Review title

Barriers and facilitators to type 2 diabetes management in the Caribbean region: a qualitative systematic review

Abstract

Review objective: The objective of this systematic review was to summarize the barriers and facilitators to type 2 diabetes mellitus (T2DM) management in the Caribbean region.

I**ntroduction:** The prevalence of T2DM in the Caribbean is of significant concern. Poor management of T2DM increases the risks of complications and death. Several studies have been conducted to explore the barriers and facilitators to T2DM management in the Caribbean, however, a systematic review has not been conducted to summarize these.

Inclusion criteria: Eligible participants were adults (aged 18 and above) with T2DM, their families/carers and healthcare professionals whose work involves the management of T2DM, in the Caribbean. The review included studies that focused on their views, experiences, attitudes, understandings, perceptions and perspectives.

Methods: Electronic searches of MEDLINE, EMBASE, CINAHL/BNI (EBSCOhost), PsycINFO, AMED, Web of Science and Scopus were conducted from database inception to January 2019. Additionally, grey literature was searched via EThOS, OpenGrey and ProQuest Dissertations and Theses. The Joanna Briggs Institute guidelines for conducting qualitative systematic reviews were followed. Screening of studies, assessment of their methodological quality and data extraction were conducted independently by two reviewers. Findings from studies were synthesized using a meta-aggregation approach, and certainty of the findings were ranked using the ConQual approach.

Results: Eight studies were included in the review, all of which focused on the patients' perspective. There were six synthesized findings which included barriers and facilitators of T2DM management. These include, cultural demands, pressures and social stigma impact self-management and general care of T2DM (moderate certainty evidence); environment context and resources impact the management of T2DM (high certainty evidence); support systems influence on the general management of T2DM (high certainty evidence); personal background and circumstances can encourage and limit good self-management and general management of T2DM (moderate certainty evidence); psychological factors that influences patient's actions towards management of T2DM (low certainty evidence); psychological factors and their influence on patient's adherence to T2DM management (low certainty evidence).

Conclusions: Patients in the Caribbean have multiple barriers and facilitators which limit and promote effective management of their T2DM. Identifying the barriers and facilitators to T2DM management in the Caribbean will assist policymakers, patients, healthcare professionals, carers, family and friends to

develop effective T2DM management programs to ensure the appropriate T2DM management. However, further qualitative studies on barriers and facilitators to T2DM management in the Caribbean should be conducted as the certainty of findings were low. Additionally, future studies should also target healthcare professionals and families/carers.

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Keywords:
Barriers; Caribbean; facilitators; type 2 diabetes management; systematic review, meta-aggregation

Abstract word count: 423

52 *Insert “summary of findings” here*

Introduction

Type 2 diabetes mellitus (T2DM) is a chronic condition characterized by high blood glucose levels in the body.[1,2] As a result of constant increase in the prevalence of T2DM, it is rapidly becoming an epidemic in many countries.[3]There are multiple risk factors associated with T2DM, and the more risk factors a person has, the more likely they are to develop T2DM.[4,5] Some of the common risk factors are ethnicity (South Asian, African-Caribbean/Black African origin and Chinese people are at higher risk), increasing age, a family history of T2DM, unhealthy diet, physical inactivity, overweight or obesity, dyslipidemia, hypertension, a history of gestational diabetes in woman and pre-diabetes.[4] Its chronic hyperglycaemia is associated with long-term complications (macro- and micro-vascular) and even death.[6] T2DM is also associated with reduced quality of life and life expectancy.[7] T2DM places a substantial burden on patients and their families and caregivers as well as on a country's economy and the healthcare system.[3] The general T2DM management strategy includes patient education, lifestyle advice, managing blood glucose levels, managing cardiovascular risk, and identifying and managing long-term complications.[2] If T2DM is detected and managed as early as possible, people with T2DM can live longer healthier lives.[9]

T2DM is one of the most contemporary and important public health challenges in the Caribbean region.[10] In the region, 95% of people living with diabetes have T2DM.[1,2,8] The prevalence of T2DM is roughly 9% in the region.[11] T2DM patients in the region have poor glycemic control and high T2DM related complications.[12] T2DM is responsible for about 14% of all deaths in the region.[11] Most of the associated morbidity and mortality occurs in adults between the age of 18 and 59 years.[10] T2DM negatively affects the economic growth and overall productivity of the region. The quality of care of T2DM patients is unacceptable in the region and this includes inadequate guidance on diet and physical activity, monitoring of blood glucose levels and screening for T2DM related complications.[12,13]

Several studies have been conducted in the Caribbean region on barriers and facilitators to T2DM management.[12,14–20] Some of the barriers identified were poor access to health care, difficulty in maintaining behavior change, negative attitudes about living with T2DM and lack of support from family members. We searched MEDLINE and EMBASE, and no systematic review has been conducted on this topic. The systematic review aimed to synthesize existing barriers and facilitators, which can occur at the patient level, family/carers level and healthcare professional level. Considering the region's unique socio-cultural structure and lifestyle, high burden and poor management of T2DM,[21–24] it was necessary to undertake this systematic review to know whether the perspectives in the region are the same or different from a global perspective. This systematic review might help the health experts to take appropriate actions to address the barriers and promote the facilitators.

Review question

What are the views, experiences, attitudes, understandings, perceptions and perspectives of T2DM patients, their families/carers and healthcare professionals regarding the barriers and facilitators to T2DM management?

Inclusion criteria

Participants

This review considered studies that were conducted among adult patients (aged 18 and above) with T2DM, their families/carers (a person who looks after a T2DM patient) and healthcare professionals whose work involves the management of T2DM (such as providers and commissioners).

Phenomena of interest

This review considered studies that focused on the views, experiences, attitudes, understandings, perceptions and perspectives regarding the barriers and facilitators to T2DM management.

Context

The following countries were considered to represent the Caribbean: Anguilla, Antigua and Barbuda, Aruba, The Bahamas, Barbados, Bonaire, British Virgin Islands, Cayman Islands, Cuba, Curacao, Dominica, Dominican Republic, Grenada, Guadeloupe, Haiti, Jamaica, Martinique, Montserrat, Netherlands Antilles, Puerto Rico, Saint Kitts and Nevis, Saint Barthelemy, Saint Lucia, Saint Vincent and the Grenadines, Sint Maarten/Saint Martin, Trinidad and Tobago, Turks and Caicos Islands, US Virgin Islands.[25] In the Caribbean region, any study setting was considered such as community, primary care, secondary care and tertiary care.

Type of studies

The review considered studies that focused on qualitative data, including, but not limited to, designs such as phenomenology, ethnography, grounded theory and action research. We also considered include cross-sectional surveys where free text relating to the review question were reported within the paper.

Methods

The systematic review procedure adhered to the Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA)[26] and the Joanna Briggs Institute (JBI) methodology for qualitative evidence systematic reviews guidelines.[27] It followed a published protocol.[28] The systematic review was also registered with PROSPERO (CRD42018097242).

Search strategy

An initial limited search was carried out in MEDLINE and EMBASE databases using the initial keywords, and the keywords were type 2 diabetes, management, barriers, facilitators and Caribbean. The titles and abstracts of the studies were screened for the same keywords used for the initial limited search, and the index terms used to describe the article were also identified. The search results were inspected to ensure that the relevant articles were identified.

We searched a wide range of sources, to find both published and unpublished studies. For published studies, the following databases and their platforms were searched from their inception dates to 11th

March 2020: MEDLINE (OVID), EMBASE (OVID), CINAHL/BNI (EBSCOhost), PsycINFO (OVID), AMED (OVID), Web of Science and Scopus (Elsevier). The full search strategies for all databases are detailed in Appendix I. These search strategies were developed through consultation with an information specialist/librarian at the University of Nottingham. The search for grey literature (unpublished studies) included EthOS (British Library), OpenGrey and ProQuest Dissertations and Theses (ProQuest), which were searched from their inception dates to 11th March 2020. The reference list of all primary studies included in the review was screened for additional studies. We restricted to the following six official languages of the Caribbean; English, Spanish, French, Dutch, Haitian Creole and Papiamento.[25]

Study selection

Following the search, reviewer one collated all citations that were identified and uploaded into EndNote X8.2 (Clarivate Analytics, PA, USA), a reference management software. Reviewer one then removed all the duplicates. Titles and abstracts were independently screened by two reviewers for eligibility using the inclusion criteria. Identified studies that were potentially eligible or those without an abstract had their full-text retrieved by reviewer one. Full-text of the studies were assessed against the inclusion criteria by the two reviewers independently. Full-text studies that did not meet the inclusion criteria were excluded. The reasons for exclusion were reported. A third reviewer was required when disagreements between the two reviewers did not reach a consensus through discussion.

Assessment of methodological quality

All the included studies were critically assessed using the qualitative standardized critical appraisal tool downloaded from JBI SUMARI.[27] The JBI critical appraisal checklist for qualitative studies used a 10 question criteria. The checklists used a scoring system, and each domain was scored as either being met (Yes), not met (No), unclear (U) or not applicable (N/A). Data extraction and synthesis were conducted for all studies which met the inclusion criteria regardless of their methodological quality. High-quality as well as low-quality studies can generate potentially valuable insights. Together, they can lead to a richer understanding of the research phenomenon.[27,29] Two independent reviewers were involved in the process. There were disagreements which surfaced between the two reviewers and they were all resolved through discussion. A third reviewer was not required to resolve disagreements.

Data extraction

The data extraction was undertaken independently by two reviewers. Any disagreements between the two reviewers were resolved through discussion. When a consensus was not reached, a third reviewer was required. A data extraction and critical appraisal database (using Microsoft Excel), based on the JBI System for the Unified Management, Assessment and Review of Information (JBI SUMARI) (Joanna Briggs Institute, Adelaide, Australia) was developed and used for the full text studies retrieved. We extracted study characteristics – authors, year of publication, study title, study period, inclusion and exclusion criteria, study design, phenomena of interest, country and context, participants (T2DM patients or their families/carers, healthcare professionals), sample size, recruitment methods, data

collection, data analysis and authors' conclusion. The specific study findings – barriers and facilitators to T2DM management in the Caribbean region were extracted for the different population groups (patients, family/carers and healthcare professionals). We extracted themes which were recorded as findings and direct quotes from participants which were recorded as illustrations. These were discovered through repeated reading of the results of the included studies. Reviewers searched for (i) any bold text and italic text, tables and diagrams; (ii) data in the form of themes, metaphor or rich descriptions; and (iii) key words such as themes, sub themes, phrases, categories, quotes, barriers and facilitators to T2DM management. The data extraction is detailed in Appendix II. Credibility of each finding was also assessed independently by two reviewers. When disagreements surfaced between the two reviewers, they were resolved through discussion. When a consensus was not reached, a third reviewer was involved. The levels of credibility are shown in Table 1.

Insert "Table 1: Levels of credibility" here

Data synthesis

Quotes detailing the views, experiences, attitudes, understandings, perceptions and perspectives of the barriers and facilitators to T2DM management were also extracted to support the findings. The illustrations and findings were the exact words of the participants and authors, respectively, which was located in the results of the included studies. All the extracted findings from the three different populations were synthesized to develop a core set of synthesized statements.

