ISSN 2564-324X

ORIGINAL ARTICLE

Barriers to Diabetes Self-Management in Grenada During the Covid-19 Pandemic: A Qualitative Study

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Smith P. Barriers to Diabetes Self-Management in Grenada During the Covid-19 Pandemic: A Qualitative Study. Int J Diabetes Manag. 2023;2(1):01-11.

Abstract

During the COVID-19 lockdown, several countries implemented restrictions that affected how persons with diabetes managed their condition. While several studies exploring diabetes self-management during the pandemic was conducted, none was done in Grenada or the Caribbean region. Therefore, the aim of this study was to identify the barriers to diabetes self-management during the COVID-19 lockdown in Grenada. The study was a descriptive qualitative study with a phenomenological approach. Semi-structured interviews were conducted with 13 participants with type 2 diabetes in Grenada over two months. Two overarching themes emerged, reflecting external and internal barriers to diabetes self-management activities. The results indicated that these personal and environmental barriers significantly affected adherence across the five self-management behaviors. The findings may be used to develop a multidisciplinary approach to improve self-management skills and attitudes and promote appropriate diabetes disaster planning for a future pandemic. Addressing those barriers to diabetes self-management will improve health outcomes and quality of life.

Key Words: *Diabetes self-management; COVID-19; Grenada*

Introduction

COVID-19 has elicited major global public health concerns since first reported in Wuhan City, China, in 2019 [1,2]. The COVID-19 pandemic has affected millions of people around the globe, and countries implemented several protocols to curb the spread of the virus. From March to May 2020, the government of Grenada enforced a mandatory lockdown, which introduced several regulations, including a curfew restricting movement, closure of businesses, physical distancing protocols, restrictions on social and religious activities, and restrictions on transportation. Diabetes self-management is an integral part of a person's daily activities. It is the process through which persons actively engage in self-care activities [3]. Diabetes self-management involves a combination of several behaviors for effective disease management to predict positive outcomes and includes healthy eating, physical activity, blood sugar monitoring, medication compliance, and foot care. The goals of these self-management behaviors are associated with glycemic control, a reduction in

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Received: March 06, 2023, Accepted: May 02, 2023, Published: May 15, 2023

further complications, and overall good health [4]. Despite well-established self-management guidelines, the evidence also highlighted that many people living with diabetes struggle to practice good self-management behaviors [5,6]. Recent data showed that Grenada has a diabetes prevalence of 13.3%, with about 10,100 cases [7].

Recent literature on the impact of the pandemic and diabetes self-management revealed the challenges people experienced in their self-management practices. These studies explored the effects of the restrictions related to the pandemic and raised questions about how people with diabetes got advice, appropriately monitored their health, and continued to manage their condition effectively [8,9]. One study reported that underlying conditions like diabetes pose a risk of severe COVID illness that is 2.7 times more and increased mortality 1.9 times more than nondiabetic patients [10]. Wicaksana et al. mentioned that the spread of COVID-19 brought many consequences for persons with diabetes [11]. Shi et al. noted that the pandemic imposed an additional struggle for self-management by diabetes patients [12]. Interestingly, Quinn et al. pointed out that diabetes self-management has been highly variable during the pandemic [13]. Furthermore, poor glucose control can provoke several acute and chronic complications that healthcare systems will have to manage during and after the pandemic [14]. Thus, it creates a valid concern that 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. In their study, Wicaksana et al. described that access to care, fresh food, and limited activity due to confinement were some of the barriers experienced. Tao et al. also mentioned that diabetic patients had difficulty obtaining insulin, blood sugar monitoring, and medications, and some feared attending clinics [14]. Banerjee et al. added that the lockdown meant limited activity, food supply restriction, and difficulty obtaining anti-diabetic medications and glucose strips.

Studies exploring how the stay-at-home order affected diabetes self-management practices were conducted in India. According to one study, about 28% of participants admitted to testing their blood sugar levels regularly, and 80% had regular diet and exercise control [15]. Several authors conducted a cross-sectional study to determine the effects of the lockdown on the lifestyle of persons with diabetes in India [16]. 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. reported that 46.88% of the participants had an increase in their food intake than before the lockdown period [17].

