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A Qualitative Study on Perceptions and Practices of Diabetes Prevention and Management in Rural South India

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Abstract

Aims: The purpose of this study is to explore the perceptions and practices of diabetes management through focus group discussions (FGDs) among adults with diabetes in rural Tamil Nadu. **Materials and Methods:** A qualitative study was conducted among individuals with diabetes who were part of the Telemedicine pRoject for screENing Diabetes and its complications in rural Tamil Nadu (TREND). A total of 16 FGDs were conducted using a semi-structured FGD guide that elicited perceptions of the different aspects of diabetes management and knowledge about diabetes prevention. The sample size was based on the attainment of thematic saturation. All FGDs were audio-recorded and transcribed verbatim. The textual data was then coded into meaning units and grouped into themes. Data were analyzed using NVIVO software version 10.0. **Results:** There were varied responses with respect to diet, medication adherence, regularity of follow-up, knowledge about diabetes, and diabetes prevention. Most participants had limited knowledge of the disease and did not have regular hospital visits. Several participants were unable to adhere to the diet prescribed by healthcare providers, as they lived alone or were dependent on someone in the family for dietary needs. Most participants were unaware that diabetes could be prevented. Some participants were interested in serving as “Diabetes ambassadors” to educate rural societies about diabetes. **Conclusions:** Understanding the perceptions and practices about diabetes management and prevention strategies could help primary healthcare workers effectively treat, manage, and prevent diabetes in underserved rural populations.

Keywords: Diabetes, perceptions, qualitative, rural, self-management

INTRODUCTION

Diabetes is a chronic disease that causes significant psychological and behavioral burdens as it requires constant self-monitoring of blood glucose levels, and dietary modifications to promote healthy eating, physical activity, and medication adherence.^[1] The International Diabetes Federation (IDF) reports that India accounts for one in seven adults with diabetes globally.^[2] Evidence has shown an increasing trend in the prevalence of diabetes in both urban and rural populations of India.^[3-5] As the prevalence of diabetes increases progressively, self-management of the disease is vital to prevent

diabetes-related complications and address the disease burden. Self-management includes three main domains: adhering to medication, and dietary recommendations; behavioral management, which includes making new lifestyle modifications like increased physical activity and healthier eating; and emotional management, which includes coping with frustration, fear, and despair caused by a chronic illness.^[6] According to the WHO, lifestyle

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intervention compliance may have a greater impact on population health than medical treatment.^[7] Thus, self-care for type 2 diabetes improves quality of life and reduces complications.

Though few studies examine the cultural practice patterns in rural areas,^[8-11] there is an increasing need to understand the beliefs about diabetes prevention and management. To understand the perceptions and practices on diabetes prevention and management, a qualitative study is considered more useful than a quantitative study because it provides, in-depth information on people's views and real-life experiences.^[12] Hence this qualitative study was undertaken to describe the perceptions and practices surrounding prevention and management of type 2 diabetes among adults in rural Tamil Nadu, a state in South India with a high burden of diabetes.

MATERIALS AND METHODS

Study participants were purposively sampled from a large door-to-door population-based cross-sectional study titled "Telemedicine pRoject for screENing Diabetes and its complications in rural Tamil Nadu (TREND)". Men and women ≥ 18 years living with diabetes for more than 1 year, and those on treatment for at least 6 months were included. The TREND study surveyed 30 villages in Chengalpattu and Kancheepuram districts of Tamil Nadu, between 2018 and 2021. After completion of the TREND study, focus group discussions (FGDs) were conducted in a subsample of TREND participants with type 2 diabetes ($n = 96$) from 16 villages, with the diabetes duration of more than 1 year during the period of April to June 2022. Type 2 diabetes was diagnosed if individuals had a physician diagnosis of diabetes and/or fasting plasma glucose ≥ 126 mg/dL or 2-hr post glucose ≥ 200 mg/dL.^[13] After conducting 16 FGDs, with each group of 5 to 8 participants, thematic saturation was reached and hence we stopped data collection. The FGDs were comprised of homogenous groups according to age, sex, and type 2 diabetes status to allow free discussion with peers who share similar characteristics.

FGDs were held in a convenient location for all the study participants, such as a village head's home, village office rooms, private schools, etc. Prior verbal permissions from village panchayats and the local village head office were obtained in case the common areas were under the supervision of the Village Head. It was ensured that the study areas for the FGDs were easily accessible, comfortable, and in a quiet environment to avoid outside distractions. The data collection team consisted of two moderators and two notetakers/assistants. Each FGD lasted for about 45 min and was conducted in Tamil, the regional language. Participants in the study were instructed to arrive 10–15 min before the start of the FGD. The moderator explained the purpose of the discussion and obtained written informed consent from participants.