The qualitative study findings from all the studies were pooled using the meta-aggregation approach.[27,30] This involved the compiling of findings and categorizing them on the basis of similarity in meaning. These categories were then subjected to a synthesis in order to produce a single comprehensive set of synthesized findings. Three reviewers were involved in data synthesis, the synthesis of findings were done initially by one reviewer (AN) and then discussed with two additional reviewers (KC and JL). One reviewer (AN) compiled all the similar findings into categories. Each finding was written on a separate label, the ones that were related were grouped and given a name or description which represented them all. This was an iterative approach until agreement between all three reviewers (AN, KC JL) was achieved. All three reviewers (AN, KC JL) then reviewed the categories to ensure that all the findings were placed appropriately. Reviewer one then grouped all similar categories to make synthesized findings. All the reviewers (AN, KC JL) met again to review the synthesized findings and to create appropriate statements to represent each one. When there were disagreements, they were resolved through discussion with all three reviewers (AN, KC JL). The entire meta-aggregation process took approximately 8 hours, including three 60 minutes of group meetings.

Assessing certainty in the findings

The final synthesized findings were graded according to the ConQual approach for establishing confidence in the output of research synthesis and presented in a summary of findings table.[31] The table includes the major elements of the review and the justification of the ConQual score reported. The table also includes the title, population, phenomena of interest and context for this systematic review.

Each synthesized finding from the review was presented along with the type of research informing it, a score for dependability, credibility and the overall ConQual score.

Results

Study inclusion

Following the literature searches, 1322 records were identified. After duplicates were removed, 777 records were screened for eligibility. Following title and abstract screening, a further 760 records were excluded, leaving a total of 107 eligible for full-text screening. Eight studies were identified as eligible for inclusion in the review (figure 1).[19,20,32–37] Ninety-nine studies were excluded at the full-text stage due to either ineligible participants (5 studies), ineligible phenomena of interest (26 studies), ineligible study context (39 studies), ineligible study design (18 studies) or the full-text paper could not be sourced from the British Library (11 studies). Reasons for exclusion can be found in Appendix III.

Insert "Figure1: PRISMA flow diagram(26)*" here.*

Methodological quality

Overall, all of the qualitative studies scored highly across the methodological quality domains (Table 3). The studies overall quality ranged from 80% (8/10) to 100% (10/10) and the majority of quality domains individually scoring 100% (8/10). However, two of the quality domains had lower scores; ("Is there a statement locating the researcher culturally or theoretically?" (Q6) = 63%, 5/8 studies; and "Is the influence of the researcher on the research, and vice-versa, addressed?" (Q7) = 25%, 2/8 studies.

Insert "Table 2: Methodological quality of the included studies" here

Characteristics of included studies

The eight included studies were published between 2005 and 2019. Two studies were conducted in Jamaica[20,34], three in the Dominican Republic[35–37], and the other three were conducted in Puerto Rico[32], St. Vincent[33], United States Virgin Islands[19]. All of the included studies recruited participants with T2DM. The studies recruited participants from diabetes clinics, health care centres, community centres, an education programme, private physician's patient log or self-referral. Seven of the included studies explicitly stated that the participants were T2DM patients.[19,32–37]; however, the eighth study recruited participants with either T1DM or T2DM - this study was included in the review as 99% of the respondents had T2DM.[20] No studies were identified which recruited families/carers or health professionals. Six of the included studies used a qualitative design[20,33–37], one used a mixed-methods design[19] and one reported free text within a cross-sectional survey[32]. The sample size ranged from 12 to 133 participants. Three sampling methods were used in the studies: purposive sampling[19,33,35–37], convenience sampling[34] and random sampling[20]. Data collection included a variety of procedures: focus groups[33,34], semi-structured interviews([19,20,33,35,37], in-depth interviews[36] and questionnaire with open-ended questions (free text).[19,32] The data analysis methods used in the studies were thematic analysis[34,35], content analysis[32], inductive analysis[36,37], constant comparative method of qualitative

analysis[19] and one study used a combination of thematic and narrative analysis.[35] Two further studies did not state which specific analysis method they used; however, they reported using coding and identifying themes.[20,33]

The included studies focused on different areas of T2DM management, shown in table 2. One study focused on physical activity, explored self-efficacy beliefs and outcome expectancies (perceived benefits and barriers) as possible social cognitive factors affecting physical activity levels in T2DM patients.[32] The second study focused on self-management, diet and medication and how diabetes-related stress impacted it.[36] The third study covered both self-management and lifestyle, focusing on the day-to-day experiences of diabetics and lifestyles that may have caused an onset and progression of T2DM, health beliefs, attitudes and knowledge of the population.[34] The fourth study addressed medication (treatment), focusing on the reasons for the use of non-prescribable medicines in T2DM patients.[33] The fifth study addressed only self-management, where it focused on self-management behaviours among T2DM patients and investigated the impact of culture on self-management attitudes, knowledge, and behaviour.[19] This study also explored whether there was an association between self-management behaviours and patient-level characteristics and the clinical outcome of glycosylated haemoglobin.[19] The sixth explored local approaches to cope with stress associated with T2DM it also nawwored in on how the approach impacted T2DM patients lifestyle (physical activity and diet), medication and clinic appointments.[37]The seventh study focused on self-management and the role social support plays through exploring the types and sources of social support across diabetes diagnosis and the self-management experiences of T2DM patients.[35] The eighth sixth study focused on two management areas, lifestyle change and glycaemic control through exploring the patients knowledge of T2DM, motivational factors, and identified possible barriers to positive lifestyle changes and glycaemic control.[20]

Insert "Table 3: Characteristics of included studies" here

Review findings

Barriers and facilitators of T2DM management

The synthesized findings collated all barriers and facilitators of T2DM management in the Caribbean from the patients' perspective. After the aggregation of 79 findings, 23 categories were generated, and following further grouping of similar themes, the 23 categories were grouped into six synthesized findings. The synthesized findings are as followed: cultural demands, pressures and social stigma impact self-management and general care of T2DM, environmental context and resources impact the management of T2DM, support systems influence on the general management of T2DM, personal background and circumstances can encourage and limit good self-management and general management of T2DM, psychological factors which influences patient's actions towards the management of T2DM and psychological factors and their influence on patient's adherence to T2DM management. No findings were identified which discussed barriers and facilitators of T2DM management from the perspectives of family/carers level or healthcare professionals level.

Synthesized finding 1: Cultural demands, pressures and social stigma impact self-management and general care of T2DM

Synthesized finding 1 was the result of nine findings which were merged into three categories (Figure 2). The finding expressed how patients continued to consume local unhealthy foods and traditional non-evidence based traditional medicines or therapies despite the repercussions. Social stigma included the shame and judgement passed from others/community to T2DM patients.

- Following an unhealthy diet

Different types of food have different effects on the body of T2DM patients. Participants expressed the importance of balancing different foods, including unhealthy foods to help assist in the management of their T2DM.

"… If I feel drowsy, sick and I take some food and throw it in me mouth, it carry the feelings down. But if you sugar some tea and drink it, throw you down clean, you see." (33)*p.1495*

Some participants develop their own remedy to tackle different symptoms or conditions associated with T2DM in some cases these were not the healthiest options. They also believed some of these foods/ remedies had been used in communities for generations, so they are appropriate to use. In some instances, participants expressed they continue to eat the unhealthy foods because they have been eating it all their lives and it has not caused any problems to them, neither are they dead yet as a result of it. As such, they believe that foods cannot be unhealthy if it does not affect them or their illness (T2DM).

"I take liberty every day. Right now I have … 3 plantains, 5 or 6 tanya, sweet potatoes, and I plan to take pig tail and cornmeal dumplings and make a big pot of peas soup…. You know the attitude I take. I live 70 years eating the same thing. What, now it's going to kill me?" (19)*p.7*

- Use of traditional non-evidence-based medicines or therapies

Patients reported the use of medicines and therapies that had no scientific evidence to support and prove what it can and cannot do for T2DM management. Different types of ingredients were used to make a medicine, which was believed to tackle certain complications associated with T2DM.

"… If you buy ah egg and you bust it a little and you throw it out in the pan, you know and you beat it with some of the milk and drink it … that is a medicine!" (33)*p.1494*

As these medicines and therapies are not evidence-based, their efficacy for T2DM management can not be inferred. Patients believed that traditional medicines and therapies were better than conventional medicines. These traditional medicines were also passed along throughout the communities and even from one diabetic patient to the next. Although patients did not have any scientific evidence on the benefits and role of the traditional medicines and therapies, they still consumed them hoping for the best results.

"(My neighbor) is a diabetic too…. Sometimes she buys bush and give me some. I don't know the name of it but it is supposed to help with sugar. So I use that." (19)*p.7*

- Stigma

Stigma was expressed as a barrier to effective T2DM self-management. Most sicknesses come with a stigma attached to it. Peoples reaction to finding out someone has diabetes has resulted in patients becoming uncomfortable and secretive about their disease. Patients expressed that a stigma has been built around the disease because is not discussed out in the open it.

"I think this needs to be more out in the open. Because you can have diabetes and control it and do everything that everybody else does. But it's so secretive … everyone will treat you like you're dying. There's a stigma attached, yes. To being diabetic or having to take medicine for it."(19)*p.7*

The community's reaction towards T2DM patients shows that they do not have enough information or understanding about the disease. It is known that people tend to be afraid of things they do not know or understand.

Insert "Figure 2: Synthesized finding 1- Cultural demands, pressures and social stigma impact self-management and general care of T2DM" here

Synthesized finding 2: Environmental context and resources impact the management of T2DM.

Synthesized finding 2 was the result of five findings which were merged into two categories. Environmental context relates to the actual physical space (such as a venue for exercise/gym), and environmental resources can refer to any service, materials or information that a person may find useful to them.

- Safety and wellbeing during physical activity

Another factor highlighted by T2DM patients which hinders physical activity is the safety. Persons do not feel safe travelling to the gym or park to do physical activity because of where it is located. Some environments or places are not safe (this may be because of the high crime rate), and people will not risk the safety going to these places.

"Safety in the area. My husband works and cannot go with me."(32)*p.87*

- Lack of resources

There was a consensus amongst the patients that many resources to aid in T2DM management were not available. There was a lack of financial, educational, healthy food options and exercise or physical activity options, which all hindered proper T2DM management. It is essential that patients, doctors and carers are educated about T2DM and its management. Patients highlighted the lack of educational resources for T2DM patients, especially immediately after diagnosis.

"I think there should be better resources for diabetics. Once you're diagnosed there should be a place that you can go to for regular classes and monitoring. I can't believe we don't have that in this day and age. There isn't even a dietician there (doctor's office)."(19)*p.7*

Patients were knowledgeable of the healthy food options, however, they could not afford it, it was too expensive. The lack of these resources promotes poor self-management.

"Making the good food choices is hard. They're simply not available in stores. Well, sometimes. Now, they tell me blueberries is good. I can eat that. But when you find that, it's five dollars for a little bag so…"[19]*p.7*

Figure 3: Synthesized finding 2- Environmental context and resources impact the management of T2DM." here

Synthesized finding 3: Support systems influence on the general management of T2DM.

This synthesized finding was the result of 12 findings which were merged into four categories (Figure 4). Support systems may include family, friends, spouses and healthcare professionals. They may also offer different types of support such as emotional, informational and instrumental, which consist any physical assistance, e.g. financial, childcare and transportation. This finding showed that family, friends and health care professionals were support systems. Family and friends had both a positive and negative influence on T2DM management. However, health care professionals were perceived to have only a positive influence on the management of T2DM.

- Lack of support from family and friends

Some patients expressed that their family and friends expected them to continue doing everything by themselves as usual with no help, even after being diagnosed with T2DM. They received limited support from family and friends which at times can be inconsistent. Also, patients reported that even if they do receive some level of support from friends, it is only for a short period and not or the long-term management of the T2DM.