A Brazilian study reported that about 59.4% of the persons with diabetes in the study had an increase, decrease, or higher variability in their glucose levels [18]. Additionally, 38.4% of persons postponed their medical appointments or routine examinations and lack of access to medications and other supplies [18]. 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 [19]. An increase in weight, waist circumference, and glycemic parameters was observed [19]. The researchers also found that the proportion of persons performing regular physical activity and exhibiting dietary compliance was low [19]. Additionally, several studies from China and the United States also looked at the pandemic's impact on diabetes self-management. While previous studies have shown that the impact of COVID-19 on diabetes

self-management has been largely negative, it also offered the opportunity for improved self-management behaviors.

Despite the considerable research on the topic, what was ultimately noted in the literature was a lack of research on diabetes self-management behaviors during the pandemic in Grenada and the wider Caribbean region. The issues faced by 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 is important to understand the perspectives of the diabetic population during the lockdown period. It was, therefore, vital to gain a better understanding of how people coped with diabetes self-management and the potential barriers they faced. Consequently, this present qualitative study addressed the gap in the literature by providing a deeper insight into the barriers to diabetes self-management practices in Grenada during the COVID-19 pandemic lockdown. Addressing this gap will allow the description of the participants' diabetes self-management experiences, which can inform interventions that may improve self-management behaviors during future pandemics.

Theory of Planned Behavior (TPB)

The TPB provides a basis for explaining and predicting behaviors and behavioral intentions. According to the TPB, intention is a major prerequisite for behavior achievement, and the theory explains that three constructs can determine intention: attitudes, subjective norms, and perceived behavioral control [20]. The theory was used in designing interview questions and in data analysis. A search of the literature showed that the TPB constructs strongly predict several diabetes self-management behaviors.

Methods

Purpose sampling was used to recruit participants for the study, and the inclusion criteria comprised of adults aged 35 to 65 years with type 2 diabetes who lived in Grenada during the COVID-19 lockdown in 2020. Flyers containing information about the study were used at three locations for participant recruitment. The study sample comprised of 13 Grenadian adults, and the rationale for the sample size was based on recommendations from previous phenomenological studies and data saturation. Saturation is the point at which the data collection process no longer provides new or relevant information or when conceptual categories no longer offer new insights [21].

Study design and data collection

This study adopted a qualitative methodology, and a descriptive phenomenological approach was used to better understand the lived experiences of diabetes self-management practices during the lockdown period. Flyers were used to recruit participants, which helped establish interest in serving as research subjects. Using this recruitment method ensured respect for privacy. Simply singling out persons with diabetes may have raised privacy concerns. Additionally, using flyers guaranteed that there was no pressure and that participation was voluntary. The flyers were posted at three physicians' offices and the Grenada Diabetes Association. Each flyer contained the purpose of the study, the participant criteria, and the contact number of the researcher.

One-on-one semi-structured interviews were conducted using an interview protocol from June to July of 2021 via telephone because of the lockdown and the need for social distancing. The research was approved by St George's University IRB [#21002]. This study was also conducted in accordance with the 1964 Declaration of Helsinki and its subsequent amendments. The participants were questioned about five self-management behaviors during

the interview: exercise, diet, medication compliance, glucose monitoring, and foot care. The interviews lasted about 20 to 30 minutes, and the researcher's thoughts and observations were noted during the interviews.

The interviews were recorded using an audio recording device, and the participants were notified of such. Written consent was obtained from the participants prior to the interviews, and they were allowed to ask questions or address concerns. The participants' privacy was carefully managed during the telephone interview, and alphanumeric codes were used to identify them. The raw data and recording devices were secured in a locked cabinet, accessible only by the researcher. Digital data was stored on a password-protected computer, and interviews were in a private room with headphones.

Evidence of trustworthiness

Credibility, transferability, dependability, and confirmability were addressed to establish the rigor of the study. The study's credibility was maintained by data saturation to ensure that there was no new information and that the codes were replicated. A research advisor and academic peers reviewed the data, and a copy of the transcribed interview was shared with the participants to review. For transferability, the interview protocol was developed using the protocol refinement framework by Castillo-Montoya [22].

The protocol refinement framework consists of four phases:

- Aligning the interview with the research question.
- Constructing the interview as a conversation that is inquiry-based.
- Seeking feedback on the interview protocol.
- Practicing the interview protocol.

Confirmability was done by rechecking the data throughout the study and practicing reflexive journaling to note insights, thoughts, or feelings. Finally, dependability was maintained by using decision trails to outline the specific details of the study. Also, categories and themes development were examined by a research advisor.

Qualitative data analysis

Each interview was transcribed manually promptly after the session concluded. The Dedoose software was used in the data analysis process. Patterns emerging from the data were identified and systematically presented while guided by the research questions.

