007; Kenny et al., 2010; Pekovic, Seth & Rothman, 2007). For example, in Hurricane Katrina 70% of the 1,300 individuals that died were over the age of 65 (Aldrich & Benson, 2008). During the European Heat Wave of 2003, the majority of the 52,000 deaths were in the age group over 60 (Pekovic et al., 2013). Shenk et al. (2009) further highlight the need to examine the impact of disasters on older adults in order to assist this age group prepare for a disaster. Given the increased prevalence of T2DM in the aging population (Lau, 2016), it is necessary to understand the particular life stage needs of individuals over the age of 60 living with diabetes.

The aging population demographic is just beginning to increase, and therefore, it is difficult to predict the potential damaging effects that may happen due to the early phase of this demographic. In the last decade, research has identified the gap in knowledge about the aging population, however, research is still in its infancy. Moreover, society has not experienced the aging population, and how this demographic trend will persist and influence vulnerability to future disasters. This, however, does not mean we can only respond reactively. There should be ways to respond pro-actively but the current literature does not offer much direction as to how the elderly can manage their adverse conditions at the time of emergencies. Addressing the needs and concerns of this age group is essential, in particular elderly individuals that are living with T2DM. Listening to what this specific group needs and utilizing their knowledge, skill, and lived experience will assist in decreasing the individual's vulnerability through building their adaptive capacity.

Adaptive Capacity as an Ability to Affect Vulnerability and Resilience

Vulnerability theorists suggest people who are older, living with chronic disease, living in isolation, lacking skills, knowledge, and resources are vulnerable (Scandlyn, Thomas & Brett, 2013). However, vulnerability theorists also indicate that vulnerable people are not just helpless victims but they are resilient and capable of making their own decisions and taking actions (Jones et al., 2010). Specifically, Barratt (2007) emphasizes that older individuals have a lot to contribute to disaster preparedness. Adults over the age of 60 are often a great resource for planning, education, and assisting in preparedness (Barratt, 2007). Often elderly individual's life experiences increase their resiliency and ability to adapt during a disaster (Adams et al., 2011; Barratt, 2007; Shenk et al., 2009). Jones et al. (2010) indicate adaptive capacity and

vulnerability are closely linked, suggesting the markers of vulnerability can be important insights into the practices and approaches that constrain or promote adaptive capacity

Adaptive capacity can be defined as “The ability of a system, human or natural, to adjust to climate change including variability and extremes, to moderate potential damages, to take advantage of opportunities, or to cope with the consequences” (Care, n.d.), however, the exact definitions of adaptive capacity can vary. Hufschmidt (2011) refers to adaptive capacity as a “Hinge that is between the human ecologist and structural perspective, this suggest that there are complementary approaches towards understanding & reducing vulnerability and risk” (p.625). Smit & Wandel (2006) suggests that adaptive capacity varies from community to community and individual to individual and is based on a complex interaction of cultural, political, social, and economic factors. Although the definition of adaptive capacity can vary, what can be agreed upon is adaptive capacity can assist in decreasing vulnerability for a specific population.

In a study by Lopex-Marrero & Yarnal (2010), the concern of creating adaptive capacity is addressed. The study was situated in Puerto Rico in two flood prone communities. The results revealed that floods were not the only risk about which participants living in these two communities were concerned (Lopex-Marrero & Yarnal, 2010). Many participants did not identify the risk of floods as their main concern. Participants’ principal concerns were for health conditions and family well-being. Therefore, if their perception of flooding was low it was likely their desire to adapt would be minimal. This study demonstrated that developing strategies for multiple risks people face would enhance their adaptive capacity in a disaster situation (Lopex-Marreeo & Yarnal, 2010). In another example, a study was conducted after the 1998 gas explosion in Victoria, Australia examining the adaptive capacity of the elderly survivors (Buckle, 2001; Poley, Cohen & O’Connor, 2001). The results of the study

demonstrated the elderly were able to conserve the amount of food and water wisely during the event as no one was certain when the first responders would arrive. The seniors showed their adaptive ability to preserve the use of resources and apply their past experience to refrain themselves. They were also aware of their daily need so that was why they were able to distribute the minimum amount of food and water to survive longer. This particular age group may have lived through previous disaster and learned from their past experience, therefore improving their ability sustain themselves for a period of time post disaster. Age, life experience, and past experience with disasters can contribute to an individual and community to build adaptive capacity.

Developing strategies, policies, and planning for all identified risks would enhance individual's adaptive capacity, therefore increase their resiliency and decrease their vulnerability during a disaster (Lopes-Marrero & Yarnal, 2010; Seguin et al., 2008). For example, the Sendai Framework (2015) from the United Nations International Strategy for Disaster Reduction (UNISDR) emphasizes the importance of implementing preparedness strategies to reduce the impact of the disaster (UNISDR, 2015). With greater knowledge of their particular risks and vulnerabilities in relation to disaster, individuals living with T2DM may be better able to prepare themselves for the 72-hour period post disaster, thus increasing their adaptive capacity. There needs to be more research to identify factors that enhance adaptive capacity of these individuals.

Disaster Preparedness as a Means to Meet the Needs of Vulnerable Groups

A disaster may occur where vulnerable populations are exposed to hazards. There is no disaster if there is no vulnerable group (O'Keefe, Westgate & Wisner, 1976). A central goal for disaster management is to aid vulnerable groups to reduce their vulnerable conditions.

Preparedness is one of the four pillars for disaster and emergency management along with

response, recovery, and mitigation. Coppola (2015) defines disaster preparedness as “Actions taken in advance of a disaster to ensure adequate response to its impacts, and the relief and recovery from its consequences” (p. 275). Emergency management refers to preparedness on a four levels: government, public, household, and personal (Coppola, 2015). These levels of preparedness all interconnect and can assist in decreasing an individual’s vulnerability if a disaster is to occur.

Government’s preparedness refers to the ability of governments to assure citizens that if a disaster was to occur they have the ability to able to assist their citizens (Coppola, 2015). Generally, each level of government is responsible to have plans, responses, and recovery in place if a disaster was to occur. Each government jurisdiction works within the confines of their responsibilities. The assurance of the government is exhibited through planning, training, equipment, and statutory authority, however the ability of the how well the government can respond is never really known until a disaster occurs (Coppola, 2015).

Public preparedness refers to the ability of actions taken to assist everyday citizens to empower themselves to help their families, neighbours, themselves, and strangers (Coppola, 2015). Empowering citizens to assist in the beginning of the disaster can alleviate the strain the response resources may feel in the first few hours of the response period. This includes educating citizens about first aid and search and rescue (Coppola, 2015). The UNISDR emphasized the importance of creating disaster risk awareness among the vulnerable population as an important component to achieve effective risk reduction (UNISDR, n.d.).

Household and personal preparedness refers to individual homes having the resources and equipment to be able to assist themselves in the immediate aftermath of a disaster. This may also refer to taking the necessary precautions to ensure the house has been equipped or built

properly to help prevent damage from water, wind, or fire. The first step towards increasing resiliency and decreasing vulnerability for individuals is creating awareness with the public about disaster preparedness (Paton & Johnston, 2001; Pekovic et al., 2007).

Public Safety Canada suggests that every household/individual should be equipped for 72 hours post disaster, should have an emergency kit prepared, have family emergency plans, have personal level risk assessment, and mitigation strategies for personal level preparedness (Public Safety Canada, 2015). During emergencies, the lack of access for individuals to emergency lifelines is a critical attribute to their survival. Individuals' lifelines in emergencies are often referred to as the basic needs; food, water, clothes, and shelter as well as other essential items, and supplies that are necessary to sustain lives. Individuals with specific health needs require lifelines and therefore their medication and medical supplies should be included in an emergency kit. It is difficult to store medications in this kit due to expiry dates, however, if able to, it is important to have access to enough medication to take with you for the 72-hour period. Some important preparedness activities are having a plan of alternative places to seek medical help, carrying extra medications if needed, keeping a copy of the individual's health history and having list of medications (Public Safety Canada, 2015).

Research demonstrates that many individuals believe that the local and federal governments will provide assistance in the instance of a disaster (Basolo et al., 2009; Paton & Johnston, 2001; Pekovic, 2007). When households are asked questions regarding their personal preparedness the answers are widespread and many defer to the local government as the ones who will help (Basolo et al., 2009; Paton & Johnston, 2001). A study was conducted by Basolo et al. (2009) in two cities, comparing actual and perceived personal preparedness. The study compared the cities of Los Angeles County and the city of New Orleans. The residents who live

in the area of Los Angeles are at risk to earthquakes and the residents who live in metropolitan area of New Orleans are at risk of hurricanes. It was evident in this study that there was a lack of personal preparedness in both New Orleans and Los Angeles County. Furthermore, the study highlighted individuals' perceptions and confidence that the government will be there to assist when an earthquake or hurricane occurs. This study underscored the need for further inquiry into encouraging individuals to be able to sustain themselves and their households for the initial 72-hour period. Providing education, policies, and strategies are essential to helping local governments ensure individuals are prepared for the initial 72-hour period. To assist in decreasing the potential risk of developing health complications from T2DM, it is important to ensure elderly individuals living with T2DM are able to survive 72 hours post disaster if they are either trapped in their home or displaced.

While Public Safety Canada recommends individuals to be prepared for emergency situations by themselves for the first 72 hours. There are not enough educational programs, specific to vulnerable groups such as elderly individuals living with T2DM to be self-sufficient during the first 72 hours.