"No one supports me, no one. How do I say this, even if I feel bad no one pays attention. Not even my sisters come to visit and lend me a hand. But God gives me strength, because no one else helps me. What happens is that when my sugar levels go up, I cannot sleep well and sometimes I get scared. Sometimes my family does things I don't like, which makes me feel ill, like I have high blood pressure. I don't know. Listen, those who have diabetes have to be careful and so they need someone who will support them so that they feel better."[35]*p.7-8*

- Incorrect/ negative advice from family and friends

T2DM patients reported that although family members were trying to be supportive by providing help, they would advise the patients against the doctor's orders or give their own advice or recommendations. Family and friends were identified as influencers of adjusting the doses of medications. As a result of self-adjustment of medications, T2DM cannot be managed efficiently and effectively.

"Well, the doctor told me to take the insulin two times but my mother tell me I want to know if this is right. He tell me to take twenty five units in the morning and twenty five in the night. But she said it's too much, and just gives me fifteen at night. So that's what I do."[19]*p.7*

- Positive support from family and friends

Although support from family and friends was a barrier to T2DM management it was also a facilitator. Participants expressed how friends were more than willing to offer their help and expertise. Friends would ensure that the T2DM patient would adhere to the healthy diet and stick to their self-management regime. In addition, friends would invite their T2DM friends to programmes and appointment that they thought were beneficial to T2DM patients. At these programmes and appointments, patients are able to learn more about their T2DM and its management.

"How did I first get here? The man sitting in the waiting room brought me. He found out about this program and invited a group of us to go with him. Every month a few of us go in his bus for our appointments."(35)*p.6*

In addition, neighbours provided instrumental support by taking the patient to the doctor and informational support by alerting the patient that they might be ill because of their physical appearance. There the doctor was able to provide informational support by making a diagnosis.

"…She told me, 'you're sick, your clothes are loose and falling off of you.' I agreed. I had a t-shirt that I no longer fit in. Dry, I was getting drier, [...to the point that] a man told others 'be fearful of that man, he could have AIDS.' And I heard that, you see? I went to my partner and told her that I felt ill. After that a neighbour took me to the see a good doctor to see about my condition where the doctor then tells me, 'sir, you are a diabetic."(35)*p.6*

- Good support from healthcare personnel

Participants expressed that male patients tend to avoid doctors making them more vulnerable to T2DM complications. However, healthcare professionals provided informational support which entailed medical advice to assist patients who were in distress or having complications and also provided health talks on self-management. The support from healthcare personnel is pivotal in T2DM management.

"For men, we can suffer from a problem with (sexual) relations. I spoke with the doctor when I had a problem [erectile dysfunction]. He told me what I need to do to control my sugar otherwise I won't get better."(35)p.8

Healthcare professionals also provided emotional support to patients, they spoke to them about their problems which helped them to feel better. This allowed patients to get a better perspective of their T2DM so that they can cope with it.

"Before I came here I felt that everything was crashing around me. Some of us feel like we're drowning in a cup of water because we do not find someone to talk to about our problems. But now I can talk to the cooperadores…to the doctor, and I feel better." (35)*p.8*

Insert "Figure 4: Synthesized finding 3- Support systems influence on the general management of T2DM" here.

Synthesized finding 4: Personal background and circumstances can encourage and limit good self-management and general management of T2DM

This synthesized finding was generated from 11 findings which were merged into five categories (Figure 5). Personal background includes a person's heritage, the level of or kind of education they received, and their social and economic status. Personal circumstances are difficulties or issues which may impact a person's ability to accomplish specific tasks. The categories which had a negative impact include competing priorities/ physical activity, co-morbidities/ medical history, and inadequate knowledge. There are some personal circumstances such as increased knowledge and perceived benefits of physical activity which has a positive impact on a person's ability to accomplish certain tasks.

- Impact of competing priorities on physical activity

Physical activity is one method used for managing T2DM. Although the participants are aware of the benefits of physical activity, they have expressed that different factors are serving as obstacles to physical activity. The most common factor was not having the time for physical activity due to other responsibilities.

"My work demands many times do not allow me to get home early."(32)*p.87*

- Co-morbidities and medical history

Due to T2DM patients co-morbidities/medical history, their body is limited to certain actions and based on their conditions or disabilities. As a result of these limitations, T2DM patients are unable to be physically active.

"When my back condition or knee does not allow me to do it." (32)p.87

There are multiple complications associated with T2DM which affects the patients' body in different ways, because of this, patients spirits are dampened and are not their usual selves.

"It's not an easy thing. Having diabetes contributes to other sickness and it's not nice, because it become like a part of you gone."(34)*p.75*

- Inadequate knowledge

It was highlighted by the authors that there was not enough knowledge about T2DM being disseminated amongst the patients, which is essential in the management of T2DM. The patients cannot manage their T2DM if they have no knowledge about it. There were no quotes or illustrations to represent the lack of knowledge.

- Perceived benefits of physical activity

Physical activity is an essential form of T2DM management, and all physically able patients should be physically active. Patients reported that because of the benefits of physical activity they were more eager to continue being physically active. Patients were able to carry out more tasks in their daily activities and their physical well-being was better.

"I am less tired in my other activities." (32)*p.87*

Being physically active has also allowed patients to form friendships which formed clubs. As a result of the social benefits more T2DM patients were encouraged to become physically active.

"When I exercised outside my house I met new friends and I joined a jogging club." (32)*p.86*

- Increased knowledge

Participants expressed that because of increased knowledge of T2DM they were more motivated to make changes in their lives and manage their diabetes properly.

The motivation that came after increased knowledge was exemplified by Ophelia who said, "So me gets-- me finds out now. So me have diabetes. And from thence on, me started the change. Them give me a diet sheet. And them tell me what to eat, and what not to eat, and so-and-so forth. But you know sometime you may eat what you are not supposed to eat." (34)*p.73*

Insert "Figure 5: Synthesized finding 4- Personal background and circumstances can encourage and limit good self-management and general management of T2DM" here.

Synthesized finding 5: Psychological factors that influences patient's actions towards management of T2DM

The synthesized finding was generated from 17 findings which were merged into five categories, low mood and low motivation, fear of the disease/ complications and denial. Psychological factors refer to the factors that mention the thinking of a person that influences his/her action to seek contentment, resulting in negative or positive results. Categories such as low mood and low motivation, fear of the disease/ complications and denial were factors which negatively influenced the patient's management of T2DM. The categories which positively influenced the patient's management of T2DM were high mood and high motivation and fear of the disease/ complications.

- Low mood and low motivation

Participants reported an overall lack of motivation and interest when focusing on obstacles to physical activity. As people were not motivated to be physically active, they were not able to use this form of management for T2DM, which is as important as any other form of management.

"Lack of motivation and interest." (32)*p.87*

Due to the toll T2DM and its complications has on the human body, participants were somewhat defeated. Patients also expressed how much they have been suffering and the psychological impact that the disease had on them.

"Ah, diabetes... Whatever I could do first, I cannot do it again…It burdens my body. It's against the body. Walking — I cannot walk straight…The most difficult part is over the body... poor circulation too... It look like it caused that too. …me fall down, as me step, me fall down…Yes, the nerves gone right out… It burn me under the heel and stick me... It can come anywhere… affecting my foot bottom and my heel. It burning me, burning me, burning like pepper...and the eyes, man, I don't know if it's a

glaucoma get in the eye and eat out the eye….I can't tell you how long I am suffering, suffering..." (34)*p.77*

- Fear of the disease/ complications

Patients showed concerns about the complications associated with T2DM and the impact it would have on their lives. This hindered them from seeking the appropriate care. Patients were also afraid to visit the doctor for check-ups because they were afraid of the doctors and the unknown of their disease (information/results they were going to receive).

"them don't go for check-ups because them afraid from the doctor." (34)*p.91*

- Stress

Patients reported finding it stressful to adhere to the recoomnended diet due to accessability and availability of foods. Patients also reported finding it stressful to cope with knowledge that not adhering to medication would result in complications associated with T2DM, including death. As a result of these stressful scenarios, patients reported not thinking about or dealing with their T2DM management as coping techniques.

"If you have AIDS, HIV, you have treatment. [handclap] Done. If you are in treatment, you can live 100 years and die of something else—you will not die of that [HIV]. But with diabetes, a person without treatment can be sure that one day, he will lose his vision. Through diabetes comes the famous diabetic foot or kidney problems. It is a tragedy for them and their family because now you have lost everything." (36)p.860

"Living with diabetes is worse . . . when you think about it. It is worse because you can even die of depression if you think about that, and [it can affect] your heart and all that.." (36)p.861

- Denial

Patients who did not want to accept that they had T2DM was in denial, and because they did not acknowledge the disease they did not attempt to manage it. Patients thought it was easier to ignore the signs rather than deal with the problem.

"I don't want to think about it (having diabetes). Like I say, I don't say I'm a diabetic. I only say my sugar is a little elevated. I don't even want to call the word." (19)*p.7*

- High mood and high motivation

Although some patients moods and motivations had a negative impact on their T2DM management, some patients reported high mood and motivation. Having T2DM made patients more eager to live a healthier lifestyle, more eager to get better and reduced complications. As a result, patients ensure that they continue their self-management regime to stay in good health.

"I feel good and it cheers me up. My self-esteem increases." (32)*p.86*

- Fear of the disease/ complications as a motivator

Patients reported that the fear of poor health outcomes if T2DM is not managed correctly had motivated them to manage their T2DM properly. Participants expressed that they would continue to take good care of themselves so that they will never have to suffer or develop any complications.

"And feeling healthy, that is the best. My mother, when she was alive, she used to take care of us, and she take care of herself until she leave us. So that's why I said I would take good care of myself just like my mom, and also she take care of her mother."(34)*p.86*

As there are many complications associated with T2DM such as loss of limbs or eyesight. The participants expressed the fear of this happening to them. This fear has motivated them to try and manage their food intake and eat healthier food options as well as stop unhealthy habits, e.g. drinking alcohol.

"I see the struggle when people lose limbs. I play the flute and don't want to lose fingers so I changed everything … I stopped the alcohol. And I cut back on all the starchy, Caribbean foods. You have to make up your mind that you're going to back out of all those foods you grew up with. I grow my own vegetables now. And that is another way I can get exercise."(19)*p.7*

"My concern about having diabetes is when you read up on it, you'll realize that if you don't take care of yourself, you can lose a limb and you can even go blind."(34)*p.74*

Insert "Figure 6: Synthesized finding 5- Psychological factors that influences patient's actions towards management of T2DM" here.

Synthesized finding 6: Psychological factors and their influence on patient's adherence to T2DM management.

This synthesized finding was the result of 14 findings which were merged into three categories. Personal attitudes are a way of thinking or feeling which is usually redirected or expressed through a person's behaviour. Both negative and positive attitudes are formed based on values, beliefs and feelings. However, negative attitudes should be avoided.

- Negative personal attitude towards adherence of good T2DM management

Patients struggled to adhere to the management of their T2DM. They did not believe in the prescribable medicines, and so they either did not use it or used it irregularly in combination with their own plant/bush remedies.

"The Doctor medicine is useful … I take it today, tomorrow I take the bush." (33)*p.1494*

It was also reported that there was a lack of self-monitoring of glucose amongst T2DM patients. Taking prescribable medicines a self-monitoring of glucose and sticking to the regime are essential aspects of T2DM management which have been dismissed by patients because of their attitudes.

