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Diabetes Self-Management of Adults With Diabetes in Grenada During the COVID-19

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Abstract

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by

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MPH, St. George's University, 2008

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Dissertation Submitted in Partial Fulfillment

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Abstract

Diabetes self-management involves several behaviors to prevent complications and ensure a good quality of life. Several studies addressed how the COVID-19 lockdown impacted diabetes self-management practices worldwide, yet little was known about self-management experiences in Grenada and the Caribbean region. The purpose of this phenomenological and directed content analysis study was to gain insight into the lived diabetes self-management experiences during the COVID-19 lockdown in Grenada. The theory of planned behavior was used as the theoretical framework for this study. The research questions addressed lived self-management experiences and attitudes, subjective norms, and perceived behavioral control toward diabetes self-management. Semistructured interviews were conducted with 13 Grenadian adults, age 35 to 65. Results were analyzed using descriptive coding and predetermined categories using the theory's constructs (directed content analysis). Three overarching themes emerged: (a) diabetes self-management activities, (b) barriers, and (c) intentions to perform self-management behaviors. Results indicated that although participants had adequate social support, there was significant nonadherence toward exercise and diabetes foot care. Findings may be used to develop a multidisciplinary approach, especially from the government of Grenada, to improve self-management skills and attitudes, and to promote appropriate diabetes disaster planning for a future pandemic.

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Dedication

I dedicate this dissertation to my parents, who sacrificed a great deal to get me to where I am today. My mother especially stepped in to help with my son and carried my burden when I could not. My father is always with me in thoughts and prayers. And to my son Nathan, who has been my motivation and my push through my doctoral journey, I love you!

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Chapter 1: Introduction to the Study

Diabetes is a chronic disorder that affects how the body turns food into energy, and it is characterized by hyperglycemia (Centers for Disease Control and Prevention [CDC], 2020). Globally, diabetes is a significant public health concern and global crisis, affecting many countries across the world. Alibrahim et al. (2020) noted that it is one of the most prevalent chronic conditions globally, with a prevalence of 9.3%. The World Health Organization (WHO, 2020) also estimated that about 422 million people worldwide have diabetes, and each year about 1.6 million deaths can be attributed to the disease. Likewise, diabetes prevalence has been steadily increasing in many developing countries; approximately 80% of those with diabetes live in low- and middle-income countries (Abouammoh & Alshamrani, 2020; McGuire et al., 2013; Shakil-ur-Rehman et al. 2017; Shrivastava et al., 2013; WHO, 2020). In Grenada, a middle-income country in the Caribbean, there has also been an increase in diabetes incidence. In 2019, diabetes prevalence was 9.5%, with about 6,500 cases (International Diabetes Federation, 2019).

Diabetes poses a significant burden on health and economies (Misra & Fitch, 2020). However, these burdens are preventable and can also be managed through several aspects of care or modifiable self-care behaviors. The self-management of diabetes is essential and is a process in which a person actively engages in self-care activities (Reyes et al., 2017). Effective diabetes self-management is necessary to ensure glycemic control, reduce further complications, and improve the overall quality of life (Hodges et al., 2019). Diabetes self-management involves a combination of several behaviors for effective disease management, including blood glucose monitoring, physical activity,

weight control, nutrition, medication, problem-solving to prevent barriers, and risk-reduction behaviors such as smoking cessation and regular eye and foot exams (Hodges et al., 2019).

Coronavirus Disease-2019 (COVID-19) emerged as a rapidly spreading communicable disease that quickly evolved and affected many countries around the world (Gupta et al., 2020). The COVID-19 outbreak has posed several new challenges to diabetes care and management (Madhu, 2020). Therefore, it was necessary to explore how people with diabetes engaged in self-management behaviors during the COVID-19 pandemic. The results from the study could assist Ministries of Health by strengthening their disaster plan and support for people with diabetes.

Chapter 1 serves as an introduction to the study. First, a background on the study's topic is detailed, followed by the problem statement and the purpose of the study. Next, the research questions that guided the study are stated, and then the theoretical framework is examined. Following is a description of the nature of the study and definitions of several key terms used in the study. Also included are assumptions, scope and delimitations, limitations, significance, and a summary.

Background

Diabetes self-management is a key aspect of ensuring glycemic control. Uncontrolled glucose levels are detrimental to diabetic patients, leading to several short- and long-term complications. Proper self-management among people with diabetes has persistently been a challenge (Banasiak et al., 2020; Misra & Fitch, 2020; Wicaksana et al., 2020). With the rapid spread of the COVID-19 pandemic, many countries worldwide

recommended that populations practice social distancing. The lockdown protocols may have affected the diabetes management of many people. Wicaksana et al. (2020) mentioned that the spread of COVID-19 had brought many consequences for people with diabetes. Shi et al. (2020) noted that the pandemic imposed an additional struggle for self-management by diabetes patients. Quinn et al. (2020) pointed out that diabetes self-management has been highly variable during the pandemic. Furthermore, poor glucose control can provoke several acute and chronic complications that health care systems will have to manage during and after the pandemic (Tao et al., 2020). Glycemic control and quality of life could be affected in the short and long terms.

Diabetic patients faced several barriers during the COVID-19 pandemic. Wicaksana et al. (2020) described that lack of access to care and fresh food and limited activity due to confinement were some of the barriers experienced. Tao et al. (2020) also mentioned that diabetic patients had difficulty obtaining insulin, blood sugar monitoring, and medications, and some feared attending clinics. Banerjee et al. (2020) added that the lockdown meant limited activity, restriction in food supplies, and difficulty in obtaining anti-diabetic medications and glucose strips.

Several studies emerged regarding diabetes self-management during the COVID-19 pandemic. Despite the availability of research on diabetes self-management, few were focused on the Caribbean region. The issues faced in diabetic patients in this region were unknown at the time of the current study. Problems and barriers regarding self-management practices are multifaceted, and it was important to understand the perspectives of the diabetic population in Grenada during the pandemic.

Problem Statement

The literature showed that many people with diabetes struggled with self-management adherence behaviors (Christensen et al., 2020; Fritz, 2017). A review of the literature indicated that disasters like pandemics can adversely affect people's ability to manage their condition. There is strong evidence that during a disaster, people with diabetes are vulnerable and face several challenges to disease management, including medication and diet needs, physical activity, and other aspects of self-management (Arrieta et al., 2008; Department of Health and Human Resources, 2020; Owens & Martsolf, 2014). Consequently, diabetic patients are at risk for serious health complications, which presents additional challenges to patients and the country's health system.

From March 2020 to May 2020, the government of Grenada enforced a lockdown with several regulations, which included a curfew that restricted movement, closure of businesses, physical distancing protocols, restrictions on social and religious activities, and restrictions on transportation (Ministry of Health Grenada, 2020). The lockdown affected many aspects of the population's daily lives, including physical activity, access to food, mental health, socialization, and health care. Sharma (2020) also discussed how public health measures for quarantine could result in possible weight gain. At the time of the current study, there was little research on diabetes self-management during the COVID-19 pandemic in Grenada. Banerjee et al. (2020) and Ranscombe (2020) explained that the restrictions raised questions about how people with diabetes can get advice, appropriately monitor their health, and continue to manage their condition. These

restrictions can adversely affect how people can manage the disease effectively. It was, therefore, vital to gain a better understanding of how people are coping with self-management and the potential barriers they may face. Furthermore, there was a lack of research on how the pandemic impacted the self-management behaviors of adults with diabetes in Grenada. The current study addressed the gap in the literature by providing deeper insights into the self-management practices of adults in Grenada with diabetes during the COVID-19 pandemic. Addressing the gap allowed the description of the experiences of the participants during the unprecedented pandemic.

Purpose of the Study

The purpose of this qualitative study was to better understand self-management practices during the COVID-19 pandemic through the perspective of adult diabetics in Grenada. This qualitative research was based on a constructivist paradigm. A constructivist paradigm assumes that there is no single reality, and a researcher elicits the participants' views of their experiences (Teherani et al., 2015). A qualitative paradigm was important to gain deeper insights into how diabetic patients described the influence of the COVID-19 lockdown restrictions on their ability to manage their condition. Adequate self-management of diabetes is necessary for ensuring optimal health levels and improved health outcomes. Results from the study may also provide fundamental insights to aid in the development of a diabetes disaster management plan or tailored interventions that may improve self-management behaviors during future pandemics. The study may also inform current limitations for more effective management. The

participants' self-management practices were explored using semistructured interviews to examine their experiences during the COVID-19 pandemic.

Research Questions

The research was guided by the following research questions (RQs):

RQ1: What were the lived self-management experiences of adults with diabetes in Grenada during the COVID-19 lockdown period?

RQ2: What were the attitudes, norms, and perceived behavior control of adults with diabetes in Grenada toward diabetes self-management during the COVID-19 lockdown period?

Theoretical Framework for the Study

The theoretical framework used for this study was the theory of planned behavior (TPB), which focuses on the intention of behavior change. The theory proposes that behavior can be predicted based on a person's attitude and explains the relationship between a person's beliefs and behavior (Kleier & Dittman, 2014; Lee et al., 2017). The theory distinguishes among three types of beliefs, including attitude, norms, and behavior control (Lee et al., 2017). Glanz et al. (2015) added that an underlying assumption of the TPB is that intention is the best predictor of a person's behavior, which is determined by their attitudes toward the behavior and social normative perceptions toward the behavior. The theory was relevant to the current topic because previous studies had provided knowledge and usefulness of the theory in predicting and explaining diabetes self-management behaviors (see Phutthong, 2018; Wongrith, 2019). The TPB was well aligned as a theoretical framework for the current study because it examines what a

person thinks about their ability to accomplish behaviors such as diabetes self-management.

The TPB also provided a framework for the design, analysis of the research problem, focus for the research questions, and identification of key concepts as coding categories. Using the theory provided an understanding of how a person's attitude was shaped by their belief about performing self-management behaviors. Insights into how normative beliefs could determine subjective norms and motivation to perform self-management behaviors were also gained. Additionally, the TPB helped me understand uncontrolled factors that may affect intentions and behaviors toward diabetes self-management.

Nature of the Study

A qualitative method was ideal for collecting detailed data and constructing a deep understanding of this topic. Qualitative studies allow researchers to investigate issues through the participants' perspective by interpreting their experiences or the meanings they attribute to those experiences (Merriam & Tisdell, 2015). I adopted a directed content analysis approach. Directed content analysis is useful in validating and extending a conceptual framework or theory (Pouralizadeh et al., 2017; Sabzmakan et al., 2020). Directed qualitative content analysis was utilized to identify, classify, and code themes and patterns in the data. Sabzmakan et al. (2014) suggested that directed content analysis is structured and is guided by a theory to promote a more detailed description of a phenomenon. Furthermore, the approach allowed a flexible yet systematic classification

process of coding and identifying themes to allow the subjective interpretation of data (see Sabzmakan et al., 2014).

Data for the study were collected through face-to-face interviews with the participants to elicit their perspectives. Semistructured interviews were in-depth and allowed the participants to answer preset open-ended questions based on the TPB. An interview guide was used, and sessions were recorded to ensure that the data were effectively captured.

Definitions

The following are definitions of key terms used in the study:

Diabetes: A chronic disease that causes elevated blood glucose levels and can lead to severe damage to multiple parts of the body such as the blood vessel, eyes, heart, kidneys, and nerves (Alqarni et al., 2018).

Diabetes self-management: Specified behaviors or activities undertaken by a person to control their condition (Reyes et al., 2017).

Directed content analysis: A type of qualitative approach that starts with a theory as guidance for initial codes in the analysis of data (Hsieh & Shannon, 2005).

Assumptions and Limitations

A potential challenge in the study was the ability to recruit participants who could provide the necessary insights. Another potential challenge was conducting one-on-one interviews under the COVID-19 regulations as stipulated by the Grenadian government. A third possible limitation of this qualitative study was response bias because data collected would be based on the participants' self-reports. Self-assessed behaviors might

be biased based on several reasons including social desirability or misunderstanding of proper behavior measurement.

Scope and Delimitations

The purpose of this phenomenological and directed content analysis study was to explore the lived experiences of people with diabetes regarding their self-management practices during the COVID-19 lockdown. Adult participants who resided in Grenada during the lockdown were recruited. Thirteen participants between the ages of 35 and 65 participated in telephone interviews. The two research questions guided the interview questions. The TPB also informed the formulation of the research questions and the data analysis.

Significance

The significance of this research was to provide information on the diabetes self-management experiences of the adult population in Grenada during the COVID-19 pandemic. The purpose for the study was to describe the perceived experiences of the participants during the COVID-19 lockdown period. The study was unique because it addressed an underresearched topic. Little is known about how individuals diagnosed with chronic illnesses manage their illnesses during disasters (Owens & Martsolf, 2014). More insights were needed on the topic to better understand the facilitators, barriers, and overall experiences of diabetes self-management behaviors during a crisis. Therefore, the study focused on the management of diabetes during the COVID-19 lockdown and explored diabetic patients' experiences in Grenada.

Findings from this study may provide vital insights to Grenada and the Caribbean region regarding the challenges diabetic patients faced during the lockdown. The findings may also contribute knowledge to Grenada's public health organizations, practitioners, responders, and the public regarding the preparedness and management of the disease. The study may also inform policymakers and people with diabetes of effective ways to manage the condition during a disaster. Public health professionals may be better equipped to address chronic disease disaster management by translating the information into action in the diabetic population.

The research also has the potential to impact positive social change in Grenada. The results may provide key information used for decision making and planning for diabetes patients. Findings may also justify needed attention and resources toward considering diabetes self-care and access to care in disaster planning. This is critical in improving the overall health of the diabetic population, decreasing mortality, and reducing the burden the disease on the small economy of Grenada.

Summary

The chapter introduced the study's topic and provided an overview of key aspects of the research. Diabetes self-management behaviors are considered effective in the overall management and control of diabetes (Shrivastava et al., 2013). During a disaster, there may be challenges or issues faced by people with diabetes that may influence their self-management behaviors. The unprecedented COVID-19 pandemic forced many countries to implement protocols that many were unprepared for and that affected how people manage their health. Therefore, it was necessary to better understand how diabetic

patients maintained their routine to manage the disease in Grenada. Chapter 3 provides a detailed description of the guiding theoretical framework and a review of the relevant literature.

Chapter 2: Literature Review

Diabetes continues to be a growing concern and is considered to be the leading epidemic of the 21st century affecting millions worldwide (Lee et al., 2017). In addition, a considerable increase in the epidemic has been seen in developing countries (Wongrith, 2019). Diabetes is responsible for increased morbidity and mortality, with 2.2 million deaths being attributed to poor diabetic control (Wongrith, 2019). C. Y. Lin et al. (2020) also noted that people with diabetes have almost twice the mortality rate compared to their healthy counterparts. Good diabetes health and diabetes control are necessary for disease maintenance and quality of life. Karimy et al. (2018) stated that adherence to self-care behaviors could reduce diabetes complications by up to 50%.

Diabetes self-management is a critical aspect of managing the disease and ensuring good health outcomes. However, studies showed that uncontrolled diabetes is a significant problem and can lead to a myriad of health issues such as retinopathy, nephropathy, and cardiovascular diseases and can pose an economic burden (Karimy et al., 2018; Mikhael et al., 2020; Shrivastava et al., 2013). Several studies addressed the importance and the challenges of diabetes self-management, including how the disease may influence the self-management practices of diabetic patients. Recent studies revealed that the COVID-19 lockdown might have impacted the lifestyle and diabetes self-management abilities of people affected in different parts of the world (Ghosh, 2020; Nachimuthu et al., 2020; Verma et al., 2020). However, there was a lack of understanding of how the COVID-19 pandemic may have affected diabetic people in the Caribbean region. The current study filled this gap and extended the knowledge on the topic. The

purpose of this qualitative study was to better understand the self-management practices during the COVID-19 pandemic through the perspective of adult diabetics in Grenada.

Chapter 2 offers an in-depth discussion of the issue to understand better and improve the phenomenon. First, the Literature Search Strategy section indicates the scope of the literature review. The Theoretical Foundation section includes a summary of findings by key theorists, philosophers, and researchers related to the topic. Finally, the Literature Review section provides a synthesis of articles related to the constructs of interest, methodology, and methods aligned with the research scope.

Literature Search Strategy

Several strategies were used to conduct the literature review. Walden's Health Science search database was used primarily for searches. Databases such as EBSCO, PubMed, MEDLINE with full text, and CINAHL Plus with Full Text were also used. The Dissertations & Theses database from the Walden University Library was also used. Google Scholar was used as an additional online search database. The following keywords were used to locate relevant articles in the various databases and search engines: *diabetes*, *diabetes self-management*, *COVID-19* and *diabetes*, *dietary behaviors* and *COVID-19*, *physical activity*, and *COVID-19.* An exhaustive literature review was conducted.

Theoretical Framework

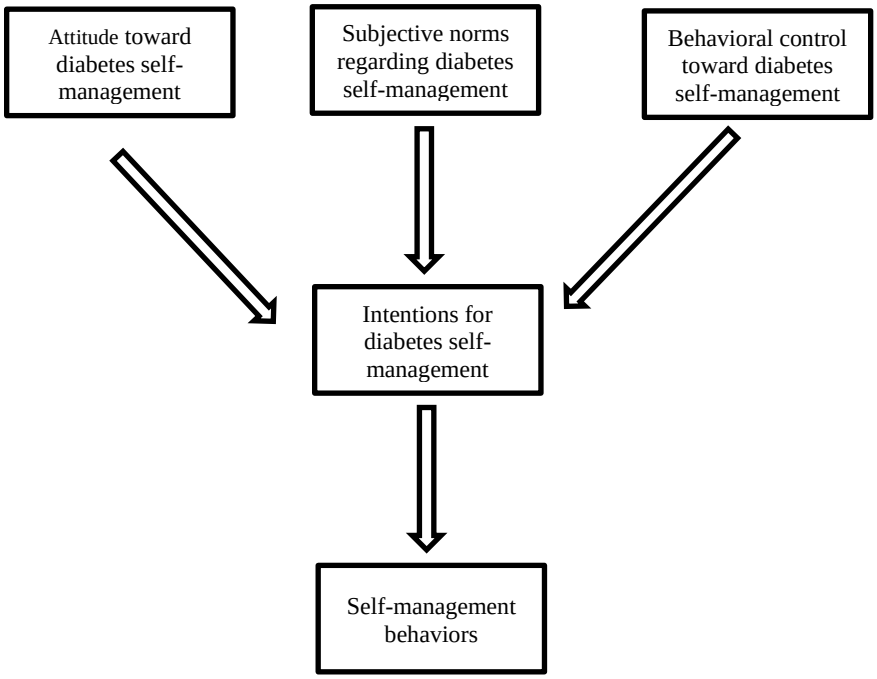
The TPB is an extension of the theory of reasoned action. The TPB provides a basis for explaining and predicting behaviors and behavioral intentions. Ajzen was instrumental in the history and development of the TPB (Lash et al., 2016). To better

understand attitudes and behaviors and improve on limitations of the theory of reasoned action, the TPB was developed to understand better the relationship between a person's attitude, intentions, and behaviors (Glanz et al., 2015).

According to the TPB, intention is a major prerequisite for behavior achievement. The TPB assumes that intentions capture motivation factors that influence behaviors, and they indicate how hard someone will try and the effort they will put in to execute a behavior (Ajzen, 1991). The theory also posits that three constructs can determine intention: attitudes, subjective norms, and perceived behavioral control (see Figure 1). Attitude refers to a person's favorable or unfavorable appraisal of a behavior (Ajzen, 1991). If a person has a positive attitude toward the outcome of a behavior, they will also have a positive attitude toward performing the behavior. Subjective norm, which is a social factor, refers to the social pressure toward performing or not performing a behavior (Ajzen, 1991). If there is social pressure to perform a behavior, then the person will have a positive subjective norm (Glanz et al., 2015). Behavior control refers to how difficult or easy someone perceives performing a behavior (Ajzen, 1991). Generally, it can be assumed that a positive attitude and subjective norm toward a behavior, the greater the perceived control, and the more likely a person will have a strong intention to perform a behavior.

Figure 1

Diabetes Self-Management Using the TPB



The TPB was related to the current study and the research questions and was suitable for studying the phenomenon of diabetes self-management. As shown in Figure 1, intentions to perform diabetes self-management activities can be predicted by a person's attitude, subjective norms, and behavioral control toward diabetes self-management behaviors. A person's attitude refers to whether they consider self-management to be beneficial. The attitude of a person with diabetes plays a crucial role in their emotional response and efforts to manage the condition daily (Kueh et al., 2015). Several researchers studied the construct of attitude among people with diabetes. Lee et al. (2017) noted that self-management behaviors like physical activity and healthy eating are reliant on a person's attitude. Lee et al. also pointed out that the exploration of

attitudes is critical for successful behavior modification among adults with diabetes. Presseau et al. (2014) explored how the TPB predictors of intention predicted strength for several behaviors and concluded that attitude was the only construct that predicted direct estimation of intention for all behaviors. Caro-Bautista et al. (2019) developed an instrument to identify barriers to self-management on the basis of the TBP and identified several critical attitudes including attitude toward food, physical activity, medication control, food care, and blood glucose level.

Didarloo at al. (2012) described subjective norms as the social pressure a person receives from others to engage in a given behavior. As it relates to diabetes self-management, subjective norm indicates a person's feelings about the approval or disapproval of self-management practices from others around them. The literature review revealed studies that presented differing views of subjective norm as a predictor of intention. Blue (2007) used the TPB to identify modifiable behaviors for diabetes behavior change. According to a survey based on the TBP, subjective norm was identified to be related to healthy activity and eating behaviors (Blue, 2007). Lee et al. (2017) provided evidence that social support can improve health outcomes of adults with diabetes. On the other hand, Downie et al. (2019) indicated that subjective norm did not have a direct relationship with self-care intention.

Perceived behavioral self-control considers whether diabetes self-management behaviors are within someone's control or if they are confident in their ability to perform them. Moreover, the TPB is an intrapersonal theory that examines what a person thinks about their ability to perform a behavior (Lee et al., 2017). Wongrith (2019) explained

that an increase in the ability to adjust medication dosages, dietary intake, and physical activity is dependent on perceived behavior control. The perception of behavior control is a critical determinant in diabetes self-management behaviors. Furthermore, Rohani et al. (2019) reported that perceived behavioral control had more effect on behavior intention than the other structures in the TPB. In a longitudinal study, C. Y. Lin et al. (2020) stated that perceived behavioral control was associated with exercise, foot care, and blood glucose monitoring. C. Y. Lin et al. also found that dietary control was not significantly correlated to behavioral intentions. For TPB constructs, intention (intention strength and direct estimation of intention) was a significant predictor of all self-reported behaviors (Presseau et al., 2014).