Literature Review Summary

The literature review examined key concepts related to this study and identified specific gaps in the existing literature. This study is grounded by the fact that there is an increased aging population and the prevalence of T2DM in people over the age of 60 that needs to be recognized in disaster preparedness activities. There appeared to be minimal research reflecting chronic disease management in disaster management in the elderly. Scholars identify that vulnerable groups should not be viewed as "helpless victims" who need to be helped through a patronized approach, rather it is important to utilize a community approach; and embrace their knowledge

and ability to assist in developing policy and planning for this specific group (Pekovic et al., 2007). Studies also suggest the limited resources available to rural healthcare service providers (Ford, 2016; Pong et al., 2011) may potentially interfere with individuals chances to become self sufficient and knowledgeable about their health conditions.

Furthermore, adaptive capacity needs to be understood as a way for individuals to take charge of their own lives and argues that heavy reliance on government agencies to care for these needs can cause negative results for long-term health and well-being of this particular age group. The elderly population's past experience and skills can be beneficial in assisting with preparedness planning. Preparedness should be emphasized at all levels from personal and household through to public and government (Paton & Johnson, 2001; Public Safety Canada, 2015). Collaborative work among all four levels of preparedness will increase the adaptability and resiliency of elderly individuals living with chronic disease. Research demonstrates failing to manage chronic disease during a disaster may increase the mortality and morbidity of individuals (Chan & Sondrop, 2008). The literature review identified that the elderly living with T2DM are particularly vulnerable to disasters, and their risk might be further heightened if there are no effective actions to promote their independence, self-sufficiency, and enhanced resiliency.

Chapter 3- Research Methodology

Through using a general qualitative research design, interviews were used to elicit participants' views of how living with T2DM could impact them during a disaster. From the interviews, I learned about individuals' understanding of their vulnerability and their ability to predict their level of risk during a disaster event. Two research questions and a few sub questions were used to gather this information. The questions are as follows:

- 1) What do the elderly individuals with T2DM know about their disaster vulnerability and risks?
 - a. How do they cope with their vulnerability in day-to-day basis?
 - b. How do they expect disaster risks to affect them?
 - c. How do they plan to manage if they are impacted by a disaster?
- 2) What do the elderly individuals with T2DM expect from healthcare workers, emergency managers, and first responders?
 - a. What information or tools are useful for healthcare workers, emergency managers, and first responders in order to assist the elderly individuals with T2DM?

The study was aimed at learning about the resulting issues to be addressed as well recommended strategies and actions for dealing with specific identified vulnerabilities as a part of a community's disaster preparedness and response activities.

Methodology Structure

General qualitative research methodology was used to design interviews in order to reveal deeper degrees of social conditions experienced by the vulnerable groups. Qualitative research allows a researcher to understand the participants lived experiences (Creswell, 2014).

Qualitative research aligns with a social constructivist worldview, which supports the notion that individuals' experiences are as a result of social, cultural, and historical patterns (Creswell, 2014). Social constructivism allows for meaning to come from the data collected and allows the researcher to interpret the meanings participants have about the questions being asked, while recognizing the researcher's background and shapes the interpretation of findings (Creswell, 2014).

In keeping with this methodological approach, the primary methods used in this study are literature reviews and interviews. The literature review assisted in identifying gaps in existing knowledge and supported the need for further research on this topic. The use of semi-structured interviews allowed the participants to share their views and experiences with the researcher (Creswell, 2014). The use of one-on-one interviews allowed the researcher to engage with participants on a personal level (Creswell, 2014). The interviews were taped on a handheld device. The use of handwritten notes while individuals interviewed allowed the researcher to include observations in the final report (Creswell, 2014). My interpretations were shaped by my personal and professional experiences (Creswell, 2014). I took steps to address any resulting bias and these steps will be described later in the paper.

Participant Recruitment Process

Participants for the study were individuals over the age of 60 who live with T2DM. Both males and females, were invited to participate in this study. Participants lived in the County of Simcoe, inclusive of the towns Midland, Penetanguishene, and the township of Tiny, and Tay, which are considered rural areas, located in the Province of Ontario.

The field study began immediately after the approval from the Royal Roads University Ethics Board on March 14, 2017. Convenience sampling was used to recruit participants to

interview for this study. Convenience sampling can be defined as a sample that is used for its convenience as the primary data (Creswell, 2014). Participants were from a family physician's practice in Midland, Ontario. A local family physician selected 21 participants that were over the age of 60 and living with T2DM. The family physician's secretary then phoned selected individuals and asked if they would be willing to participate in a research project regarding living with T2DM. The secretary either spoke to the individual or left a message to call. The secretary asked the participants' if it was ok for the researcher to contact the individual by phone regarding the study.

Of the 21 participants contacted, 11 agreed to participate, six individuals declined and four did not call back. Only 10 were interviewed as one had a medical emergency on the day of the interview and spent the following 10 days in hospital. I did not want to increase the individual's stress level so advised the participant to contact me if he would like to participate. I then contacted the ten individuals by phone from the physician's office and explained the study (see appendix D), and offered a selection of 14 dates and a variety of times throughout the days for the interview. The participants were offered to come to physician's office or I could come to them. Ten participants choose to come to the physician's office and one choose for me to go to his house, however, he withdrew from the study due to a medical emergency. I then mailed a copy of the thesis proposal and a consent form (see Appendix A) to the participants. Consent was not obtained and signed until the participant arrived at the interview. Three participants were accompanied by their family members as they did not drive. They wished their accompanied family members to stay with them for the interview. Another two participants (husband and wife) wished to be interviewed together. For these cases, I felt it was important to accommodate the participants' needs because it was primarily for their convenience. I accepted their requests

and explained the consent process to them including the accompanying family members, and obtained their consent.

Data Sources and Types

There were two data sources used for this research. The first was the interviews transcripts from the tape recorded interviews and notes from the interviews with research participants, the other was academic and grey literature. The participants in the research were male, female and all over the age of 60. There were six male participants and four female participants. The age range was 68 years old to 84. They all lived independently in their own homes. Independent meant that participants did not require assisted living or have assisted care in their home. In addition to the participants lived experiences, other data sources were used. These sources included literature regarding T2DM and an example of a treatment plan used for an individual with T2DM. Further, the literature review focused on what is known or not known in the academic literature about the following topics: T2DM as a chronic disease, disaster related vulnerabilities of people living with T2DM, aging, adaptive capacity, and personal preparedness. The interview transcripts and my notes were the principle source of the data.

Researcher's Background and Role

As a researcher, my observation and experience in patient care as an RN assisted in the ways to interpret the interview data. My professional knowledge gives me understanding about T2DM medications, disease process, and available medical services. My past and present experiences with patient care assisted in the questions I asked and in the manner in which they were asked. Furthermore, my experience allowed me to clarify or answer any questions the participants had regarding their health. At the end of the interview I was able to provide information about where to go and find information about neuropathy. I addressed my biases by

ensuring comments I made regarding healthcare were supported with grey or academic literature. If participants asked my questions regarding their health or access to healthcare. I addressed the questions at the end of the interview so my answer would not influence the participant's response.

Data Collection-Interview Data

The interview process used semi-structured interviews to collect data; the questions are listed in Appendix B. The use of semi structured questions during the interviews allowed me to explore the experiences of the participants and the meaning the participants attributed to their experiences. The semi-structured approach supports asking questions building on the responses received (Kvale, 2007; Tong, Sainsbury & Craig, 2007). During the interview process, the interviewer can re word or clarify the question to further investigate the answers the participant has given (Tong et al., 2007). Asking open ended questions elicits more information and allows the participant to expand on the question rather than just on a couple of words to answer (Kvale, 2007). A one-to-one interview technique allowed for the exploration of personally sensitive themes (Tong et al., 2007). To assist individuals living with T2DM in the event of a disaster, interviews helped identify possible change factors (Tong et al., 2007). The interviews took place in private room in a physician's office. Interviews ranged in time from 27 minutes to 64 minutes. The interviews were recorded on a voice recorder, notes were taken during the interview, and the researcher summarized after each interview. The interviews were then transcribed by the researcher. Each participant was assigned a letter A through K as to protect their confidentiality. The letter I was omitted to limit confusion.

Data Analysis

The process in qualitative data analysis includes conceptualization, coding, and categorizing (Marshall & Rossman, 2016a). The researcher utilized thematic analysis for initial evaluation of the data collected through interviews. This included the (a) collecting and documenting of the raw data; (b) transcribing and organizing the data; (c) coding; (d) identifying and legitimatizing themes; and (e) reporting the findings (Creswell, 2016, Marshall & Rossman, 2016a). To organize the concepts and coding from the interviews sticky notes and flow charts were used to visually see and organize the results. Themes were defined and applicable phrases were coded. The utility of coding allows the researcher to link the data and the idea (Saldana, 2009). The researcher's coding, analysis and interpretations often reflect the concepts, models, and theories that designed the study in the beginning (Saldana, 2009). The analyzed data will be used for future educational tools that provides essential information for the elderly individuals living with T2DM, as well as emergency responders to cope with disaster situations.

Trustworthiness and Credibility

To ensure the accuracy of the information collected during the interview process, a researcher can share the information from the transcripts individually with the participants (Marshall & Rossman, 2016b). This process is called member checking (Marshall & Rossman, 2016b). I did offer to share the transcripts with the participants, however all 10 participants declined. To ensure trustworthiness and credibility Marshall & Rossman (2016b) suggest developing an audit trail. This involved the taping and transcribing of the interviews to verify the information being given by the participant.

Further, I identified my biases throughout the research from beginning to completion. Recognizing that my experience has the potential to bias my research. For example, I work in

the Emergency Department in the local hospital and am familiar with diabetes; instead of relying on my own knowledge I sought out colleagues and literature to ensure the knowledge I have and advice I was giving was accurate. I recognized that what was common knowledge to me is not to others. Triangulation refers to the bringing together more than one source of data to reflect on a single point (Marshall & Rossman, 2016b). To triangulate the results, I used my practical knowledge acquired, from working with patients living with T2DM, RN's, physicians, as well as Health Canada website, medical journals, and textbooks. My healthcare knowledge, knowledge gained in the MADEM program, and from the literature review influenced the questions I asked, and furthermore informed how the interview was conducted. In qualitative research the literature suggests using peer debriefing to strengthen trustworthiness and credibility (Marshall & Rossman, 2016b). I drew on the expertise of my thesis committee members: Lisa Maks with expertise in the diabetes field; Dr. Etsuko Yasui, with expertise in research and the DEM field; and Dr. Jean Slick, with expertise in the research and DEM field.