- Positive personal attitudes and thoughts towards the adherence of good T2DM management

Patients reported that they changed their eating habits to ensure that it coincides with their T2DM management. They have done this to avoid depending heavily on medication. Due to their positive

attitude towards T2DM management, they foud it easy to succeed in their T2DM management and limit the associated complications.

"*My doctor told me what to eat, so I just stick by that. It's not hard as I cut down on portion size. Good eating habit, I can tell you. And why I know as I talk about the medication, I was following people and see, you can't get up every day just taking tablet, taking tablet."* (34)*p.88*

Patients also ensure that managing their T2DM takes priority over everything else. They ensure to go to their doctors' appointments, follow the doctor's instructions as well as save to purchase their prescribed medications as it is expensive.

"…the medications are very expensive. No matter how small it is, whatever, I have to make sure I put that money aside to fill my prescription. I don't put nothing before it." (34)*p.83*

Some patients were able to adhere to a good T2DM management through not thinking about their illness and keeping busy in their lives. Thus, using these as coping strategies to maintain diabetic control, live normal, happy lives.

"If you are working, your mind will be busy and you won't remember that you're sick. You'll live your normal life." *(37)p.6*

- Positive impact of religion

Results showed that participants found comfort and emotional support by praying to God. They view praying to God as a way of having a conversation to get advice and to feel better about their T2DM condition. It lifts their spirits making it easier to manage and deal with their T2DM.

"If you say you prayers and you go to yuh bedside and you pray you does get yuh own little thing. Sometimes one leaf of bush they will tell you to boil and you know! You feel much better." (33)*p.1494*

"You pray a lot about your condition. A way to get comfort." (34)*p.79*

Insert "Figure 7: Synthesized finding 6- Psychological factors and their influence on patient's adherence to T2DM management" here.

Discussion

This is the first systematic review to summarize the barriers and facilitators to the management of T2DM in people from the Caribbean. After an extensive search of the literature, a total of 1322 hits were identified. Following best practice methods, eight papers were included in the review. Overall, the included studies were of high methodological quality. The included studies focused on patient-level barriers and facilitators that affected different aspects of T2DM management (including self-management) in five different Caribbean countries. However, no findings were identified which related to discussing T2DM management from the perspective of family/carers or healthcare professionals. The barriers and facilitators identified were cultural demands, pressures and social stigma impact self-management and general care of T2DM, environmental context and resources impact the management of T2DM, support systems influence on the general management of T2DM, personal background and circumstances can encourage and limit good self-management and general management of T2DM,

psychological factors which influences patient's actions towards the management of T2DM and psychological factors and their influence on patient's adherence to T2DM management. Four of the synthesized findings were considered to be both barriers and facilitators in some areas such as support systems, personal background and circumstances, influence of psychological factors and personal attitudes. Among these were themes such as moods and motivation, stress, attitudes towards adherence, knowledge, medical history, availability of resources, physical activity benefits and support.

Physical activity is an integral part of T2DM management[38], and so is ensuring that it is part of patients with T2DM management regime. This study showed that the multiple benefits of physical activity, such as improvement in a patients' overall physical and mental health, encourage patients to continue being physically active. A study conducted in India contained supporting evidence which revealed that the awareness of the benefits of exercise also emerged as a facilitator.[39] Despite the benefits of physical activity being a facilitator, there were also barriers associated with physical activity. Patients competing priorities made them unable to be physically active. Patients expressed there was too much going on in their lives to fit any physical activity into their schedule. It was supported by other studies carried out in South Asian populations.[39–42] A study conducted in South Asia found that fear of injury or worsening health with exercise was a barrier to T2DM management, which was consistent with the findings from this review.[41] In South Asia populations, the lack of gender-specific facilities for physical activity was a barrier to T2DM management, however, this was not consistent with this review's findings.[41] In addition, unsafe environments for physical activity was also a barrier to T2DM management in South Asia as participants did not want to risk their lives or risk getting hurt going to gyms which were situated in dangerous areas.[41]

This review found that cultural practices influence the diet of patients negatively, two other studies which highlighted the barriers to self-management and management of T2DM (carried out in the Unites states and United Kingdom respectively) supported this.[43,44] Cultural demands/pressures showed that patients religious beliefs as well as their belief that traditional foods did not aid in the management of T2DM management. This result was consistent with one of the overall themes from a study from South Asia. They found that social responsibilities to continue with traditional diet and misconceptions on the components of diabetic diet were barriers to T2DM management.[41] This study showed that there were many misconceptions about T2DM and its' management, some findings showed that what patients believed about T2DM and its' management were false or had no scientific evidence to support its' benefit. Some of the procedures followed by patients to manage their T2DM may have been doing more harm than good. Stigma is associated with knowledge as it is usually present when there is a lack of understanding, hence being grouped into this category. People tend to be afraid of what they do not understand or have no knowledge about, and as a result, they do not always adapt to changes.[44–47] Nevertheless, there are cases where patients do adapt to cultural changes such as following appropriate dietary advice and exercise regime which facilitates with their T2DM management. This finding was supported by other studies across the world, in South Asia, the United States and the United Kingdom.[41]

Participants displayed negative attitudes towards adherence to good management which was identified as a barrier. Non-compliance consisted of patients not following doctors' orders or using prescribed medications which managed their T2DM. In a study conducted in the United States, communication with healthcare providers was not specifically identified as a synthesized finding. However, patients non-compliance to prescribed medication was a barrier to T2DM management.[43] Similar themes such as communication discordance with healthcare providers, non-compliance to partake in self-management, lack of understanding about medication management and prefer for folk and phytotherapy (herbal/ traditional medicine) were found by another study done in South Asia.[41] Some studies show that non-compliance may have been the result of lack of trust between healthcare professionals and patients, lack of knowledge/education, patients' own beliefs not coinciding with what was told or given by healthcare professionals, and not being able to follow the regimen or not being able to afford the appropriate healthy food or services.[41,48,49] In this study, there was no illustration or theme which highlighted trust in health care providers as a facilitator or lack of trust in healthcare providers as a barrier to T2DM management. However, this does not mean that it does not exist, as one study showed that trust in health care providers was a facilitator to T2DM management.[41]

There were some positive attitudes towards T2DM management adherence where patients expressed the importance of following the doctors' orders, taking their medications, adopting a diabetic diet and ensuring that they were managing their T2DM to the best of their ability. Fear was presented as a barrier and facilitator to T2DM management. Fear as a barrier was supported by Byers et al.[49] however it did not support the findings of fear being a facilitator, participants expressed that the fear of complications was not enough to motivate them to adhere to good T2DM management. Patients have also used their moods and own self-motivation as a barrier and facilitator to negatively and positively influence their T2DM management. Barriers entailed patients not wanting to control their diet and having no motivation to keep healthy. Facilitators entailed patients wanting to live and stay healthy.

Support was identified as both a barrier and a facilitator to T2DM management depending on the circumstances. The support as a facilitator was the richest finding, it had the most themes and many illustrations to support the themes. It also outweighed support as a barrier by having more positive outcomes than adverse outcomes with regards to supports' influence on T2DM management. The facilitators proved that there was support given to patients from immediate and extended family, spouses, friends, neighbours and healthcare professionals. Family support and were facilitators that were consistent in both the Caribbean and South Asia. There was emotional, physical, informational and instrumental support provided to T2DM patients, all of which helped with their disease management. A driving force of this could have been that these persons cared for the patients and wanted them to have the best possible health outcome. Studies have supported the importance of support as a barrier and a facilitator.[39,45,49–53] However, it is also important to note that there was no comments/ evidence that the support from healthcare professionals had a negative impact on T2DM patients' management.

However, the patients also identified some barriers associated with support. One of these barriers was "a lack of emotional support from a cohabitating partner", this could have been anyone living in the patient's household or with them. Another barrier was that "support from friends and neighbours were less prominent in the long-term management stage than the support from partners and providers". One main reason for the occurrence of these barriers could be the lack of knowledge. It could be that persons do not know what is required of them when providing support, how long it is needed for and how to give support correctly. It cannot be said for sure what type of support was given more than the other or who gave more support than the other, but from the results, it can be said that support was more of a facilitator to T2DM management than a barrier.[54–57] A study done in the United States identified a lack of active support groups as a barrier to T2DM management.[43] This study did not identify any illustrations or themes where support groups were mentioned. This may be because there are none available or patients are not aware that there are support groups available.

Knowledge was identified as a barrier and a facilitator to T2DM management. Increased knowledge of T2DM was identified as a facilitator. Any knowledge, whether it is big or small, it is essential. A study done in the United States reiterated that "personal understanding of T2DM" was a facilitator T2DM management.[43] However, there was an overall lack of educational resources on T2DM and its management. The lack of educational resources may have been the result of healthcare professionals not knowing the information to deliver to patients or inappropriate medium used to deliver the information. Although one finding stated that some patients acquired knowledge about diabetes, it was done after they began treatment for the disease. Realistically, information on T2DM should have been provided on the diagnosis of the disease, however, this was not the case.[58] Lack of knowledge may have also lead to patients' non-compliance. Studies which focused on South Asia, the United States and the United Kingdom also identified lack of knowledge as a barrier to T2DM management.[41,44] The language barrier between T2DM patients and healthcare providers was identified as a T2DM management barrier in studies conducted in South Asia and the United States but not in the Caribbean.[41,43] Language may not have been a barrier in the Caribbean because the healthcare providers speak the first language of the country, in most cases this is English. Whereas in countries such as South Asia and the United States, both patients and healthcare providers may speak different languages as they are more likely to have different backgrounds.

The study done in the United States showed that the lack of other resources in the local community was a barrier to T2DM management.[43] In the Caribbean, unsafe environment for physical activity and lack of resources such as affordable healthy foods and medicines and the poor infrastructure to exercise were all additional factors that were as barriers to T2DM management.[39,54,59] Despite the patients' wanting to follow good T2DM management practices, the resources were not available. For example, although healthy foods are available in the Caribbean people could not access it due to the high cost of living.

Most of the themes/categories are somewhat connected. For example, being educated or having knowledge about T2DM may affect or change people's belief, views and understanding of the disease's management. It can determine whether patients comply with their doctor's instructions, stick to their prescribed medications in addition to knowing what is required when giving support. This shows that r knowledge can eliminate more than one barrier. There were many similarities in the barriers and facilitators to T2DM management when compared to the literature. Although some themes such as "personal understanding of T2DM" and "Knowledge of T2DM" were described differently or had a different heading, their illustrations were similar, and they all came under the same category/ theme. It is now evident that many of the barriers faced in the Caribbean are being faced in other countries, such as South Asia, the United States and the United Kingdom. However, there were some barriers which were identified by patients in other geographical regions but not in the Caribbean. In the Caribbean patients did not express the lack of time spent with physicians and empathy as a barrier to T2DM management, but it was in South Asia. Another barrier T2DM management identified in South Asia was cold weather being a hindrance to physical activity, however, this was not a barrier in the Caribbean. This difference may be the result of geographical location, different cultural background, level of the health care system and health care provided, resources available to healthcare providers and patients and the country's economy.