A systematic coding process [23] was used to make meaning of the data and to move from coded units to larger representations:

- Data preparation and organization.
- Reading of data.
- Coding of data.
- Generating themes and categories.
- Representation of themes and categories.

The process was systematic and transparent, involving the generation of codes from the data and the subsequent development of categories and themes. The transcripts were coded using open coding, then inductively, codes with similar meanings or relationships were grouped, and links between categories were established [24].

Results

The sample size included 13 adults aged 35 to 65 (see table 1). There were five males and eight females residing in the rural [31%] and urban parts of the island [61%]. Each participant was assigned an alphanumeric code to ensure their confidentiality and protect their identity. Nine [69%] of the participants were employed, one

[8%] was unemployed, and three [23%] were retired.

Ten categories were identified, which were then grouped into two overarching themes:

- Environmental factors
- Personal factors [Table 2].

Theme 1: Environmental factors

Category: Financial burden

The difficulty in meeting the financial costs for food, medication, and testing supplies was identified as a barrier. Participants shared that it was increasingly difficult as the financial burden they experienced prevented them from

TABLE 1
Demographic information for participants in study

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

TABLE 2
Themes and categories from the data

Theme	Category	Number of responses (N=13)
Environmental factors	High cost	5
	Accessibility of resources	8
	COVID-19 restrictions	8
	Lack of support	6
Personal factors	Underlying health condition	3
	Worry and concern	7
	Negative attitude towards self-management	7
	Perceived behavioral control	6
	Personal beliefs and values	5

adequately carrying out their self-management behaviors. P10 said, "in the starting of COVID, I use to eat a lot of vegetables. And then they brought up the prices, so I tend to eat less you know." Another 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."

Category: Accessibility of resources

One of the challenges to successful diabetes self-management was issues related to the accessibility of the necessary resources to manage the disease and maintain a healthy lifestyle. Some of the 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." P11 said, "the supplies, getting what you want. It was very hard getting the stuff that was better for you." 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 admitted to eating less to manage her low insulin supplies. The procurement of diabetes glucose testing strips was also difficult.

Category: COVID-19 restriction

The 24-hour curfew restricted the free movement of the population and resulted in persons being confined to their homes. P10 disclosed challenges in sourcing food. The participant said, "in the lockdown now, people couldn't really go in the market." There was also the issue of long lines and extended 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." It was also challenging to have an exercise routine because of the confinement, and persons reported decreased 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 people could not go beyond their yards. Additionally, several persons could not visit their physicians or community clinics for routine visits or follow-ups. A participant reported being unable to get diabetes supplies from the community health center because of the curfew.

Category: Lack of 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 revealed, "those children not checking on me. They never really bother you know. They never really come with concern." 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."

Theme 2: Personal factors

Category: Underlying health condition

Having comorbidities was common among the participants. They voiced that their underlying conditions influenced their ability to adequately self-manage their diabetes by making it more challenging or impossible to complete. Because of their visual issues, P9 could not prepare regular meals, be physically active, or monitor blood glucose levels by themself. P5 was a

wheelchair user and could not do any physical activity. P6 was bedridden and dependent on community-centered care to monitor their blood sugar levels was unable to leave for testing.

Category: Worry and concern

Participants emphasized the experience of 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 exercising was challenging 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 inside. P11 said, "because of my condition, I was fearful. So that was my greatest fear last year, so that's why I would stay inside."

Category: Negative attitude towards self-management behaviors

The participants expressed a poor attitude and frustration in performing self-management behaviors. 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. Participants exclaimed that they were "frustrated" because "every time you have to juke your hand." P5 and P11 did not like testing as well, and P11 went on to explain that their husband assisted them with glucose monitoring. This was similarly shared by P12, who said, "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, several participants did not exercise because they had an overall unfavorable attitude towards it. The majority of participants had a negative attitude towards diabetes foot care and did not practice any foot care behaviors.

Category: Perceived behavioral control

While finger picks for glucose monitoring are unavoidable for a person with diabetes, 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 have. 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." 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."

Category: Personal beliefs and values

Participants' personal beliefs and values were also barriers to their self-management practices. Participants utilized nontraditional medicines as a substitute for their prescribed medications. P9 drank "bush tea" because it was "good for their condition," and P7 also consumed "spice tea or ginger tea" in an effort to "control the sugar." P10 argued that the prescribed diabetes medication is unnecessary and believes "there is a cure" for the disease.