Research Ethics

Ethical consideration and issues are addressed through all stages of the research process and should be thought of from beginning to end (Kvale, 2007). Ensuring individuals have signed and understand informed consent is essential. Obtaining informed consent from participants to interview and share results is reflective of the standards and guidelines outlined by the College of Nurses in Ontario as well as Tri- Council expectations. All participants were mailed the consent form ahead of time as to give them time to read over it and be able to ask questions. None of the participants read or signed the consent prior to attending the interview. At the beginning of the interview participants were asked if they would like to read it or have it read to them. Six

participants elected to have the consent read to them. Participants were given the opportunity to withdraw at any time during the process.

Recognizing that I, as the researcher, am an RN in the community and that the interviews were conducted in the participants' family physician's office, there may be a perceived position of power through the process. I addressed this potential perception through acknowledging there will be no effect on current or future medical services an individual may receive and participants may withdraw at any time. When using interviews, a researcher is presented with participants most sensitive and private information (Kvale, 2007). In this particular research I was asking individuals about their health and personal experiences. Respecting and endeavoring to protect the confidentiality of the participants' information is essential. To ensure individual's confidentiality will be preserved, each participant was assigned an alphanumeric letter to protect their identity in the final report. The information was recorded on a tape recorder and handwritten notes were made during the interview. All the confidential data was kept in a locked draw in the researcher's desk at home and on the researcher's laptop that requires a password to access it. The data on the computer was backed up on a memory stick that was also kept in the same locked drawer. After a year from the final report the paper data will be shredded and the digital data will be deleted. The final report will be shared with participants if individuals are interested.

Study Limitations

A general qualitative methodology utilizing interviews is limiting as the results reflect specific individual's thought or experiences about living with diabetes. Participant's experiences, or lack of experience, with disasters and certain individual vulnerabilities limited the study. For example, only one participant had experience and was affected by a weather

related hazard, while two other participants' experience with a social disaster was living through the IRA occupation in Belfast in the early 1970's. Another limiting factor was participants' knowledge of T2DM. For example, one participant was diagnosed five weeks prior to the interview, he was told over the phone and had yet to meet with the physician to discuss the diagnosis. His only knowledge about T2DM was what he had googled that morning prior to the interview.

Using the interview process is an intimate encounter that depends on trust; the short time frame of an interview may limit the in-depth response from the participant. The participants may not feel comfortable speaking to the researcher or unsure how to express themselves. For example, two participants were husband and wife, when asked if they wanted to be interviewed together or separate the wife spoke up and said together. During the husband's interview, the wife often spoke for him or refuted what he said. Another limitation was participants bringing someone with them to the interview. Although senior friendly healthcare recommends people be offered to bring someone with them as an extra set of ears or as their mode of transportation, bringing someone may undermine the participant's response. Due to the age, it was convenient if they could bring someone. The participants did not seem to have any problems answering interview questions while their family members were present. However, it might have influenced their answers and it could have been different if they had participated alone. Using a general qualitative methodology, maybe prohibitive in extending the findings to other individuals in the same age group because each individual has their own experience.

There are some populations that will be excluded from my study. The existing Francophone population was excluded due to lack of time for a translator and funding to have a French translator. Also, I did not include individuals living with Type 1 diabetes as T2DM is

more prevalent in the age group over 60. Anyone under the age of 60 was excluded due to their age.

The area the study was conducted in does not have frequent disasters or hazard events, and the disaster events that have occurred resulted in minimal impact to individual's daily life. This influenced the answers given as there were few past experiences for participants to reflect on. The use of interviews may limit my study because I may not be receiving all the knowledge the participants have to offer. The use of interviews in a short period of time does not always allow the participant to become comfortable with the researcher. Having more time may have allowed participants to be more comfortable and explore their thoughts.

Chapter 4- Findings

This chapter provides the demographic information of the interview participants and summaries of answers to the interview questions. These data are organized and coded to develop themes for further analysis. Presented in this chapter are the themes that emerged from the results of coding and categorization.

Demographic Information

The following chart illustrates the demographics of the participants; it is in no particular order.

Table 1: Participant demographic data

Participant	Age	Gender	When participant was diagnosed with Type 2 Diabetes
A	84	M	2017(March)
B	68	F	2012
C	75	F	1974
D	75	M	Late 1990's
E	77	M	2012
F	76	M	2007
G	72	M	1997
H	70	F	1997
J	76	F	2015
K	82	M	1992

As previously mentioned the participants are from Simcoe County specifically the Township of Tiny, Township of Tay, and the towns of Midland and Penetanguishene. The geographical area covers a large area on the shores of Lake Huron. All are considered rural areas and rely on the same emergency services system. The area has a large elderly population due to being a popular retirement area. Nine of the participants are full time residents of the area and

one participant spends the winter months in the southern United States. The interviews were conducted in a family physician's office. Four participants came to the interview on their own, five participants brought their spouse, and one brought his son.

The following information was collected based on the interview answers and my observations. All ten participants are retired and all live in single detached houses. Four participants live with their spouses, two participants are married to each other, live in the basement of the house, their son and his family live upstairs. One participant lives with his son and another participant lives with her daughter and grandchildren. Two other participants live on their own. All participants are independent and able to care for themselves. Five participants are very active in the community with volunteer work and one participant is involved with caring for their grandchildren. All 10 participants received some form of private or government retirement pension. There was no mention by the 10 participants referring to finances or lack of funds as being a barrier to the basic cost of living. Four participants immigrated to Canada, two from Northern Ireland, one from Scotland, and one from England. Two participants had university education and three did not finish high school. I am unsure about the literacy level of participants, a few participants did ask me to read the informed consent to them, I did not ask why. Two participants spoke openly and often about God, however did not offer which if any religious affiliation they ascribed to.

Interview Summary

The primary data was collected through the use of semi-structured interviews. The data was collected using 6 questions for the interview. The questions were divided into different topics started from (a) warm up question, (b) individuals experience with disasters, (c) daily routine for caring for their diabetes, (d) fears and concerns living with diabetes during a disaster

and individual concerns, and (e) questions to ask others (see details of interview questions in Appendix B). The questions were designed to facilitate discussion with the individual and to get them to share their experiences with me as the researcher. I used prompts to assist people answering each of the six questions.

Warm up questions. In the warm up questions I asked participants to tell me a little about themselves, more precisely about their diabetes, what they knew about their diabetes, when they were diagnosed, how they felt about living with it, and what causes their BG to rise. Seven participants referred to stress increasing their BG; some offered the information without being prompted. Three others referred to stress affecting their lives but not in the context of diabetes. Of the seven participants that mentioned stress affected their BG, all had learned by experience and provided examples when this happened. All participants spoke of how they felt living with T2DM and the answers were varied. The participants' knowledge base of their disease and medications was varied from not knowing anything about T2DM, their medications, and diet, to being well informed about T2DM and how to take care of themselves.

Experience with disasters. Many of the participants interviewed had very little experience with disasters. Five of the participant's experience was with Hurricane Hazel in 1954 and this had minimal to no impact on their lives. Two participants experience was with a social disaster, living through the IRA in Belfast, Ireland in the early to mid 1970s. One participant spends her winters in the southern United States and has been affected by several tornadoes, floods, and hurricanes. Another participant mentioned there was flooding in her village when she was a teenager. The only effect she could remember was that she was unable to get to work because the roads in and out of the village were closed. One participant said the only disaster he

could remember was the tornado that went through Midland in 2010, and it did not affect him at all.

Daily routine for caring for their diabetes. All participants have other chronic diseases and health concerns aside from T2DM. Two participants were more concerned with their other health issues than living with T2DM. All participants take prescription medication, however eight of the participants did not know what they were taking their medications for. Of the eight, three participants couldn't tell me what medications they took. These three participants referred to their spouse for the kind of medications they took. Nine participants were aware that diet effected their BG, however not all followed a diet that was conducive to maintain a healthy BG. One participant had only been diagnosed five weeks prior to interview, they had been prescribed medications, however, had yet to see their family physician about the diagnosis.

Fears and concerns living with diabetes during a disaster and individual concerns. The majority of the participants had not given much thought to what would happen if a disaster occurred, until I asked the question in the interview. Many of the participants were not prepared if a disaster happened. All participants were concerned about access to medication, water and food. Three participants had generators and extra gas for generators. The majority of the participants did have at least a 90-day supply of medication on hand, however, it would depend where there were in the 90-day period if they would have enough to get them through. All participants saw their family physician every three months for a checkup and prescription renewal. Some of the participants had extra supplies of water and food for a few days. Some participants were concerned about being able to renew their prescriptions, to be able to do this they need to visit their family physician. Many of participants have the cost of their prescriptions covered by the government because they are over the age of 65. Some participants

rely on foot care and either go to the foot care provider or the foot care provider visits them in their home. A complication of T2DM is neuropathy (Deshpande et al., 2008).

Individuals are prone to having infections due to poor circulation, maintaining their foot care is important (American Diabetes Association, 2005). A simple stub of the toe or dropping something on their foot can result in an infection and may affect their BG. Checking their feet daily contributes to preventing infections, maintaining the health of their feet, and maintaining their BG (American Diabetes Association, 2005). Seven participants referred to having their feet checked as part of their routine care for their T2DM. Individuals may have complications such as cellulitis, they rely on the family physician, hospital, or home care to provide the support necessary to help them heal (American Diabetes Association, 2005). Also, when the participants have difficulty with their BG being either too high or too low participants rely on seeking healthcare for assistance. All participants responded they would be reliant on various government agencies or systems to help if a disaster was to happen. A few were confident that emergency services such as police, emergency medical services, and the hospital would assist them if a disaster was to happen.