Strengths and limitations

This study was carried out using two independent reviewers throughout, which helped to reduced bias from occurring. The level of confidence of the study findings generated were moderate to high. It showed that the results were reliable, accurate and could be trusted. Out of 28 islands in the Caribbean, the six studies in this systematic review was conducted in five Caribbean islands (Puerto Rico, St. Vincent, Jamaica, Dominica Republic and United States Virgin Islands). Although the islands all share similar culture on the surface, they all differ in their unique way. Every island has been influenced by its colonisers or immigrants and as a result the Caribbean is made up of different ethnicities and each island ethic make up is different. Every island has its' own unique national(main) dish which is made up of different ingredients that are grown or can be found on all the islands. This information shows that although they differ in certain aspects, other things, for example, their staple foods are the same. It is recommended that researchers conduct further research in other Caribbean countries so that a full picture can be sought regarding the barriers and facilitators of T2DM management. There were no studies found which covered the views of healthcare providers and family/carers. It is important to have healthcare professionals and family/carers views as there are these are the people directly involved in the management of a patients' T2DM. Whether it may be family/carers assisting with medication regime or healthcare professionals providing care they all play an essential role in ensuring proper T2DM management.[60–65] Therefore, their views on barriers and facilitators to T2DM management is equally important as those from the patients.

Implications

Firstly, as this systematic review is now the most trustworthy source of evidence to guide healthcare practice, the moderate to high confidence in the qualitative results are pivotal in the successful management of T2DM patients in the Caribbean. Secondly, with the information provided, patients will now be able to relate to other patients and have a clearer understanding of what will help them manage their disease and what will not. For example, knowing what actions, beliefs or personal traits are classified as harmful to their health and what is beneficial. Thirdly, the findings will allow T2DM patients to be more effective and efficient in communicating with healthcare professionals to decrease non-compliance and non-adherence. It is also imperative that the T2DM patients are given the appropriate resources and guidance to address the barriers that they face and promote the facilitators, all through education. This may include high-quality T2DM management guidelines, interventions that can be used on patients and policies. Fourthly, the results from this systematic review will allow policymakers to develop evidence-based recommendations/policies which deals with the issues presented. Policymakers may find it useful to should ensure that resources are available and affordable, e.g. healthy foods medicines, and there are safe environments for exercise. As well as develop policies to develop and provide supportive environments to T2DM patients to help motivate them. Policymakers may also find focusing on educating people more and giving advice on the disease, appropriate diet and medicines and physical activity very useful.[66] Some other studies which were conducted in the United States showed that tailored advice and personal guidance are more productive and more consistently associated with good health outcomes and behaviour change.[67–69] Lastly, There were a few issues identified throughout the studies included in the review. Although all the studies were of high quality, the critical appraisal highlighted the common poor reporting of the influence of the researcher on the research amongst the studies.

The Caribbean region is a large multi-cultural/multi-ethnic diverse area. Due to the history of colonisation by many nations and immigrants, multiple ethnic groups from across the world merged. The Caribbean people are mostly descendants from different ethnic backgrounds such as Africans, Europeans, Asians, Tainos and Caribs East Indians. This indicates that the region is not made up of one ethnicity and one culture, therefore, when healthcare professionals are planning ways to eliminate barriers and increase facilitators in the different countries different cultural and ethnic background should be taken into consideration. As the findings were Caribbean T2DM patients, their views and perspectives can be different from other populations such as healthcare professionals and family/carers. However, because healthcare professionals and family/carers are usually the ones caring for T2DM patients, they would be able to assist in promoting the facilitators and tackle the barriers identified as quickly as possible based on this evidence.

Conclusion

This was the first systematic review to explore the barriers and facilitators to T2DM management in people from the Caribbean. Overall, the findings showed that the barriers of T2DM management amongst patients in the Caribbean are cultural demands/pressures and influences and social stigma,

poor environmental context and resources, poor support from the most immediate influences, personal background and circumstances which limit, negative and influence of psychological factors and negative personal attitudes of T2DM patients towards the adherence of treatments. The facilitators to T2DM management amongst patients in the Caribbean are good support from the most immediate influences, personal background and circumstances which encourage good self-management and general management of T2DM, positive influence of psychological factors and positive personal attitudes of T2DM patients towards the adherence of treatments. Further research is needed which explores the views and experiences of T2DM healthcare professionals and families and carers of people with T2DM so that a more precise picture regarding the barriers and facilitators to the management of T2DM in people from the Caribbean is available.

Recommendation for practice

Based on the evidence highlighted in the summary of findings, the JBI grades of recommendations was used to assist in the development of the following recommendations shown in Table 4. A binary system for grading the recommendations, a 'strong' recommendation (Grade A) or a 'weak' recommendation (Grade B) was used.[70]

Insert "Table 4: Grades of recommendations for practice" here

Recommendation for research

Throughout the characteristics of data extraction, it was evident that there was poor reporting of the methodology in more than half of the studies. Some of the characteristics were not reported, and others were not reported in detail. It is recommended that researchers ensure that their methodology is thorough and included all the necessary information. Although a few qualitative studies were identified, there should be more qualitative studies on T2DM management conducted in more Caribbean countries so that a broader range of islands can be included in the summary of evidence. Future qualitative studies should also include healthcare professionals and carers perspectives since this systematic review was only able to synthesize findings from patients' perspective. Hopefully, the experiences, views and perspectives from other individuals may identify more barriers and facilitators that were not identified in this review.

Conflict of interest

Jo Leonardi Bee is a Senior Associate Editor of the journal and was not involved in the management or decision-making processes associated with the manuscript.

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Appendix I: **Search strategies**

Published studies

MEDLINE (1946- 11th March, 2020)

1. exp diabetes mellitus, type 2/
2. exp diabetes complications/
3. (MODY or NIDDM or T2DM).tw,ot.
4. ((typ? 2 or typ? II or typ?2 or typ?II) adj diabet$).tw,ot.
5. 1 or 2 or 3 or 4
6. (barrier* or impediment* or challenge* or hindrance* or obstacle* or hurdle* or obstruction* or deterrent* or facilitator*).mp.
7. exp qualitative research/
8. exp interview/
9. exp focus groups/
10. exp cross-sectional studies/
11. exp surveys and questionnaires/
12. (qualitative or interview* or focus group* or cross-sectional or cross sectional or survey*).mp.
13. 6 or 7 or 8 or 9 or 10 or 11 or 12
14. exp Caribbean Region/
15. (Trinidad and Tobago).mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]
16. exp Antigua and Barbuda/
17. exp Barbados/
18. exp Martinique/
19. exp Dominican Republic/
20. exp Haiti/
21. exp Jamaica/
22. exp Puerto Rico/
23. exp Cuba/
24. exp Bahamas/
25. exp Dominica/
26. exp Saint Lucia/
27. exp Grenada/
28. exp Guadeloupe/
29. exp Curacao/
30. exp Aruba/

31. exp Netherlands Antilles/
32. exp United States Virgin Islands/
33. exp British Virgin Islands/
34. exp Saint Kitts and Nevis/
35. exp Sint Maarten/
36. exp West Indies/
37. exp Saint Vincent and the Grenadines/
38. ((Caribbean) or (Trinidad) or (Tobago) or (Antigua) or (Barbuda) or (Barbados) or (Martinique) or (Dominican Republic) or (Haiti) or (Hispaniola) or (Jamaica) or (Puerto Rico) or (Cuba) or (Bahamas) or (Dominica) or (Saint Lucia) or (Grenada) or (Guadeloupe) or (Curacao) or (Bonaire) or (Aruba) or (Saba) or (Saint Eustatius) or (Virgin Islands) or (Tortola) or (Virgin Gorda) or (Jost Van Dyke) or (Anegada) or (Saint Croix) or (Saint Thomas) or (Saint John) or (Saint Kitts) or (Nevis) or (Saint Christopher) or (Sombrero) or (Saint Martin) or (Sint Maarten) or (West Indies) or (Saint Vincent) or (Grenadines) or (Eastern Caribbean) or (Greater Antilles) or (Lesser Antilles) or (Leeward Islands) or (Windward Islands) or (Caribbean Islands) or (Cayman Islands) or (Montserrat) or (Turks and Caicos Islands) or (Anguilla) or (Saint Barthelemy)).mp.
39. 14 or 15 or 16 or 17 or 18 or 19 or 20 or 21 or 22 or 23 or 24 or 25 or 26 or 27 or 28 or 29 or 30 or 31 or 32 or 33 or 34 or 35 or 36 or 37 or 38
40. 5 and 13 and 39

Embase (1947- 11th March, 2020)

1. type 2 diabetes.mp. or non insulin dependent diabetes mellitus/
2. diabetes complications.mp. or diabetic complications/
3. (MODY or NIDDM or T2DM).mp. [mp=title abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, key word, floating subheading word, candidate term word]
4. (MODY or NIDDM or T2DM).tw,ot.
5. ((typ? 2 or typ? II or typ?2 or typ?II) adj diabet$).tw,ot.
6. 1 or 2 or 3 or 4 or 5
7. (barrier* or impediment* or challenge* or hindrance* or obstacle* or hurdle* or obstruction* or deterrent* or facilitator*).mp.
8. qualitative research.mp. or qualitative research/
9. interview.mp. or interview/
10. focus groups.mp. or information processing/
11. cross-sectional studies.mp. or cross-sectional study/
12. (surveys and questionnaires).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word]
13. (qualitative or interview* or focus group* or cross-sectional or cross sectional or survey*).mp.
14. 7 or 8 or 9 or 10 or 11 or 12 or 13
15. Caribbean Region.mp. or Caribbean/
16. (Trinidad and Tobago).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacture, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word]
17. (Antigua and Barbuda).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacture, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word]
18. Barbados.mp. or Barbados/
19. Martinique.mp. or Martinique/
20. Dominican Republic.mp. or Dominican Republic/
21. Haiti.mp. or Haiti/
22. Jamaica.mp. or Jamaica/
23. Puerto Rico.mp. or Puerto Rico/
24. Cuba.mp. or Cuba/
25. Bahamas.mp. or Bahamas/
26. “Dominican (Dominica)”/ or Dominica.mp. or Dominica/
27. Saint Lucia.mp. or Saint Lucia/
28. Grenada.mp. or Grenada/

29. Guadeloupe.mp. or Guadeloupe/
30. Curacao.mp. or Curacao/
31. Aruba.mp. or Aruba/
32. Netherlands Antilles.mp. or Netherlands Antilles/
33. United States Virgin Islands.mp. or “Virgin Islands (U.S.)”/
34. British Virgin Islands.mp. or Virgin Islands (British)”/
35. (Saint Kitts and Nevis).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word]
36. Sint Maarten.mp. or Saint Martin (Dutch)”/
37. West Indies.mp. or Caribbean Islands/
38. (Saint Vincent and the Grenadines).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word]
39. ((Caribbean) or (Trinidad) or (Tobago) or (Antigua) or (Barbuda) or (Barbados) or (Martinique) or (Dominican Republic) or (Haiti) or (Hispaniola) or (Jamaica) or (Puerto Rico) or (Cuba) or (Bahamas) or (Dominica) or (Saint Lucia) or (Grenada) or (Guadeloupe) or (Curacao) or (Bonaire) or (Aruba) or (Saba) or (Saint Eustatius) or (Virgin Islands) or (Tortola) or (Virgin Gorda) or (Jost Van Dyke) or (Anegada) or (Saint Croix) or (Saint Thomas) or (Saint John) or (Saint Kitts) or (Nevis) or (Saint Christopher) or (Sombrero) or (Saint Martin) or (Sint Maarten) or (West Indies) or (Saint Vincent) or (Grenadines) or (Eastern Caribbean) or (Greater Antilles) or (Lesser Antilles) or (Leeward Islands) or (Windward Islands) or (Caribbean Islands) or (Cayman Islands) or (Montserrat) or (Turks and Caicos Islands) or (Anguilla) or (Saint Barthelemy)).mp.
40. 15 or 16 or 17 or 18 or 19 or 20 or 21 or 22 or 23 or 24 or 25 or 26 or 27 or 28 or 29 or 30 or 31 or 32 or 33 or 34 or 35 or 36 or 37 or 38 or 39
41. 6 and 14 and 40