A digital recorder was placed in the center of the discussion circle. The semi-structured FGD guide which contained open-ended questions was developed and used to guide the discussion (Supplementary Table S1). The FGD guide was designed to elicit information on participants' perceptions and practices regarding: diabetes prevention and management namely, diabetes knowledge and diagnosis, availability and usage of healthcare facilities, regularity of follow-up, medication adherence, family and social support, availability of healthy and unhealthy foods, self-monitoring and ways to prevent diabetes. The FGD guide was pilot-tested before the collection of data to ensure the understandability of the questions asked. Based on the pilot test results the FGD guide was further developed. During FGDs, probing techniques were used to ensure the elicitation of in-depth data.

Data analysis

The audio recordings from the FGDs were transcribed verbatim. Transcription of the discussion was started as soon as the first FGD was completed. The notetaker was trained to record of participants' expressions and to note key points of the discussion and later the notes were used to augment the discussion captured on the digital recorders. The verbatim transcripts from each discussion were translated from Tamil to English with an emphasis on maintaining the meaning of what participants shared, rather than a literal translation of the words. Additionally, selected key terms, phrases, and local proverbs were retained in Tamil in the transcript. The moderator checked the translated version of each manuscript for accuracy by listening to the recordings and simultaneously reviewing the transcript and revising the transcript as needed. Two main strategies were used to develop codes such as deductive and inductive. Deductive content analysis was used to code the data pertaining to the preexisting theoretical framework. New information was developed into meaningful codes and categories using inductive content analysis. This approach is useful when researchers are exploring a new topic and do not have preconceived ideas about the data.^[14] Combining both approaches provided a more comprehensive analysis of the data.

Moderator 1 independently coded all the transcripts and Moderator 2 reviewed the codebook and accuracy of the coding to discuss any discrepancies. All the interview transcripts were then coded related to text and quotes using NVIVO software version 10.0 and were then exported to Microsoft Excel to explore the prominent themes that emerged. Response for each code was then carefully read and organized into specific categories. The data-driven reports related to specific beliefs within each coded segment were then generated as themes and subthemes. Each theme was adjudicated as likely to be relevant to the diabetes management and prevention of diabetes if it satisfied the following criteria: more than two individuals with diabetes mentioned the high frequency of specific beliefs.

Table 1: Demographic information on participants (n = 96)

Variables	n (%)
Sex	
Male	38 (39.6)
Female	58 (60.4)
Age	
<60 years	73 (76)
>60 years	23 (24)
Diabetes duration	
<10 years	33 (34.4)
>10 years	63 (65.6)
Occupation	
Agriculture	71 (74)
Non-agriculture	15 (15.6)
Unemployed	10 (10.4)
Education	
Illiterate	30 (31.3)
School education	54 (56.2)
College education	12 (12.5)
Marital status	
Married	79 (82.3)
Widow/widower	17 (17.7)
Income	
<5000 INR	63 (65.6)
>5000 INR	33 (34.4)
Treatment	
Public health care	47 (49)
Private hospitals	8 (8.3)
No treatment	41 (42.7)
A1C control (%)	
Good control (<7.0)	17 (17.7)
Fair control (7.0–8.0)	16 (16.7)
Poor control (>8.0)	63 (65.6)

RESULTS

A total of 96 individuals with type 2 diabetes participated in the FGDs. The general characteristics of the participants are given in Table 1. The majority of the participants were females. The mean age of the study participants was 53.9 ± 10.6 years, 32% were illiterate, 74% engaged in agricultural activities, 82% lived with a spouse and only 17.7% had A1C under good control (<7%). Perceptions and practices were presented as themes, subthemes, and newly emerged themes [Figure 1(a and b)]. The overall response to the perceptions and practices of diabetes prevention and management is represented as a word cloud in Figure 2.

Theme 1: Diabetes management

Subtheme 1.1: Diabetes knowledge and diagnosis

Nearly half of the participants thought that diabetes was a dangerous disease. Very few had knowledge about diabetes and its causes, but the majority of them felt that diabetes was caused due to the body's weakness and the food (sweets) consumed. The majority of them recognized diabetes as a disease that caused numbness or burning sensation in the hands and feet, giddiness, and loss of eyesight. Some participants were upset or in denial, after being diagnosed with diabetes. Diagnosis ranged from diabetes camps during eye tests, fever, piles surgery, accidents, etc. A few of the responses below describe the life experiences of the participants due to poor diabetes knowledge.