Questions to ask others. When participants were asked about what was important to ask other people living with T2DM and what they needed during a disaster, many were unsure, some needed to give it some thought, and two said to ask about their medical conditions.

Themes Found in the Interview Data

Based on the summaries of interview data, there are certain themes found in their narratives. The participants are (1) aware that stress increases blood glucose, (2) are concerned about accessibility to lifelines, (3) are influenced by past experience that effects how people live and approach disasters, (4) are reliant on public services help, and (5) are not informed on the

importance of personal level emergency preparedness. The themes are introduced and provided in more detail in Chapter 5.

Chapter 5- Discussion and Analysis

Primary data from participants and the literature review emphasize (a) T2DM as a particular type of chronic disease, (b) disaster vulnerability of people with T2DM, (c) aging society as a prevailing trend that generates emerging social conditions, (d) adaptive capacity as an ability to affect vulnerability and resilience, and (e) disaster preparedness as a means to meet the needs of vulnerable groups. In this chapter, interview themes are presented and discussed while referring to the literature to prepare for the answers to the research questions that follows in Chapter 6.

Awareness of Their Stress that Increases Blood Glucose

Stress was the most referenced theme in the research. All 10 participants referred to stress as a factor affecting their lives and in particular their blood glucose. Seven of the participants remarked that increase of stress does increase their BG. When asked if anything increases their BG, two participants answered no, Participant E remarked “No, not that I remember,” and Participant K stated “I don’t think so”. Participant F commented “It was possible stress could increase his BG,” but wasn’t sure. The term stress can be perceived in many different contexts. The researcher did not qualify the term stress nor did the researcher ask if having T2DM is considered a stressor. Some participants commented that they had been diagnosed with T2DM after a stressful time in their lives. Participant J commented that after having pneumonia, her BG was elevated and was advised to keep an eye on her BG:

Um, I had pneumonia and when I came out of that, I got a call from the doctor’s office saying your sugars are high, your diabetic come on in. So I went in and we looked over and yes, my sugars were high but the doctor said this can happen in times of medical trauma, it doesn’t make you diabetic but it is a warning to watch, again undergoing

chemotherapy my sugars went up and again it was due to medical stress. Then two things happened, the marker for diabetes changed and I was diagnosed celiac which contributed to my increased BS and I was diagnosed with T2DM.

Participants C, G, and H all remarked how stress increased their BG. Participant G felt his diabetes became more difficult to control after their house burned to the ground; he started using insulin as well as OHA's. Participant H felt the years of trauma caused her BG to be elevated:

We had other traumas and that through the years that caused situations and that there was something that happened at that time which traumatized us. I guess we can't talk about that, but we did have something that happened to both of us and it happened.... anything really traumatic, your not thinking about it and your really shocked and my BG levels were always high. After the house fire I went on insulin.

Participant C felt that the stress causes her BG levels to increase such as a difficult pregnancy and having German measles contributed to her T2DM: "Um, they thought it was just through pregnancy, cause I had a difficult time." She further remarked "When I get stressed.... That is what happen when my mother-in-law was very ill and there was no one around except my husband and I and my children were small, my BG increased." It seems that even though many participants are not aware of their disaster vulnerability due to their chronic disease, they are conscious of their stress level because they know that stress can increase their BG. If they had been introduced to disasters as a stressor for their BG, they might have better understood their vulnerability and the implications that lack of preparedness for disasters has.

The increase in participants' BG can contribute to an increase need for access to medical attention or intervention (American Diabetes Association, 2005). The increase in BG may be

caused by stress. Individuals not having access to food, water, or medication may increase their stress and therefore, their BG may increase (American Diabetes Association, 2005; Fonesca et al., 2009). When an individual is displaced to a different location or at home waiting for assistance, this may increase a person's stress level. To promote an individual's independence during a time of crisis such as a disaster, it is important to assist in mitigating their stress level, which helps in promoting a healthy BG (American Diabetes Association, 2005). In disaster planning it is important to recognize the growth globally in this specific population and the increased prevalence of T2DM in this age group.

Concerns for Access to Lifelines

Research identified the importance of individuals being prepared and having access to their health requirements such as food, water, and medication to be able to care for T2DM (Cefalu et al., 2006; Aldrich & Benson, 2008). Several participants claimed if they were displaced somewhere else or at home waiting for assistance, it would be imperative they have medication, access to food, and access to water. When asked the question what would you need to take with or you were stuck at home, participant K stated "My insulin I guess... and the pill yeah and something that either got sugar in it or something that had protein." Participant D remarked "My main plan would be getting my medication and making sure that uh, I had it, you know?" Participant B stated "Groceries probably, food right away... I don't think I would have to ask for medication, I always have some, but I am not sure." When asked the same question Participant F commented "My pills.. Well, I guess you gotta eat and you gotta drink." The lack of access to these necessities may cause the individual to become ill and increase the risk of further complications from their T2DM, therefore increasing their vulnerability.

People living with T2DM also rely on government assistance through financial resources, and access to resources such as support groups, foot care, and diet planning. In Canada, the provincial government subsidizes medications for those over 65 and covers the cost to seek medical care. In a time of disaster, individuals may continue to rely on the services the government provides and may require access to food and water. Research has also identified that seniors have increased vulnerability during a disaster due to their age (Fordham et al., 2009). Conversely, older adults have a lot of knowledge, experience to contribute, and are a great resource for disaster planning (Adams et al., 2011; Barratt, 2007; Runkle et al., 2012; Shenk et al., 2009; Thomas et al., 2013).

Individuals living with chronic disease are encouraged to utilize a routine that is inclusive of several components to be able to optimize their health. The ability to access medication, food, and water was a predominate theme in the interviews, furthermore, access to food, medication, and water ensures optimal health. Participant E remarked he is not concerned with access to food and if he couldn't have his medications he would just watch what he eats and stay away from sweets "Without my medication? Just watch what I would eat for- stay away from sweets, mind you I eat sweets everyday."

In Ontario, individuals over the age of 65 have their medication covered by the provincial government. BG testing strips are also covered, however, syringes, glucometers, and lancets are not. There are strict guidelines when patients can re-fill their medication. Usually the medication has to be 80% used before they qualify for a re-fill. Eight participants have a 90-day supply of their medication at home, Participant A stated "Like I get the 90-day supply and usually about a week or week and half before I go and put an order in for some." Participant D remarked "For three months" and Participant C commented "I always have some. The last week before I come,

I mark 90 days in my calendar so I usually come on my 85th day.” One participant collects their medication every 14 days from the pharmacy and one participant did not mention their supply of medication. Participant C did express concern that if she did not have access to her own medication and had to take a substitute, she could have an allergic reaction to it, “Because if you gave them something else, like say I couldn’t get the Janumet, and you gave me, um, Metformin, just supposing I may have a reaction from it.” All eight participants remarked that their 90-day supply of medication was at home and, thus, not carried with them at all times. Participant B commented:

I should keep more than one day, but like right now I have stuff in my purse that if I got stuck here, I can still take my pills... So, they should always have something on them to last at least overnight.

Access to food is important to assist in regulating an individual’s BG (Diabetes Canada, n.d.). Not eating and taking an OHA sulfonylurea such as glyburide or gliclazide or insulin can cause BG to drop, further, not eating at all can affect your BG levels in either direction. When asked the question, if you had to leave or were stuck in your house, what would be important to take care of yourself if a disaster occurred. Nine participants commented that access to food is important to them. For example, Participant B commented that “Uh, groceries probably, food right away,” Participant D remarked “And uh, to eat properly, you know,” Participant E mentioned “I guess a little bit of water, food and my medication,” and participant H commented “It’s just basically what we’ll need to get by and um, a bit of food, a bit of protein, a bit of something.” Participant F, is “Currently not interested in food or how to access it.”

Being able to have clean water was important to seven participants. Two people stated water as their first response when asked what would be most important to able to care for

yourself if a disaster occurred. For example, Participant C, stated “Access mainly just, um water in one,” and Participant E, commented “Uh, I guess a little bit of water, food, and my medication.” Participants G and H have a well on their property and felt this was very important because it gave them access to clean water. Participant A, remarked that he lived on the water so would have access to water. The body of water the participant lives on is fresh water and is potable.

The individuals interviewed were able to identify their needs in order to be able to care for themselves, however, it was evident there was minimal confidence in how the ability for them to care for themselves would happen. All participants rely on the government subsidy to be able to collect their medication and some of the glucometer supplies.

Influence of Past Experiences- How People Live and Approach Disasters

Participants’ experience, or lack of experience, contributed to their knowledge and preparedness for a disaster. Aging and accumulated life experience contributes to resiliency that enables individuals to acclimatize more easily in adverse situations such as a disaster. Speaking with individuals and gathering information from them, enables people to reflect on what experiences they have had and how they would improve on preparing in the future.

Participants were asked about their experiences and knowledge with and about disasters. All ten participants disclosed they had lived in an area where a disaster had occurred. Individual experiences were varied. Three participant’s answers reflected their past experiences with disasters contributed to how they have lived there lives since. Participant A, when asked if he had lived or been affected by a disaster, stated he was in the area when a tornado went through five years ago “Yeah but it didn’t really affect us.” Five participants reflected that the only disaster they could recollect was Hurricane Hazel in 1954. When asked if the Hurricane affected

their lives at all, the responses varied. Participant B was a child when Hurricane Hazel happened and she remembers “Yes, yes it took our back tree out and everything.” She further commented “We didn’t go to school for, I’d say three to four days.” Participant F remembers Hurricane Hazel, however it did not directly affect him where he lived “But I mean I- where I was it didn’t really affect us that much. I lived in Elmvale at the time.” He further remarked “We haven’t really had severe tornados in this area. Had one in Barrie a few years back, but it uh- you know, we had I guess heavy rains and winds here, nothing disastrous.” Participant E can only recollect Hurricane Hazel, “Hurricane Hazel, but I mean that didn’t bother us like that much down around the beaches..... well we had lots of rain but kind of live on higher ground.” Participant D commented the only disaster he can remember was Hurricane Hazel:

The main thing I remember about that is all of the TV antennas being bent over and that because TV had just come in the then- in ’54 and uh, I remember um, a little child being killed in uh, I wouldn’t say the neighborhood it was about ten miles over.