A search of the literature showed that the TPB constructs strongly predict several diabetes self-management behaviors. Physical activity is an integral part of a healthy lifestyle and diabetes care behaviors. Regular exercise has been shown to increase glucose sensitivity and control blood glucose and has been shown to reduce the risk of diabetes by about 27% (Fattahi et al., 2019). Gao et al. (2020), Fattahi et al. (2019), and Wongrith (2019) explained that the TPB has been used extensively and has been effective in predicting physical activity. Gao et al. concluded that intention was the strongest predictor of exercise behavior and mediated the relationship between perceived behavioral control and exercise. Plotnikoff et al. (2010) also described the use of the TPB in understanding exercise motivation. The study indicated that attitude, subjective norm, and perceived behavior control were the main predictors of intention to exercise among diabetics. The research conducted by Fattahi et al. demonstrated how the TPB could

predict the physical activity outcomes of diabetic patients. The findings showed that a positive attitude toward physical activity and subjective norms were significantly related to a person's intention to perform physical activity. The results also revealed that a positive attitude yielded only moderate physical activity, suggesting that other factors play a role in that behavior.

Other researchers applied the TBP constructs to address dietary control among diabetics. Watanabe et al. (2015) explained that the constructs were highly predictive of healthy eating and showed that participants with higher scores for perceived behavior control, attitudes, and subjective norms had the highest intentions of consuming low glycemic foods. Wongrith (2019) found that social support such as medical providers, nurses, caregivers, and concerned family members was consistent with healthier eating patterns. Lee et al. (2017) also argued that the evidence indicated having a positive attitude, influence from others, and perceived control were associated with a strong intention of healthy eating.

Literature Review

Diabetes Self-Management

Diabetes is a chronic lifestyle disease that occurs when a person's blood glucose level is too high. The most common type of diabetes is type 2 diabetes (Abouammoh & Alshamrani, 2020). Type 2 typically occurs when the body cannot make insulin or use insulin well enough to regulate blood glucose at normal levels (CDC, 2020). Although diabetes can affect people of different ages, it is most commonly seen among adults (CDC, 2020). Generally, diabetes and its consequences are relatively manageable.

Diabetes requires the constant and active involvement of the person affected by the disease. Christensen et al. (2020) explained that about 99% of diabetes care involves self-management or self-care. Ricci-Cabello et al. (2014) described self-management as a person's ability to manage the symptoms of the disease, its treatment, and the involvement of associated lifestyle changes. Shrivastava et al. (2013) also defined diabetes self-management activities as behaviors that people with the disease implement to manage on their own successfully. Diabetes self-management is critical in the treatment of diabetes.

The literature provided evidence of the importance of self-management activities for people with diabetes. Self-management activities have been found to be positively correlated to glycemic control and a reduction in disability and health long-term complications, including cardiovascular, neuropathy, kidney disease, stroke, eye, and complications of the extremities (Christensen et al., 2020; Powers et al., 2016; Shrivastava et al., 2013; Weaver et al., 2014). Short-term complications of poorly managed diabetes can include headaches, weakness, dizziness, anxiety, and depression, among others (Vanstone et al., 2017). When diabetes is managed well, the onset of complications is often delayed or prevented from happening in the first place (Weaver et al., 2014). Overall, self-management results in better health outcomes for people affected by the disease and improves their quality of life. Several activities have been identified as essential diabetes self-management behaviors, including physical activity, healthy eating, blood sugar monitoring, and foot care (Andriyanto et al., 2019; Christensen et al. 2020; Hailu et al., 2019; Pavithra et al., 2020; Vanstone et al., 2017).

Physical Activity

Physical activity is a crucial component of diabetes self-management, and a growing body of work suggested that it positively affects diabetes health outcomes. Cleven et al. (2020) indicated that high levels of physical activity are considered to have a protective effect on diabetes. This study provided evidence of a link between increased physical activity levels and a decrease in the incidence of diabetes. In a cross-sectional study, Martina and Adisasmita (2019) revealed that exercise plays a role in the regulation of blood glucose levels and provides additional benefits such as obesity prevention and regulating blood pressure. Shakil-ur-Rehman et al. (2017) assessed the effects of aerobic exercise programs on glycemic control, plasma insulin levels, fasting blood glucose level, and insulin resistance among people with diabetes. The results showed positive effects on all variables in the experimental group. It was also noted that physical activity and modest weight loss could reduce a person's risk of impaired glucose tolerance by up to 58%.

Contrarily, several studies reported no significant effects of exercise on the quality of life of people with diabetes. Bello et al. (2011) carried out a study to determine the effects of 8 weeks of exercise on people with diabetes. The intervention group received supervised aerobic training, and blood analysis was done for both the intervention and control group at the end of the period. Bello et al. noted that there was no statistically significant difference in fasting blood sugar, HbA1c, lipoproteins, and quality of life. Reid et al. (2010) evaluated the effect of exercise on quality of life and health status, as reported by the patients. The exercise included aerobics and resistance

exercises offered to participants for 22 weeks. The variables measured (BMI and HbA1c) showed no statistically significant improvements in physical health status between the intervention and control groups. Plotnikoff et al. (2010) reported similar results in their study to determine whether resistance training would provide benefits to patients with diabetes. No significant changes in A1C levels were observed in the intervention group.

Blood Glucose Monitoring

Having good glycemic control that is normal or within normal limits is essential for diabetic patients. Ginsberg (2007) explained that blood glucose monitoring is necessary to provide information to the person to help in medication adjustment, provide averages so the person can know how well they are doing, serve as a reminder to alter behavior, and be used by providers to make changes to the person's regimen. Previous and recent studies established that glycemic regulation through glucose monitoring self-management behaviors can decrease the risk of complications.

Ong et al. (2014) stated that the main benefits of glucose self-monitoring are ensuring glycemic control and enabling diabetic patients to assess their lifestyle to make necessary changes. Similarly, Gopalan et al. (2020) indicated that glucose self-monitoring is associated with better glycemic control and higher self-care confidence. Machry et al. (2018) conducted a systematic review investigating the effects of self-monitoring of glucose on glycemic control among persons with diabetes. They reported that the self-monitoring of glucose seemed to have more benefits in the short term than the long term and was more beneficial in persons with worse glycemic control. It was evident that glycose self-monitoring is a vital diabetes self-management behavior.

Additionally, glycemia is associated with multiple severe long-term complications (Pamungkasn et al., 2017).

Healthy Eating

An understanding of healthy eating as a self-management behavior was derived from long-term perspective research among people with diabetes (Forouh et al., 2018). Current dietary recommendations emphasize the eating of nutrient-dense and high-quality foods. Dietary patterns for people with diabetes point to the promotion of vegetables, fruits, whole grains, nuts, legumes, and dairy products and reducing the intake of processed meats, refined grains, and sugars (Forouh et al., 2018). There is evidence in the literature that substantiates the importance of proper nutrition in the management of diabetes. Vanstone et al. (2017) explained that diet modification is a critical component of diabetes self-management and maintaining glycemic control. In a cross-sectional study carried out by Antonia et al. (2019), the results showed that diabetic patients with poor diets had 2.92 times the chance of having poor glycemic control compared with patients who had healthier diets. The authors also focused specifically on the idea that a low carbohydrate diet is vital in the management of diabetes.

Adherence to Medication

Adherence to diabetes medication is a critical aspect of diabetes self-management. Yasmin et al. (2020) defined adherence as the extent to which a person's behavior corresponds to advice from a provider. Adherence to diabetes medication is a multidimensional concept as patients interact continuously with their health care providers, family, and social and physical environment (Kes, & Gökdoğan, 2020; Rao et

al., 2020). Huang et al. (2019) described medication adherence as taking medications as prescribed by a provider, which is important for achieving treatment goals. The different forms (oral and injection) of diabetes medication are recommended to ensure glycemic control (Aminde et al., 2019; Kes & Gökdoğan, 2020; Lin et al., 2017; Milky & Thomas, 2020; Wabe et al., 2011). Rao et al. (2020) also mentioned that medication adherence could reduce the development of health complications. According to a report from the WHO, adherence is lower in developing countries when compared to developed countries (Alqarni et al., 2018; Basu, 2019).

Foot Care

Proper foot self-care behaviors are necessary among people with diabetes, especially those with an at-risk foot. Foot care behaviors involve several activities, including daily inspection of one's feet, proper hygiene, professional treatment of wounds or lesions, and the appropriate footwear and footgear checks (Bonner et al., 2016). Uncontrolled diabetes resulting from poor foot selfcare can lead to lower extremity amputations (Bonner et al., 2016; Sari et al., 2020). Pavithra et al. (2020) explained that appropriate diabetes self-management could aid in the prevention of about 49-85% of diabetic foot-related complications. Pavithra et al. (2020) conducted a cross-sectional study in India and found that 4 out of every ten persons demonstrated good self-management practice of care of feet. Complications from poor foot care can result in adverse effects like physical disability, depression, high financial burden, low quality of life, and even mortality (Sae-Sia et al., 2013).

Predictors of Diabetes Self-Management

Diabetes self-management involves considerable lifestyle modifications. Although diabetes self-management is critical in preventing complications and improving the quality of life of those affected, the literature shows that many persons have several challenges with self-management behaviors. Despite the threat that elevated blood glucose presents, only about 15.8% of people have their glucose levels under control (Shen et al., 2020). Pamungkasn et al. (2017) and Banasiak et al. (2020) explained that it is difficult for persons to consistently engage in self-management practices necessary for good glycemic control. Wardian & Sun (2014) suggested that many self-management behaviors are stress in the daily management of diabetes. Weaver et al. (2014) reported that the consequences of poor management could compromise a persons' health capability and involves a myriad of potential complications, including death.

People with diabetes face several challenges concerning their self-management tasks. Integrating the required self-management behaviors in their daily routine may be demanding or seem complex to some. It is estimated that about 14.3% of patients with diabetes are at their glycemic goal (Andrich & Foronda, 2020). Shakil-ur-Rehman et al. (2017) mentioned that persons with diabetes have difficulty implementing an exercise program. Diet modification is another challenge for persons with diabetes. Forouh et al., 2018, explained that nutrition is one of the most challenging aspects of diabetes self-management. Despite the known advantage of good nutrition, many persons struggle to adopt and maintain the recommended diet (Vanstone et al., 2017). Medication adherence also poses a significant challenge for diabetic patients. Huang et al. (2019) noted that

about 33% of oral medications and 38% of insulin for diabetes are not taken as prescribed. Various factors can contribute to poor medication adherence. In their cross-sectional study, Kes and Gökdoğa (2020) reported that negative attitudes towards medication adherence were related to a lack of knowledge and belief that treatment was ineffective or harmful. Several other factors may contribute to poor self-management behaviors. Pamungkasn et al. (2017) and Kurnia et al. (2017) reported that low levels of self-efficacy, insufficient family support, lack of knowledge, and low self-commitment had been associated with poor diabetes self-management.

Diabetes and COVID-19

COVID-19 has elicited major public health concerns across the globe. Since it was first reported in Wuhan City, China, in 2019, thousands of cases were reported in various countries (Barone et al., 2020; Syed & Marathe, 2020). COVID-19 was identified as a pandemic, with about 3,842,000 confirmed COVID-19 cases in the world (Pradhan et al., 2020). The disease presented itself from an asymptomatic state to severe respiratory tract infections like pneumonia and resulted in an increase in mortality due to respiratory distress syndrome (Bhandari et al., 2020; Önmez et al., 2020; Pradhan et al., 2020)

As a part of the public health response to halt the spread of COVID-19, several protocols were established. By March 29th, 2020, Grenada announced its ninth confirmed case of COVID-19 and imposed an island-wide lockdown. The lockdown protocols in Grenada mandated persons to stay inside their homes, except for designated times when they were allowed to carry out essential activities. The Emergency Powers COVID-19

regulations stated that persons should work remotely from home and imposed restrictions on freedom of movement (Ministry of Health, 2020). All businesses, except for medical facilities and other essential companies were closed, and allowed days for shopping were announced.

The issue of diabetes during the COVID-19 pandemic aroused the interest of several researchers. Though it is unclear, diabetes was shown to be a significant predictor of those affected with COVID-19 (Hussain et al., 2020; Wang et al., 2020; Wicaksan et al., 2020). Moreover, Mukona and Zvinavashe (2020) and Joshi et al. (2020) suggested that the risk of death from COVID-19 was about 50% more among people with diabetes than people without diabetes. The pathophysiological mechanisms were not yet known, but it was noted that most of the severe and fatal cases of COVID-19 occurred among people with conditions like diabetes (Banerjee et al., 2020; Mukona & Zvinavashe, 2020; Wang et al., 2020). Some studies also spoke to a vulnerable and susceptible immune system that existed among diabetic patients (Khader et al., 2020; Mukona & Zvinavashe, 2020; Wang et al., 2020). Wang et al. (2020) added that infection by COVID-19 could trigger stress and consequently cause elevated blood glucose and diabetic complications. However, several other authors highlighted no evidence that people with diabetes had high susceptibility to the disease (Hussain et al., 2020; Nachimuthu et al., 2020; Ma & Holt, 2020). The authors noted that although the evidence was controversial, there was an association between diabetes and higher infections (Hussain et al., 2020; Ma & Holt, 2020; Nachimuthu et al., 2020). Furthermore, it was established that there was a relatively strong association between COVID-19 as the leading cause of deaths among

diabetes (Guan et al., 2020; 2020; Sardu et al., 2020; Tascioglu et al., 2020). Mukherjee et al. (2020) also suggested that there is a possibility of developing a public health crisis regarding diabetes among COVID-19 survivors.

Diabetes Self-Management During the COVID-19 Pandemic

Diabetes self-management during the COVID-19 pandemic was also a topic of interest. Consequently, several studies investigated diabetes self-management during the COVID-19 pandemic. Gosh et al. (2020) explained that their mathematical simulation model estimated an increase in the number of persons with uncontrolled diabetes and its complications. What was evident in the literature was how the COVID-19 pandemic affected diabetes self-management behaviors. Banerjee et al. (2020) indicated that the nationwide lockdown stipulated by governments to control the spread of COVID-19 negatively impacted diabetes management. Physical distancing protocols, quarantine, lockdown lifestyle, and other restrictions affected several aspects of diabetes self-management. The literature shed information on how the course of the disease and glycemic control were adversely affected by the COVID-19 lockdown. It was noted that maintaining glycemic control was an effective means of preventing the transmission of COVID-19 among persons with diabetes (Banerjee et al., 2020; Wang et al., 2020; Wicaksana et al., 2020). A review of recent articles produced several publications on the topic.

Researchers in India conducted a study to determine how persons coped with diabetes during the COVID-19 lockdown. According to the study, about 28% of participants admitted to testing their blood sugar levels regularly, and 80% were regular

with their diet and exercise control (Nachimuthu et al., 2020). Gosh et al. (2020) conducted a cross-sectional study to determine the effects of the lockdown on the lifestyle of persons with diabetes in India. The results showed that over half the participants reported that their meal timings were affected, 21% had an increase in their carbohydrate consumption, 13% had an increase in fat consumption, 23% snacked more, and 7% saw an increase in fruit consumption. Khader et al. (2020) reported that 46.88% of the participants had an increase in their food intake than before the lockdown period.

Another study to determine the effect of the lockdown on glycemic control among diabetes was conducted by Khare and Jindal (2020) in India. The observational cohort study revealed that fasting blood glucose and postprandial blood glucose levels were higher in the lockdown period, and about 39.15% of participants experienced hyperglycemia. The authors also mentioned that many of the participants reported a decrease in sleep and psychological stress (Khare & Jindal, 2020). A study by Barone et al. (2020) in Brazil reported that about 59.4% of the persons with diabetes in the study had an increase, decrease, or higher variability in their glucose levels. Additionally, 38.4% of persons postponed their medical appointments or routine examinations and experienced a lack of access to medications and other supplies (Barone et al., 2020).

A Turkish retrospective observational study was conducted where they investigated the effects of the lockdown on the blood sugar levels, weight, diet, and exercise patterns of persons with type 2 diabetes (Önmez et al., 2020). An increase in weight, waist circumference, and glycemic parameters was observed (Önmez et al., 2020). The researchers also found that the proportion of people performing regular

physical activity and exhibiting dietary compliance was low (Önmez et al., 2020). The literature also identified the issue of weight gain during the COVID-19 lockdown. Sharma (2020) noted the possibility of weight gain during the COVID-19 quarantine period. Zachary et al. (2020) hinted at the widespread concern about weight change during the COVID-10 pandemic. In their study, the authors reported 22% of the participants' weight gain. Physical activity was also affected during the pandemic. Khader et al. (2020) said that 59.07% of the diabetic participants in the study had a decrease in their physical activity and Barone et al. (2020) reported similar results, with 59.5% having a reduction in their physical activity.

Several authors pinpointed reasons for the self-management challenges faced by persons with diabetes during the COVID-19 pandemic. Khare and Jindal (2020) mentioned that the COVID-19 lockdown shook the pillars for glycemic control (diabetes self-management behaviors). Khader et al. (2020) added that there were major disruptions to diabetes care during the lockdown period. Persons were encouraged not to visit or had limited access to medical facilities or pharmacies due to the imposed lockdown (Mukona & Zvinavashe, 2020; Nachimuthu et al., 2020; Önmez et al., 2020). Tao et al. (2020) also explained that many diabetic patients feared attending clinics during their home isolation. As a result, persons missed appointments or routine checkups resulting in sustained periods of hyperglycemia or hyperglycemia (Mukona & Zvinavashe, 2020). Some persons also experienced the uncertainty of the availability of medicines (Khader et al., 2020). Restrictions in health services resulted in diabetes treatment delays or interruption of routine care. Wicaksana et al. (2020) mentioned that

some people with diabetes had limited access to fresh fruits and vegetables and consumed canned or packaged foods that affected their weight or glycemic control. Additionally, restriction of activities and dietary changes resulted in increased anxiety and stress (Önmez et al., 2020). Being home with little or no exercise was also an issue for people with diabetes during the lockdown period resulting in impaired blood sugar regulation (Khare & Jindal, 2020).

Summary

Diabetes is a global concern that disproportionately affects developing countries. Maneze et al. (2019) described the disease as a "silent pandemic" and one of this era's most common chronic diseases. Diabetes self-management or self-care is a significant aspect of diabetes care and the overall management of the disease. The COVID-19 pandemic forced several countries worldwide to implement regulations to reduce the spread of the virus. This chapter summarized what was known about diabetes self-management and diabetes self-management during the COVID-19 pandemic.

Diabetic patients must manage their condition to ensure glycemic control and prevent disability and rehabilitation (M. M. Adu et al., 2019; Shrivastava et al., 2013). The daily care of diabetes depends majorly on the persons affected with diabetes. Several essential behaviors predict good outcomes, specifically healthy eating, physical activity, blood sugar monitoring, compliance with medications, and good foot care. The literature revealed that these self-management behaviors were associated with glycemic control and overall good health among people with diabetes. The evidence also showed the challenges faced by persons in managing their condition. Despite well-established self-

management guidelines, many people living with diabetes struggle to practice good self-management (M. M. Adu et al., 2019; Banasiak et al., 2020). Khairnar et al. (2019) mentioned that a small portion of people with diabetes achieves their glycemic goal.

The novel COVID-19 emerged as a global pandemic in late 2019. Several countries across the world implemented lockdowns and other regulations to restrict the movement of people. The literature showed that people with diabetes were more at risk from COVID-19 infection (Joshi et al., 2020; Mukona & Zvinavashe, 2020; Schofield et al., 2020). Furthermore, several authors wrote about how the COVID-19 pandemic affected the diabetes self-management of patients. Banerjee et al. (2020), Khare and Jindal (2020), Nachimuthu et al. (2020), and Gosh et al. (2020) explored how the stay-at-home order in India affected the diabetes self-management practice. Mukona and Zvinavashe (2020) looked the effect of Zimbabwe's social distancing and lockdowns on diabetes self-management. A Brazilian report by Barone et al. (2020), an Italian research by Di Renzo et al. (2020), and a Turkish study by Önmez et al. (2020) reported the effects of the lockdown on various aspects of diabetes care. Several studies originated from China and the United States also looked at the pandemic's impact on diabetes self-management.

In the literature search, what was ultimately noted was a lack of research done on the self-management behaviors of diabetes during the pandemic in Grenada and the wider Caribbean region. Thus, this study aimed to fill this gap in the literature and extend the knowledge for this area. What follows in Chapter 3 is a description of the research methodology. Outlined is the research strategy, the research method, the research

approach, the data collection method, the selection of the sample, the research process, the data analysis, and the ethical considerations.

Chapter 3: Research Method

In Chapter 2, the literature was reviewed, and a synopsis of six self-management behaviors, predictors of diabetes self-management, COVID-19 pandemic and diabetes, and diabetes self-management during the lockdown was presented. The purpose of this qualitative study was to explore the perceptions of adults with diabetes in Grenada regarding their self-management behaviors during the COVID-19 lockdown period. In this chapter, I provide details about the research design and methodology, the role of the researcher, participant selection, data management and analysis, recruitment strategies to obtain the sample, data collection and analysis, issues of trustworthiness, and ethical issues.

Research Design and Rationale

The following research questions guided the study:

RQ1: What were the lived self-management experiences of adults with diabetes in Grenada during the COVID-19 lockdown period?

RQ2: What were the attitudes, norms, and perceived behavior control of adults with diabetes in Grenada toward diabetes self-management during the COVID-19 lockdown period?

For this study, a phenomenological approach was embedded with a directed content analysis approach. The phenomenological approach was employed to better understand the experiences of adults with diabetes during the lockdown period. Creswell and Poth (2018) described a phenomenological study as an approach that describes the common meaning of the lived experiences of a concept of several individuals. Individuals

react or behave differently to an event based on their perceptions of the situation. Phenomenology provides a subjective understanding of people's reactions and their perceptions of a phenomenon to place it within a context (Burkholder et al., et al. 2016). Phenomenology has a strong philosophical background based on the writings of Husserl and several others who later expanded on his views (Burkholder et al., 2016; Creswell & Poth, 2018).

Phenomenology studies have several features that make them appropriate as the chosen research tradition. There is an emphasis on a single phenomenon explored with a group of individuals who have experienced a similar phenomenon and involves interviews with those who have experienced the phenomenon (Creswell & Poth, 2018). Descriptive phenomenology involves taking the reported experiences from individuals and presenting them in a manner that is easy to understand through themes and patterns (Burkholder et al., 2016).

In the current study, a qualitative content analysis approach was used to understand the attitudes, norms, and perceived behavior control of the participants' diabetes self-management during the COVID-19 lockdown period. Qualitative content analysis is a type of research methodology used to interpret data (Kibiswa, 2019). Qualitative content analysis is the subjective interpretation of data through a systematic classification of coding and theme identification (Hsieh & Shannon, 2005). A long history can be seen with content analysis as an analytic technique dating back to as early as the 18th century (Hsieh & Shannon, 2005). Krippendorff (1980, as cited in Kibiswa, 2019) and Weber (1985, as cited in Kibiswa, 2019) were among the earliest theoreticians

of content analysis. This type of research focuses on the content or the contextual meaning of the data that are collected in the study (Kibiswa, 2019).