CINAHL (1961-11th March, 2020)

1. (MH “type 2 diabetes mellitus”) or (MH “type 2 diabetes”) or (MH “diabetes type 2”)
2. (MH “diabetes complications”)
3. MW (“MODY” or ‘NIDDM” or “T2DM”)
4. MW (typ? 2 or typ? II or typ?2 or typ?II (N diabet$))
5. 1 or 2 or 3 or 4 / S1
6. TX (barrier* or impediment* or challenge* or hindrance* or obstacle* or hurdle* or obstruction* or deterrent* or facilitator*)
7. (MH “qualitative research”)
8. (MH “interview”)
9. (MH “focus group”)
10. (MH “cross-sectional studies”)
11. (MH “surveys and questionnaires”)
12. TX (qualitative or interview* or focus group* or cross-sectional or cross sectional or survey*)
13. 6 or 7 or 8 or 9 or 10 or 11 or 12 / S2
14. TX ((Caribbean) or (Trinidad) or (Tobago) or (Antigua) or (Barbuda) or (Barbados) or (Martinique) or (Dominican Republic) or (Haiti) or (Hispaniola) or (Jamaica) or (Puerto Rico) or (Cuba) or (Bahamas) or (Dominica) or (Saint Lucia) or (Grenada) or (Guadeloupe) or (Curacao) or (Bonaire) or (Aruba) or (Saba) or (Saint Eustatius) or (Virgin Islands) or (Tortola) or (Virgin Gorda) or (Jost Van Dyke) or (Anegada) or (Saint Croix) or (Saint Thomas) or (Saint John) or (Saint Kitts) or (Nevis) or (Saint Christopher) or (Sombrero) or (Saint Martin) or (Sint Maarten) or (West Indies) or (Saint Vincent) or (Grenadines) or (Eastern Caribbean) or (Greater Antilles) or (Lesser Antilles) or (Leeward Islands) or (Windward Islands) or (Caribbean Islands) or (Cayman Islands) or (Montserrat) or (Turks and Caicos Islands) or (Anguilla) or (Saint Barthelemy))
15. MH ((Caribbean) or (Trinidad) or (Tobago) or (Antigua) or (Barbuda) or (Barbados) or (Martinique) or (Dominican Republic) or (Haiti) or (Hispaniola) or (Jamaica) or (Puerto Rico) or (Cuba) or (Bahamas) or (Dominica) or (Saint Lucia) or (Grenada) or (Guadeloupe) or (Curacao) or (Bonaire) or (Aruba) or (Saba) or (Saint Eustatius) or (Virgin Islands) or (Tortola) or (Virgin Gorda) or (Jost Van Dyke) or (Anegada) or (Saint Croix) or (Saint Thomas) or (Saint John) or (Saint Kitts) or (Nevis) or (Saint Christopher) or (Sombrero) or (Saint Martin) or (Sint Maarten) or (West Indies) or (Saint Vincent) or (Grenadines) or (Eastern Caribbean) or (Greater Antilles) or (Lesser Antilles) or (Leeward Islands) or (Windward Islands) or (Caribbean Islands) or (Cayman Islands) or (Montserrat) or (Turks and Caicos Islands) or (Anguilla) or (Saint Barthelemy))
16. 14 or 15 / S3
17. 5 and 13 and 16 / S1 and S2 and S3

PsycINFO (1806- 11th March, 2020)

1. Type 2 diabetes.mp. or Type 2 Diabetes/
2. exp Type 2 Diabetes/ or diabetes mellitus, type 2.mp.
3. (MODY or NIDDM or T2DM).tw,ot.
4. exp Type 2 Diabetes/ or diabetes complications.mp.
5. ((typ? 2 or typ? II or typ?2 or typ?II) adj diabet*).tw,ot.
6. 1 or 2 or 3 or 4 or 5
7. (barrier* or impediment* or challenge* or hindrance* or obstacle* or hurdle* or obstruction* or deterrent* or facilitator*).mp.
8. exp qualitative research/
9. exp interview/
10. exp Group Discussion/
11. exp Group Discussion/ or exp qualitative research/ or focus groups.mp.
12. cross-sectional studies.mp.
13. exp surveys/ and questionnaires/
14. (qualitative or interview* or focus group* or cross-sectional or cross sectional or survey*).mp.
15. 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14
16. Caribbean Region.mp.
17. (Trinidad and Tobago).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures]
18. (Antigua and Barbuda).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures]
19. Barbados.mp.
20. Exp Countries/ or Martinique.mp.
21. Dominican Republic.mp.
22. Haiti.mp.
23. exp Countries/ or Jamaica.mp.
24. exp Countries/ or Puerto Rico.mp.
25. exp Countries/ or Cuba.mp.
26. Bahamas.mp.
27. Dominica.mp.
28. Saint Lucia.mp.
29. Grenada.mp.
30. Guadeloupe.mp.
31. Curacao.mp.
32. Aruba.mp.
33. Netherlands Antilles.mp.
34. United States Virgin Islands.mp.
35. British Virgin Islands.mp.

36. (Saint Kitts and Nevis).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures]
37. Sint Maarten.mp.
38. West Indies.mp.
39. (Saint Vincent and the Grenadines).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures]
40. ((Caribbean) or (Trinidad) or (Tobago) or (Antigua) or (Barbuda) or (Barbados) or (Martinique) or (Dominican Republic) or (Haiti) or (Hispaniola) or (Jamaica) or (Puerto Rico) or (Cuba) or (Bahamas) or (Dominica) or (Saint Lucia) or (Grenada) or (Guadeloupe) or (Curacao) or (Bonaire) or (Aruba) or (Saba) or (Saint Eustatius) or (Virgin Islands) or (Tortola) or (Virgin Gorda) or (Jost Van Dyke) or (Anegada) or (Saint Croix) or (Saint Thomas) or (Saint John) or (Saint Kitts) or (Nevis) or (Saint Christopher) or (Sombrero) or (Saint Martin) or (Sint Maarten) or (West Indies) or (Saint Vincent) or (Grenadines) or (Eastern Caribbean) or (Greater Antilles) or (Lesser Antilles) or (Leeward Islands) or (Windward Islands) or (Caribbean Islands) or (Cayman Islands) or (Montserrat) or (Turks and Caicos Islands) or (Anguilla) or (Saint Barthelemy)).mp.
41. 16 or 17 or 18 or 19 or 20 or 21 or 22 or 23 or 24 or 25 or 26 or 27 or 28 or 29 or 30 or 31 or 32 or 33 or 34 or 35 or 36 or 37 or 38or 39 or 40
42. 6 and 15 and 41

AMED (1985- 11th March, 2020)

1. exp diabetes mellitus, type 2/
2. exp diabetes complications/
3. ("MODY" or "NIDDM" or "T2DM").af.
4. ((typ? 2 or typ? II or typ?2 or typ?II) adj diabet*).mp.
5. 1 or 2 or 3 or 4
6. (barrier* or impediment* or challenge* or hindrance* or obstacle* or hurdle* or obstruction* or deterrent* or facilitator*).mp.
7. Research/ or qualitative research.mp.
8. exp interview/
9. focus groups.mp.
10. cross-sectional studies.mp.
11. (surveys and questionnaires).mp. [mp=abstract, heading words, title]
12. (qualitative or interview* or focus group* or cross-sectional or cross sectional or survey*).af.
13. 6 or 7 or 8 or 9 or 10 or 11 or 12
14. Caribbean Region.mp.
15. (Trinidad and Tobago).mp. [mp=abstract, heading words, title]
16. (Antigua and Barbuda).mp. [mp=abstract, heading words, title]
17. Barbados.mp.
18. Martinique.mp.
19. Dominican Republic.mp.
20. Haiti.mp.
21. Jamaica.mp.
22. Puerto Rico.mp.
23. Cuba/ or Cuba.mp.
24. Bahamas.mp.
25. Dominica.mp.
26. Saint Lucia.mp. or Saint Lucia/
27. Grenada.mp.
28. Guadeloupe.mp.
29. Curacao.mp.
30. Aruba.mp.
31. Netherlands Antilles.mp.
32. United States Virgin Islands.mp.
33. British Virgin Islands.mp.
34. (Saint Kitts and Nevis).mp. [mp=abstract, heading words, title]
35. Sint Maarten.mp.
36. West Indies.mp.
37. (Saint Vincent and the Grenadines).mp. [mp=abstract, heading words, title]

38. ((Caribbean) or (Trinidad) or (Tobago) or (Antigua) or (Barbuda) or (Barbados) or (Martinique) or (Dominican Republic) or (Haiti) or (Hispaniola) or (Jamaica) or (Puerto Rico) or (Cuba) or (Bahamas) or (Dominica) or (Saint Lucia) or (Grenada) or (Guadeloupe) or (Curacao) or (Bonaire) or (Aruba) or (Saba) or (Saint Eustatius) or (Virgin Islands) or (Tortola) or (Virgin Gorda) or (Jost Van Dyke) or (Anegada) or (Saint Croix) or (Saint Thomas) or (Saint John) or (Saint Kitts) or (Nevis) or (Saint Christopher) or (Sombrero) or (Saint Martin) or (Sint Maarten) or (West Indies) or (Saint Vincent) or (Grenadines) or (Eastern Caribbean) or (Greater Antilles) or (Lesser Antilles) or (Leeward Islands) or (Windward Islands) or (Caribbean Islands) or (Cayman Islands) or (Montserrat) or (Turks and Caicos Islands) or (Anguilla) or (Saint Barthelemy)).mp.
39. 14 or 15 or 16 or 17 or 18 or 19 or 20 or 21 or 22 or 23 or 24 or 25 or 26 or 27 or 28 or 29 or 30 or 31 or 32 or 33 or 34 or 35 or 36 or 37 or 38
40. 5 and 13 and 39

Web of Science (1900- 11th March, 2020)

1.TS=(typ? 2 NEAR/1 diabet? Or diabetes complications or type 2 diabetes mellitus)

2.TS=(barrier* or impediment* or challenge* or hindrance* or obstacle* or hurdle* or obstruction* or deterrent* or facilitator*)

3. TS=(qualitative or interview* or focus group* or cross-sectional or cross sectional or survey*)

4. #2 or #3

5. TS=(Caribbean count* or Caribbean region or Caribbean islands or Caribbean*)

6. 1 AND 4 AND 5

Scopus (1960-111th March, 2020)

TITLE-ABS-KEY (typ? 2 W/1 diabet? Or diabetes complications or type 2 diabetes mellitus) and (TITLE-ABS-KEY (barrier* or impediment* or challenge* or hindrance* or obstacle* or hurdle* or obstruction* or deterrent* or facilitator*) or TITLE-ABS-KEY (qualitative or interview* or focus group* or cross-sectional or cross sectional or survey*)) and TITLE-ABS-KEY (Caribbean count* or Caribbean region or Caribbean islands or Caribbean*)

Unpublished studies

EthOS- 11th March, 2020

1. Diabetes
2. Type 2 diabetes
3. Caribbean

OpenGrey- 11th March, 2020

type 2 diabetes in the Caribbean

ProQuest Dissertations and Theses- 11th March, 2020

SU((typ? 2 W/1 diabet? Or diabetes complications or type 2 diabetes mellitus)) and SU((barrier* or impediment* or challenge* or hindrance* or obstacle* or hurdle* or obstruction* or deterrent* or facilitator*)) or SU((qualitative or interview* or focus group* or cross-sectional or cross sectional or survey*)) and SU((Caribbean count* or Caribbean region or Caribbean islands or Caribbean*))

Appendix II: Study findings and illustrations

Physical activity in Puerto Rican adults with type 2 diabetes mellitus Davila [32]	
Finding 1	Positive Benefits to Health Status (U)
illustration	“Improves my diabetes condition and blood circulation.”
Finding 2	Optimal physical status (U)
illustration	“Physically my body hurts less, I feel lighter and stronger.”
Finding 3	Optimal psychological status U)
illustration	“I feel good and it cheers me up. My self-esteem increases.”
Finding 4	Optimal social benefits (U)
Illustration	“When I exercised outside my house I met new friends and I joined a jogging club.”
Finding 5	Benefits in daily life activities (U)
Illustration	“I am less tired in my other activities.”
Finding 6	Physical impairments by medical history (U)
Illustration	“When my back condition or knee does not allow me to do it.”
Finding 7	Overwhelmed by multiple responsibilities from work and home (U)
Illustration	“My work demands many times do not allow me to get home early.”
Finding 8	Concerns regarding their own safety (U)
Illustration	“Safety in the area. My husband works and cannot go with me.”
Finding 9	Motivation and self-esteem (U)
Illustration	“Lack of motivation and interest.”