Participant J spends her winters in the Southern USA, with her fifth wheel and usually stays in trailer parks. She was able to comment about living through tornados, hurricanes, and floods. Utilizing this experience has increased Participant J’s resiliency. For example, she has a “vial of life” container, this is a bottle given to them by the government, in which individuals put a list of their medications and medical conditions in the bottle and place it on the top shelf on the right- hand door of their fridge, then put a label in the window by the door, “So that people know if there is a disaster-where they can find what conditions you have and where they can learn about them.” Additionally, she commented that “When you’re out in Arizona there’s no drainage ditches in – you don’t drive when it’s raining because these floods can just come across and literally sweep our big truck right off the road.” In the winter living in her trailer, she is able

to survive longer without outside help; her trailer is set up to run with a portable generator, whereas at home she is dependent on electricity to run the house and her generator would not run the whole house. Participant J also remarked that when her husband was alive they helped people in time of emergencies, but didn't feel they needed help:

Uh, for instance, we had a four-day ice storm hit South Padre Island a few years ago and a lot of the people there, uh, did not have generators. Older people own trailers that they have just put onsite. Electricity gone, only a limited supply of fuel, uh propane for their heat, they were going to be running out. You know, my husband and I were we immediately got out there. We had one generator but going around checking for people – how were you going to heat a – hooking up a vehicle, you know, getting to run – charge their batteries, or getting generators, maybe someone had two generators or someone with a big motorhome didn't need to run it all the time, had lots of fuel – Okay, would you run a power line over to John and Joan there for four hours a day to help? You know? We got involved. That's how I tend to be, like when someone was drowning out here it was my husband who jumped in the dingy to go rescue. I was the one that called the rescue people and that's how we are.

This participant further remarks “We're not ones to sit back and wait for others to do for us. Now, as I'm getting older that may change, you know what I'm saying? Just because of your own frailty.”

Participants G and H discussed living through the political turmoil of Northern Ireland (social disaster) in the mid 70's. The loss of infrastructure halted their ability to continue with their daily routine. At times they were unable to buy food and other essentials. Moving around the village safely was difficult. Utilities were cut off intermittently and at times they were

unable to purchase petrol. The experience of living in this particular situation contributed to how they dealt with their house burning down and how they have conducted their lives since then. These experiences resulted in these participants starting a charity to help those children without the necessities of life. These participants' recollections of past experiences demonstrate their resilience to various life-threatening situations. The literature suggests that the high adaptive capacity of the elderly groups due to their life experiences can contribute to their coping ability at the time of disasters (Eiseman et al., 2007; Jones et al., 2010; Lopex-Marrero & Yarnal, 2010; Seguin et al., 2008).

Reliance on Public Services to Help

Research and the data from the interviews demonstrate the reliance participants have on the infrastructure of government, in their ability to care for themselves in everyday life, particularly in a disaster situation (Basolo et al., 2009). The reliance on all levels of public service in Canada, specifically in rural settings, may impede an individual's ability to empower themselves to be able to be self-sufficient, if the public service infrastructure were to collapse during a disaster. Furthermore, the data correlated with the research that educating individuals would be beneficial to increasing their resiliency during and post disaster (Aldrich & Benson, 2008; Cefalu et al., 2006; Eisenman et al., 2007; Seguin et al., 2008). The self management program promoted by Diabetes Canada is a good example of how healthcare services emphasize the importance of empowering individuals living with diabetes (Diabetes Canada, n.d.). Yet, such an effort tends to demand resources and is not always feasible outside urban centers. As mentioned earlier, resources may be limited in rural communities, therefore programs such as these are not always practical. Rather healthcare workers must optimize the availability of

resources for the majority, which may undermine patients' sense of independence and reinforces the tendency to be dependent.

All participants assume the government will come in and help, and would turn to family for help. Participant J remarked on the lack of community she felt in the area she resided in the summer and that she wouldn't rely on anyone to help her, "The sense of community is better in the US than in the Midland area." This participant uses Facebook and Twitter for a source of information. When asked the question who would they rely on for help if a disaster occurred. Six participants said they would rely on government services such as police and ambulance for help. Participant G remarked:

After a very short time shortly within 48 hours the infrastructure of the country takes over and all of the resources, which are massive, which are available, with the military have- when I say military, I mean their vehicles and their search and rescue and all that stuff, and all of the police departments and the medical-like it all just comes together, as one would expect. That what I would think anyway.

Participant H states that they would call 911, and Participant K would go the police station to get help. A few of the participants had not given much thought to who would come to help them and were quick to say they would call 911. However, some participants said that they would give more thought to the question.

All the participants rely on some form of government support in caring for their T2DM. All of these supports are funded and maintained by various government agencies. This support includes money to cover their medications, Participant E "Most of the drugs are covered because I am over 65." Participant F stated "The government covers everything I probably pay a prescription fee." In addition, to having their medications covered, participants rely on

government funded services, such as visiting their family physician, support groups, foot care, counselling for dietary, and lifestyle changes. Participant G and Participant H shared “We visit our doctor every 3 months for a checkup,” “Foot care every 3 months,” and a “Diabetic nurse every 6 months.” Participant K remarked “We go to the clinic every so often just to –we go through his meds and what not just to see how he’s doing and they advise him, well, maybe you should try this or try that.” Participant B stated, “I see the doctor every 90 days” and “I belong to a support group that meets every month and we can talk about things and they do foot care for free.” Participant C stated, “I see the doctor every 3 months, for bloodwork, check up, and to renew my medications,” and “sometimes I go to the diabetic clinic for help with meals and pills”. Many participants mentioned these supports but did not prioritize having access to them as being important in a disaster.

It seems that government and healthcare services providers in the rural context have developed a system and structure for people living with diabetes to utilize so that they can continue to live without going through major disruptions. As a result, individuals preserve the lifestyle they had before their diagnosis, may rely on these public services and pay minimum attention to their vulnerability, which may possibly lead them to believe in a false sense of safety.

Need for Personal Level Emergency Preparedness

Preparedness is a key element in decreasing an individual’s vulnerability during a disaster. Identifying individual’s specific needs concerning their concept of preparedness can be challenging. The data from the interviews highlighted a gap in knowledge regarding disaster preparedness at a personal level. Literature highlighted the importance of identifying the needs to ensure personal preparedness, additionally, educating and encouraging all individuals to

participate in preparedness at a personal and public/community level (Aldrich & Benson, 2008; Basolo et al., 2009; Jones et al., 2010; Mokdad et al., 2005; Paton & Johnson, 2001; Runkle et al., 2012; Public Safety Canada, 2015).

Participants were asked about their experience with disasters and if they would be able to take care of their diabetes if a disaster was to happen. More specifically, were asked if they had supplies at home. Five of the participants had not given any thought to having extra supplies or medical supplies to be prepared. Participant F remarked, that he “Has never thought about having extra food and things in the house, in case of a disaster.” Participant C stated, that “I would just have to deal with the situation as it came along.” Participant D stated, “Haven’t thought about it but I’d survive.”

Other participants felt they were prepared in some ways. As discussed previously nine participants usually had a 90-day supply of medications, depending on where in the 90-day cycle they were. In terms of household preparedness, the following participants commented. Participant A remarked, that he felt very self “Reliant and would be fine,” whereas he does not have an emergency kit put together, but they “Have a freezer full of food, 3 generators and 15 gallons of gas and they live on a lake.” Participant J has a handheld VHF radio and thought about selling it with her boat but thought she should keep it. She stated:

No, because in the past we have found it more reliable for getting information in a disaster um, then commercial radio but I also have a wind up radio that works off solar and batteries or wind-up and I have and emergency marine- not emergency, a portable marine radio that I am planning on keeping because in times or tornados or other things like that you can often get the best information from it.

In the winter she lives in the RV that has electricity, but she has it set up to run without electricity:

I have a gas stove, Um, I have a portable generator, I have battery operated lights and things and furnaces and so on. So as long as I had a supply of food in – and I usually tend to overstock, I don't see a problem. At home more of a problem because you depend on electricity.

This participant also mentioned that she has a generator at home, but “it wouldn't run the house.” She does not mention having gas for the generator. She does say she usually overstocks on food. Participant G remarked that they “have basic medications, live on a well, lots of clean water, we've got a huge generator.” These participants did not mention having gas for the generator or having food. Most participants in this study answered that they have not thought of a disaster situation that can increase their risk of being displaced or difficulty caring for themselves. There is a gap in their risk perception between living with T2DM and the potential adverse outcomes that may happen at the time of a disaster.

Based on the data collected from the interviews and the gaps identified in the literature review, it is evident that creating an awareness about personal preparedness is necessary. Moving forward, drawing on this population's experience and needs will assist healthcare workers and emergency managers in providing education on personal preparedness for these individuals. Providing the awareness about personal preparedness and how best to access the healthcare needs of individuals living with T2DM during a disaster is important for positive health outcomes.