One of the main goals of directed content analysis is to validate or extend a theory or framework (Assarroudi et al., 2018; Hsieh & Shannon, 2005; Sabzmaka et al., 2020). As such, directed content analysis is deductive in nature. Generally, theories can help focus the research questions and then provide predictions about the study variables, which aids in the determination of a coding scheme or relationships among codes (Assarroudi et al., 2018).

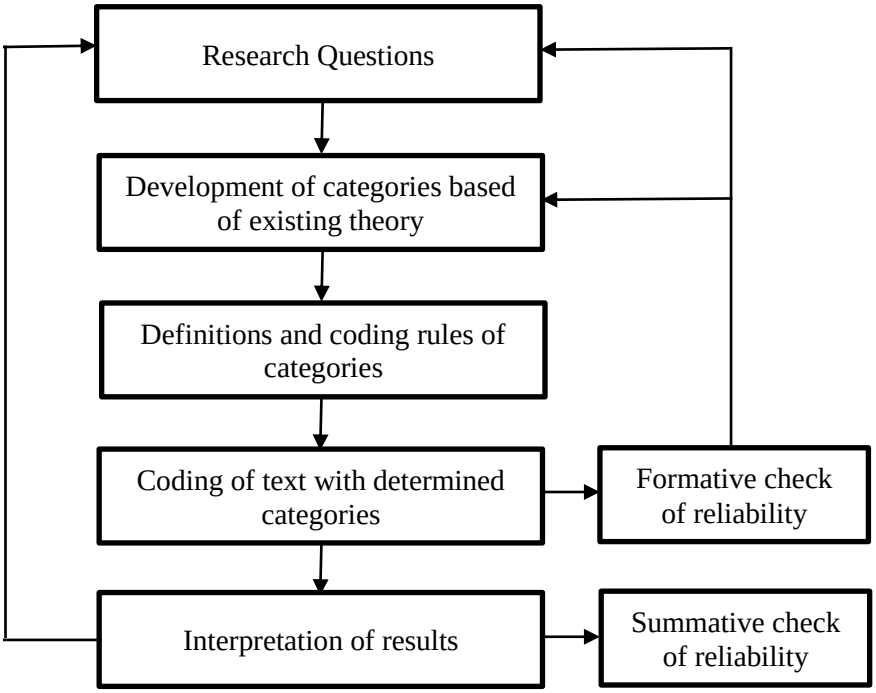
The rationale for using directed content analysis for the current study was in its structured approach to research analysis. Assarroudi et al. (2018) explained that the approach first determines categories using a theory and then identifies key concepts that can be identified as initial coding categories. The theory is then used to guide the discussion of findings. Assarroudi et al. noted that the findings of the directed content analysis could also support or provide nonsupporting evidence for a theory. Assarroudi et al. also added that the interpretation of the data collected is guided by the categories and themes defined before data collection, and as the analysis progresses, the initial codes can be revised or refined, and additional codes can be developed. Directed content analysis allows researchers to understand social reality in a subjective but scientific manner (Assarroudi et al., 2018).

The steps in directed content analysis can be seen in Figure 2. Concepts were identified as initial coding categories using the theory of interest, and definitions of the categories were determined (see Hsieh & Shannon, 2005). The interviews included

targeted questions regarding the predetermined categories (see Hsieh & Shannon, 2005). Coding was done with the predetermined codes, and data that could not be coded were later analyzed to determine whether they represented a new category or a subcategory of an existing code (see Hsieh & Shannon, 2005).

Figure 2

Directed Content Analysis Process



Note. Adapted from Mayring (2000).

Role of the Researcher

According to Creswell and Creswell (2018), the researcher is a crucial instrument responsible for collecting and analyzing data through an inductive process. I had the role of an observer and was obligated to identify myself and share the study's goals during the

interaction with the participants. In addition, my role included designing, interviewing, transcribing, analyzing, and reporting the experiences and perceptions of the participants.

There is a potential for bias across all research. In qualitative studies, bias can result in the multiple choices a researcher makes due to their underlying assumptions or beliefs (Ravitch & Carl, 2016). Therefore, it is critical to understand these values and beliefs and confront them in the research decisions and approaches as an ethical responsibility of the researcher.

There was bias in my epistemological and ontological assumptions. This bias was managed by the deliberate choices to account for and acknowledge these biases through deliberate methodological choices (see Ravitch & Carl, 2016). It was also essential to discuss and approach the study within the limitations of these biases. My beliefs, experiences, and understanding of the topic also presented bias. As such, I collaborated and had dialogic engagements with colleagues who were researchers. These dialogic engagements allowed me to challenge my biases and interpretations (see Ravitch & Carl, 2016). This was important to allow more experienced researchers to be involved in thoughtful and critical dialogue about various aspects of the research process. These engagements also pushed me to examine myself and parts of the research that may have otherwise been taken for granted or left unexamined (see Ravitch & Carl, 2016). Another way biases were managed was through the piloting of the testing instrument. The interview questions were shared with several research colleagues. Their revisions helped me refine the questions to ensure that they would address the research questions and mitigate potential biases.

Methodology

Participant Selection Logic

The sampling strategy that was used was convenience sampling, which involved selecting convenient people from a target population. This sampling strategy allowed for recruitment of people who were available or more likely to participate. An advantage of using convenience samples is that it is easy to access, relatively inexpensive, and efficient when gaining access to a population of interest that is difficult to find (Lewis-Beck et al., 2004; Salkind, 2010). Instead of making multiple attempts at contacting or selecting participants, convenience sampling provides some latitude in determining participants for the study. Another practical advantage of this sampling strategy is that an exhaustive list of the study population is not required (Frey, 2018). This strategy saved me time and travel expenses.

The target population was Grenadian adults who had been diagnosed with diabetes. Several criteria were used to represent the characteristics reflected in the sample population to address the research questions. The following criteria were used for the inclusion of participants: the diagnosis of type 2 diabetes, residence in Grenada during the lockdown period, and age range between 35 and 65 years. Flyers were used in the recruitment of participants, which helped establish interest to serve as research subjects. Using this method for recruitment ensured respect for privacy. Singling out people with diabetes may have raised privacy concerns. The use of flyers guaranteed that there was no pressure, and that participation was voluntary. The flyers were posted at three physician’s offices and the Grenada Diabetes Association, both located in the capital city

on the island. Each flyer contained the purpose of the study, the participant criteria, and the contact number of the researcher (see Appendix B). When contacted, I provided more information and helped the potential participant make an informed decision on whether they would participate. Once the participant agreed, a consent form was shared, and a convenient day and time were discussed to have the interview.

For the study, a sample size of 13 participants was used. According to Ravitch and Carl (2016), there are no set rules in qualitative research regarding the number of participants. The sample size in qualitative research is typically smaller than the sample size in quantitative research. This is because qualitative research methods are concerned with obtaining an in-depth understanding of a topic and are not focused on generalizing about a population. A sample size of 13 was sufficient for the current study because the goal was to answer the questions and achieve a multiperspective understanding (Ravitch & Carl, 2016). Additionally, the sample size supported the depth of the case-oriented analysis by virtue of the participants' ability to provide rich information (see Vasileiou et al., 2018).

The rationale for the sample size of the study was based on recommendations for phenomenological studies. Burkholder et al. (2016) explained that a sample size between five and 15 is appropriate for phenomenological studies. Qualitative studies using a directed content analysis approach also provided the basis for the sample size. Belil et al. (2018) used a sample size of 22 and used semistructured interviews to explore aspects of self-efficacy among people with chronic physical conditions. Sabzmakan et al. (2020) conducted 26 interviews with open-ended questions based on the TPB and used directed

content analysis to analyze the data. Humble (2009) conducted semistructured interviews with 14 participants and used directed content analysis in their investigation.

Saturation was another important concept that was considered. Saturation can be defined as the point at which the data collection process is no longer providing new or relevant information or when conceptual categories no longer offer new insights (Dworkin, 2012). A sample size of 15 to 20 is considered appropriate for the saturation of themes during data analysis (Given, 2008). Saturation is essential because it indicates data validity (Hennink & Kaiser, 2019).

Instrumentation

Interviews were used as the data collection instrument in the current study. Interviews are conversations between the participants and the researcher, with the researcher asking questions and listening and the participants answering. Interviews are in-depth explorations between the researcher and participants in which the participants are encouraged to speak freely regarding the topics discussed (Oishi, 2003). In the current study, interviews were sufficient to answer the research questions. The questions elicited rich responses about participants' experiences. During the interview, I recorded the session and took notes. The recordings were later transcribed.

A data collection protocol or a set of questions that prompted responses from the participants was used to collect data (see Appendix A). Although the nature of a semistructured interview allows the interviewer the scope to digress, the major topics in the interview guide will be targeted (Morris, 2015). Additionally, semistructured interviews offer flexibility, allowing questions to emerge while the interview progresses

(Morris, 2015). The interview protocol in the current study was reviewed using the protocol refinement framework presented by Castillo-Montoya (2016) to strengthen the research reliability. The protocol refinement framework consists of four phases: (a) aligning the interview with the research question, (b) constructing the interview as a conversation that is inquiry based, (c) seeking feedback on the interview protocol, and (d) practicing the interview protocol (Castillo-Montoya, 2016).

The development of a guide was based on several key aspects. First, the overall topic and research question formed the framework of the questions (see Table 1). Second, the interview guide constituted key topics that shaped the overall interview (see Morris, 2015). Questions within the topics were developed using the key topics. Furthermore, directed questions about main categories extracted from the theory were used (see Table 2). Probes were also used during the interview to generate richer information.

Table 1

Topics for Interview Guide

Research Question 1	Research Question 2
Topic 1: Diet	Topic 1: Attitudes
Topic 2: Exercise/physical activity	Topic 2: Norms
Topic 3: Medication adherence	Topic 3: Perceived behavior control
Topic 4: Glucose monitoring	

Table 2

Sample Interview Questions for Research Question

Theoretical construct	Interview question
Attitudes	Can you explain how you felt about exercising?
Subjective norms	How did the people around you respond to you exercising or not exercising?
Perceived behavior control	How confident did you feel about exercising regularly?

Procedures for Recruitment, Participation, and Data Collection

Data were collected during the interviews held via telephone calls, and I collected the data as the sole researcher in the study. The interviews were conducted over a 2-month period according to the participants' availability. The interviews were recorded using an audio recording device. After data collection, participants were asked to review the transcribed interview to ensure accuracy and transparency. Participants corrected or clarified any statements that were not correctly reflected.

Data Analysis Plan

Data from interviews were used to answer the research questions, and data analysis plan was a major part of the research process. A software called Dedoose was used to help manage the data. After the interviews, the audio recordings were converted into text. Transcription of participants' responses verbatim was done using the dictate feature in Microsoft Word. Ravitch and Carl (2016) explained that immersive engagement allows the researcher to immerse themselves, engage critically with, read, and analyze research data. This was done through, firstly, engaging in multiple readings.

A thorough reading, also called unstructured reading, allows the researcher to grasp the overarching context and be immersed in the entire data (Ravitch and Carl, 2016).

After the transcripts were generated, coding began, which further organized the data for analysis. Coding was the second step in immersive engagement. According to Ravitch and Carl (2016), codes are descriptive labels that allow data to be organized into manageable units. The approach to coding incorporated a strategic combination of both inductive (coming from the data) and deduction (coming from the TPB) approaches. The Dedoose application was used to manage the coding process. Inductively, codes were assigned to related words or phrases. Deductively, preliminary categories using the TBP were used in the data analysis.

For inductive coding, the process involved steps suggested by Creswell and Creswell (2018). The process included organizing and preparing the data for analysis and then reading through the data. Then, the data were coded using open coding, which included reading through the transcripts, breaking them into small pieces, and then coding the discrete pieces of data with a descriptive label (see Rudestam & Newton, 2015). The next step was the generation of themes and categories. This step involved looking for connections or relationships between the codes and condensing them into broader categories (see Allen, 2017). Finally, selective coding involved bringing codes together with one overarching theme (see Mills et al., 2010).

The deductive coding process involved defining codes before data analysis using the TPB. Main categories and subcategories were developed based on theoretical definitions (Assarroudi et al., 2018). There was also the potential for the emergence of

new main categories during the analysis process (Assarroudi et al., 2018). After this, preliminary codes with similar meanings or relationships were grouped, and links between generic and main categories were established (Assarroudi et al., 2018).

Issues of Trustworthiness

Issues of trustworthiness were addressed to ensure that the current study made sense of the data without comprising its richness. The criteria for trustworthiness included credibility, transferability, dependability, and confirmability. Credibility considers the confidence that can be placed in the findings of the research (Korstjens & Moser, 2018). In order to maintain credible results, data saturation was considered. Though a sample size was suggested, saturation ensured replication of categories and the generation of no new information. For research using content analysis, it was recommended that preliminary analysis starts after a few interviews (Elo et al., 2014). Peer review or engaging with other researchers was used to ensure credibility in this study. The support and feedback of other professionals helped guide and improved the quality of this research. Elo et al. (2014) noted that self-awareness or reflexivity is essential from the viewpoint of credibility. A pre-interview helped me examine my actions and ensure the interview questions were suitable for retrieving rich data to answer the research questions (see Elo et al., 2014).

Transferability refers to the degree to which the research is applicable to other contexts or settings with other participants (Korstjens & Moser, 2018). Rich and thick verbatim descriptions from the participants were included to ensure transferability. Purposeful sampling of participants also ensured transferability. The stability of the

results over time is known is dependability (Korstjens & Moser, 2018). Audit trails were used to address dependability. This involved being transparent and accounting for the research process, including collecting, recording, and analyzing data (see Anney, 2014). I kept a detailed written account of the steps taken in the research. Keeping an audit trail also addressed confirmability. Audit trails consider the extent to which the research findings can be validated by other researchers (Korstjens & Moser, 2018). Furthermore, intercoder reliability was established by utilizing independent researchers to examine the codes. Once researchers agree on the coding, then reliability was established.

Ethical Procedures

The research was conducted ethically by considering and anticipating ethical issues. Permission to gain access to human participants and to engage in the study's procedures was done in accordance with the ethical standards of the Institutional Review Board (IRB). A written application, which provided evidence that the study will follow their guidelines, was submitted to St. George's University's IRB in Grenada and Walden University's IRB. Once approval was granted, data collection for this study began. Written consent was obtained from the participants prior to the interviews. The participants were adequately informed about the research and the data collection process and were given the opportunity to ask questions or address concerns. Documents were kept in a locked cabinet where no one else can access them. The participants' privacy was carefully managed during the telephone interview, and their identity was not revealed in the data analysis process and results. Instead, alphanumeric codes were used to identify the participants. Data were stored on a password and fingerprint-protected computer, and

the data were transcribed in a private room with headphones so others would not hear the recordings.

Summary

Chapter 3 highlighted the methods that were used in the research. The research design consisted of a combination of phenomenology and a directed content approach. My role as the role researcher was to carry out the research process while identifying and mitigating potential biases. Convenience sampling was used to select 13 participants, and semistructured interviews were conducted. An interview guide was employed to develop the interview questions. The data were coded, and a directed content analysis approach was used with predetermined categories. Issues of trustworthiness with regards to credibility, transferability, dependability, and confirmability were addressed to ensure the integrity of the research. Additionally, the protection of human subjects was ensured through the application of appropriate ethical procedures.

Chapter 4: Results

The purpose of this phenomenological and directed content analysis qualitative study was to better understand the self-management behaviors of people with diabetes in Grenada during the 2020 COVID-19 lockdown. I investigated the participants' experiences to gain insight into and better understand the phenomenon of interest. Both a directed content analysis and a phenomenological approach were used. Directed content analysis was a structured approach that included predetermined categories from the TPB constructs. Phenomenology is concerned with the essence of a phenomenon and allows a researcher to describe it from a person who has experienced it (Neubauer et al., 2019). The current study was intended to describe the participants' lived experiences in terms of what they experienced and how it was experienced.

Dietary and lifestyle changes are the best approaches for self-care for people with diabetes. Several recommended self-management behaviors are critical for long-term control of the disease. Diabetes self-management becomes a core part of their daily living. The TPB was used as a framework to explore the participants' experiences regarding performing self-management behaviors (attitude), beliefs about the expectations and behaviors of others around them (subjective norms), and whether participants thought they were capable of performing self-management behaviors (perceived behavioral control). Two research questions guided the study:

RQ1: What were the lived self-management experiences of adults with diabetes in Grenada during the COVID-19 lockdown period?

RQ2: What were the attitudes, norms, and perceived behavior control of adults with diabetes in Grenada toward diabetes self-management during the COVID-19 lockdown period?

Five self-management behaviors were explored during the interview: exercise, diet, medication compliance, glucose monitoring, and foot care. Semistructured interviews were carried out with 13 Grenadian adults who resided on the island during the mandatory COVID-19 lockdown in 2020. The interview questions were open-ended, and an interview protocol was used as a guideline.

This chapter includes a description of the study demographics and data collection. The data analysis section includes a description of the systematic process of how the main themes were derived from the interviews. The chapter also addresses issues of trustworthiness, including credibility, transferability, dependability, and confirmability. The findings are presented by themes and categories, along with supporting data, and a summary concludes the chapter.

Demographics

The study sample comprised 13 Grenadian adults between the ages of 35 and 65. The participants provided information about their gender, age, location, number of years with diabetes, and occupation (see Table 3). Each participant was assigned an alphanumeric code to ensure their confidentiality and protect their identity. There were five male and eight female participants in the study. Nine (69%) of the participants were employed, one (8%) was unemployed, and three (23%) were retired. Four (31%) of the

participants lived in the rural parts of the island, while nine (61%) lived in the urban regions.

Table 3

Participants' Demographic Information

Participant ID	Sex	Age	Years with T2D	Occupation	Location
P1	Male	35	5	Farmer	Rural
P2	Female	54	4	Writer	Urban
P3	Female	50	10	Nurse	Urban
P4	Female	64	15	Retired	Urban
P5	Male	65	14	Retired	Urban
P6	Female	43	5	Unemployed	Urban
P7	Female	56	7	Cook	Rural
P8	Female	40	3	Housekeeper	Rural
P9	Male	65	4	Retired	Rural
P10	Male	38	5	Bus driver	Urban
P11	Female	37	3	Teacher	Urban
P12	Female	54	12	Cleaning	Urban
P13	Male	59	11	Carpenter	Urban

Data Collection

Data were collected during semistructured interviews with 13 adult participants. The proposed sample size was 20 participants. However, saturation was reached at nine participants, and data were collected from 13 participants. Saturation was determined when the coding did not provide new information or add value to the data. The interviews

were completed between May 2021 and June 2021, and they occurred over the telephone. The participants reached out to me to discuss a convenient day and time. The informed consent form was also reviewed. On the scheduled day, the participant was called, and the interview was conducted. The interview time ranged from 20 minutes to 1 hour, with an average of 30 minutes. The interviews were conducted in an enclosed private room, the phone was placed on speaker, and the interview was recorded using a digital recorder. During the interviews, I took notes to capture my thoughts or observations. A $15 call credit was sent to the participants' phones after the interview. The recordings were then uploaded onto a password-protected computer and transcribed. There were no variations in data collection according to the plan presented in Chapter 3. Some challenging circumstances included late and rescheduled interviews due to long working hours, personal responsibilities, or conflicts in schedules.

Data Analysis

Data Analysis Process

Data analysis for the research involved qualitative coding. P. Adu (2019) characterized coding as a rigorous process in which a researcher makes meaning of the data. The process is systematic, transparent, and subjective and involves generating codes from the data and subsequent development of categories and themes (P. Adu, 2019). The following process suggested by Creswell and Creswell (2018) was used to move from coded units to larger representations:

1. Organization and preparation of data for analysis: The recorded interviews were uploaded on a password-protected computer for transcription. A

consistent naming system was used for the audio files (e.g., P1, P2), and the transcripts were organized in designated folders. Each interview was transcribed after the session. The Microsoft Word transcription feature was used initially for uploading the audio and transcription. However, most of the conversations were not transcribed accurately, so I had to transcribe the interviews manually. I also made sure mistranscribed words due to the local dialect were spelled correctly to improve readability and ensure accuracy.

2. Read the data: After transcription, the transcripts were printed, and I browsed through them. Then I read through each transcript carefully, once again listening to the audio as I read. I also made a note of any first impressions.
3. Coding of data: The transcripts were read, and relevant phrases or sentences were labeled with preliminary codes using colored pens. The coding strategy that was employed was descriptive coding, which involves using a word or short phrase to describe chunks of the data (Saldana, 2012). During the coding process, I considered the purpose of the study and the research questions. A code list was also created using the constructs of the TPB and was used during the coding process (see Table 4). The Microsoft Word copies of the transcripts were uploaded to the Dedoose software. In the software, descriptors were created using the participants' demographic information, and codes were created using the preliminary codes generated from the hard copy transcripts. The transcripts were again coded in Dedoose. The codes were revised and then refined.

4. Generation of themes and categories: A list of the codes was exported from Dedoose into an Excel file, and categories were created by bringing several codes together. The process involved assessing each code, reviewing the commonalities among the codes, and grouping them based on similar characteristics (see P. Adu, 2019). Themes were formulated based on examination of the categories, which were reduced to represent the codes and address the research questions (see P. Adu, 2019). According to Creswell and Creswell (2018), the themes are the major findings of the study. Categories were also created using the coding frame developed from the TPB (directed content analysis). The relevant information was extracted from the data and then assigned to the preexisting categories.
5. Representation of themes and categories: The themes and categories were displayed and supported by quotations to show the different perspectives of the participants.