Contextualizing Experiences of Diabetes-Related Stress in Rural Dominican Republic Gonzalez Rodriguez et al. [36]	
Finding 1	Sources of stress- Food access and availability (U)
Illustration	‘‘There are people who can follow their diet, but many cannot. We often must eat things that we should not eat because [living with] hunger is hard. . . . [Diabetes] is harder for the poor . . . I would say it is much harder. I feel bad for those of us that suffer from this illness. Sometimes I go to sleep hungry, and more so when one lives in the countryside. Things in the countryside are very difficult.’’
Finding 2	Sources of stress-Medication stress (U).
Illustration	“If you have AIDS, HIV, you have treatment. [handclap] Done. If you are in treatment, you can live 100 years and die of something else—you will not die of that [HIV]. But with diabetes, a person without treatment can be sure that one day, he will lose his vision. Through diabetes comes the famous diabetic foot or kidney problems. It is a tragedy for them and their family because now you have lost everything.”
Finding 3	Sources of stress - Stress-induced stress. (C)
Illustration	‘‘[Living with diabetes] is worse . . . when you think about it. It is worse because you can even die of depression if you think about that, and [it can affect] your heart and all that.
Finding 4	Coping with stress- Diabetes program Diabetes education and self-management techniques provided by cooperadores and providers at the clinic alleviated participants’ stress by reducing their uncertainty about diabetes. (U)
Illustration	“Through them, many people have been able to, as they say, [have] a little joy in their life because they have totally controlled [their] diabetes . . . it is like a blessing from God having them here.”

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Living with Diabetes: Experiences from Jamaican Diabetes Clinics in Kingston and Morant Bay Morrissey-Ross et al. [34]	
Finding 1	Doctor appointments (U)
Illustration	Nathan also expressed the importance of seeing the doctor, saying, “Yes, sometimes, I miss my appointment, but I hardly miss my appointment. And in me, sometimes if I do, it eating on me…When I miss my appointment…I call and they get me in.”
Finding 2	Obtaining and taking medications (C)
Illustration	Robert, an 82 year old man living in a rural community had suffered with type 2 DM for 32 years. He attributed his success in managing his disease without the onset of kidney disease, heart disease or stroke to taking his medication and regular exercise.
Finding 3	Knowledge of Type 2 Diabetes (U)
Illustration	The motivation that came after increased knowledge was exemplified by Ophelia who said, “So me gets-- me finds out now. So me have diabetes. And from thence on, me started the change. Them give me a diet sheet. And them tell me what to eat, and what not to eat, and so-and-so forth. But you know sometime you may eat what you are not supposed to eat.”
Finding 4	Concerns, worries, and fears (U)
Illustration	“My concern about having diabetes is when you read up on it, you'll realize that if you don't take care of yourself, you can lose a limb and you can even go blind.”
Finding 5	Most difficult part of having Typ2 2 DM (U)
Illustration	“It’s not an easy thing. Having diabetes contributes to other sickness and it’s not nice, because it become like a part of you gone.”
Finding 6	Psychosocial support (U)
Illustration	For the majority, supports were multifaceted, ranging from encouraging phone calls from concerned sisters overseas to such things as young grandchildren assisting with the administration of insulin and a daughter-in-law who visited every day on her way to work to check the blood sugar. Gina said, “In Jamaica, if you have family somewhere, you’re rich, you know.

Finding 7	Physiological impact (U)
Illustration	“Ah, diabetes... Whatever I could do first, I cannot do it again…It burdens my body. It’s against the body. Walking — I cannot walk straight…The most difficult part is over the body... poor circulation too... It look like it caused that too. …me fall down, as me step, me fall down…Yes, the nerves gone right out… It burn me under the heel and stick me... It can come anywhere… affecting my foot bottom and my heel. It burning me, burning me, burning like pepper...and the eyes, man, I don’t know if it’s a glaucoma get in the eye and eat out the eye….I can’t tell you how long I am suffering, suffering...”
Finding 8	Relationship with God (U)
Illustration	“Mary, I know that it’s God keeping me. Because there is nothing I don’t talk to Him about. I talk to …and tell him Lord, I leave everything to you. So sometimes I feel like is Him keeping me. It’s not really like the medication, I think He’s holding me.”
Finding 9	Partnership with God (U)
Illustration	“You pray a lot about your condition. A way to get comfort.”
Finding 10	Optimism from faith in God (U)
Illustration	“He’s keeping me. Me just believe that the diabetes, what I have, the Lord can cut it down. I can get healing for it.”
Finding 11	Economic Impact (U)
Illustration	“You cannot keep a strict diet without money because that come with money. So I have to find the money to buy it, and sometimes the drugs are expensive — as for the insulin. So if drug store don’t have don’t have insulin, you have to buy the insulin because I have to keep on the medication. You’re looking at three thousand or to three five (about $24-$28 U.S.) for one vial of insulin.”
Finding 12a	Beliefs about what would help. (U)
Illustration	“…the medications are very expensive. No matter how small it is, whatever, I have to make sure I put that money aside to fill my prescription. I don't put nothing before it.”
Finding 12b	Beliefs about what would help. (U)

Illustration	“…what I learn about cerasee tea is that diabetic cannot feel any. It will hide the blood sugar… you will do the test, and it show normal with it creeping up.” Iris mused, “I tell myself, you see if the bushes worked nobody would have diabetes. So if you find yourself with medical problem, go to medical care. I don't believe in staying home and doing it yourself.”
Finding 13	Motivation to seek care (U)
Illustration	“And feeling healthy, that is the best. My mother, when she was alive, she used to take care of us, and she take care of herself until she leave us. So that's why I said I would take good care of myself just like my mom, and also she take care of her mother.”
Finding 14	Action taken to mitigate the effects of Type 2 DM (U)
Illustration	“My doctor told me what to eat, so I just stick by that. It's not hard as I cut down on portion size. Good eating habit, I can tell you. And why I know as I talk about the medication, I was following people and see, you can't get up every day just taking tablet, taking tablet.”
Finding 15	Differences between Genders relative to Type 2 DM (U)
Illustration	“them don’t go for check-ups because them afraid from the doctor."

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Rural Vincentians' (Caribbean) beliefs about the usage of non-prescribable medicines for treating Type 2 diabetes Moss et al. [33]	
Finding 1	An irregular pattern of usage emerged as plant and prescribed medications were used concurrently and interchangeably (U)
Illustration	"The Doctor medicine is useful … I take it today, tomorrow I take the bush."
Finding 2	A contrast in beliefs regarding the efficacy of prescribed medicine for diabetes and the nature of the relationship with medical personnel (C)
Illustration	"Doctor say is better for me not to take any tablets. Ah say, "Yes Doctor! Give me the tablets." … You must have yuh tablets to show that you coming to Doctor."
Finding 3	Traditional foods as medicine (alternative medicine) (U)
Illustration	"… If you buy ah egg and you bust it a little and you throw it out in the pan, you know and you beat it with some of the milk and drink it … that is a medicine!"
Finding 4	The importance of bitterness in diabetes treatment also emerged from the findings and this was perceived as being good (U)
Illustration	"I could tell you when my sugar raise then. It does pain me head plenty and when ah see me head start to pain me ah does say "well is the sugar raise" and when ah go and get ah cucumber and ah use that cucumber dey! Betime evening ah feel much better. The ache the headache gone then. That feel like the sugar gone down."
Finding 5	God was seen to be the source of information on diabetes treatment (U)
Illustration	"If you say you prayers and you go to yuh bedside and you pray you does get yuh own little thing. Sometimes one leaf of bush they will tell you to boil and you know! You feel much better.'"
Finding 6	A lack of belief in the efficacy of prescribable medicines (C)
Illustration	Participant C did state that prescribed medicines put her blood glucose up, which she rectified by taking both cucumber and carila.
Finding 7	Use and belief of non-prescribable medicines (U)
Illustration	Herbal medicines were categorized according to their perceived efficacy. Corila was described as 'the strongest one of all', Shaddom Vinni as a 'very good thing for the sugar' and Elder Bush as 'good' and 'very good'

Finding 8	Control of diabetes was ascribed to a balanced intake of starchy and bitter foods and different food types were utilized to give this balance (U)
Illustration	"… If I feel drowsy, sick and I take some food and throw it in me mouth, it carry the feelings down. But if you sugar some tea and drink it, throw you down clean, you see."
Finding 9	Participants felt that their folk medicine had got the better of conventional medicine (C)
Illustration	This became evident in the face of their amusement that 'doctor nah know yet' when he was pleased with the improvement in their blood glucose levels that they attributed to their herbal medicines.