Chapter 6- Recommendations and Conclusion

The increasing prevalence of chronic disease, specifically T2DM combined with the growing elderly population demonstrates the necessity to focus on this population in disaster planning and preparedness. I identified a gap in knowledge in the management of chronic disease during a disaster, and lack of personal preparedness of elderly individuals living with T2DM. The conceptual framework used to frame this study included (a) chronic disease, (b) vulnerability, (c) aging society, (d) adaptive capacity, and (e) disaster preparedness. From this framework, I examined these topics in relation to elderly individuals living with T2DM in the literature. The literature review identified key themes present in the interview data prompting further analysis. These concepts informed the interview data analysis, through which I generated themes for further discussion and exploration. Key themes from the interview data emerged and were captured as my research findings: (a) awareness of stress, (b) concerns for access to lifelines, (c) influence of past experience, (d) reliance on public services, and (e) need for personal preparedness.

There were two main questions and three sub-set questions used to frame my research for data collection and analyses. In this section, I further elaborate on the insights and meanings of these analyses by using my two main questions to guide the discussion. The two main research questions I addressed were: What do the elderly individuals with T2DM know about their disaster vulnerability and risk; and what do the elderly individuals with T2DM expect from healthcare workers, emergency managers and first responders? For the first question, my study found that many individuals have little knowledge about their chronic disease in relation to disaster risk. At risk people are not always aware that their health conditions can make them further vulnerable to disasters. What I learned from the interviews was that some of these

individuals do not know much about their chronic disease and how to care for themselves. They seem oblivious that their health conditions may be affected if a disaster occurred. They seem to have a hard time perceiving that being elderly and living with a chronic disease may increase their vulnerability during a disaster. At the same time, many of them do not believe that they should prepare for emergencies on their own and rather rely on public service to care for them. I learned that these people have very limited understanding of their disaster risk, and the importance of personal level planning in disaster preparedness (i.e., first 72 hours). This insight contributes to further development of the existing literature that endorses the idea of autonomy and independence of those who are vulnerable (Wisner et al., 2004).

While they do not recognize certain aspects of their disease, they recognize that stress and an increased BG can have adverse effects on them, therefore increases, their vulnerability. They seem to perceive that stress may increase their BG and try to manage stress in their daily practice. Nevertheless, they are not particularly concerned about the greater need for preparing for disasters in advance. The interpretation of these findings is that the prevalence of T2DM as a chronic disease normalizes their condition which makes them feel it is not a serious, life threatening disease. There is a perceived abundance of public services available to them to live with this disease without any inconvenience. With that level of perception, they just do not see living with T2DM as a threat, even in an emergency. Through the interview data, I found that many vulnerable individuals do not know how to manage their vulnerable conditions if facing a disaster. However, these vulnerable individuals can benefit from developing a personal disaster preparedness plan and increase their understanding of their T2DM, so that they can care for themselves and know where to seek assistance during the time of a disaster.

The second research question was used to identify the information that would be needed to assist healthcare workers and emergency managers when caring for elderly individuals living with T2DM during a disaster. The question was: What do the elderly living with T2DM expect from healthcare workers, first responders and emergency managers? Many individuals had not given much thought about how a hazard may affect them, or see themselves as at an increased risk. This may be due to participants' limited experience with disasters and understanding of potential hazards in the rural area they live. I learned from the interviews some participants had no idea what to expect from first responders or emergency managers. Rather they assume that emergency responders would know how to take care of individuals with chronic diseases. These findings suggest there maybe a disconnect in their perception between coping with their vulnerability in everyday life versus what may happen in their ability to cope in the context of a disaster. They do understand their vulnerability associate with T2DM but what they fail to understand was if they were able to cope with their T2DM in emergencies.

Meanwhile, some participants expressed that they were not sure of where to seek assistance if a disaster happened. Thus, their vulnerability may increase due to lack of risk related information and resources. What was learned from the interviews was that some of these individuals are not well informed about their disease, the medications they take, and are naïve about how their age, and life with T2DM may increase their vulnerability if a disaster was to occur. In contrast, the literature suggested that elderly individuals are resourceful and adapt well to changes, are able to preserve the use of resources, and aware of their daily needs (Bucke, 2001; Pekovic et al., 2007; Poley et al., 2001). Further, the elderly has a wealth of knowledge to contribute and should be included when developing disaster planning specific to this population (Barratt, 2007). My interview data support the adaptability of these participants while utilizing

their accumulated past experiences, yet there seems a gap indicating that certain needs are not met to strengthen their resiliency. Identifying the needs of this specific population, and providing education for these individuals, will assist the elderly living with T2DM to be able to adapt or recover if their life circumstance were to change temporarily or permanently due to a disaster.

Recommendations

Based on findings from the primary data and the literature review and the area the study was conducted in; this study offers the following recommendations. Two types of recommendations are proposed in this study: future considerations in practice and future research. These recommendations are targeted to the following five groups of people (a) first responders in particular Emergency Service workers, (b) healthcare workers, (c) emergency managers and (d) individuals, and (e) researchers in the disaster management related field.

Recommendations for first responders. Based on my findings which have specific contexts, this study found there are roles that first responders can play in order to provide information related to emergency preparedness at the personal level. First responders are often the first access point for individuals in a time of crisis. Emergency Service workers, police, fire, often see individuals in a time of a health crisis. To ensure elderly people living with T2DM have access to resources to care for their specific needs and improve their health it is important first responders have the necessary information regarding potential hazards in the area. Currently, education is provided to first responders on chemical spills and pandemics such as flu or Ebola. A future consideration is:

In order to assist the elderly living with T2DM, first responders need education on the potential hazards in community they work. To assist these individuals, it is important for

first responders to have the information regarding what hazards may occur in the area and how the hazards could potentially affect the medical conditions of these people. For example, it is important for first responders to receive education on what potential hazards could be, how people living with T2DM may be affected, and understand what resources these individuals may require if they need help. An elderly individual living with T2DM may require medical attention. This may include checking their BG, being able to have access to medications they may require, and having access to food and water. Further, it is important to be able to identify the complications an elderly individual living with T2DM may experience and be able to direct them to the appropriate resources. In this community there are no walk in clinic's or urgent care clinics, healthcare professionals in this community include family physicians, family healthcare teams and the hospital. Two examples of these resources are: the pharmacy for medications or the hospital for medical treatment. To ensure first responders would be able to assist this specific population if a hazard occurred, it would be important to combine the knowledge of potential hazards and the specific needs of this population.

Recommendation for healthcare workers. This study found that healthcare workers can provide a safe environment to ensure lifelines are available for this potentially vulnerable group at the time of a disaster. Included in healthcare workers are family health teams, that include their family physician where many individuals seek their medical care and ongoing support. Any disruption in this service may create increased stress for individuals, therefore, potentially exacerbating their T2DM and increase their vulnerability. Having an alternative temporary location for the family health team to operate out of would be beneficial. This would assist to reduce stress levels of elderly people living with T2DM, decrease the impact on the

healthcare system, and provide continuity of care. The family health teams could work collaboratively with emergency planners to facilitate this plan and provide elderly individuals living with T2DM the necessary information. A future consideration is:

A plan should be identified to facilitate the needs of the patients with chronic diseases. Providing alternative locations for family health teams if they are unable to operate for an extended period of time. For example, to create space for family health teams to work, elective out-patient procedures at ambulatory care clinics in hospitals could be cancelled or rescheduled. This would ensure individuals with chronic diseases have access to medical treatment if needed and continue to have prescriptions renewed. Having a plan in place may decrease the stress of individuals seeking care as they could continue to see their family health team (includes physician, nurse practitioner, diabetic nurse) and not go prolonged periods of time without access to familiar healthcare.

Recommendation for municipal emergency managers. This study suggests that emergency managers can contribute to resources that support the community to develop disaster plans at the local community level. Municipal emergency managers need to collaborate with all stakeholders to ensure all needs of the community are met during a disaster. Some of the stakeholders include hospitals, first responders, vulnerable groups, and family health teams. It is important for emergency managers to keep informed of the vulnerable populations in the community. To assist during the planning process, it is helpful for emergency managers to be able to identify the specific needs of this vulnerable population. Some of the future considerations are:

1. Emergency managers can be leaders in the community to promote personal and public preparedness by creating awareness about disasters and managing chronic disease. To

accomplish this, emergency managers can pave the way by creating workshops for elderly people living with T2DM, their families, and caregivers. These workshops would identify the needs and resources individuals living with chronic disease, specifically the elderly population living with T2DM would require if a disaster occurred. In preparing these workshops, there could be an emergency kit specifically aimed towards these individuals. For example, the kit could include water, non-perishable food, lancets, batteries for glucometer, a spare glucometer, essential medications, and information where to seek shelter or further assistance, specific to their community. Presenting the information and having interactive participation, generates discussion among people, promotes autonomy, and encourages these individuals to be prepared.

2. There is a movement in healthcare and the County of Simcoe to making senior friendly communities, with the rapidly aging population. Many smaller towns have become retirement communities. At the municipal level, there needs to be increased emergency planning for elderly individuals living with chronic disease. One suggestion is to develop a plan that identifies households elderly people with T2DM live in. For example, Participant J who spends her winters in the southern United States of America, mentioned a sticker she stuck in the bottom right hand corner of the window by her door of her trailer. This sticker identified she had medical conditions and where her list of conditions and medications could be found in the house. Using a focus group to identify what information is needed for a program similar to this it would be helpful. The focus group should consist of all stakeholders inclusive of elderly individuals living with T2DM, emergency managers, first responders etc. Once the information is gathered, identify

how best to share the information with the community and provide education on this program to first responders.

3. Emergency managers can contribute by ensuring emergency shelters would be equipped with appropriate resources to support elderly individuals living with T2DM. Some of the resources are food, water, and medical supplies. When creating a list of appropriate resources for emergency shelters in the community it should be a collaborative effort. Included in the collaboration should be the hospital, emergency managers, elderly individuals living with T2DM, and a member of the family health team.
4. A component to disaster planning should be every emergency manager should be trained and educated about the particular vulnerabilities people living with chronic disease may face in the event of a disaster. Many of these individuals may be dependent on lifeline systems to maintain their health and any slight disruption to these lifelines may have adverse effects on their health. The education should include; how hazards that are local to the geographical area impact those with chronic disease and specific social factors that may affect vulnerability.