Table 4

Code List Using the TPB

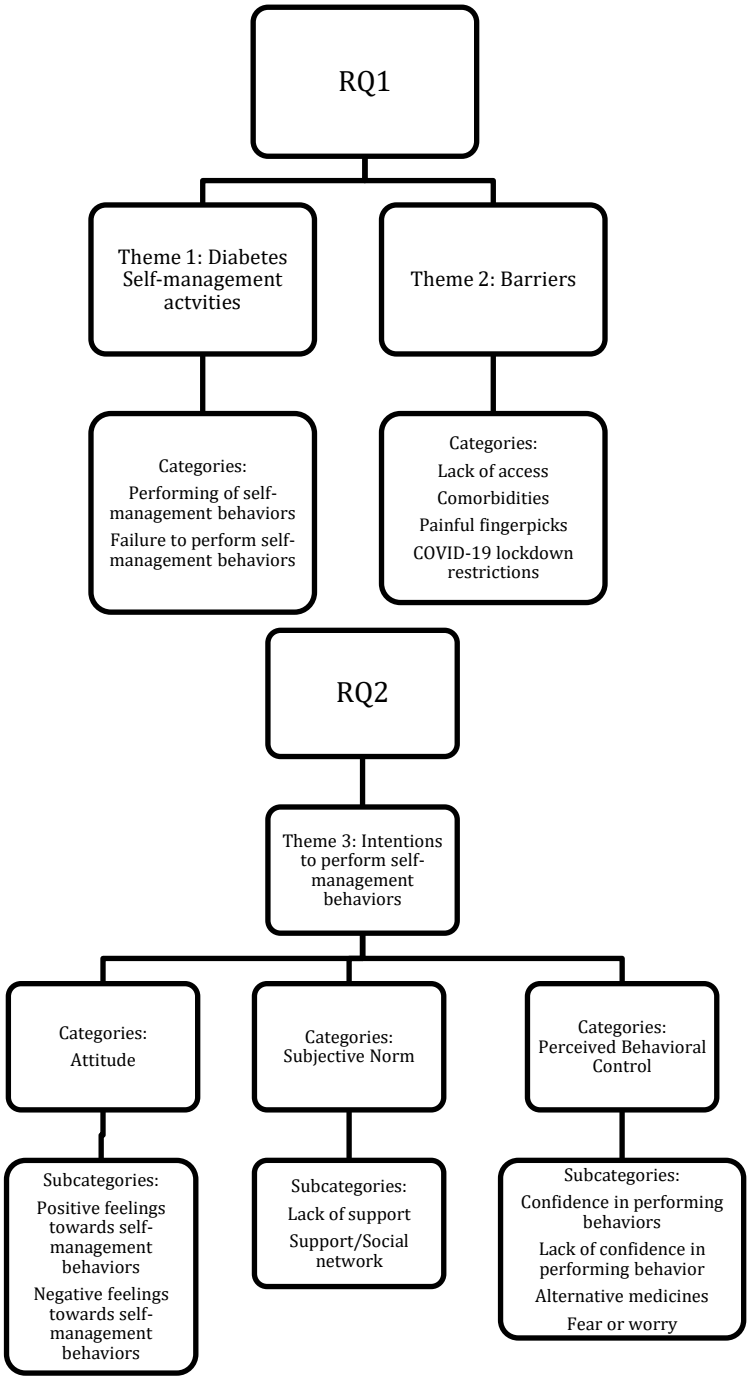
Theory construct/theme	Description	Research question
Attitude	The degree to which performance of the behavior is positively or negatively valued	How did you feel about exercising or physical activity? How did you feel about eating healthy? How did you feel about taking your medication as prescribed? How did you feel about doing footcare?
Subjective norm	The perceived social pressure to engage or not to engage in a behavior	How did the people around you respond to you exercising or not exercising? How did the people around you respond to your diet/eating habits? How did the people around respond to medication compliance/how you were taking your medications? How did the people around you respond to your foot care?
Perceived behavioral control	Refers to a person's perceptions of their ability to perform a given behavior	How confident do you feel about exercising regularly? How confident were you about eating healthy or following your recommended diet? Can you describe how confident you were in taking your prescribed medication? How confident are you in your foot care?

Codes, Categories, and Themes

Several codes emerged from the transcribed data. The codes were then grouped and formed into categories and then further into themes. Three main themes emerged from the data: (a) diabetes self-management activities, (b) barriers, and (c) intention to perform self-management behaviors (see Figure 3). Three categories relevant to Theme 3 (attitude, subjective norm, and perceived behavior control) were predetermined using direct content analysis.

Figure 3

Codes, Categories, and Themes From Data



Evidence of Trustworthiness

Credibility, transferability, dependability, and confirmability were addressed to establish evidence of trustworthiness. Credibility was assessed to ensure that the study addressed what was intended. The study's credibility was maintained by ensuring saturation of the data. Transcription and coding occurred after each interview to ensure that there was no new information and that the codes were replicated. Peer review and engaging with professionals also enhanced credibility. Professional colleagues were given the opportunity to scrutinize the research and provide feedback, which enabled the refinement or strengthening of different aspects of the study. These colleagues assisted in coding and reviewing the categories and themes. Also, I conducted a preinterview, which helped me refine the interview protocol, gauge my pace, and have some experience with the process. Transcript review also provided credibility in the research. A copy of the transcribed interview was shared with the participants, and they were given an opportunity to review and make any necessary amendments. Finally, tactics to ensure honesty from the participants were employed. Participants were given the opportunity to refuse to participate in the study, and they were encouraged to be honest when answering the questions.

Transferability was ensured by using purposeful sampling to select participants who were best suited to answer the research questions. Also, transferability was accomplished by giving an account of the data collection techniques utilized, interview protocol and questions, and the length of data collection. Other rich accounts of the data, such as participant demographics and sample size, were given.

Confirmability was significant in the study to ensure that the findings resulted from the participants' experiences and not from my experiences. This was done by rechecking the data throughout the study. Engaging in reflexive journaling also provided confirmability. Note-taking to record my insights, thoughts, or feelings immediately after the interview and throughout data analysis was done. New ideas come into mind during data analysis, and it was important to document for future reference. Reflective writing also encouraged me to brainstorm ideas. Furthermore, it facilitated a chronological presentation of how codes were assigned and how categories and themes were developed (see Adu, 2019). Finally, I used transparency to maintain dependability. Dependability occurred by using decision trails by detailing the study's specific purpose and how participants were selected. The research process, including data collection, recording of interviews, and interpretation and presentation of findings, were also thoroughly described.

Results

The emerging themes and categories were organized based on the two research questions. The three themes and associated categories (see Figure 3) were identified and explained using quotes from the participants.

Themes Relevant to Research Question 1

RQ1: What were the lived self-management experiences of adults with diabetes in Grenada during the COVID-19 lockdown period?

Research Question 1 probed participants to share their self-management experiences during the COVID-19 lockdown in 2020. Based on the participants'

responses, two themes relevant to Research Question 1 emerged. The associated themes, categories, and codes are outlined in Table 5.

Table 5

Themes and Categories Associated With Research Question 1

Theme	Categories	Code example
1. Diabetes self-management activities	1. Performing of self-management behaviors 2. Failure to perform self-management behaviors	Eating a balanced diet, exercising as housework, not able to exercise, forgetting to take medication, exercise from farming
2. Barriers	1. Lack of access 2. Comorbidities 3. Painful fingerpicks 4. COVID-19 lockdown restrictions	High cost of food, no medication, curfew, pain when testing, 24-hour curfew

Theme 1: Diabetes Self-Management Activities

Participants were asked to describe their exercise routine, diet, medication routine, how they monitored their blood sugar, and their foot care. All the participants provided insights into their experiences. Diabetes Self-Management Activities was an appropriate theme from Research Question 1. The codes from the transcript (examples shown in Table 5) centered around all the participants' activities to manage the disease. The findings revealed specific self-management behaviors they were engaged in or behaviors they did not employ. The key findings were organized and simplified into two themes: Performance of Self-Management Behaviors and Failure to Perform Self-Management Behaviors. These two categories suggested the overarching idea of diabetes self-management. Subsequently, they were further organized into the main theme, Diabetes Self-Management Activities.

Category 1: Performing Self-Management Behaviors. Question 1 a) asked about the participants' exercise routine. Persons with diabetes should get about 30 minutes of regular exercise per day, five days a week (Mekonnen et a., 2021). Few participants indicated that they had an exercise routine. However, most participants shared that even though they did not have an exercise routine, they were physically active during the lockdown. Several participants used the beach as recreation and a form of exercise. Physical activity considers all the movement carried out by the body that increases energy use, whereas exercise is planned, intentional, and structured physical activity (Colberg et al., 2016). Consistent physical activity is also critical for persons with diabetes. It is recommended that adults engage in at least 150 minutes of physical activity of moderate intensity, 75 minutes of physical activity vigorous in intensity, or an equivalent combination of the two intensities per week (Oh, 2020).

P11 said, "well, I used to just do some skipping. I had a skipping rope. A little before that, I was doing it, you know. And I use to walk in my yard." P7 also did some walking during the lockdown. They said, "yeah, I was able to do some exercise. Even though it was the lockdown, and they said we couldn't go anywhere. Like I walked. Sometimes I go down the beach and walk." P1 noted that their exercise was related to their work. Their daily farming duties, which often included lifting, digging, and walking, were their exercises during the lockdown. They stated:

> Well, I'm a farmer, so most of my exercise during that time was related towards farming. There were also some instances where there was no public transportation, and I needed some supplies. So, then I got a little bit extra exercise

> because I had to walk a lot of miles to get some supplies. So, during the lockdown, I did get a bit of exercise.

Other participants shared that they were active doing house chores during the lockdown time. Housework included cooking, cleaning, and doing laundry. P2 noted that while they did not have an exercise routine, they were physically active around the house. It was not usually part of their daily routine, but they embraced the opportunity to move around since they could not leave the house.

> I cooked two meals a day, Monday to Friday, which is unusual for me. In regular time I work. So, I would buy breakfast and lunch. But with the lockdown, I had to actually stand in the kitchen preparing breakfast, including baking bread. And you know, it may not sound as much, but it is unusual for me to be in the kitchen and doing regular household work. But every day, I found something to do. Some days, when I jump out of bed, the bed stays like that until I get home. But in that time, you know I did the things around the house. What may be an everyday thing for some people, because I work, and I have to travel from St. David to St. George, two buses, usually on the morning. I am running to get out of the house. During lockdown, I was able to do bits and pieces in the house every single day. That was my activity.

Question 2 a) inquired about the diet of the participants during the lockdown period. A healthy diet comprises of foods from the 6 Caribbean food groups: staples, legumes, food from animals, fats, fruits, and dark green leafy and yellow vegetables. For persons with diabetes, the recommendation is the consumption of fish, white meat,

vegetables, fruits in moderation, legumes, complex or unprocessed carbohydrates, and foods high in fiber (Caribbean Public Health Agency, 2019).

Some of the participants noted that they tried to eat a balanced diet to the best of their ability during the lockdown, and they also tried to limit unhealthy foods. Soup as a meal came up repeatedly as a food of choice for the participants. Soups for many of the participants contained starchy ground provisions and meat. P2 managed well during the lockdown where their diet was concerned. Before the lockdown, P2 ate more processed carbohydrates but was able to eat more vegetables and meats and less starch during the lockdown. P7 shared, "well, during the lockdown time I tried not to use too much things with starch and much sweet. I tried my best to have a balanced diet." P4 shared that their daughter cooked their meals and stated, "I have no problem eating healthy." The participants also mentioned that they preferred to eat more soup. P6 also said, "well food as usual. Rice, peas, a lot of soup, vegetables."

Diabetes medication is often prescribed to patients to help lower insulin levels. Question 3a) examined the medication routine of the participants. Participants suggested that they valued their medication adherence as their instrument to maintaining health. Two of the participants (P1 and P4) did not have a medication routine. Two participants used insulin in their medication routine. P11 indicated, "I usually take insulin because they tried giving me the Metformin, and I can't take it." P2 also shared:

> Well, the only medication I use is insulin. The routine is that I wake up in the morning, I check my levels. I aim for my levels to be under 100. If I am 101 or 110, it doesn't bother me, because I just woke up. Then I will prepare breakfast.

> According to what I was going to consume, then I will probably take a little insulin, the slow release. As for lunch I do the same thing, check my levels, and according to where I was, I have to take some insulin and give it some time for it to work before I eat again. So, every time I have a meal, I must check my level. And according to what I consume, then I know I have to take insulin.

Six of the other participants used Metformin. Metformin was a common drug used among the participants. P10 and P12 indicated that they were on both Metformin and Diamicron. P9 said, "I am on metformin. I took 2 per day," and P8 also said, "yeah, I'm on Metformin. Well, it's twice a day." P7 adjusted their routine based on their levels, but their doctor did not establish it. They shared, "I use to have to take one a day. Only if it high I will take two, twice a day." Interestingly, P6 did not know the name of the medication and simply said, "well, I am on medication. I take the sugar tablets twice a day."

Blood glucose monitoring is an essential tool for diabetics. Regular testing and being aware of blood glucose levels can prevent further health complications. Most participants checked their levels haphazardly. For example, P7 said, "yes, I use to check it off and on. I would check it at home." Similarly, P9 said, "we have a machine, so we check it. My daughter checks it when she remembers, maybe every other week. I know what I'm supposed to eat so it makes no sense checking it every day. I don't really have symptoms." Participant 8 did not check it every day and admitted to skipping day. This was in an effort to save strips.

Other participants had a clear routine and checked their levels more consistently. Participants 2, 10, and 13 reported checking their levels daily during the lockdown. This allowed them to be more aware of their glucose levels to ensure good health. Others noted that they could eat certain foods because their glucose level was in a certain range. P8 checked levels regularly and adjusted their medication accordingly. P8 described their routine by saying:

> Well, I mean I would take in the morning before I eat anything, would check it. And depends on what I eat for the day. Because when it is high, I could tell. If I feel it's high, I would check it to see how it is. If I check it and it's like 300 something, I will take two tablets instead of one.

Participants were also asked to describe their foot care during the COVID-19 lockdown. Diabetic foot care involves activities such as inspection or examination, proper foot coverings, toenail care, and proper washing and drying (Fatemeh et al., 2021). Very few participants exhibited good awareness about foot care or had a consistent foot care routine. P4 placed high emphasis on taking care of their foot as it was part of their daily routine. P4 reported, "I normally have to change the dressings every day. If it stays too long, it will get wet. My daughter would do it for me. She goes to the Medical Center and get packages and do it." P12 also explained that they "always take care of my feet." "I don't wear closed shoes, only sandals, and slippers. Yeah. And I don't let anyone cut my toenails." P3 referred to their foot care as an important part of their life. They said:

> You have to care for your foot. To prevent yourself from cutting your foot, you have to have your foot covered. If a stone juke me, it will hurt a lot. When you

> having a bath, you wipe below your feet properly. I work on the surgery ward, and I see lot of people lose their foot from carelessness.

Category 2: Failure to Perform Self-Management Behaviors. Participants admitted to not performing their recommended self-management activities. Failure to perform self-management activities due to lack of access was unintentional, however, in some instance, was purposeful. Some of the participants acknowledged failure to follow their recommended diet. Participants resorted to consuming more of the starchy ground provisions and processed starch. When asked about their diet, P11 stated, "well, that one wasn't too good nuh. Because you cannot get the things you wanted. So, you have to stick to the, to the rice and macaroni." Similarly, P3 said, "so, it's hard to know you have to keep on eating that every day, the macaroni, or the rice." P1 also admitted to eating unhealthily. They said, "umm? I broke all the rules. Most of the things I ate were high in starch. They were ground provision, and so on. Those things are not for diabetics. But as I said, it was what was available." P1 also admitted to snacking during the lockdown. P8 also struggled with their eating habits. The participant said:

> I had to use what I had. So sometimes more starch do come in the diet because you would not get all the vegetable you need. Sometimes you would get a large portion just to full you, instead of eating something healthy.

Lack of exercise was evident among the participants during the lockdown.

Physical inactivity was also a common experience for many participants. One of the reasons for lack of physical activity or exercise was physical limitations. P12 was visually impaired and shared that their family would encourage them to move around

more. However, the participant admitted that they did not want to go outside, and as a result, had no exercise routine and was hardly physically active. P5 used a walker to get around and was afraid of walking long distances. P4 remained indoors and only moved around in their home. P6 was not able to walk or move around by themselves due to swelling of their extremities.

Other participants, like P12, acknowledged their lack of motivation to want to exercise, “no, I didn’t exercise. It’s just that I was lazy. I don’t feel like doing anything. P8 also said:

> No, not much you know. I think during that time, It was, you know, when you’re home, you tend to get lazy. I think after that, after they open up a bit, I start doing jogging on mornings. So not during the lockdown, no.

Medication non-adherence was fairly common. To sustain a high quality of life, persons need to adhere to their medication as prescribed. Participants like P11 did not take their insulin as prescribed, and others self-prescribed medication based on their diet. P10 admitted to forgetting to take their medication. The participant said, “sometimes I forget, and sometimes I just have to take it. I mean, not every day I will take it, but I have to take it. Sometimes I wish I don’t have to take it for good.” P12 simply skipped taking it at times. P12 responded:

> I was on Metformin and Diamicron, twice a day. And sometimes I don’t take it, if I check it and it’s ok, I will leave it out. I does monitor how I eat. I like mango, and mango does bring up my sugar. So, if I suck mango, I will take it as I should. The doctor said to take it morning and night, but sometimes I don’t.

Several participants did not regularly check their blood glucose during the lockdown period. They did not own a glucometer and was unable to visit the community health center to get it checked. P1 ran out of batteries for their device and was unable to use it. P13 did not own a glucometer. P10 had the resources at home to check their blood glucose levels but purposefully neglected to follow recommended testing regime. The participant confessed, “and there were sometimes, carelessness, I never use to monitor it and then when I find I was urinating a lot, I said some is wrong. That means it high.” Nearly all participants did not have a clear diabetes foot care routine. Neglect of diabetic foot care is a major cause of amputation, and it is preventable by regular foot care (Chappidi et al., 2018). When P11 was asked if they had a foot care routine and to describe it, the participant said, “no, I don’t have that. No feet and my hands are just okay.” When asked the same question, P10 reported, “none. And honestly, I don’t want any. Even if I keep my sugar levels at bay, and I get a cut, I could heal.” Similarly, P9 noted, “no, I don’t know about that. I don’t normally do any foot care,” and P7 said, “my skin is okay, so I don’t check it.

Theme 2: Barrier to Self-Management

Participants faced several limitations with regard to their self-management. They expressed concerns about the high cost of food, no medication, pain when testing, and the 24-hour curfew. These codes (seen in Table 5) were grouped into four categories: lack of access, comorbidities, painful finger pricks, COVID-19 restrictions, and fear or worry. The categories were then described as the second theme, Barriers.

Category 3: Lack of Access. Limited access to essential resources was an apparent problem. Due to the COVID-19 lockdown, participants were without several things necessary to manage the disease and maintain a healthy lifestyle. Some participants struggled with a lack of access to healthy foods and vegetables. P1 said that what prevented them from eating healthy was "the lack of ability to get the healthier stuff." Lack of access to fresh fruits and vegetables meant also eating what was accessible. P4 said, "I had macaroni and so on too. I had to eat what was accessible. Because it was difficult." When asked if there was anything that prevented them from eating healthy, P11 said, "well, the supplies, getting what you want, first of all. It was very hard getting the stuff that was better for you." P3 shared the same views and said "well, preventing you from getting this stuff. Like the green provision, lettuce, the cucumber. You couldn't get them because the farmers couldn't go get their produce. So, the supermarkets could not get enough stuff for their customers."

Other participants had issues related to accessing medication. P11 disclosed issues related to their insulin: "my medication ran out because I get my medication through the dispensary, and they don't give you a double supply, they give you one supply. So, it ran out, and the dispensary was closed." Additionally, P2 had concerns about getting insulin and admitted to eating less to manage insulin supplies. The participant said:

> The borders were closed, so supplies wouldn't come in. I mean, we grow vegetables here, people slaughter animals, but we can't make insulin in Grenada. There were occasions during the lockdown where I worried, you know briefly but I didn't let it get the best of me, I figured something will work out. But there were

> times when I wondered, I'm I going to run out of insulin. And I would count the vials, count the pen, ensuring that I had long lasting, ensuring that I had rapid action. And also, the snacking. When you're home, everything is right at hand. And every time I eat, I may have to take insulin, according to what it was. So, I didn't eat all the time or let temptation get the best of me. Because I had to ensure that I had insulin there. I always wanted to know what I had the insulin that I need.

Financial constraints were also evident. Employment was an issue, and even persons who were employed struggled with salary cuts. There was also the concern of increased cost of food items. Due to the shortage of fresh produce, the prices increased. P7 indicated, "well, eating healthy is a bit expensive you know. But I tried my best." P10 said that their current financial situation affected their ability to eat healthily. The participant said:

> Well for me, once I have the funds, I am eating healthy. Once I don't have the funds then I can't do anything. But the only thing is how society is, the thing that is healthy for you is very expensive. That's the only downfall about it. And not all the time you could go in the market. So, when you go to the supermarket, it's just the prices and when you're watching your budget, it discourages you from buying certain things. And even if you buy it, you can't have it for a length of time, to say it could last a week or whatever. So, for the money, you not getting enough.

P3 said:

> But it's challenge. Especially as I have to test it three times a day. And then I had to make sure I have the strips. Because if I don't have it, I cannot do the testing. And you know the strip is very expensive.

Category 2: Comorbidities. Having other health issues or comorbidities was common among the participants. Participants conveyed that their comorbidity influenced their ability to self-manage their diabetes. It made their self-management activities more challenging, and in some instances, prevented them from carrying them out. Because of their visual issues, P9 could not prepare meals, be physically active, or monitor blood glucose levels by themself. P5 was a wheelchair user and was also not able to do any physical activity. P6 was bedridden and shared that they could not go to the community clinic regularly for glucose testing.

Category 3: Fingerpick Fear. Glucose monitoring is a routine practice and involves pricking the finger with a lancet. Testing can be done at home or at a medical facility. While finger picks for glucose monitoring are an unavoidable part of life, participants revealed that it was painful, and they experienced some anxiety during the process. Because it was an uncomfortable experience, participants did not test as often as they should. Self-testing triggered distress and hampered the self-management of P12 because they were unable to do it themselves. "I don't like juking myself eh. So, what I use to do, during the lockdown time, I had a friend who had a machine too. So, when they open for the day, and I will go and check it." P2 added, "it's a painful process. You know the tips of the fingers are sensitive, and it doesn't matter how you try to go as shallow as

possible, the nerves are right there." P3 mirrored the same view and said, "yes, frustrated, painful because every time you have to prick your hand. It's a needle."

Category 4: COVID-19 Lockdown Restrictions. The government of Grenada implemented a 24-hour curfew that restricted the free movement of the population. Persons had to be confined to their homes and were given specific times to purchase essentials. The impact of the lockdown was evident on the lifestyles and diabetes self-management of persons. Firstly, the lockdown social distancing rules restricted food supplies causing persons to alter their dietary habits. P10 admitted to challenges in sourcing food. The participant said, "in the lockdown now, people couldn't really go in the market. Farmers couldn't really go and sell their produce. And if the produce do come into the supermarket, it is limited amount." There was also the issue of long lines and long waiting times. P4 said, "well, maybe the lockdown rules and not being able to go out when you want. It was kinda frustrating standing in the hot sun."

Secondly, it was challenging to have an exercise routine because of the confinement, and persons reported a decrease in their physical activity. Participants 2, 3, and 10 shared that the time given to be outdoors was not enough to take a walk. Lack of yard space to exercise also materialized as an issue since persons could not go beyond their yards. Thirdly, the procurement of diabetes medication and testing strips were difficult. Lastly, several persons could not visit their physicians or community clinics for routine visits or follow-ups. Insulin and other medications were generally cheaper at the government health facilities. However, most facilities were closed during the lockdown and unavailable to the participants.