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Self-management among Patients Living with Diabetes in the United States Virgin Islands Nunez et al. [19]	
Finding 1	Cultural nuances shaped perspectives on self-management: Use of herbal, complementary, and alternative remedies (CAMP) (U)
Illustration	“(My neighbor) is a diabetic too…. Sometimes she buys bush and give me some. I don’t know the name of it but it is supposed to help with sugar. So I use that.”
Finding 2	Cultural nuances shaped perspectives on self-management: Importance of maintaining local diet. (U)
Illustration	“I take liberty every day. Right now I have … 3 plantains, 5 or 6 tanya, sweet potatoes, and I plan to take pig tail and cornmeal dumplings and make a big pot of peas soup…. You know the attitude I take. I live 70 years eating the same thing. What, now it’s going to kill me?”
Finding 3	Culturally-specific challenges were barriers to effective self-management: Stigma (U)
Illustration	“I think this needs to be more out in the open. Because you can have diabetes and control it and do everything that everybody else does. But it’s so secretive … everyone will treat you like you’re dying. There’s a stigma attached, yes. To being diabetic or having to take medicine for it.”
Finding 4	Culturally-specific challenges were barriers to effective self-management: Limited access to healthy food options/ exercise (U)
Illustration	“Making the good food choices is hard. They’re simply not available in stores. Well, sometimes. Now, they tell me blueberries is good. I can eat that. But when you find that, it’s five dollars for a little bag so…”
Finding 5	Medical homes were rarely viewed as a primary source of diabetes education or support: Lack of educational resources (U)
Illustration	“I think there should be better resources for diabetics. Once you’re diagnosed there should be a place that you can go to for regular classes and monitoring. I can’t believe we don’t have that in this day and age. There isn’t even a dietician there (doctor’s office).”
Finding 6	Medical homes were rarely viewed as a primary source of diabetes education or support: Self-adjustment of medication dosing and regimen influenced by friends and family (U)

Illustration	“Well, the doctor told me to take the insulin two times but my mother tell me I want to know if this is right. He tell me to take twenty five units in the morning and twenty five in the night. But she said it’s too much, and just gives me fifteen at night. So that’s what I do.”
Finding 7	Fear of disease complications largely motivated or stalled self-management practices: Denial/Minimization (U)
Illustration	“I don’t want to think about it (having diabetes). Like I say, I don’t say I’m a diabetic. I only say my sugar is a little elevated. I don’t even want to call the word.”
Finding 8	Fear of disease complications largely motivated or stalled self-management practices: Resilience (U)
Illustration	“I see the struggle when people lose limbs. I play the flute and don’t want to lose fingers so I changed everything … I stopped the alcohol. And I cut back on all the starchy, Caribbean foods. You have to make up your mind that you’re going to back out of all those foods you grew up with. I grow my own vegetables now. And that is another way I can get exercise.”

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Coping with diabetes stress among adults in rural Dominican Republic: “I don’t think about it” Sadeghzadeh et al. [37]	
Finding 1	Why people don’t think about diabetes – Almost all participants considered diabetes a manageable lifelong condition, such that in achieving diabetic control, they did not have to exhaust mental energy to think about diabetes every day. (U)
Illustration	“I think that with diabetes, you can die from something else that isn’t diabetes. If you take your medicine and the necessary care, you aren’t necessarily going to die from diabetes.”
Finding 2	How to not think about diabetes- Reflecting the integration of not thinking about it as part of diabetes management (U).
Illustration	I would say to learn how to manage what you eat. Learn how to manage the situation of sugar [diabetes]. And don’t think about it. Always have your mind busy with work, and exercise. Diabetics shouldn’t just sit.
Finding 3	How to not think about diabetes - Staying physically and socially active to keep your mind busy entailed doing house- hold chores, working (paid employment), volunteering, or visiting friends and family (U).
Illustration	“If you are working, your mind will be busy and you won’t remember that you’re sick. You’ll live your normal life.”
Finding 4	How to not think about diabetes - the central role of faith in most rural Dominican communities, religion and religious-related practices, such as attending church events and reading religious text, kept participants socially engaged and helped them not think about diabetes. (C)
Illustration	“I always live with a clear mind because I like to read the word of God.”
Finding 5	Outcomes of no le doy mente - maintaining a sense of normalcy and protecting their health.(U)
Illustration	“. . .living your normal life. Taking your medication, managing your diet. . .doing the things that the doctor tells you to do. Sure, all of that. But not thinking, “Oh I am diabetic, I am diabetic,” because if I sit here thinking that I am diabetic all day, I will be stuck here.”
Finding 6	Outcomes of no le doy mente - The influence of seeing others living normal lives is notable here, as it reflects the social influence processes of observing others as they successfully manage diabetes and live a normal life. (U)
Illustration	“I know there are people who live many years with diabetes, and they have a normal life. But it’s because they take care of themselves. That has motivated me to take care of myself.”

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Types and Sources of Social Support among Adults Living with Type 2 Diabetes in Rural Communities in the Dominican Republic Wallace et al. [35]	
Finding 1	The path of direct support for diagnosis from friends and neighbours (U)
Illustration	"…She told me, 'you're sick, your clothes are loose and falling off of you.' I agreed. I had a t-shirt that I no longer fit in. Dry, I was getting drier, [...to the point that] a man told others 'be fearful of that man, he could have AIDS.' And I heard that, you see? I went to my partner and told her that I felt ill. After that a neighbour took me to the see a good doctor to see about my condition where the doctor then tells me, 'sir, you are a diabetic."
Finding 2	Informational and instrumental support from friends and neighbours to get to the clinic (U)
Illustration	"How did I first get here? The man sitting in the waiting room brought me. He found out about this program and invited a group of us to go with him. Every month a few of us go in his bus for our appointments."
Finding 3	Cooperadores played a key role in disseminating diabetes-related information and increasing awareness of the diabetes programme in their communities. (U)
Illustration	"I started here because I used to get checked out in a distant part of the province. Then, I went to a public clinic and heard about a diabetes centre from the staff. That is how I learned about the programme and that's how I came here."
Finding 4	Cohabitating partners were often the primary supporters mentioned by participants when asked 'who supports you with your diabetes?' (U)
Illustration	"Yes, my wife supports me with my treatment. She'll gives me what I can or should eat [for my diet]. If I can't eat something she does not prepare it."
Finding 5	Women had the primary responsibilities of the home such as domestic work and preparing family meals, even when those meals were not part of their recommended diet. Maintaining the same level of responsibilities they had before having diabetes coupled with reporting little support in the home led to narratives depicting stress and frustration. Below Rosa, a 52 year-old female living with diabetes for three years, described having limited support at home and how it affected her physically. (U)
Illustration	"No one supports me, no one. How do I say this, even if I feel bad no one pays attention. Not even my sisters come to visit and lend me a hand. But God gives me

	strength, because no one else helps me. What happens is that when my sugar levels go up, I cannot sleep well and sometimes I get scared. Sometimes my family does things I don't like, which makes me feel ill, like I have high blood pressure. I don't know. Listen, those who have diabetes have to be careful and so they need someone who will support them so that they feel better."
Finding 6	The role of support from cooperadores, who are tasked with not only supporting diabetes care and medication, but also delivering health talks on the importance of diabetes self-management strategies to all participants and the community at large. These health talks were often referenced in the interviews as a form of informational support to learn how best to manage their condition. Cooperdores also provided emotional support by showing that they cared about their participants through actively listening to their successes and challenges. (U)
Illustration	"Before I came here I felt that everything was crashing around me. Some of us feel like we're drowning in a cup of water because we do not find someone to talk to about our problems. But now I can talk to the cooperadores…to the doctor, and I feel better."
Finding 7	Physicians served as sounding boards for issues related to their diabetes and their day-to-day stressors. (U)
Illustration	"For men, we can suffer from a problem with (sexual) relations. I spoke with the doctor when I had a problem [erectile dysfunction]. He told me what I need to do to control my sugar otherwise I won't get better."
Finding 8	Support from friends and neighbours was less salient in the long-term management stage than the support from partners and providers. (C)
Illustration	The long-term management stage was characterized by instrumental and emotional support from family, especially partners. Healthcare providers and cooperadores provided informational and instrumental support to help participants manage their diabetes. Friends and neighbours were less salient in this stage compared to the diagnosis and programme enrolment stages. Although participants reported a greater variety of social support sources in this stage, participants also described the negative effects of limited or no support to manage their diabetes.
Finding 9	Having a friend who ensured that he adhered to his diet was appreciated and helped him adhere to his self-management regimen. (U)
Illustration	Miguel: I have a good friend that when we go out to eat, he argues with me about what I can eat. He tells me, 'no you can't eat this and that, because it's harmful.'

	Interviewer: And when he says that, how does that make you feel? Miguel: Good, because he’s looking out for me.

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Knowledge, Motivation and Barriers to Diabetes Control in Adults in Jamaica Wint et al. [20]	
Finding 1	To keep healthy (N)
Finding 2	Perceived risk of complications (N)
Finding 3	Fear of death, discomfort (N)
Finding 4	Desire to live (N)
Finding 5	Follow doctors' orders (N)
Finding 6	Feeling compelled (N)
Finding 7	Support from family and friends (N)
Finding 8	Experience of complications (N)
Finding 9	Lack of self-monitoring of blood glucose (N)
Finding 10	Lack of perceived risk of complications (N)
Finding 11	Overweight or obese state (N)
Finding 12	Inadequate knowledge (N)
Finding 13	Little motivation to maintain health (N)
Finding 14	Non-compliance with medication (N)
Finding 15	Little effort to control diet (N)
Finding 16	Use of "bush teas" (N)
Finding 17	Belief that diabetes can be cures (N)

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Appendix III: Studies ineligible for full textr eview

Studies excluded on full-text examination	
References	**Reasons for exclusion**
Apparico N, Clerk N, Henry G, Seale J, Sealy R, Ward S, et al. How well controlled are our type 2 diabetic patients in 2002?. An observational study in North and Central Trinidad. Diabetes Res Clin Pract [Internet]. 2007;75(3):301–5. Available from: http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=emed10&NEWS=N&AN=46091812	Quantitative studies / cross-sectional surveys that contain no free text
Foster T, Mowatt L, Mullings J. Knowledge, beliefs and practices of patients with diabetic retinopathy at the University Hospital of the West Indies, Jamaica. J Community Health [Internet]. 2016;41(3):584–92. Available from: http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=emexa&NEWS=N&AN=620155270	Quantitative studies / cross-sectional surveys that contain no free text
Ezenwaka C, Olukoga A, Onuoha P, Worrell R, Skinner T, Mayers H, et al. Perceptions of Caribbean type 2 diabetes patients on self-monitoring of blood glucose. Arch Physiol Biochem [Internet]. 2012;118(1):16–21. Available from: http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=med7&NEWS=N&AN=22103450	Quantitative studies / cross-sectional surveys that contain no free text
Rodriguez-Vigil E, Kianes-Perez Z. Quality of care provided to patients with diabetes mellitus in Puerto Rico; managed care versus fee-for-service experience. Endocr Pract [Internet]. 2005;11(6):376–81. Available from: http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=med5&NEWS=N&AN=16718949	Quantitative studies / cross-sectional surveys that contain no free text
Harnarayan P, Cawich S., Islam S, Ramsewak S. Self-directed treatment for lower limb wounds in persons with diabetes: A short report. Patient Prefer Adherence [Internet]. 2014;8:1173–7. Available from: http://www.dovepress.com/self-directed-treatment-for-lower-limb-wounds-innbsppersons-with-diabe-peer-reviewed-article-PPA	Quantitative studies / cross-sectional surveys that contain no free text
Gordon S. The effect of health literacy level on health outcomes in patients with diabetes at a type v health centre in Western Jamaica. Int J Nurs Sci [Internet]. 2017;4(3):266–70. Available from: http://www.journals.elsevier.com/international-journal-of-nursing-sciences/	Quantitative studies / cross-sectional surveys that contain no free text
Bobb A, Gale D, Manmohan S, Mohammed A, Seetahal F, Small P, et al. The impact of the chronic disease assistance plan (CDAP) on the control of type 2 diabetes in Trinidad. Diabetes Res Clin Pract [Internet].	Quantitative studies / cross-sectional surveys that contain no free text

2008;80(3):360–4. Available from: http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=med6&NEWS=N&AN=18407368	
Roopnarinesingh N, Brennan N, Khan C, Ladenson PW, Hill-Briggs F, Kalyani RR. Barriers to optimal diabetes care in Trinidad and Tobago: a health care Professionals' perspective. BMC Health Serv Res. 2015 Sep;15.	Quantitative studies / cross-sectional surveys that contain no free text
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