Discussion

The onset of the COVID-19 restrictions resulted in a change in the lifestyles of persons with diabetes and impacted their self-management capabilities. It is, therefore, necessary to better understand the various factors that hindered their ability to manage their diabetic condition appropriately. This study offers insight into the diabetes self-management barriers faced during the COVID-19 lockdown. Emerging from the data were the common barriers to diabetes self-management, categorized as environmental factors and personal factors.

A key aspect that inhibited diabetes self-management among the participants was a shortage of essential items needed to maintain their health. Issues related to access to fresh fruits and vegetables were repeatedly mentioned, and the lack of access resulted in unhealthy eating habits. Likewise, one study noted that the lockdown restricted food supplies and created the unavailability of diabetic medications and testing strips [25]. This is in line with a quantitative study that showed that self-isolation during the pandemic was significantly related to access to food and medicine [26]. Another study demonstrated a decrease in the intake of vegetables during the COVID-19 lockdown, which is consistent with this study. Conversely, other findings suggested a significant increase in vegetable consumption and reported maintaining dietary compliance [27,28]. Participants also experienced financial constraints that added to their issues with accessing food. Similarly, a previous study in India found that socioeconomic difficulties altered eating habits during the lockdown [29].

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 as they could have before the lockdown. Other studies indicated similar results during the lockdown. Researchers found that the stay-at-home mandate resulted in limited space to exercise and reduced physical activity [30]. Participants repeatedly mentioned that they felt a lack of support regarding their self-management behaviors from the people around them. These results were consistent with a qualitative study that reported that access to family support was affected during the lockdown [12]. This current study revealed that participants received insufficient support for their exercise and foot care practices. The participants who received support from family and friends felt motivated and empowered to be consistent. Nonetheless, the findings add to previous knowledge that social support is a fundamental tool in diabetes self-management.

Another relevant finding in the data was feelings of stress or fear during the lockdown, expressed mainly by the female participants. This finding was also reported in a cross-sectional study in India, where 17% reported moderate to severe depressive symptoms, 29% reported moderate to severe anxiety symptoms, and 8% reported moderate to intense stress levels [31]. Another article explained that people with diabetes experienced greater worry about being infected than people without diabetes [32]. Nonetheless, participants mentioned that they tried to cope despite feeling stressed during the lockdown. Participants also revealed a negative attitude and non-compliance toward their self-management routine. A lack of confidence in performing self-management behaviors was also evident. Pain when pricking the finger for testing emerged as a barrier to effective self-management among several participants. To date, no other study indicated painful fingerpick while testing as a barrier to diabetes self-management during

the pandemic. Furthermore, participants also had comorbidities that added to their inability to manage their disease. The literature did not include any studies related to comorbidities as a barrier to self-management during the lockdown.

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. There may be an opportunity for education and empowerment in self-management skills at the individual level. This may increase perceived behavioral control and confidence in performing diabetes self-management behaviors. Family members may benefit from education programs that will empower them to provide support appropriately. Greater emphasis on community-focused events to encourage healthy eating and proper food choices when dealing with limited access should be developed. Improvements regarding access to medical care and other healthcare facilities should be considered at the societal level. The implementation of telemedicine or e-health services should be viewed as an avenue to provide healthcare during restrictions. Finally, interventions should be developed to improve confidence in activities such as glucose monitoring, cooking affordable, healthy meals, and performing appropriate exercises. The literature suggested that for people with diabetes, social support can impact their psychosocial health [34]. Studies can explore the role of support on diabetes self-management outcomes. There is also a need to investigate the experiences and perspectives of persons with comorbidities and their ability to navigate the pandemic's uncertainties. This can provide valuable insights into how emergency-type situations can alter self-management practices, allowing for better planning and preparation.

Conclusions

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 diabetic population in Grenada or the Caribbean during the COVID-19 lockdown. The study indicated several barriers that affected adherence to self-management during the pandemic. The lockdown increased the difficulty of several self-management behaviors. Environmental factors like finances, resources, COVID restrictions, and support were notable barriers. Footcare appeared to be the self-care behavior with the lowest priority among the participants. Personal factors like attitude and perceived behavioral control were significant barriers to self-management. The study's findings also emphasized the need for a multidisciplinary approach to address the needs of diabetic people during a pandemic. Therefore, health education interventions are necessary to improve overall diabetes knowledge and attitudes. These social change interventions may culminate in better preventive self-care practices and quality of life for diabetic populations.

Acknowledgement

Thank you to all the participants for their time and sharing their experiences. Thank you to Dr. Dunn and Sharma for their guidance.

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