Themes Relevant to Research Question 2

RQ2: What were the attitudes, subjective norms, and perceived behavior control experiences of adults with diabetes in Grenada towards diabetes self-management during the COVID-19 lockdown period?

The second research question explored the participants' beliefs and intentions towards performing their self-management activities. Participants were questioned about their attitudes, subjective norms, and perceived behavioral control towards five self-management behaviors. The categories and subcategories correlated with this theme are shown in Table 6.

Table 6

Themes and Categories Associated With Research Question 2

Theme	Category	Subcategory	Code example
3. Predictors of self-management behaviors	Attitude	1. Positive feelings towards self-management behaviors 2. Negative feelings towards self-management behaviors	Happy to move around, feeling good about monitoring levels, eating healthy is expensive, nonadherence to monitoring
	Subjective norm	1. Lack of adequate support 2. Adequate support/Social network	Family cooks, proud children, family checks in, all alone
	Perceived behavioral control	1. Confidence in performing behaviors 2. Lack of confidence in performing behavior 3. Non-traditional medicine 4. Fear or worry	Knowing what to eat, don't know how to monitor levels, alternative medicines

Theme 3: Intentions to Perform Self-Management Behaviors

The constructs of the TPB were utilized as predetermined categories in the data analysis (Directed content analysis). Thus, attitudes, subjective norms, and perceived behavioral were developed as main categories. The overarching theme that characterized attitudes, subjective norms, and perceived behavioral was Intentions to Perform Self-management Behaviors. This is because the TPB is used in predicting an individual's intention to engage in healthy behavior.

Category 1: Attitude. Participants were asked how they felt about performing each of the self-management activities. Generally, participants felt good or happy about doing them, while some expressed discomfort or displeasure in doing their self-management behaviors (see Table 6). Consequently, Positive Feelings Towards Self-Management Behaviors and Negative Feelings Towards Self-Management Behaviors were created as subcategories to the Category Attitude.

Subcategory: Positive Feelings Towards Self-Management Behaviors

The experiences of the participants demonstrated an overall positive attitude towards their self-management behaviors. Eating healthy, physical activity, taking their medication, and checking glucose levels were a pleasure to many because it ensured that they maintain good health and kept their glucose levels at a healthy range. When P5 was asked how they felt about eating healthy, they said. "well, it feel good you know. Because the sugar was really high. Because I started using less sugar, it's better." P2 had this to say in response to the same question:

> I felt good about myself. I said if I could stay home forever, it will be good. I can take my time, I can plan my meals. Being home made me eat better and made me pay attention to the meals I prepared and consumed because I wasn't busy, I didn't have to run off to the office. And just ordering for lunch whatever was available. I was able to prepare what was good for me.

Other participants echoed the same views. P9 mentioned, "well, I'm pretty normal honestly. I feel good. Sweets and salt don't put me out," and P3 said, "yeah, it's good. I mean, I use to feel good about eating healthy." For P9, having a good diet was their "main focus," and felt that explained that "I was health-conscious." P10 expressed their pleasure in eating healthy by saying, "if I know what I knew before, I would have started eating healthy long. To be honest, eating healthy is nice eh."

Physical activity was also positively attributed to feelings of reward and pleasure. Their evaluation of exercise was that it was good in helping to manage their disease. While participants were not able to exercise regularly during the lockdown, they understood the importance of exercise for their condition. Generally, they felt good about moving, especially due to the restrictions and not being able to leave their homes. P10 commented, "to be honest, I was glad for the exercise, eh. Because we were inside all the time." P11 indicated, "well, not bad, you get a nice little sweat, and P7 said, "I feel good, trust me when I exercise, my body does feel real good." Participants also mentioned that being physically active during house chores was "fun." Furthermore, P1 said that exercising was "very much tied into the way I make my living, so I look forward to it."

Overall, participants acknowledged a positive attitude towards medication compliance and glucose monitoring. This was reflected in their beliefs about the outcomes of performing those behaviors as well as their evaluation of the expected outcomes. P3 and P7 said that felt "good" about taking their medication. P3 went on to say, "because it is to protect me from my stress going up. Because when you take on stress is more higher it get. So, then you have to obey doctor procedure and what the doctor saying." P5 said, "well, I don't have no problem taking it you know. I take it as I should." When asked how they felt about testing their blood glucose, P7 said that they "felt good" and was able to "check it for myself". Another participant responded, "it's okay, it's just a little juke. I find it's okay doing it." Likewise, P11 said, "well, I feel good enough because it makes me know where I stand."

Subcategory: Negative Feelings Toward Self-Management Behaviors. The participants expressed unhappiness and frustration in performing self-management behaviors. The codes highlighted a poor attitude towards self-management and were summarized by the subcategory Negative Feelings Towards Self-Management Behaviors. P7 and P10 felt that eating healthy was expensive. Prices of fruits, vegetables, and fish were higher than that of unhealthy foods. P10 further argued that they believed medication is unnecessary and believes "there is a cure." When asked to describe how they felt about taking their medication as prescribed, P9 shared that they did not feel like taking the "same thing every day." Glucose monitoring also evoked negative feelings. P3 exclaimed that they were "frustrated" because "every time you have to juke your hand. So having diabetes is a challenge. Especially as I have to test it three times a day." P5 and

P11 did not like testing as well, and P11 went to explain that their husband still had to help them with glucose monitoring. This was similarly shared by P12, who said, “no, honestly, I don’t like to juke my hand. If someone has to do it, I turn my head. But if I have to do it, it’s a whole stress. It’s not easy for me. My pressure might raise.” Regarding exercise, P3 said expressed feelings of annoyance of exercising because of the lockdown limitations. P10 said that they did not exercise because, “it has sometimes you don’t feel like doing anything.” When asked how they felt about exercise, P11 said:

> It’s okay. At times you don’t want to do it, but because of your situation you have to because you not moving outside of that. You stuck at home. When you’re going to work, you know you’re moving, but when you’re at home, you can move so rapidly. It’s kind of confining. Sometimes you don’t feel like doing it, because it’s kinda confining.

Category 2: Subjective Norm. ***Subcategory 1: Adequate Support/Social Network***. From most participants’ viewpoint, the important people in their lives approved and supported their self-management behaviors. There was a general expectation from the participants’ loved ones to engage in their advised self-care activities routinely. Concerning medication compliance, P7 said, “one thing, my mother will always ask if I am taking my medication. Sometimes if I have a complaint, she will always say it’s because I am not taking my medication. And she does know.” When asked how their family responded to their exercise routine, P7 answered, “well, the only thing they would say sometimes, mommy, how come you not going and exercise.” In responding to the same question, P11 explained:

> Well, my husband was my motivator. He would tell me, come on let's go. You know, and I test the blood sugar and it's a bit high. Even if I take medication for it, but you know and then based on what you eat. But he will say come, but it have times you don't really feel like doing it.

Participants also shared that they had great support from their family with regards to their diet. Participants 4, 5, 6 and 9 depended entirely on their family to prepare their meals. Participant 7 explained that their family was the main provider. The participant said, "well, they support me, and they get the things that I really need." A participant commented that her family would remind her of the things she should not eat: "well, those children will say, you not supposed to drink plenty soft drinks, or starchy foods." Participant 2 also felt that they had encouragement from their family:

> Again, my son is always checked on me to find out what I was having and if I ate, veggies and meats and so. And he is the one who checks on me daily where meals are concerned. And I think he understands more about temptation and eating the wrong thing, and he has been a diabetic for much longer than I have been. He probably figured I had candy because my grandchildren are always here. But when they left, I packed it for them to take with them. I think he was worried that I will give up and eat all the wrong things. But no, I don't. And the other children just wanted to make sure that I had stuff. When they open the supermarket for a few hours, once they were going, they would call and ask if I needed anything. They were always supportive. My son will sneak up on me as well. He's the one who's doing more support because I think he's gone through all those periods

> where you know he just he just wanted to eat what he wants to eat. So, he would tell me. I would say all my family was supportive. They checked up on me. And made sure I had the proper food that I needed during the lockdown.

Subcategory 2: Lack of Adequate Support. In some instances, a lack of adequate support from family was seen. P10 shared that no one urged them to eat healthily, and P2 said that their family "didn't say anything much." P12 also shared, "those children not checking on me. They never really bother you know. They never really come with concern." P8 explained that the main person in their life was an elderly mother and had no support with regards to any self-management activities. P8 responded to the question about medication routine by saying, "I don't know how to answer that, but for me, nobody actually know what I take, how I take it. So, basically, it's up to me."

Category 3: Perceived Behavioral Control. ***Subcategory 1: Confidence in Performing Behaviors***. Participants were questioned about their confidence in performing each of the self-management behaviors, and they related a sense of ease in performing them. For the most part, participants felt assured in their capability to carry out their self-management behaviors. Several participants thought that they were "confident" or "100 percent confident." P2 stated that they did not worry about eating properly and had the ability to prepare and eat healthy foods. P3 said they managed the condition "in my best ability" and expressed that they were "very controlled" over what they ate. Another participant mentioned that as the woman in the house, they did the cooking and shopping. The participant alluded to confidence in ensuring that they had good dietary habits for themself and their family.

Subcategory 2: Lack of Confidence in Performing Behavior. When asked how confident they were in carrying out tier self-management behaviors, several participants expressed their doubt and uncertainty with their capability and control. In some instances, it was due to their inability to carry out the specific behaviors. Some participants were unable to cook themselves or do self-testing on their own. Other participants were unable to have an exercise routine or be physically active because of underlying conditions.

Subcategory 3: Nontraditional Medicine. One of the codes that emerged was using alternative medicines. A positive perception in caring for their condition was communicated by their accounts of the use of alternative medicine, along with their conventional medication, as part of their routine. These nontraditional medicines are commonly referred to as "bush tea." Individuals frequently included these and aired that their reasons for using them were for prevention and improving their general well-being. P9 drank the occasional "bush tea" because it was "good for their condition." P7 also consumed "spice tea or ginger tea" in an effort to "control the sugar." Other participants used local herbs and plants as a substitute for their prescribed medications. P11 revealed that "when I don't have the medication, I drink those. I always have zebapique and corilla in my house. I will draw it and drink it." P10 also disclosed:

> There's a herb called moringa. They say don't take it with the medicine, because the medicine may not be as effective. But me, if I don't have medication, like if I forget to buy, I drink some moringa tea. And that keep me good, keep my sugar at bay and everything.

Subcategory 4: Fear and Worry. Several participants emphasized their fear and worry during the pandemic. The stress of being locked down, the constant anxiety of the virus, and life's irregularity with the pandemic, affected their ability to manage the disease effectively. P3 noted that it was challenging to exercise because of the fear of going out. P1 referred to outside as "a death wish." P13 expressed their worry and fear that the virus would negatively affect them, so they preferred to stay. When P11 was asked how confident they were in eating healthy during the lockdown, they said that they struggled with getting supplies because of the fear of leaving home. P11 said

> Well, the supplies, getting what you want was challenging. First of all, it was very hard getting the stuff that was better for you. Secondly, I'm not going an stand up in long lines. And then again, because of my condition, I was fearful. So that was my greatest fear last year, so that's why I would stay inside. I was very, very, very fearful of that so that affected my confidence greatly.

Conclusion

The plan for this study was to better understand the lived experiences of how persons with diabetes were able to manage their condition during the COVID-19 lockdown in 2020. 13 adults participated in this study, including five males and eight females who resided in urban and rural regions on the island. Semistructured interviews were carried out, and the data were coded to reveal themes and categories. The results were presented based on the two research questions that guided the study.

The first research question was designed to understand the self-management experiences of persons with diabetes. The first theme associated with this research

question was diabetes self-management activities, and the second theme was barriers. Regarding Theme 1, participants were generally able to maintain good self-management practices throughout the COVID-19 lockdown period. However, several persons struggled with maintaining their routines or practices. In some cases, failure to perform their self-management behaviors was deliberate. Participants also revealed several barriers they faced during the lockdown. These barriers reflected the things that prevented them from managing their condition effectively.

Regarding the second research question, participants were asked how they felt about performing the self-management behaviors, how the people around them responded to the behaviors, and how confident they were in performing them. An overall positive attitude was expressed among the participants. However, few communicated an unfavorable appraisal of some self-management behaviors. An overwhelming account of family support was seen among the participants, with a few lacking adequate social support. Finally, there were differing perceptions regarding how easy or difficult people felt about performing their self-management behaviors. Most people conveyed a sense confidence, while some seemed to lack confidence in performing the behaviors. Several participants also modified their prescribed medication regime with herbs, teas or other nontraditional medicines.

Chapter 5: Discussion, Conclusions, and Recommendations

Diabetes is a chronic disease, and its management is multifaceted. To manage the disease, people with diabetes must make lifestyle changes and maintain prescribed regimes. The goal of diabetes self-management is to manage blood glucose levels to ensure good health and maintain an adequate quality of life. Additionally, maintaining glycemic control can prevent the progression of associated complications (Shrivastava et al., 2013). The COVID-19 pandemic in 2020 was a global public health crisis. Several countries, including Grenada, enforced a 24-hour curfew to contain the spread of the virus.

The purpose of the current study was to obtain a better understanding of the diabetes self-management practices of people in Grenada during the COVID-19 lockdown in 2020. There was no research addressing this phenomenon in the Caribbean region, and I sought to fill this gap in the literature. In-depth interviews were conducted with participants, their experiences of the phenomenon were analyzed, and themes were identified based on the data analysis.

A phenomenological approach was employed as the method of qualitative inquiry. According to Patton (2015), this approach allows a phenomenon to be described based on how the participants perceive it, describe it, feel about it, remember it, and make sense of it. In-depth interviews with people with diabetes who had direct experiences with self-management behaviors were carried out, and participants described their lived experiences during the lockdown. The resulting data captured the commonality of their lived experiences and were further grouped and condensed.

Thirteen adults between the ages of 35 and 65 participated in interviews. Three main themes emerged from data collection and coding. The first theme was diabetes self-management activities, which reflected the participants' self-care regarding their diet, exercise, medication, glucose monitoring, and foot care. Findings indicated that participants were diligent in their self-care routine, or they failed to perform it. Barriers was the second theme. This theme highlighted challenges the participants faced that prevented them from engaging in self-management activities or things that made it difficult. Financial constraints, high cost of food, issues sourcing healthy foods, closed medical facilities, painful fingerpicks when testing, and lockdown restrictions were some of the barriers to self-management. The third theme, intentions to self-management behaviors, addressed the broad perceptions of the participants concerning their intentions to perform each self-management behavior. Participants had either a positive or negative attitude toward the behaviors, had support or had no support from the people around them, were confident or lacked confidence in performing the behaviors, or used alternative medicines to treat the disease.

Interpretation of Findings

Research Question 1

Theme 1: Diabetes Self-Management Activities

Theme 1 was related to the five diabetes self-management experiences of the participants during the lockdown. Overall, few participants engaged in exercise or had an exercise routine during the lockdown. Although some participants exercised occasionally, most admitted to only being physically active. Participants mentioned physical activity

only during housework. For example, P2 said “but the exercising part of it, I haven’t been really going outside to exercise for a bit, for a while. But I knew I couldn’t just lie in bed. So having to get up and do things in the house, even if it was doing laundry.”

Other participants attributed their lack of exercise to laziness or lack of motivation. P8 answered the question about their exercise routine by saying “no, not much you know. I think during that time, you know, when you’re home, you tend to get lazy. So, not during the lockdown, no.” One participant stated that their activity was based on their work as a farmer. That same participant admitted that they were significantly overweight. An important finding in a related study was physical inactivity was seen predominantly in younger people (Sankar et al., 2020). Three of the current participants were physically unable to engage in exercise because they were in a wheelchair or had other health-related complications.

With regard to exercise, similar results were seen in other studies done during the COVID-19 lockdown. Tao et al. (2020) indicated that several participants engaged in low-intensity activities such as housework and walking, which compromised the achievement of the standard and intensity of exercise recommendation. Ruiz-Roso et al. (2020) and Ruiseen et al. (2020) found a decrease in physical activity during the COVID-19 lockdown among people with diabetes. On the other hand, in a quantitative study in India, Nachimuthu et al. (2020) found that most participants were regularly exercising.

Some of the current participants were able to maintain a relatively healthy diet. However, many reported an increase in complex starch in their diets. Tao et al. (2020) also noted that the consumption of appropriately diverse foods, including vegetables and

protein, was problematic during the lockdown. Few current participants noticed increase snacking during that period. Social isolation during the lockdown could have led to boredom and overeating unhealthy foods (Kumari et al., 2020). Current participants struggled with sourcing consistent fruits and vegetables and had to resort to eating other unhealthy options. This finding was also seen in other studies. Tao et al. found a decrease in the intake of vegetables during the COVID-19 lockdown. Conversely, Ruiz-Roso et al. (2020) found a significant increase in vegetable consumption, and Nachimuthu et al. (2020) reported that the participants maintained dietary compliance. This result was also seen in a current participant who stated that the lockdown period enabled her to prepare healthy foods.

Many current participants reported a consistent medication routine. Diabetes oral medication is relatively cheap and widely available on the island. Most participants had enough supplies and were taking them as prescribed. Some participants noted that they were taking their medication regularly because they were at home. P12 related “uh-huh. We inside, what will prevent us? My medication is on my table where I am eating. So, it’s right there.” P3, a nurse, shared that they were able to get medication supplies from the hospital during the lockdown.

Although some participants had medication, they did not take it as prescribed. Medication was purposely missed by some, like P3, who said “well, there were times I would stress in a way and say, oh gosh, I have to take this tablet every day yes. Sometimes I will skip it. But it’s really twice a day I have to take it.” A participant ran out of insulin supplies and was unable to take it as prescribed during the lockdown.

Glucose self-monitoring was done occasionally, and some participants admitted checking it based on how they felt or what they ate. P7 said “yes, I use to check it off and on. I would check it at home.” P8 also said “well, I don’t check it every single day. Yes, some days I skip days instead of doing it every time. I check it depending on how I feel.” One participant seemed to have a consistent daily routine for checking their levels throughout the lockdown. This observation was also reported by Nachimuthu et al. (2020), who noted that only a small portion of participants regularly checked their levels during the lockdown. In contrast, Anjana et al. (2020) reported an increase in the frequency of glucose monitoring.

Foot care was poorly established among the current participants. Participants did not think it was necessary to have a routine or did not give the self-care behavior any thought. One participant, a nurse, exhibited good foot care practices. The participant recalled seeing several patients amputated on the ward and stressed the importance of caring for one’s foot. Likewise, P4 had a consistent foot care routine that included regular cleaning and changing of the bandages. P4 said

> I normally have to change the dressings every day. If it stays too long, it will get wet. But I cannot do it myself, so my daughter does it for me. She goes to the Medical Center and get packages and do it.

A quantitative study in India also indicated that foot care among the participants was very poor at about 6.48% (Bala et al., 2021). Prior to the COVID-19 lockdown, available evidence suggested that foot care among diabetes was suboptimal (Nicolucci et al., 2013). Narmawan et al. (2018) reported that people with diabetes normally ignore

foot care and assume it is only necessary when there is an injury.

Theme 2: Barriers

An important point that emerged from the interviews was that participants had issues or things that prevented them from effectively managing their condition during the lockdown. First, many struggled with acquiring essential items that they needed. There were issues related to access to fresh fruits and vegetables. Several participants raised this concern, and the lack of access resulted in unhealthy eating habits. One participant noted "you can't get the vegetables. The truth is it was a bit hard." Participants attributed access issues to limited supplies at the supermarket and the high prices. A participant also mentioned the lack of transport to get to the supermarket: "well, as I said, I don't have transportation, so I couldn't go the market during the times they were opened to get bulk stuff." Some admitted that financial constraints also added to their issues with accessing food. P10 said "in the starting of COVID, I use to eat a lot of vegetables with some starch. And then they brought up the prices, so I tend to eat less, you know." P9 repeated the same views: "well basically sometime moneywise. Sometimes I wasn't able to get all that I need." In a Turkish study, Krastas et al. (2020) also found that socioeconomic difficulties altered eating habits.

Getting sufficient supplies of medication was an issue for the two participants who used insulin. Participants resorted to using less medication or eating less in an effort to save their supplies. P11 recalled "well, what prevented me from taking it was just shortage. Not having it. That was the only thing, because as long as I have it, I take it."

P2 also struggled with insulin supplies and had to monitor what they ate closely. They said:

> I basically told myself, you need to watch yourself and not eat every minute because you need insulin. Because if I use insulin three times a day, it would last longer than if I use it five times a day.

Another participant relayed her struggles with getting strips: “But it’s challenge, especially as I have to test it three times a day. And then I had to make sure I have the strips. Because if I don’t have it, I cannot do the testing. And you know the strip is very expensive.”

Second, the COVID-19 lockdown restriction proved to be a significant barrier to self-management. The mandate to stay indoors affected the participants’ ability to exercise and move around as they could have down before the lockdown. P12 depended on a friend to do blood glucose testing and when the participant was asked what prevented them from testing, they said “the only the only, is I don’t do it. And when we lock down, I cannot go by the friend.” Participants also noted that with limited house or yard space, they were unable to exercise. This showed that the participants had limited knowledge concerning exercise during the lockdown. P2 stated “I couldn’t go anywhere” and “I didn’t have much of my yard space.” Furthermore, participants also had comorbidities that added to their inability to manage their disease. P9 said “well, I don’t do much exercise. And I can’t see, so I can’t move around too much to do exercise. I didn’t leave the house either.” The literature did not include any studies related to comorbidities as a barrier to self-management during the lockdown.

As a result of the lockdown, many medical facilities had limited opening hours. A participant shared that she was unable to get her insulin from the government dispensary, and another indicated that the strips ran out and they were unable to buy. P4 did not have a glucometer at home and depended on the community health centers for glucose monitoring. P4 did not check levels regularly due to closure of the health center. The participant said "every now and then I was able to do it. Not as regular as before the lockdown. We would go to the medical center and check it sometimes. Maybe twice for the month or so." Other studies indicated similar barriers faced by diabetic patients during the COVID-19 period. Tiwari et al. (2021) found that the stay-at-home mandate resulted in limited space to exercise and reduced physical activity. Tiwari et al. also noted that the lockdown restricted food supplies and created the unavailability of diabetic medications and testing strips.

Pain when pricking the finger for testing appeared to be a barrier to diabetes self-management. Participants remembered the pain and frustration felt when testing their blood glucose. P3 recollected "frustrated. Every time you have to juke your hand. Yes, frustrated, painful because every time you have to prick your hand. It's a needle. So having diabetes is a challenge." P2 also added "it hurts, yes, I can't say that I am used to the pinpricks on the tip of my finger, but it's a lot. It hurts, but I know I have to do it, and I do it routinely. Right now, it's a part of life." In each instance, the barrier did not prevent the participant from carrying out self-testing completely, but it reduced the frequency with which they would test. Pain during testing was reported only by the

female participants. To date, no other study indicated painful fingerpick while testing as a barrier to diabetes self-management during the pandemic.