Recommendation for individuals. This study found that the resilience of the elderly is an important factor for them to be able to reduce their disaster risk, become self-sufficient, and autonomous to manage their vulnerability. Personal preparedness is fundamental to supporting any individual during a disaster. Encouraging elderly people living with T2DM to create their own personal preparedness plan assists in decreasing their dependency on other agencies, increases their independence, furthermore creates an awareness they can share with other members in their community. Those individuals that belong to support groups can bring this

information forward to share, subsequently creating community awareness. Some of these future considerations are:

1. Elderly individuals living with T2DM can decrease their vulnerability and dependency on others by increasing their awareness of the medical conditions they are living with, by identifying the medications they take, and the reason they take them. Being confident in their health condition and medication can be a contributing factor to decreasing stress levels in a time of crisis.
2. To ensure the elderly individuals living with T2DM have everything they need if they are evacuated from their house, it is important to have a piece of paper or a vial of life with their medical conditions, medication, and allergies visible in their house for first responders to see. This piece of paper also alerts the first responders to look for signs and symptoms of exacerbation of T2DM if needed.
3. Elderly individuals living with T2DM should create a personal emergency kit for home and one to go. This kit should include medications, glucometer (if possible), syringes, insulin pens, extra batteries, lancets, glucose strips, food, and water. Having this kit ensures the individual has the basic supplies they need for an extended period of time. It is important to routinely check the kit to ensure contents have not expired, medications, batteries, glucose strips, and food all have expiry dates. Checking the kit every two months and exchanging the contents ensures the kit is up-to-date, eliminates potential waste, and unusable medications, or equipment. Public Safety Canada advocates that individuals should be able to care for themselves for 72 hours however, ensuring extra supplies accounts for misplacing items and not relying on help to arrive within the 72 hr. period.

Recommendations for future research. This study may not be transferrable due to the small sample size and rural community setting of the study. Further, the depth and scope of the study is limited due to the time allotted for the research. These limiting factors may have influenced the outcomes. While vulnerability analysis claims that older age and chronic disease can most likely add to an individual's vulnerability, the participants I interviewed seemed relatively well off and resourceful. There appears to be a gap in knowledge in the management of elderly individual's living with a chronic disease among themselves and in disaster planning. Some future recommendations for research are:

1. This study was carried out in a rural setting, it may be beneficial to carry out a similar study in an urban setting to see if there would be any difference in the results.
2. This study was limited to the Anglophone population in the area. There is a large Francophone and Indigenous population in the area. For future research it would be curious to carry out the same study including the francophone and indigenous population to see if the results would be similar or different.
3. It would be important to investigate further, if access to financial and healthcare resources is a barrier for elderly people living with T2DM to be independent in their care during a disaster.

Conclusion

This exploratory study suggests there needs to be further research in field of disaster management relating to elderly individuals and chronic diseases. Specifically, there should be a focus on T2DM as the literature illustrates the increased prevalence in elderly individuals living with T2DM (Meneilly et al., 2015; Statistics Canada, 2015). In Canada, the largest population living with T2DM is over the age of 60 (Diabetes Canada, n.d; Public Health Agency, 2011;

Statistics Canada, 2015). The literature highlights the statistical evidence that the global aging population is just beginning and predicted to increase by over 50% in the next 30 years (Barratt, 2007; United Nations, 2015). Individuals over the age of 60 living with T2DM may be at an increased vulnerability if a disaster occurs. Further, this research underscored a gap in individual's knowledge of their vulnerabilities. However, the literature reviewed emphasized the resilience and adaptive capacity the elderly population demonstrates in disaster situations (Pekovic et al., 2007; Seguin et al., 2008). To strengthen the planning phase for emergency managers and increase this specific population's level of preparedness it would be valuable to capitalize on elderly individuals living with T2DM knowledge and life experiences. Most importantly this research corresponds with the literature that there needs to be an increase in developing disaster planning for this specific population.

Research demonstrates the financial and physical benefits to investing in planning and preparedness (Barratt, 2007; Eiseman et al., 2007; Seguin et al., 2008). This research serves as preliminary guide to further educating first responders and emergency managers in regards to the needs of elderly individuals living with T2DM in rural settings. During my fieldwork I have already seen some positive influence on my interviewees' perceptions towards disaster risk. Prompted by my interview questions, the participants seem to have generated a willingness to plan and develop their personal preparedness. Looking ahead, in the community where the research took place, use the recommendations to begin the conversation about the needs of this specific population and the importance of personal preparedness. This research presents a platform for developing personal preparedness kits for this specific population, utilizing the information the participants shared and are willing to share. Elderly individuals living with

T2DM increase their chance of survival in disasters if they are able to understand their own vulnerable health conditions.

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Appendix A

Informed Consent

Why am I Here?

I would like you to join in a research project. I would like to talk to you about the project and explain your involvement in the process from the beginning to the end.

Who am I?

My name is Alexandra Carruthers. This research project will help me finish my thesis for a Masters of Disaster and Emergency Management at Royal Roads University. This university is located in Victoria, British Columbia. You can check with my thesis coordinator Dr. Jean Slick to confirm this project and who I am. Dr. Slick's telephone number is xxx-xxx-xxxx and her email address is xxxxxxxxxxxx. I am a Registered Nurse (RN). For this research I am a student. I will follow the standards from the College of Nurses of Ontario about keeping your information private. I can show you a copy of these standards or tell you where to find a copy.

What is this Form?

This form is an agreement to participate in my research project. This form is to explain why I am doing this research and that you agree to participate. If at any point you have questions or unsure of what is being said, please ask me or the thesis coordinator (Dr. Jean Slick). You can stop participating at any time during the project. You can choose to tell me or not tell me why you do not want to continue. I will respect your privacy.

Purpose of the Research

The purpose of this research project is to collect information about people living with Type 2 diabetes and problems they may have during a disaster. I will be working with people over the age of 60. The information collected will help future education and planning for this population.

The information will show what their needs during a disaster would be and how DEM workers can best support their needs.

Participants Role

I will be using interviews to collect this information. The interview will take between 60 and 90 minutes. Please let me know if this is good for you. The questions asked will be about your experience living with Type 2 diabetes, including the problems you may face with your health if a disaster was to happen. Some of the questions are personal and may be sensitive (i.e. medical information, personal feelings). We can take time for you to think about your answers for any question or come back to them anytime after the interview. If you have any questions that I cannot answer I will give you information to help answer these questions.

We are not able to give money or gifts for joining. I will offer help with transportation if needed. Food and refreshments will be offered during the interview. Joining the research will provide information about how to best support individuals living with Type 2 diabetes if a disaster was to happen. In joining this study there are no expected risks or possible harm to you. Some of the questions asked may be emotional. If you require help or support, it will be offered.

Research Findings

The findings from this research will be used for my research purposes and will be presented in a paper at the end of the project. Participants will be given a code name to protect their privacy in the final report. Information will be recorded with a tape recorder and handwritten notes in the interview. At no time will any comments be credited to you unless you agree. A tape recorder is used to help in checking the information given by the participant. If you wish not to be recorded during the interview, please let me know and we will not use a tape recorder. The information you have shared is personal and I will respect what you would like to

do with the information after the research is finished. The information people have shared belongs to each person, sharing with the researcher how to best use the information for education and planning is important. If you are not comfortable or would not like the information collected to be used for learning and planning purposes, please let me know and the information will be destroyed. All results will be kept in a locked drawer in my desk at home and on my laptop, which requires a password to access. I will have my findings on the laptop backed up on a memory stick which will be kept in a locked drawer in my desk. The final report will be shared with my supervisor, committee members and members of the thesis defense committee. The report will be shared with you and other participants if individuals would like.

An electronic copy, with no public access will be held for a period of one year at Royal Roads University. The report may be reviewed by future MDEM learners, provided the writer of the report agrees.

Confidentially and Anonymity

I will use a tape recorder and take during the interview. If you do not agree with this, we will make a plan that is comfortable for you. The information you share with me will be used for my research purposes. I will keep all of your information private using a code name in the final report. I will be the only one there with you during the interview. Any information you share with me will be used for research and kept in confidence. You may be sharing your medical information with me. If you are not comfortable with sharing information, please let me know. There may be a chance that your privacy is not secure. To increase your privacy, please do not share with any information you do not want known by anyone. The information you have shared will not be used and can be destroyed if you wish. Every person in this research project has been given the same information about consent and confidentiality.

Conflict of Interest

I am working with persons of all cultures over the age of 60 male and female. Part of the area I am doing my research in is officially bilingual (French and English). I am not able to offer the interview in French. If participants have difficulty reading, or have a medical condition restricting reading, consent will be offered and obtained in a verbal manner.

There may be a recognized position of power through the research process, because I am an RN in the area. There will be no effect on present or future medical help an individual may need. The information shared with me is for research purposes will not be shared with the individual's doctor or other healthcare workers.

Consent

You do not have to join in this research project. If you decide to join, you are free to withdraw at any time without judgment or reason. If you choose not to join in this research project, this information will be kept in private.

I agree to join in the interviews and have those interviews recorded through a tape recorder and handwritten notes.

Yes ____

No ____

Please Initial ____

Please Initial ____

I have read this paper about the study or it was read to me. I understand the possible risks and benefits. I understand that being in this study is up to me. I choose to be in this study. I understand that the information gathered will be kept in private and used for research purposes only. I understand that at any time during this study I can withdraw. I understand that it is my

choice to be taped. In signing this form, I give free and informed consent to participate in the study. I have received on the date signed a copy of this paper. If I am unable to sign I will give verbal consent through a tape recorder.