Research Question 2

Theme 3: Intentions to Perform Self-Management Behaviors

The third theme summarized the participants' intent to perform diabetes self-management behaviors. Attitude, subjective norm, and perceived behavioral control were predetermined categories. The TPB constructs provided a basis for understanding the adoption of self-management behaviors during the COVID-19 pandemic. Moreover, the constructs predicted intention to perform behaviors, and the three constructs were positively associated with a person's intention and behavior in other studies (Watanabe et al., 2051). The role of related factors to health care such as attitude, subjective norm, and perceived behavioral control emerged as beliefs in the participants' abilities to manage their diabetes.

First, the participants' experiences regarding their attitude toward self-management were explored. Many of the participants were aware of the importance of engaging in self-management activities. They had an overall positive attitude toward performing those activities and viewed them as good. When asked how they felt about eating healthy, one participant said "yeah, it's good. I mean, I use to feel good about eating healthy. Because remember now, when you are a diabetic, you can't go beyond the limit." Other participants responded "I feel good, trust me when I exercise, my body does feel real good" and "Well, I feel good because I choose thing to eat. Sometimes I cook

certain things, and I don't eat it because I have children." P8 also mentioned that eating healthy was their main focus during the lockdown.

Participants responded similarly to exercise and physical activity. Though most participants did not engage in exercise, they had an overall positive attitude toward the behavior. Furthermore, some of the participants who had a good attitude also displayed good self-management practices. P7 was able to do some walking during the lockdown and said, "I feel good, trust me when I exercise, my body does feel real good." P10 also walked occasionally and said "to be honest, I like to exercise. It does make me feel as if I'm doing something." P2 noted "I was happy for things to do" and then added "you know, I don't sit all day, I don't sit too long, for a long period. I was happy to get some little physical something."

In some cases, participants expressed an unfavorable attitude towards diabetes self-management. Several participants cited negative feelings in their attempt to manage the condition. Regarding exercise, a participant commented, "it has sometimes you don't feel like doing anything." P13 explained that they did not feel like exercising and preferred resting during the lockdown. P3 and P11 shared the same sentiments. While they acknowledged that exercise and physical activity were necessary, they admitted to not liking exercise and wanting to do it during the lockdown. P8 evaluation of exercise during the lockdown down was that her mind was "not there for it."

Based on the findings, all participants were aware that they needed to maintain a healthy diet. However, for a few participants, their evaluation of good nutrition was negative. P10 said, "it throws me off a bit. It was kinda hard for us." Some correlated

healthy eating to high costs. P10 stated, “the thing that is healthy for you is very expensive.” Similarly, when asked to describe how they felt about eating healthy, P7 said, “well, eating healthy is a bit expensive, you know.” P1 responded, “to be honest, I didn’t give it much thought.”

Few participants had a negative attitude towards their medication routine. When asked how they felt about taking medication every day, P9 said, “honestly, sometimes I say, I don’t have to take it every day. Cause you know, taking the same thing every day.” P10 felt that the diabetes medication was unnecessary. The participant said, “sometimes I wish I don’t have to take it for good. Honestly, for me, I believe there is a cure, but nobody is saying anything.” The results also indicated that participants had a negative attitude towards testing. They associated blood glucose testing with pain and discomfort and indicated that they did not like doing it. Participants described the behavior as “a whole stress,” “a painful process,” and “stressed.” In some instances, a poor attitude to diabetes self-management revealed inadequate self-management behaviors. For example, both P9 and P10 admitted to not taking their medication as prescribed. P9 admitted, “there are times I skip a day,” and P10 said, “sometimes I forget.”

Secondly, the issue of social support was a significant finding in the study. Subjective norms refer to the beliefs about the approval and support of a behavior. Adequate support and lack of adequate support reflected the participants’ beliefs regarding the subjective norms surrounding the self-management behaviors. Subjective norms and social support are not interchangeable. The results showed that many participants had adequate support from their family or had a strong social network.

Evidence suggests that social support is integral in diabetes-specific quality of life and self-management behaviors (Mohebi et al., 2018). The participants described that their family members were a source of support, who helped them in various aspects of their diabetes self-management. Examples of support included maintaining healthy eating habits, reminders for glucose monitoring and taking medication, and motivation to exercise.

Participants shared accounts of how the persons around them provided assistance or encouragement in various aspects of their self-management. This notion of strong family support and a good support network appeared to be an underlying factor in their adherence to their self-management behaviors. P3 said, “well, my family used to tell me not to eat too much in of the one thing.” P7 also said, “well, they respond good you know, they were there. If I have any questions, I can call and find out certain things.” Participants also noted that family members assisted in preparing meals, administering medication, or helping with testing. P12 also mentioned that they would visit a friend who would assist with blood glucose testing. A good social network was also evident. For instance, P3 spoke of support at work and said, because they use to counsel us on work and tell us to make sure you are taking your medication.” One participant had a child who had diabetes as well and they were in close contact their child. The participant found that communicating regularly was helpful and improved their overall ability to manage the condition.

Conversely, participants shared scenarios where they felt that they lacked support from the persons around them. P3, in response to the question, said, “well, they didn’t say

anything much." P8 was the only participant who did not have support for their self-management behaviors. Very few participants mentioned support from the people around regarding exercise. The data revealed support given mostly for the other diabetes self-management behaviors. Additionally, inadequate support was given to participants regarding their foot care. While several studies prior to the lockdown explored support and diabetes self-management, to my knowledge, none reviewed this concept during the lockdown. Nonetheless, the findings add to previous knowledge that social support is a fundamental tool in diabetes self-management.

Thirdly, the category perceived behavioral control was an evaluation of the participants' ability to carry out the required self-management behaviors successfully. The participants appeared to be relatively confident in managing their condition. The majority of participants expressed a sense of ease in performing the self-management behaviors. On the other hand, other participants conveyed a perception of difficulty and a lack of confidence in various aspects of their diabetes self-management. For example, P4 did not feel confident in doing their blood glucose testing or exercising. P10 and P12 communicated a lack of confidence in doing their blood glucose testing. Furthermore, participants perceived the use of local plants as a factor that facilitated their self-management. Studies show that alternative medicines are popular among persons with diabetes (Cander et al., 2018). When asked about their confidence in carrying out their self-management behaviors, participants suggested the use of alternative medicines to control their blood glucose levels or for overall good health.

Another relevant finding in the data was feelings of stress or fear during the lockdown, which was expressed mainly by the female participants. This finding was also reported in a cross-sectional study in India (Sankar et al., 2020). Current participants shared that their fear of the virus disrupted their self-management practices. A paper explained that people with diabetes experienced greater worry about being infected than people without diabetes (Joensen et al., 2020).

Theoretical Framework

The TPB served as the theoretical framework in the study. The theory was guided the overall study, including the research questions, interview questions, data analysis, and interpretation. Based on the results of the study, the TPB was supported. Participants who had a positive attitude towards self-management behaviors exhibited good performance of the behaviors. This finding was seen for diet, medication complications, and glucose monitoring.

Participants who demonstrated a good attitude towards exercises exhibited poor exercise practice. This is in line with a study that found that participants with a positive attitude towards physical activity engaged in moderate activity (Fattahi et al., 2019). Another study indicated that attitude was not predictive of self-care activities (Kleier & Dittman, 2014). Additionally, the participants who expressed a negative attitude towards the self-management behaviors exhibited poor performance of the behaviors. This was clearly demonstrated as it relates to footcare; the participants who had a negative attitude towards the behavior also demonstrated poor adherence.

The experiences of the participants illustrated good diabetes self-management outcomes for participants for those who had good social support and social network. This finding was corroborated by another study that found that support from family and friends was the main predictor of good diabetes self-management (Wongrith, 2019). This was generally seen for all the self-management behaviors except exercise. This finding was not consistent with another study that found that social support indicated positive exercise and physical activity outcomes (Fattahi et al., 2019).

Rohani et al. (2019) indicated that perceived behavioral control had a more significant effect on behavior than the other constructs. Participants who expressed confidence in engaging in self-management practices had good outcomes. Again, this was not seen for both exercise and foot care. Fattahi et al. (2019) reported no significant correlation between perceived behavioral control with intention and physical activity. Furthermore, Lin et al. (2020) indicated that positive perceived behavioral control was correlated with good foot care. This study suggested that having good perceived behavioral control was not associated with good footcare outcomes.While the TPB was useful in predicting self-management behavioral outcomes, there were some limitations to the theory in this study. The theory does not account for other factors that may influence behavioral intention and behavioral outcomes. In this study, there was evidence that economics, physical health, and mental health could influence the outcome of diabetes self-management behaviors. Also, there is the potential for various environmental factors, fear, and motivation to affect behaviors. Furthermore, the current

study revealed significant barriers to self-management behavior outcomes. The TPB does not consider barriers as a predictor of behaviors.

Limitations of the Study

It is important to mention the possible limitations of this study. This study had several limitations, including the recruitment and interview process, sample, and recall bias. Firstly, the study was limited to Grenadian diabetics between the ages of 36 to 65. By nature of these criteria from which the sample was selected, it did not include persons outside of this age range who had diabetes. The study was also limited by the fact that the sample only included persons who visited the recruitment site. Additionally, I was unable to verify the diabetes status of the participants in the research. Secondly, the majority of participants were female and lived in the urban parts of the island. Furthermore, the majority of participants were above the age of forty-five.

Another notable limitation was the issue of recall bias. Participants were asked to recall and account for their experiences during the lockdown in 2020. There was a possibility that participants may have forgotten some of their experiences. Also, the study did not explore pre-pandemic diabetes self-management experiences. Finally, another possible limitation was the use of telephone calls for data collection. Interviews were carried out over the phone, which reduced nonverbal communication. While most nonverbal gestures or actions are not always helpful, some may contribute to the interpretations of the participants' verbal responses. Despite these limitations, this study was able to give an account of the experiences of the diabetic population in Grenada during the COVID-19 lockdown.

Recommendations

The data and themes from the study revealed several recommendations for further research grounded in the strengths and limitations of the study and the literature. Researchers interested in conducting further studies on self-management practices can employ a mixed-methods methodology to allow a larger, more diverse sample. The quantitative portion can increase the degree of certainty of the results with statistical data and statistical significance.

Living with diabetes can be challenging, and the COVID-19 pandemic may have created an additional burden on persons. The study revealed that participants experienced a level of fear, stress, or anxiety during the lockdown. The finding is in line with other research done in other parts of the world, which reported that persons with diabetes felt anxious, lonely, distressed, or even scared during the COVID-19 lockdown (Rose & Scibilia, 2021; Utli & Doğru, 2021). Research can be done among the Grenadian population further to explore the psychosocial health of persons during the pandemic.

Madsen et al. (2021) suggested that for people with diabetes, social ties can impact their psychosocial health. Therefore, further research can also be done exploring the role of support on psychological well-being. There is also a need to explore the specific experiences of persons with comorbidities and underlying conditions and how they navigated the uncertainties of the COVID-19 pandemic. Research into footcare practices is also imperative. According to Narmawan et al. (2018), routing foot care is an essential self-management behavior that can minimize the risk of foot injury or complications.

Research can also be done exploring the pre-pandemic diabetic self-management experiences. This can provide valuable insights into how emergency-type situations can alter self-management practices, allowing for better planning and preparation. Finally, a study can be implemented to investigate the effect of socioeconomic status on diabetes self-management during the COVID-19 pandemic.

Implications

The results of this study showed that it is necessary to comprehensively address the factors affecting diabetes self-management during an emergency such as a pandemic. Consequently, this study may have several potential impacts for positive social change at the individual, family, organizational, and societal levels. The COVID-19 lockdown clearly impacted the lifestyles of persons with diabetes. At the individual level, there may be an opportunity for education and patient empowerment in self-management skills. The study provided an opportunity to explore persons' experiences in managing their own diabetic needs. In this regard, it is crucial to plan and implement measures for persons to take responsibility for their care and increase self-management capabilities during a lockdown. This may increase perceived behavioral control and their confidence in carryout out diabetes self-management practices. Also, the pandemic revealed psychological issues that could have lasting impacts on individuals and societies. At the individual level, support to assist in managing stress and self-motivation may be developed.

At the family level, education is an important area for positive social change. The study showed that social support was a pivotal aspect of the participants' diabetes self-

management. Family members may benefit from education programs that will allow them to be adequately educated on the disease and how they can appropriately support their family in an emergency. While social support was widely seen for several self-management behaviors, it was inadequate in the practice of foot care. Support with regards to proper foot care may be given to the persons affected with diabetes and the persons who provide support to them. This will enable them better to promote consistent foot care behaviors in their routine self-care.

Physical activity is a critical part of routine diabetes self-care. However, the lockdown restricted the outdoor physical activities of people with diabetes. Hence, it is necessary to improve and increase skills in physical exercise at the community level. Programs may be developed where persons are informed about alternative exercises that can be done indoors or in a limited space. Community-focused events such as programs should be developed to encourage healthy eating and proper food choices when dealing with limited access.

During the pandemic, it was challenging to have in-person medical care for persons with diabetes. Improvements regarding access to medical care and other health care facilities should be considered at the societal level. During the lockdown in Grenada, participants recalled that community health centers in their area were not opened. The two hospitals were accessible only for emergency and critical health issues. Thus, it is necessary to implement measures such as telemedicine or e-health for individuals with diabetes. This may be done at the community, organizational, and societal levels. This

new area of support can improve self-management, encourage behavior change, and troubleshoot problems that may arise.

Another opportunity for social change is targeting ways to handle and cope with social isolation and limited social interaction during a pandemic. Organizations can devise ways of providing support networks for persons with little social support. Organizations can additionally work collaboratively to generate alternative avenues through which persons with diabetes and comorbidities can receive advice and support during a pandemic will also be beneficial. Finally, the experiences and opinions of persons with diabetes should be incorporated into stakeholder decisions at societal levels. This may result in the necessary financial allocations to enable the creation of programs and appropriate support systems.

Finally, as it relates to the TPB, the study results also have social change implications. Interventions can be developed to address increase and improving attitudes towards diabetes self-management practice. Understanding of appropriate and correct self-care activities can be reinforced by the community health centers. Another potential area for improvement is perceived behavioral control. Persons with diabetes may benefit from programs geared towards encouraging confidence in carrying activities such as glucose monitoring. Additionally, teaching persons how to cook affordable, healthy meals and perform exercises based on their physical fitness may also improve confidence.

Conclusion

Diabetes is undoubtedly a public health concern worldwide. For persons affected with the disease, self-management is a crucial part of their everyday life. Self-management is multifaceted and involves proper nutrition, exercise, medication adherence, glucose monitoring, and footcare. COVID-19 emerged as a global pandemic in 2020, and Grenada adopted lockdown measures to curb the spread of the virus. This study was theory-driven and aimed to gain a deeper understanding of the lived experiences of diabetes self-management during the COVID-19 lockdown. The study also explored the experiences of participants regarding their behavioral intentions using the TPB. The findings revealed that self-management behaviors were affected in different ways and varying degrees.

Three underlying themes emerged from the data. The first theme was diabetes self-management activities. Several participants were generally able to carry out the five self-management behaviors adequately. However, a number of them struggled with non-adherence and non-compliance across the five self-management behaviors. Exercise had very poor outcomes. The second theme summarized the barriers participants experienced with self-management during the lockdown. The participants identified several barriers that inhibited self-management and were organized into five categories: lack of access, comorbidities, painful finger pricks, COVID-19 restrictions, and fear and worry. The final theme was Intention to Perform Self-management behaviors and reflected the factors that facilitated or impeded self-management behaviors. The participants expressed positive and negative feelings, confidence, and lack of confidence. There was an

indication of adequate social support among the participants, which facilitated overall good self-management. Insufficient support was found for diabetes foot care behaviors.

This study contributes to an understanding and fills the gap in current knowledge relating to diabetes self-management practices during the COVID-19 lockdown. No research to date has explored the experiences of the Grenadian diabetic population during the COVID-19 lockdown. Several implications for social change developed from the finding. The study's findings also emphasized the need for a multidisciplinary approach to address the needs of diabetic people during a pandemic. Health education interventions are also necessary to improve overall diabetes improvement of knowledge and thereby attitudes. These social change interventions may culminate in better preventive self-care practices and overall better quality of life for the diabetic population.

References

Abouammoh, N. A., & Alshamrani, M. A. (2020). Knowledge about diabetes and glycemic control among diabetic patients in Saudi Arabia. *Journal of Diabetes Research*, 1–6. https://doi-org/10.1155/2020/1239735

Adu, M. D., Malabu, U. H., Malau-Aduli, A. E. O., & Malau-Aduli, B. S. (2019). Enablers and barriers to effective diabetes self-management: A multi-national investigation. *PloS One*, *14*(6), 1-22. https://doi-org/10.1371/journal.pone.0217771

Adu, P. (2019). *A step-by-step guide to qualitative data coding*. Routledge.

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, *50*(2), 179–211. https://doi-org/10.1016/0749-5978(91)90020-T

Alibrahim, A., AlRamadhan, D., Johny, S., Alhashemi, M., Alduwaisan, H., & Al-Hilal, M. (2020). The effect of structured diabetes self-management education on type 2 diabetes patients attending a primary health center in Kuwait. *Diabetes Research and Clinical Practice*, *171*, 1-9. https://doi-org/10.1016/j.diabres.2020.108567

Alqarni, A. M., Alrahbeni, T., Qarni, A. A., & Qarni, H. (2018). Adherence to diabetes medication among diabetic patients in the Bisha governorate of Saudi Arabia - A cross-sectional survey. *Patient Preference and Adherence*, *13*, 63–71. https://doi.org/10.2147/PPA.S176355

Aminde, L. N., Tindong, M., Ngwasiri, C, A., Aminde, J. A., Njim, T., Fondong, A. A., & Takah, N. F. (2019). Adherence to antidiabetic medication and factors

associated with non-adherence among patients with type-2 diabetes mellitus in two regional hospitals in Cameroon. *BMC Endocrine Disorders*, *19*(1), 1–9. https://doi-org/10.1186/s12902-019-0360-9

Andrich, D., & Foronda, C. (2020). Improving glycemic control and quality of life with diabetes self-management education: A pilot project. *Journal of Continuing Education in Nursing*, *51*(3), 119–123. https://doi-org/10.3928/00220124-20200216-06

Andriyanto, A., Rekawati, E., & Rahmadiyah, D. C. (2019). Increasing knowledge, attitudes, skills, and glucose control in type-2 diabetic patients through EMAS interventions. *Nurse Media Journal of Nursing*, *9*(2), 141–150. https://doi-org/10.14710/nmjn.v9i2.22989

Anjana, R. M., Pradeepa, R., Deepa, M., Jebarani, S., Venkatesan, U., Parvathi, S. J., Balasubramanyam, M., Radha, V., Poongothai, S., Sudha, V., Shanthi Rani, C. S, Ranjani, H., Amutha, A., Manickam, N., Unnikrishnan, R., & Mohan, V. (2020). Acceptability and utilization of newer technologies and effects on glycemic control in type 2 diabetes: Lessons learned from lockdown. *Diabetes Technology & Therapeutics*, *22*(7), 527–534. https://doi-org/10.1089/dia.2020.0240

Anney, V. N. (2014). Ensuring the quality of the findings of qualitative research: Looking at trustworthiness criteria. *Journal of Emerging Trends in Educational Research and Policy Studies*, *5*(2), 272–281. http://196.44.162.10:8080/xmlui/bitstream/handle/123456789/256/Ensuring%20t

he%20Quality%20of%20the%20Findings%20of%20Qualitative%20Research%20NEW.pdf?sequence=1&isAllowed=y

Arrieta, M. I., Foreman, R. D., Crook, E. D., & Icenogle, M. L. (2008). Insuring continuity of care for chronic disease patients after a disaster: Key preparedness elements. *American Journal of the Medical Sciences*, *336*(2), 128–133. https://doi.org/10.1097/MAJ.0b013e318180f209

Assarroudi, A., Nabavi, F. H., Armat, M. M., Ebadi. A., & Vaismoradi, M. (2018). Directed qualitative content analysis: The description and elaboration of its underpinning methods and data analysis process. *Journal of Research in Nursing*, *23*(1), 42–55. https://doi-org/10.1177/1744987117741667

Bala, R., Srivastava, A., Potsangbam, T., Anal, L., & Ningthoujam, G. D. (2021). Self care practices and psychological distress among diabetic patients in Manipur during COVID-19: A scenario from the North East. *Diabetes & Metabolic Syndrome: Clinical Research & Reviews*, *15*(1), 93–98. https://doi-org/10.1016/j.dsx.2020.12.015

Banasiak, K., Hux, J., Lavergne, C., Luk, J., Sohal, P., & Paty, B. (2020). Facilitating barriers: Contextual factors and self-management of type 2 diabetes in urban settings. *Health and Place*, 61, 1-7. https://doi-org/10.1016/j.healthplace.2019.102267

Banerjee, M., Chakraborty, S., & Pal, R. (2020). Diabetes self-management amid COVID-19 pandemic. *Diabetes & Metabolic Syndrome*, *14*(4), 351–354. https://doi.org/10.1016/j.dsx.2020.04.013

Barone, M. T. U., Harnik, S. B., de Luca, P. V., Lima, B. L. de S., Wieselberg, R. J. P., Ngongo, B., Pedrosa, H. C., Pimazoni-Netto, A., Franco, D. R., Marinho de Souza, M. de F., Malta, D. C., & Giampaoli, V. (2020). The impact of COVID-19 on people with diabetes in Brazil. *Diabetes Research and Clinical Practice*, 166, 1-9. https://doi-org/10.1016/j.diabres.2020.108304

Basu, S. (2019). Medication adherence and glycemic control among diabetes patients in developing countries. *Journal of Health, Population, and Nutrition*, *38*(1), 32. https://doi-org/10.1186/s41043-019-0198-9

Belil, F. E., Alhani, F., Ebadi, A., & Kazemnejad, A. (2018). Self-efficacy of people with chronic conditions: A qualitative directed content analysis. *Journal of Clinical Medicine*, *7*(11), 1-11. https://doi-org/10.3390/jcm7110411

Bello, A., Owusu-Boakye, E., Adegoke, E. O. A., & Adjei, D. N. (2011). Effects of aerobic exercise on selected physiological parameters and quality of life in patients with type 2 diabetes mellitus. *International Journal of General Medicine*, 4, 723–727. http://doi.org/10.2147/IJGM.S16717

Bhandari, S., Rankawat, G., Singh, A., Gupta, V., & Kakkar, S. (2020). Impact of glycemic control in diabetes mellitus on management of COVID-19 infection. *International Journal of Diabetes in Developing Countries*, *40*(3), 1–6. https://doi.org/10.1007/s13410-020-00868-7

Blue, C. L. (2007). Does the theory of planned behavior identify diabetes-related cognitions for intention to be physically active and eat a healthy diet? *Public*

Health Nursing, *24*(2), 141–150. https://doi.org/10.1111/j.1525-1446.2007.00618.x

Bonner, T., Foster, M., & Spears-Lanoix, E. (2016). Type 2 diabetes-related foot care knowledge and foot self-care practice interventions in the United States: A systematic review of the literature. *Diabetic Foot & Ankle*, 7, 1-8. https://doi.org/10.3402/dfa.v7.29758

Burkholder, G. J., Cox, K. A., & Crawford, L. M. (2016). *The scholar-practitioner's guide to research design*. Laureate Publishing.

Caribbean Public Health Agency. (2019). *Healthy lifestyle counselling: Guidelines for the management of diabetes in primary care in the Caribbean*. https://carpha.org/Portals/0/Publications/CARPHA-Guidelines-Management-Diabetes-Module-2.pdf

Caro-Bautista, J., Espinar-Toledo, M., Villa-Estrada, F., Lupiáñez-Pérez, I., Kaknani-Uttumchandani, S., García-Mayor, S., Salas-Samper, F., & Morales-Asencio, J.-M. (2019). Development and psychometric validation of an instrument to identify barriers to self-care among Spanish patients with type 2 diabetes on the basis of theory of planned behavior. *Value in Health*, *22*(9), 1033–1041. https://doi-org/10.1016/j.jval.2019.04.1921

Castillo-Montoya, M. (2016). Preparing for interview research: The interview protocol refinement framework. *The Qualitative Report*, *21*(5), 811–831. https://nsuworks.nova.edu/cgi/viewcontent.cgi?article=2337&context=tqr

Centers for Disease Control and Prevention. (2020). *What is diabetes?* https://www.cdc.gov/diabetes/basics/diabetes.html#:~:text=Diabetes%20is%20a%20chronic%20(long,your%20pancreas%20to%20release%20insulin.

Chappidi, M., Chidambaram, P, & Sivananjiah, S., & Somanna, N. (2018). Non-adherence to foot-care activities and its associated factors among patients with type 2 diabetes mellitus in an urban area of South India: A cross sectional study. *International Journal of Community Medicine and Public Health*, *5*(12), 1-7. https://doi.org/10.18203/2394-6040.ijcmph20184745

Christensen, N. I., Drejer S, Burns, K., Lundstrøm, S. L., & Hempler, N. F. (2020). A qualitative exploration of facilitators and barriers for diabetes self-management behaviors among persons with type 2 diabetes from a socially disadvantaged area. *Patient Preference and Adherence*, 14, 569–580. http://doi.org/10.2147/PPA.S237631

Cleven, L., Krell-Roesch, J., Nigg, C. R., & Woll, A. (2020). The association between physical activity with incident obesity, coronary heart disease, diabetes and hypertension in adults: A systematic review of longitudinal studies published after 2012. *BMC Public Health*, *20*(726), 1-15. https://doi-org/10.1186/s12889-020-08715-4

Colberg, S. R., Sigal, R. J., Yardley, J. E., Riddell, M. C., Dunstan, D. W., Dempsey, P. C., Horton, E. S., Castorino, K., & Tate, D. F. (2016). Physical activity/exercise and diabetes: a position statement of the American diabetes association. *Diabetes Care*, *39*(11). https://doi.org/10.2337/dc16-1728

Creswell, J. W., & Poth, C. N. (2018). *Qualitative inquiry & research design: Choosing among five approaches*. SAGE Publications

Creswell, J. W., & Creswell, D. (2018). *Research Design: Qualitative, quantitative, and mixed methods approaches*. SAGE Publications

Department of Health and Human Resources. (2020). *Disasters and chronic disease*. https://dhhr.wv.gov/hpcd/Pages/Disasters-and-Chronic-Disease.aspx

Didarloo, A. R., Shojaeizadeh, D., Gharaaghaji, R. A. S. L., Habibzadeh, H., Niknami, S., & Pourali, R. (2012.). Prediction of self-management behavior among iranian women with type 2 diabetes: Application of the theory of reasoned action along with self-efficacy (ETRA). *Iranian Red Crescent Medical Journal, 14*(2), 86–95. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3372043/

Di Renzo, L. Gualtieri, P., Pivari, F. Soldati, L., Attinà, A., Cinelli, G., Leggeri, C., Caparello, G., Barrea, L., Scerbo, F., Esposito E., & De Lorenzo A. (2020). Eating habits and lifestyle changes during COVID-19 lockdown: An Italian survey. *Journal of Translational Medicine*, *18*(229), 1-13. https://doi.org/10.1186/s12967-020-02399

Downie, G. A., Mullan, B. A., Boyes, M. E., & McEvoy, P. M. (2019). The effect of psychological distress on self-care intention and behavior in young adults with type 1 diabetes. *Journal of Health Psychology*, *26*(4), 543-555. https://doi-org/10.1177/1359105318824795

Dworkin, S. L. (2012). Sample size policy for qualitative studies using in-depth interviews. *Archives of Sexual Behavior*, *41*(6), 1319–1320. https://doi-org/10.1007/s10508-012-0016-6

Elo, S., Kääriäinen, M., Kanste, O., Pölkki, T., Utriainen, K., & Kyngäs, H. (2014). Qualitative content analysis: A focus on trustworthiness. SAGE Open, 1-10. https://doi-org/10.1177/2158244014522633

Fattahi, A., Nikanjam, R. Mehr, M. B. & Beigi, A. M. (2019). Predictors of physical activity in type 2 diabetic patients based on the theory of planned behavior. *Iranian Journal of Diabetes and Obesity*, *11*(4), 226–232. https://doi.org/10.18502/ijdo.v11i4.2878

Forouhi, N. G., Misra, A., Mohan, V., Taylor, R., & Yancy, W. (2018). Dietary and nutritional approaches for prevention and management of type 2 diabetes. *British Medical Journal*, 361, 1-9. https://doi-org.10.1136/bmj.k2234

Fritz, H. A. (2017). Challenges to developing diabetes self-management skills in a low-income sample in North Carolina, USA. *Health and Social Care in the Community*, *25*(1), 26–34. https://doi.org/10.1111/hsc.12172

Frey, B. (2018). Qualitative research. *The SAGE encyclopedia of educational research, measurement, and evaluation*. https://doi.org/10.4135/9781506326139

Gao M, Chen X, Sun X, Wang F, & Fan L. (2020). Predicting stage of exercise among patients with type 2 diabetes: A test of the extended theory of planned behavior. *Patient Preference and Adherence*, 14, 277–285. https://doi.org/10.2147/PPA.S236813

Ghasemi, M., & Sabzmakan, L. (2015). Experiences of high school students about the predictors of tobacco use: A directed qualitative content analysis. *Journal of Education and Community Health*, *2*(3), 1–11. https://doi-org/10.20286/jech-02031

Ghosh, A., Arora, B., Gupta, R., Anoop, S., & Misra, A. (2020). Effects of nationwide lockdown during COVID-19 epidemic on lifestyle and other medical issues of patients with type 2 diabetes in north India. *Diabetes & Metabolic Syndrome: Clinical Research & Reviews*, *14*(5), 917–920. https://doi-org/10.1016/j.dsx.2020.05.044

Ginsberg, B. H. (2007). Blood glucose monitoring: necessary and sufficient? *Journal of Diabetes Science and Technology*, *1*(5), 612–613. https://doi.org/10.1177/193229680700100502

Glanz, K., Rimer, B. K., & Viswanath, K. (2015). *Health behavior: Theory, research, and practice*. San Francisco, CA: Jossey-Bass.

Gonzalez, J. S., Tanenbaum, M. L., & Commissariat, P. V. (2016). Psychosocial factors in medication adherence and diabetes self-management: Implications for research and practice. *The American Psychologist*, *71*(7), 539–551. https://doi.org/10.1037/a0040388

Gopalan, G., Suttner, L., Troxel, A. B., McDonough, K., & Schapira, M. M. (2020). Testing patient-informed approaches for visually depicting the hemoglobin A1c value to patients with poorly controlled diabetes: A randomized, controlled trial.

BMC Health Services Research, *20*(1), 1–11. https://doi.org/10.1186/s12913-020-5035-8

Guan, W. J., Ni, Z. Y., & Hu, Y. (2020). Clinical characteristics of coronavirus disease 2019 in China. *The New England Journal of Medicine*, *382*(18), 1708–1720. https://doi.org/10.1056/nejmoa2002032

Gupta, R., Ghosh, A., Kumar Singh, A. K., & Misraa, A. (2020). Clinical considerations for patients with diabetes in times of COVID-19 epidemic. *Diabetes and Metabolic Syndrome*, *14*(3), 211–212. https://doi.org.10.1016/j.dsx.2020.03.002

Hailu, F. B., Moen, A., & Hjortdahl, P. (2019). Diabetes self-management education (DSME)- effect on knowledge, self-care behavior, and self-efficacy among type 2 diabetes patients in Ethiopia: A controlled clinical trial. *Diabetes, Metabolic Syndrome and Obesity*, 12, 2489–2499. https://doi.org/10.2147/DMSO.S223123

Hennink, M., & Kaiser, B. (2019). Saturation in qualitative research. In P. Atkinson, S. Delamont, A. Cernat, J.W. Sakshaug, & R.A. Williams (Eds.), *SAGE Research Methods Foundations.* https://doi.org/10.4135/9781526421036822322

Hodges, L. S., Trueman, M. S., Jefferys, D. T. (2019). Improving self-management of type 2 diabetes in African Americans age 40 and over: Development and implementation of a culturally sensitive community education program. *Alternative, Complementary & Integrative Medicine*, *5*, 1-6. https://doi.org/0.24966/ACIM-7562/100063

Horn, R. B., & Kirsch, T. D. (2018). Disaster response 2.0: Noncommunicable disease essential needs still unmet. *American Journal of Public Health, 108*(3), S202–S203. https://doi.org/10.2105/AJPH.2018.304604

Hsieh, H. F., & Shannon, S. E. (2005). Three approaches to qualitative content analysis. *Qualitative Health Research, 1*(9), 1277-1288. https://doi.org/10.1177/1049732305276687

Huang, Z., Lum, E., Jimenez, G., Semwal, M., Sloot, P., & Car, J. (2019). Medication management support in diabetes: A systematic assessment of diabetes self-management apps. *BMC Medicine*, *17*(1), 127. https://doi-org/10.1186/s12916-019-1362-1

Humble, A., M. (2009). Technique triangulation for validation in directed content analysis. *International Journal of Qualitative Methods*, 8. https://doi-org/10.1177/160940690900800305

Hussain, A., Bhowmik, B., & do Vale Moreira, N. C. (2020). COVID-19 and diabetes: Knowledge in progress. *Diabetes Research and Clinical Practice*, 162, 1-9. https://doi.org/10.1016/j.diabres.2020.108142

International Diabetes Federation. (2019). *IDF North America and Caribbean members*. https://www.idf.org/our-network/regions-members/north-america-and-caribbean/members/62-grenada.html

Joensen, L. E., Madsen, K. P., Holm, L., Nielsen, K. A., Rod, M. H., Petersen, A.A., Rod, N. H., Willaing, I. (2020). Diabetes and COVID-19: Psychosocial consequences of the COVID-19 pandemic in people with diabetes in Denmark-what

characterizes people with high levels of COVID-19-related worries? *Diabetes Medicine*, 37(7), 1146-1154. https://doi.org/10.1111/dme.14319

Joshi, R., Atal, S., Fatima, Z., Balakrishnan, S., Sharma, S., & Joshi, A. (2020). Diabetes care during COVID-19 lockdown at a tertiary care centre in India. *Diabetes Research and Clinical Practice*, 166, 1-6. https://doi.org/10.1016/j.diabres.2020.108316

Karimy, M., Koohestani,H. R., & Araban, M. (2018). The association between attitude, self-efficacy, and social support and adherence to diabetes self-care behavior. *Diabetology & Metabolic Syndrome*, *10*(1), 1–6. https://doi-org/10.1186/s13098-018-0386-6

Khader, M. A., Jabeen, T., & Namoju, R. (2020). A cross sectional study reveals severe disruption in glycemic control in people with diabetes during and after lockdown in India. *Diabetes & Metabolic Syndrome*, *14*(6), 1579–1584. https://doi-org/10.1016/j.dsx.2020.08.011

Khare, J., & Jindal, S. (2021). Observational study on effect of lock down due to COVID 19 on HBA1c levels in patients with diabetes: Experience from Central India. *Primary Care Diabetes*, 1-5. https://doi.org/10.1016/j.pcd.2020.12.003

Kes, D., & Gökdoğan, F. (2020). Relationship between medication adherence and psychosocial adjustment in patients with type 2 diabetes: A cross-sectional study. *Nordic Journal of Nursing Research*, *40*(3), 116–122. https://doi-org/10.1177/2057158520937456

Khairnar, R., Kamal, K. M., Giannetti, V., Dwibedi, N., & McConaha, J. (2019). Barriers and facilitators to diabetes self-management in a primary care setting – Patient perspectives. *Research in Social and Administrative Pharmacy*, *15*(3), 279–286. https://doi-org/10.1016/j.sapharm.2018.05.003

Kibiswa, K. N. (2019). Directed qualitative content analysis (DQlCA): A tool for conflict analysis. *The Qualitative Report*, *24*(8), 2059-2079. https://nsuworks.nova.edu/tqr/vol24/iss8/15

Kleier, J. A., Dittman, P. W. (2014). Attitude and empowerment as predictors of self-reported self-care and A1C values among African Americans with diabetes mellitus. *Nephrology Nursing Journal*, *41*(5), 1-9. https://pubmed.ncbi.nlm.nih.gov/26295091/

Kueh, Y. C., Morris, T., Borkoles, E., & Shee, H. (2015). Modelling of diabetes knowledge, attitudes, self-management, and quality of life: A cross-sectional study with an Australian sample. *Health and Quality of Life Outcomes*, *13*(129). https://doi.org/10.1186/s12955-015-0303-8

Korstjens, I., & Moser, A. (2018). Series: Practical guidance to qualitative research. Part 4: Trustworthiness and publishing. *European Journal of General Practice*, *24*(1), 120–124. https://doi-org/10.1080/13814788.2017.1375092

Kumari, A., Ranjan, P., Vikram, N. K., Kaur, D., Sahu, A., Dwivedi, S. N., Baitha, U., & Goel, A. (2020). A short questionnaire to assess changes in lifestyle-related behavior during COVID 19 pandemic. *Diabetes & Metabolic Syndrome: Clinical Research & Reviews*, *14*(6), 1697–1701. https://doi-org/10.1016/j.dsx.2020.08.02

Kurnia, A. D., Amatayakulb, A., Karuncharernpanit, S. (2017). Predictors of diabetes self-management among type 2 diabetics in Indonesia: Application theory of the health promotion mode. *International Journal of Nursing Sciences*, 4, 260-265 https://doi-org/10.1016/j.ijnss.2017.06.010

Lash, D. N., Smith, J. E., & Rinehart, J. K. (2016). Can the theory of planned behavior predict dietary intention and future dieting in an ethnically diverse sample of overweight and obese veterans attending medical clinics? *Appetite*, 99, 185–192. https://doi.org/10.1016/j.appet.2016.01.013

Lee, L. T., Bowen, P. G., Mosley, M. K., & Turner, C. C. (2017). Theory of planned behavior: Social support and diabetes self-management. *Journal for Nurse Practitioners*, *13*(4), 265–270. https://doi-org/10.1016/j.nurpra.2016.07.013

Lewis-Beck, M. S., Bryman, A., & Futing Liao, T. (2004). Basic qualitative research. *The SAGE encyclopedia of social science research methods*. https://doi-org/10.4135/9781412950589

Lin, C. Y., Cheung, M., Hung, A., Poon, P., Chan, S., & Chan, C. (2020). Can a modified theory of planned behavior explain the effects of empowerment education for people with type 2 diabetes? *Therapeutic Advances in Endocrinology and Metabolism*, *11*. https://doi.org/10.1177/2042018819897522

Lin, L.-K., Sun, Y., Heng, B. H., Chew, D. E. K., & Chong, P. (2017). Medication adherence and glycemic control among newly diagnosed diabetes patients. *BMJ Open Diabetes Research & Care*, *5*(1), 1-9. https://doi-org/10.1136/bmjdrc-2017-000429

Ma, R., & Holt, R. (2020). COVID-19 and diabetes. *Diabetic Medicine*, *37(*5), 723–725. https://doi.org/10.1111/dme.14300

Machry, R. V., Rados, D. V., Gregório, G. R. de, & Rodrigues, T. C. (2018). Self-monitoring blood glucose improves glycemic control in type 2 diabetes without intensive treatment: A systematic review and meta-analysis. *Diabetes Research and Clinical Practice*, 142, 173–187. https://doi-org/10.1016/j.diabres.2018.05.037

Madhu S. V. (2020). Post COVID-19 diabetes care-lessons and challenges. *International Journal of Diabetes in Developing Countries*, 1–3. Advance online publication. https://doi.org/10.1007/s13410-020-00831-6

Madsen, K. P., Willaing, I., Rod, N. H., Varga, T. V., & Joensen, L. E. (2021). Psychosocial health in people with diabetes during the first three months of the COVID-19 pandemic in Denmark. *Journal of Diabetes and its Complications*, *35*(4). https://doi-org/10.1016/j.jdiacomp.2021.107858

Maneze, D., Weaver, R., Kovai, V., Salamonson, Y., Astorga, C., Yogendran, D., & Everett, B. (2019). “Some say no, some say yes”: Receiving inconsistent or insufficient information from healthcare professionals and consequences for diabetes self-management: A qualitative study in patients with type 2 Diabetes. *Diabetes Research and Clinical Practice*, 156. https://doi-org/10.1016/j.diabres.2019.107830

Martina, & Adisasmita, A. C. (2019). Association between physical activity and obesity with diabetes mellitus in Indonesia. *International Journal of Caring Sciences*,

12(3), 1703–1709. http://internationaljournalofcaringsciences.org/docs/42_martina_original_12_3.pdf

McGuire, M., Freyder, M., Ricketts, P. (2013). *A review of diabetes treatment adherence interventions for the eastern Caribbean*. https://www.measureevaluation.org/resources/publications/sr-14-90.html

Mekonnen, C. K., Ferede, Y. M, & Abate, H. K. (2021). Determinants of dietary adherence among type 2 diabetes patients aimed covid-19 at the university of gondar comprehensive specialized hospital. *Diabetes, Metabolic Syndrome and Obesity*, 14, 917–927. https://www.dovepress.com/getfile.php?fileID=67214

Merriam, S. B., & Tisdell, E. J. (2015). *Qualitative research: A guide to design and implementation*. Wiley & Sons

Mikhael, E. M, Hassali, M. A., & Hussain, S. A. (2020). Effectiveness of diabetes self-management educational programs for type 2 diabetes mellitus patients in middle east countries: A systematic review. *Diabetes, Metabolic Syndrome and Obesity*, 13, 117–138. https://doi-org/10.2147/DMSO.S232958

Milky, G., & Thomas, J., 3rd. (2020). Shared decision making, satisfaction with care and medication adherence among patients with diabetes. *Patient Education and Counseling*, *103*(3), 661–669. https://doi-org/10.1016/j.pec.2019.10.008

Mills, A. J., Durepos, G., & Wiebe, E. (2010). *Encyclopedia of case study research*. https://doi.org/10.4135/9781412957397

Ministry of Health Grenada. (2020). *COVID-19*. https://covid19.gov.gd/covid-19/

Misra, R., & Fitch, C. (2020). A model exploring the relationship between nutrition knowledge, behavior, diabetes self-management and outcomes from the dining with diabetes program. *Preventive Medicine*, 141, 1-7. https://doi.org/10.1016/j.ypmed.2020.106296

Mohebi, S., Parham, M., Sharifirad, G., Gharlipour, Z., Mohammadbeigi, A., & Rajati, F. (2018). Relationship between perceived social support and self-care behavior in type 2 diabetics: A cross-sectional study. *Journal of Education and Health Promotion*, *7*(1), 48. https://doi-org/10.4103/jehp.jehp_73_17

Morris, A. (2015). Developing the interview guide. In Morris, A. *A practical introduction to in-depth interviewing*. https://doi-org/10.4135/9781473921344

Mukherjee, S., Banerjee, O., Singh, S., & Maji, B. K. (2020). COVID 19 could trigger global diabetes burden - A hypothesis. *Diabetes & Metabolic Syndrome*, *14*(5), 963–964. https://doi.org/10.1016/j.dsx.2020.06.049

Mukona, D. M., & Zvinavashe, M. (2020). Self- management of diabetes mellitus during the Covid-19 pandemic: Recommendations for a resource limited setting. *Diabetes & Metabolic Syndrome*, *14*(6), 1575–1578. https://doi-org/10.1016/j.dsx.2020.08.022

Nachimuthu, S., Vijayalakshmi, R., Sudha, M., & Viswanathan, V. (2020). Coping with diabetes during the COVID-19 lockdown in India: Results of an online pilot survey. *Diabetes & Metabolic Syndrome*, *14*(4), 579–582. https://doi-org/10.1016/j.dsx.2020.04.053

Narmawan, N., Syahrul, S., Erika, K. A. (2018). The behavior of foot care in patients with type 2 diabetes Mellitus: Applying the theory of planned behavior. *Public Health of Indonesia*, *4*(3), 129 –137. https://doi-org/10.36685/phi.v4i3.209

Neubauer, B. E., Witkop, C. T., & Varpio, L. (2019). How phenomenology can help us learn from the experiences of others. *Perspectives on Medical Education*, *8*(2), 90–97. https://doi-org/10.1007/s40037-019-0509-2

Nicolucci, A., Kovacs, B. K., Holt, R. I., Comaschi, M., Hermanns, N., Ishii, H., Kokoszka, A., Pouwer, F., Skovlund, S. E., Stuckey, H., Tarkun, I., Vallis, M., Wens, J., & Peyrot, M. (2013). Diabetes attitudes, wishes and needs second study (DAWN2™): Cross-national benchmarking of diabetes-related psychosocial outcomes for people with diabetes. *Diabetes Medicine*, *30*(7), 767-77. https://doi-org/10.1111/dme.12245

Oh, H. S. (2020). Opposite effects of work-related physical activity and leisure-time physical activity on the risk of diabetes in Korean adults. *International Journal of Environmental Research and Public Health, 17*(16), 1-14. https://doi-org/10.3390/ijerph17165812

Ong, W. M., Chua, S. S., & Ng, C. J. (2014). Barriers and facilitators to self-monitoring of blood glucose in people with type 2 diabetes using insulin: A qualitative study. *Patient Preference and Adherence*, 8, 237–246. https://doi.org/10.2147/PPA.S57567

Önmez, A., Gamsızkan, Z., Özdemir, Ş., Kesikbaş, E., Gökosmanoğlu, F., Torun, S., & Cinemre, H. (2020). The effect of COVID-19 lockdown on glycemic control in

patients with type 2 diabetes mellitus in Turkey. *Diabetes & Metabolic Syndrome*, *14*(6), 1963–1966. https://doi-org/10.1016/j.dsx.2020.10.007

Oishi, S. M. (2003). A few words about qualitative interviewing. *The Survey kit: How to conduct in-person interviews for surveys*. https://doi.org/10.4135/9781412984416

Owens, J. K., & Martsolf, D. S. (2014). Chronic illness and disasters: Development of a theoretical framework. *Qualitative Report*, *19*(22), 1–23. https://nsuworks.nova.edu/tqr/vol19/iss22/1/

Pamungkas, R. A., Chamroonsawasdi, K., & Vatanasomboon, P. (2017). A systematic review: Family support integrated with diabetes self-management among uncontrolled type II diabetes mellitus patients. *Behavioral Sciences*, *7*(3), 62. https://doi-org/10.3390/bs7030062

Patton, M. Q. (2015). *Qualitative Research & Evaluation Methods*. SAGE Publications.