Name (please print): _____

Signed: _____

Date: _____

Appendix B

Interview Guide

Introduction

Thank you for your willingness to participate in my research. My name is Alexandra Carruthers. I am currently a Masters student in Disaster and Emergency Management at Royal Roads University. I am in the thesis course of the program. I am conducting research about individuals living with Type 2 diabetes and their vulnerabilities during a disaster. The purpose of this interview is talk to you about how you would for yourself during a disaster. I will also talk to you about how Disaster Emergency/Healthcare professionals can best help you during a disaster. During the interview, if there is something you are not comfortable discussing please let me know that you do not want to discuss that. I want you to feel comfortable. If at any time you would like to stop or take a break, we will stop, re-assess how you would like to continue. To be respectful of your time the length of time for the interview is 60 to 90 minutes. If you would like to shorten the length, please let me know and if it is past 90 minutes you are free to continue as long as you like. If at anytime you would like to come back to a question because there is something else you would like to add, please let me know. This process is as much your process as it is mine and it is important to me that you feel comfortable guiding and shaping our conversation about your experiences. During this process I will be using a tape recorder and taking notes with your answers, if you agree. The information you share with me will be used for my research, and privacy will be maintained at all times, your name will not be used in the final report.

Before we continue, I would like to review with you the informed consent we went over and signed earlier. If you have any questions or concerns about the informed consent and the

interview, please ask me. At anytime during or after the interview you can withdraw consent or ask me to remove some of the information given. To maintain privacy, I will not use your name in any report or future documents.

Interview Prompts

Warm Up/Feeling Comfortable Question

1. I would like to start by asking you to tell me a little about yourself?

Possible prompts could explore.

- Can you tell me when you were diagnosed with Type 2 diabetes?
- How do you feel about being living with Type 2 diabetes and can you tell me about it?
- How comfortable are you with the medication you take? What is your current treatment plan? Can you tell me a little about both?

What is Your Experience with Disasters?

2. Can you tell me about what possible disaster may happen or have happened in the area you live in and how it has or may affect your ability to take care of yourself?

Possible prompts could explore.

- What are some recent disasters that have happened in the area?
- What disasters are you concerned about?
- What would you need to take with you to be able to care for your diabetes?
- How did the disaster effect or could effect your ability to care for yourself?

Daily Routine

3. Can you tell me about your daily routine in caring for your Type 2 diabetes?

Possible prompts could explore.

- What are the medications you take and can you tell me about them?
- Are there any other daily activities/routine, aside from taking your medication that you follow in your treatment plan and can you explain them to me?
- How are your medications and blood glucose testing strips obtained? Can you explain to me how this process work for you?

Fears and Concerns

4. Living with Type 2 diabetes can have some challenging aspects. Can you share with me the aspects you find easy and some of aspects you find difficult?

Possible prompts could explore.

- Are there times you are not able to follow your daily treatment plan and if so can you tell me about it?

- Are there aspects of your treatment plan you feel that would not be affected if a disaster was to occur? Or aspects that may be more affected.
- How do you see a disaster effect your treatment plan?

Individual Concerns

5. Living through a disaster can be a frightening experience. What are some thoughts or actions that would help you be able to maintain your treatment plan that others could assist you with?

Possible prompts could explore.

- What it is most important to you to be able to maintain your health if a disaster was to occur?
- Can you tell me about the current resources you use (if any) and if they are beneficial or if they can be improved upon?
- What resources to you feel would assist you to maintain your treatment of your diabetes in the event of a disaster?

Questions to Ask Others

6. If you were speaking to other individuals living with Type 2 diabetes about their particular risk conditions in the event of a disaster/hazard what questions would you think would be important to ask?

Closing

We have come to the end of the questions in the interview process, is there anything you would like to add or talk about. Do you have any questions or concerns for me? I would like to thank you for taking the time to come and share, your thoughts, feelings, experiences and concerns with me so openly. If you at anytime feel you would like to add or talk about anything pertaining to the questions asked or your answers, please feel free to reach out to me. With the information you have given me I will be compiling it then will reach out to you and go over the information I have to ensure it is accurate. I am interviewing other individuals with Type 2 diabetes and their fears, concerns and barriers they may encounter in the event of a disaster/hazard. In collecting this research, I am hoping to share this information (if you agree) with emergency management practitioners and healthcare providers so we are able to provide

you with the necessary resources to assist in adhering to your Type 2 diabetes treatment plan if a disaster or hazard were to occur. Thank you again for your valuable time and information.

Appendix C

Telephone Script

Hello Mr./Miss/Mrs./Ms.

My name is Alex Carruthers and I am a Masters student at Royal Roads University and working on a research project as part of my Masters program.

Dr. Jeff Golisky forwarded me your name and with your permission said it was ok to contact you by phone to see if you would be interested in participating in the study. Are you interested in hearing more about the study and possible participating in the study? Do you have a few minutes to talk or is there a better time for you that we can speak.

If yes proceed

If no, thank you very much for your time. Have a good day

If no. Is there another time that works for you that we could talk?

The purpose of my study is to understand particular conditions that elderly individuals with Type 2 diabetes might face during disaster. I am hoping to learn from your experiences so that I can provide information for emergency managers to improve their current emergency management and planning better to assist you and others living with Type 2 diabetes. I would like to talk to you tell us how you would do if a disaster was to happen. For the purposes of my research a disaster can mean an environmental disaster such as fire, tornado, heat wave etc or a chemical disaster such as chemical spill. The age group I am focusing on is people over the age of 60 living with Type 2 diabetes.

Is this something you would be interested participating in? Would you be interested in sharing your thoughts and experiences with me?

If yes proceed.

If no. Thank you for your time. Have a good day.

Your participation would involve an interview that would about 60 -90 minutes and be at a location that is convenient for you. Discuss the consent form and agree on a time and place to meet.

Thank you for your time today and have a great day. If you have any questions please contact me at any time either by phone xxx-xxx-xxxx or through email xxxxxxxxxxxx.

Appendix D

Invitation Letter

Why are you being given this letter?

To see you are interested in joining a research project. This letter will explain the project would and explain your involvement in the process from the beginning to the end.

Who am I?

My name is Alexandra Carruthers. This research project will help me finish my thesis for a Masters of Disaster and Emergency Management at Royal Roads University. This university is located in Victoria, British Columbia. You can check with my thesis coordinator Dr. Jean Slick to confirm this project and who I am. Dr. Slick's telephone number is xxx-xxx-xxxx and her email address is xxxxx. I am a Registered Nurse (RN). For this research I am a student. I will follow the standards from the College of Nurses of Ontario about keeping your information private. I can show you a copy of these standards or tell you where to find a copy.

Purpose of the Research

The purpose of this research project is to collect information about people living with Type 2 diabetes and problems they may have during a disaster. I will be working with people over the age of 60. The information collected will help future education and planning for this population. The information will show what their needs during a disaster would be and how DEM workers can best support their needs.

Participants Role

I will be using interviews to collect this information. The interview will take between 60 and 90 minutes, please let me know if this is good for you. The questions asked will be about your experience living with Type 2 diabetes. The problems you may face with your health if a

disaster was to happen. Some of the questions are personal and may be sensitive (ie medical information, personal feelings). We can take time for you to think about your answers for any question or come back to them anytime after the interview. If you have any questions that I cannot answer I will give you information to help answer these questions.

We are not able to give money or gifts for joining. I will offer help with transportation if needed. Food and refreshments will be offered during the interview. Joining the research will provide information about how to best support individuals living with Type 2 diabetes if a disaster was to happen. In joining this study there are no expected risks or possible harm to you. Some of the questions asked may be emotional. If you require help or support, it will be offered.

Research Findings

The findings from this research will be used for my research purposes and will be presented in a paper at the end of the project. Participants will be given a code name to protect their privacy in the final report. Information will be recorded with a tape recorder and handwritten notes in the interview. At no time will any comments be credited to you unless you agree. A tape recorder is used to help in checking the information given by the participant. If you wish not to be recorded during the interview, please let me know and we will not use a tape recorder. The information you have shared is personal and I will respect what you would like to do with the information after the research is finished. The information people have shared belongs to each person, sharing with the researcher how to best use the information for education and planning is important. If you are not comfortable or would not like the information collected to be used for learning and planning purposes. Please let me know and the information will be destroyed. All results will be kept in a locked drawer in my desk at home and on my laptop, which requires a password to access. I will have my findings on the laptop backed up on a

memory stick which will be kept in a locked drawer in my desk. The final report will be shared with my supervisor, committee members and members of the thesis defense committee. The report will be shared with you and other participants if individuals would like.

An electronic copy, with no public access will be held for a period of one year at Royal Roads University. The report may be reviewed by future MDEM learners, provided the writer of the report agrees.

Confidentially and Anonymity

I will use a tape recorder and take notes during the interview. If you do not agree with this, we will make a plan that is comfortable for you. The information you share with me will be used for my research purposes. I will keep all of your information private using a code name in the final report. I will be the only one there with you during the interview. Any information you share with me will be used for research and kept in confidence. You may be sharing your medical information with me. If you are not comfortable with sharing information, please let me know. The information you have shared will not be used and can be destroyed if you wish. Every person in this research project has been given the same information about consent and confidentiality.

Conflict of Interest

I am working with persons of all cultures over the age of 60 male and female. If participants have difficulty reading, or have a medical condition that limits reading, consent will be offered and obtained verbally.

There may be a recognized position of power, because I am an RN in the area. There will be no effect on present or future medical help an individual may need. The information shared with me is for research purposes will not be shared with the individual's doctor or other

healthcare workers.

If Interested

If you are interested, please let Dr. Golisky know. He can provide my phone number and/or email address to you. If you are comfortable you can give Dr. Golisky your phone number to pass along to me. I will then contact you to talk further about the research.