Pavithra, H., Akshaya, K. M., Nirgude, A. S., & Balakrishna, A. G. (2020). Factors associated with awareness and practice about foot care among patients admitted with diabetes mellitus: A cross sectional research from a medical college hospital of southern India. Nepal *Journal of Epidemiology*, *10*(3), 897–904. https://doi-org/10.3126/nje.v10i3.29213

Phutthong, S. (2018). Predictive factors on the plasma glucose level in type 2 diabetes mellitus client: Relative analysis under the theory of planned behavior in Surat Thani hospital region. *Medical Journal*, *31*(1), 83–96. https://doi.org/10.14341/DM10290

Plotnikoff, R. C., Lippke, S., Courneya, K., Birkett, N., & Sigal, R. (2010). Physical activity and diabetes: An application of the theory of planned behavior to explain physical activity for type 1 and type 2 diabetes in an adult population sample. *Psychology & Health*, *25*(1), 7–23. https://doi-org/10.1080/08870440802160984

Pouralizadeh, M., Khankeh, H., Ebadi, A., & Dalvandi, A. (2017). Factors influencing nursing students' clinical judgment: A qualitative directed content analysis in an Iranian context. *Journal of Clinical & Diagnostic Research*, *11*(5), 1–4. https://doi-org/10.7860/JCDR/2017/25753.9822

Powers, M. A., Bardsley, J., Cypress, M., Duker, P., Funnell, M. M., Fischl, A. H., Maryniuk, M. D., Siminerio, L., & Vivian, E. (2016). Diabetes self-management education and support in type 2 diabetes: A joint position statement of the American diabetes association, the American association of diabetes educators, and the academy of nutrition and dietetics. *Clinical Diabetes Journal*, *34*(2), 70–80. https://doi.org/10.2337/diaclin.34.2.70

Pradhan, D., Tripathy, G., Pradhan, S., Behera, B., & Samantaray, A. (2020). The emergence of novel SARS-CoV-2 (COVID-19) a triple reassortant corona virus immunogenicity and reactogenicity in human. *Journal of Clinical & Diagnostic Research*, *14*(6), 1–4. https://doi.org/10.7860/JCDR/2020/44381.13761

Presseau, J., Johnston, M., Francis, J., Hrisos, S., Stamp, E., Steen, N., Hawthorne, G., Grimshaw, J., Elovainio, M., Hunter, M., & Eccles, M. (2014). Theory-based predictors of multiple clinician behaviors in the management of diabetes. *Journal*

of Behavioral Medicine, *37*(4), 607–620. https://doi-org/10.1007/s10865-013-9513-x

Quinn, L. M., Davies, M. J., & Hadjiconstantinou, M. (2020). Virtual consultations and the role of technology during the COVID-19 pandemic for people with type 2 diabetes: The UK perspective. *Journal of Medical Internet Research*, *22*(8). https://doi-org/10.2196/21609

Rao, D., Maurer, M., Meyer, J., Zhang, J., & Shiyanbola, O. O. (2020). Medication adherence changes in blacks with diabetes: A mixed methods study. *American Journal of Health Behavior*, *44*(2), 257–270. https://doi-org/10.5993/AJHB.44.2.13

Ranscombe, P. (2020). How diabetes management is adapting amid the COVID-19 pandemic. *The Lancet*, *8*(7), 571. https://doi.org/10.1016/S2213-8587(20)30181-9

Raoufi, A. M., Tang, X., Jing, Z., Zhang, X., Xu, Q., & Zhou, C. (2018). Blood glucose monitoring and its determinants in diabetic patients: A cross-sectional study in Shandong, China. *Diabetes Therapy*, *9*(5), 2055–2066. https://doi.org/10.1007/s13300-018-0499-9

Ravitch, S. M., & Carl, N. M. (2016). *Qualitative research: Bridging the conceptual, theoretical, and methodological*. Sage Publications.

Reid, R., Tulloch, H., Sigal, R., Kenny, G., Fortier, M., McDonnell, L., Wells, G., Boulé, N., Phillips, P., & Coyle, D. (2010). Effects of aerobic exercise, resistance exercise or both, on patient-reported health status and well-being in type 2

diabetes mellitus: A randomised trial. *Diabetologia*, *53*(4), 632–640. https://doi.org/10.1007/s00125-009-1631-1

Reyes, J., Tripp-Reimer, T., Parker, E., Muller, B., & Laroche, H. (2017). Factors influencing diabetes self-management among medically underserved patients with type II diabetes. *Global Qualitative Nursing Research*, *4*, 1-13. https://doi-10.1177/2333393617713097

Ricci-Cabello, I., Ruiz-Pérez, I., Rojas-García, A., Pastor, G., Rodríguez-Barranco, M., & Gonçalves, D. C. (2014). Characteristics and effectiveness of diabetes self-management educational programs targeted to racial/ethnic minority groups: a systematic review, meta-analysis and meta-regression. *BMC Endocrine Disorders*, *14*(60), 2-13. https://doi.org/10.1186/1472-6823-14-60

Rose, K. J., & Scibilia, R. (2021). The COVID19 pandemic – Perspectives from people living with diabetes. *Diabetes Research and Clinical Practice*, 173, 1-4. https://doi-org/10.1016/j.diabres.2020.108343

Rohani, H., Malekahmadi M., Ahmad Ali Eslami, A. A., Ghaderi, A., Bidkhori, M., Raei, M., & Zinat-Motlag, S. F. (2019). Predicting dietary behavior of type 2 diabetics: Application of the theory of planned behavior and perceived risk of diabetes complications construct. *Chronic Diseases Journal*, *3*(2), 71–78. https://doi-org/10.22122/cdj.v3i2.153

Ruiz-Roso, M. B., Knott-Torcal, C., Matilla-Escalante, D. C., Garcimartín, A., Sampedro-Nuñez, M. A., Dávalos, A., & Marazuela, M. (2020). COVID-19 lockdown and changes of the dietary pattern and physical activity habits in a

cohort of patients with type 2 diabetes mellitus. *Nutrients*, *12*(8). https://doi-org/10.3390/nu12082327

Ruissen, M., M, Hannah, R., Cyril, P., L., Marielle, S., Ingrid, J., Michiel, F. N., & Hanno, P. (2021). Increased stress, weight gain and less exercise in relation to glycemic control in people with type 1 and type 2 diabetes during the COVID-19 pandemic. *BMJ Open Diabetes Research & Care*, *9*(1). https://doi-org/10.1136/bmjdrc-2020-002035

Sabzmakan, L., Mohammadi, E., Morowatisharifabad, M. A., Afaghi, A., Naseri, M. H., & Mirzaei, M. (2014.). Environmental determinants of cardiovascular diseases risk factors: A qualitative directed content analysis. *Iranian Red Crescent Medical Journal*, *16*(5), 1-11. https://doi.org/10.5812/ircmj.11573

Sabzmakan, L. Eslami, F., Sighaldeh, S. S., & Izuka, N. J. (2020). Intention to quit water pipe smoking among Iranian women: A qualitative directed content analysis. *BMC Women's Health*, *20*(1), 1–9. https://doi.org/10.1186/s12905-020-00922-w

Sae-Sia, W., Maneewat, K., & Kurniawan, T. (2013). Effect of a self-management support program on diabetic foot care behaviors. *International Journal of Research in Nursing*, *4*(1), 14-21. https://doi-org/10.3844/ijrnsp.2013.14.21

Salkind, N. J. (2010). Research methods. *Encyclopedia of research design*. Thousand https://doi-org/10.4135/9781412961288

Sankar, P., Ahmed, W. N., Koshy, V. M., Jacob, R., & Sasidharan, S. (2020). Effects of COVID-19 lockdown on type 2 diabetes, lifestyle and psychosocial health: A hospital-based cross-sectional survey from South India. *Diabetes & Metabolic*

Syndrome: Clinical Research & Reviews, *14*(6), 1815–1819. https://doi-org/10.1016/j.dsx.2020.09.005

Sardu, S., Gargiulo,G., Esposito, G., Paolisso, G., & Marfella, R. (2020). Impact of diabetes mellitus on clinical outcomes in patients affected by Covid-19. *Cardiovascular Diabetology*, *19*(1), 1–4. https://doi-org/10.1186/s12933-020-01047-y

Sari, Y., Upoyo, A. S., Isworo, A., Taufik, A., Sumeru, A., Anandari, D., & Sutrisna, E. (2020). Foot self-care behavior and its predictors in diabetic patients in Indonesia. *BMC Research Notes*, *13*(1), 1–6. https://doi-org/10.1186/s13104-020-4903-y

Schofield, J., Leelarathna, L., & Hood Thabit, H. (2020). COVID-19: Impact of and on diabetes. *Diabetes Therapy*, *11*(7), 1429–1435. https://doi-org/10.1007/s13300-020-00847-5

Shakil-Ur-Rehman, S., Karimi, H,, & Gillani, S. A. (2017). Effects of supervised structured aerobic exercise training program on fasting blood glucose level, plasma insulin level, glycemic control, and insulin resistance in type 2 diabetes mellitus. *Pakistan Journal of Medical Sciences*, *33*(3), 576-580. https://doi-org/10.12669/pjms.333.12023

Sharma, M. (2020). Potential of weight gain during COVID-19 community-wide quarantine. *Advances in Obesity, Weight Management & Control*, *10*(2), 48–49. https://doi.org/10.15406/aowmc.2020.10.00305

Shen, Y., Wang, T., Gao, M., Wang, F., Zhu, X., Zhang, X., Li, D., Gan, Y., Zhang, Y., Gao, Y., & Sun, X. (2020). Association of glucose control and stages of change

for multiple self-management behaviors in patients with diabetes: A latent profile analysis. *Patient Education and Counseling*, *103*(1), 214–219. https://doi-org/10.1016/j.pec.2019.08.020

Shi, C., Zhu, H., Liu, J., Zhou, J., & Tang, W. (2020). Barriers to self-management of type 2 diabetes during covid-19 medical isolation: A qualitative study. *Diabetes, Metabolic Syndrome and Obesity*, 13, 3713–3725. https://www.dovepress.com/front_end/cr_data/cache/pdf/download_1608683617_5fe29061340f6/dmso-268481-barriers-to-self-management-of-type-2-diabetes-during-covid-.pdf

Shrivastava, S. R., Shrivastava, P. S., & Ramasamy, J. (2013). Role of self-care in management of diabetes mellitus. *Journal of Diabetes and Metabolic Disorders*, *12*(14), 1-5. https://doi.org/10.1186/2251-6581-12-14

Statistic Solutions. (2020). *Qualitative sample size*. https://www.statisticssolutions.com/qualitative-sample-size/#:~:text=Qualitative%20analyses%20typically%20require%20a%20smaller%20sample%20size%20than%20quantitative%20analyses.&text=The%20goal%20of%20qualitative%20researchers,in%20additional%20perspectives%20or%20information.

Syed, S. M., & Marathe, R. P. (2020). Corona virus global emergency: An overview. *International Journal of Pharmacy & Life Sciences*, *11*(8), 6874–6878. https://www.researchgate.net/publication/344385602_Corona_Virus_Global_Emergency_An_Overview

Tao, J., Gao, L., Liu, Q., Dong, K., Huang, J., Peng, X., Yang, Y., Wang, H., & Yu, X. (2020). Factors contributing to glycemic control in diabetes mellitus patients complying with home quarantine during the coronavirus disease 2019 (COVID-19) epidemic. *Diabetes Research and Clinical Practice*, 170, 1-10. https://doi-org/10.1016/j.diabres.2020.108514

Tascioglu, D., Yalta, K., & Yetkin, E. (2020). Hypertension and diabetes mellitus in patients with COVID 19: A viewpoint on mortality. *Cardiovascular Endocrinology & Metabolism*, *9*(3), 108–109. https://doi.org/10.1097/XCE.0000000000000213

Teherani, A., Tina Martimianakis, T., Stenfors-Hayes, T., Wadhwa, A., & Varpio, L. (2015). Choosing a qualitative research approach. *Journal of Graduate Medical Education*, *7*(4), 669–670. https://doi.org/10.4300/JGME-D-15-00414.1

Tiwari, A., Kumar, D., Ansari, M. S., Chaubey, S. K., Gupta, N. R., Agarwal, V., Chandra, K. P., Pande, A. R, Awasthi, R., Gupta, M., & Chowdhary, S. (2021). Impact of lockdown on self-care management among patients with type 2 diabetes mellitus residing in Lucknow city, India – A cross-sectional study. *Clinical Epidemiology and Global Health*, 10, 1-6. https://doi-org/10.1016/j.cegh.2021.100703

Utli, H., & Doğru, V. B. (2021). The effect of the COVID-19 pandemic on self-management in type 2 diabetics. *Primary Care Diabetes*, 1-7. https://doi-org/10.1016/j.pcd.2021.07.009

Vanstone, M., Rewegan, A., Brundisini, F., Giacomini, M., Kandasamy, S., & DeJean, D. (2017). Diet modification challenges faced by marginalized and nonmarginalized adults with type 2 diabetes: A systematic review and qualitative meta-synthesis. *Chronic Illness*, *13*(3), 217–235. https://doi-org/10.1177/1742395316675024

Vasileiou, K., Barnett, J., Thorpe, S., & Young, T. (2018). Characterising and justifying sample size sufficiency in interview-based studies: Systematic analysis of qualitative health research over a 15-year period. *BMC Medical Research Methodology*, *18*(148), 1-18. https://doi.org/10.1186/s12874-018-0594-7

Verma, A., Rajput, R., Verma, S., Balania, V. K. B., & Jangra, B. (2020). Impact of lockdown in COVID 19 on glycemic control in patients with type 1 diabetes mellitus. *Diabetes & Metabolic Syndrome*, *14*(5), 1213–1216. https://doi-org/10.1016/j.dsx.2020.07.016

Wabe, N. T., Angamo, M. T., & Hussein, S. (2011). Medication adherence in diabetes mellitus and self-management practices among type-2 diabetics in Ethiopia. *North American Journal of Medical Sciences*, *3*(9), 418–423. https://doi.org/10.4297/najms.2011.3418

Wang, A., Zhao, W., Xu, Z., & Gu, J. (2020). Timely blood glucose management for the outbreak of 2019 novel coronavirus disease (COVID-19) is urgently needed. *Diabetes Research and Clinical Practice*, 162, 1-2. https://doi.org/10.1016/j.diabres.2020.108118

Wardian, J., & Sun, F. (2014). Factors associated with diabetes-related distress: Implications for diabetes self-management. *Social Work in Health Care*, *53*(4), 364–381. https://doi-org/10.1080/00981389.2014.884038

Watanabe, T., Berry, T. R., Willows, N. D., & Bell, R. C. (2015). Assessing intentions to eat low-glycemic index foods by adults with diabetes using a new questionnaire based on the theory of planned behavior. *Canadian Journal of Diabetes*, *39*(2), 94–100. https://doi-org/10.1016/j.jcjd.2014.09.001

Weaver, R. R., Lemonde, M., Payman, N., & Goodman, W. M. (2014). Health capabilities and diabetes self-management: The impact of economic, social, and cultural resources. *Social Science & Medicine*, 102, 58–68. https://doi-org./10.1016/j.socscimed.2013.11.033

Wicaksana, A. L., Hertanti, N. S., Ferdiana, A., & Pramono, R. B. (2020). Diabetes management and specific considerations for patients with diabetes during coronavirus diseases pandemic: A scoping review. *Diabetes & Metabolic Syndrome*, *14*(5), 1109–1120. https://doi.org/10.1016/j.dsx.2020.06.070

Wongrith, P. (2019). Predicting diabetic self-care management based on the theory of planned behavior among elderly with type 2 diabetes in Thailand. *Diabetes Mellitus*, *22*(4), 367–376. https://doi-org/10.14341/DM10290

World Health Organization. (2020). *Diabetes.* https://www.who.int/news-room/fact-sheets/detail/diabetes

Yasmin, F., Nahar, N., Banu, B., Ali, L., Sauerborn, R., & Souares, A. (2020). The influence of mobile phone-based health reminders on patient adherence to

medications and healthy lifestyle recommendations for effective management of diabetes type 2: A randomized control trial in Dhaka, Bangladesh. *BMC Health Services Research*, *20*(1), 1-12. https://doi.org/10.1186/s12913-020-05387-z

Zachary, Z., Brianna, F., Brianna, L., Garrett, P., Jade, W., Deyo Alyssa, D., & Mikayla, K. (2020). Self-quarantine and weight gain related risk factors during the COVID-19 pandemic. *Obesity Research & Clinical Practice*, *14*(3), 210-216. https://doi.org/10.1016/j.orcp.2020.05.004

Appendix A: Interview Protocol

1. Ensure that the recording device is functional.
2. Call the participant and introduce the study and the researcher: Hi, my name is Pauline Smith, and I am a Ph.D. student at Walden University. I want to thank you again for agreeing to participate in the study. As I shared before, the purpose of the study is to get a better understanding of the self-management or self-care behaviors of persons with diabetes here in Grenada during the COVID-19 lockdown period.

   I would be asking you questions about your diabetes self-management during the COVID-19 lockdown period. Diabetes self-management includes things a person with diabetes would do to take care of the condition. The timeframe I would be referring to is April to May of 2020. I would also like to confirm that you are a Grenadian, that you have Type 2 diabetes, is between the age of 35 to 65, and was living in Grenada during the 24-hour lockdown period between April and May. I would also like the following information: your age, which parish you live in, and the number of years you have had diabetes. Please note that you do not have to share this information with me.
3. Inform the participant about their privacy: You were sent a consent form which you signed and returned. As outlined in the consent form, the recordings will be handled and stored with your privacy and confidentiality in mind. At no time will your name or any other personal information be shared. If you have any questions, please feel free to stop me and ask at any time.

4. Recording procedures: I would like to remind you that the interview is being recorded. I am currently in an enclosed room by myself where no one can hear us.
5. Interview protocol: Your participation is voluntary, and you can choose to stop at any time. I will ask each question and then give you the opportunity to share. You can also choose not to answer any of the questions posed to you. Also, if you did not hear or understand anything, please feel free to ask me to repeat it or explain it further.
6. The interview would last about an hour. Please let me know if you are comfortable and ready to begin.
7. Begin interview.
8. Inform the participant of the last question.
9. Ask if the participant has any questions.
10. Thank the participant: Your time and participation were greatly appreciated. After this, I will transcribe this interview, meaning that I will convert our spoken conversation into written works. When I am finished, I can provide you with a copy of it for your review.
11. If at any time you have any questions or concerns, please feel free to contact me on the number provided.

Interview Questions

Q1. Describe your exercise routine during the lockdown period?

a) How did you feel about exercising?

Probe: Do you think they were advantages or disadvantages to regular exercising? Did you have any positive or negative feelings towards exercising?

b) How did the people around you respond to you exercising or not exercising?

Probe: Were there people around you who approved or disapproved of you being physically active?

c) How confident do you feel about exercising regularly?

d) Can you describe the things that prevented you from exercising regularly?

Q 2. What about your diet? What was your general diet during the lockdown period?

Probe: Did you eat the types of foods recommended by your health care provider?

a) How did you feel about eating healthy?

Probe: Do you think they were advantages or disadvantages to eating healthy? Did you have any positive or negative feelings towards maintaining a healthy diet?

b) How did the people around you respond to your diet/eating habits?

Probe: Were there people around you who approved or disapproved of your diet?

c) How confident were you about eating healthy or following your recommended diet?

d) Can you describe the things that prevented you from eating healthy?

Q. 3 Please describe your medication routine during the lockdown.

Probe: Share whether you were taking your diabetes medication as prescribed during the lockdown period?

One pill a day

a) How did you feel about taking your medication as prescribed?

Probe: Do you think they were advantages or disadvantages to taking medication as prescribed? Did you have any positive or negative feelings towards taking your medication?

b) How did the people around respond to medication compliance/how you were taking your medications?

c) *Probe: Were there people around you who* Can you describe how confident you were in taking your prescribed medication?

approved or disapproved of your medication compliance?

They encourage

d) Can you describe how confident you were in taking your prescribed medication?

e) Can you describe the things that prevented you from taking your medication?

Nothing prevented me

Q 4. How did you monitor/check your blood sugar levels during the lockdown?

Not regularly

a) How did you feel about checking your blood sugar levels during the lockdown period?

Probe: Do you think they were advantages or disadvantages to checking your levels? Did you have any positive or negative feelings towards carrying out blood glucose checks?

b) How did the people around you respond to you monitoring/not monitoring your blood glucose level?

Probe: Are there people around you who supported/approved or disapproved of you monitoring your blood glucose level?

c) How confident do you feel about monitoring your blood glucose level?

d) Can you describe the things that prevented you from monitoring your blood glucose levels?

Q 5. Can you describe your diabetes foot care routines during the lockdown?

e) How did you feel about foot care during the lockdown period?

Probe: Do you think they were advantages or disadvantages towards your foot care? Did you have any positive or negative feelings towards carrying it?

f) How did the people around you respond to your foot care?

Probe: Are there people around you who supported/approved or disapproved of you monitoring your blood glucose level?

g) How confident do you feel about diabetes foot care?

h) Can you describe the things that prevented you from taking care of your feet?

Appendix B: Recruitment Flyer

Participants Needed!!

Do you have DIABETES ?

Research

To understand the diabetes self-management practices during the COVID-19 lock-down period

Requirements

- Have diabetes
- Lived in Grenada during the COVID-19 lockdown
- Between 35 to 65 years

Participants will be given $15 call credits

Contact

Please contact the researcher for more information:

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Your participation will help provide much-needed insights on diabetes management in Grenada