“I did not have diabetes at those times and hence I was not aware of this. I don't know that I will lose

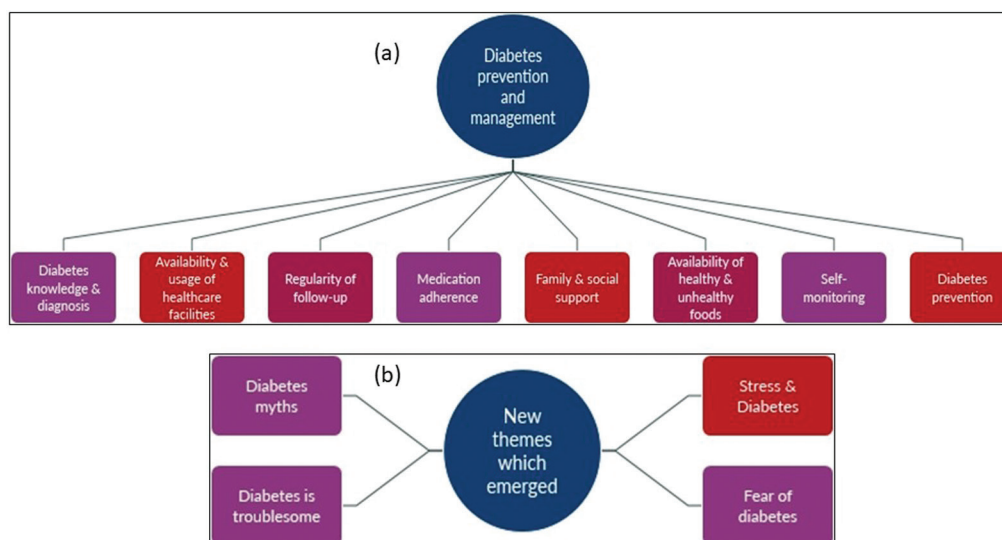


Figure 1: (a) Diabetes self-management themes and subthemes. (b) Newly emerged themes and subthemes

symptoms as a result. Many nonadherent participants stated that their blood glucose levels were normal during the blood test and thus stopped taking tablets and some of them stated that taking medications for a prolonged period of time can cause kidney damage. Few of the study participants were only using traditional medicines though their doctor prescribed allopathy medicines for them.

“I don’t take medicines regularly. Once in a while I go to the medical shop and get medicines for a month”.

“I checked blood tests and they told me that it was normal. I stopped taking tablets”.

“Drinking Knol-khol (German Turnip) juice on a daily basis helps in reducing blood glucose levels and we don’t need modern medicines at all”

Subtheme 1.5: Family and social support

Prudent care was provided by the family members of the individual with diabetes. They rendered help and support which included following a meal plan (making rotis and other healthy meals), medications, and hospital visits. Some of their families overwhelmed them with care, like forcing them to eat only bitter foods and foisting strict restrictions on sweets. One-fourth of the study participants stated that they did not receive any support from their spouse or family members due to various misunderstandings, whereas some of them took care of themselves as they lived alone. Financial constraints and family disputes also contributed to the lack of family support among the study participants.^[15]

“My family cares for me too much after I got diabetes, thinking that I will die soon. They don’t even allow to take a small piece of sweet even during festival occasions”

“My spouse provides all-in-all support in diabetes management. Diet control, taking my tablets on time, and waking me up at 4:00 or 4.30 to go for a walk, encourage me to follow the proper control methods. That is why my blood glucose level is under control now”.

Subtheme 1.6: Availability of healthy and unhealthy foods

The majority of the individuals with diabetes were aware of the dietary recommendations such as limited intake of rice, roots and tubers, sweets, and blood glucose advised by the healthcare professional. Though they were aware of the following dietary restrictions, the majority of the participants were unable to follow portion control on the rice intake. They informed that they were not willing to compromise on the quantity of rice as they were working

in the agricultural fields. They showed their non-preference toward wheat (chappati) as it involved a tedious process in preparation and caused indigestion. Few of them tried to replace millets like ragi, bajra, jowar, and other varieties of rice as porridge for white rice; nevertheless, in long term, it was difficult for them as the prices were higher than rice.

Fresh vegetables such as ladies’ fingers, brinjal, pumpkin, and drumstick leaves were grown on the farms and many of them consumed vegetables daily whereas due to restrictions and high-cost, none of them reported regular fruit intake. Unhealthy foods such as fast foods and fried foods were also easily available but, it was consumed rarely by a few of them under unavoidable situations and not regularly. Few of them did not take care of their diet restrictions as they could not eat foods at the right time. One of the participants was worried that restrictions on roots and tubers may have a direct impact on the nutrient imbalance of the other family members who eat the same food which could be one of the reasons for noncompliance with diet among the study participants.

“Rice is the main thing. Can’t avoid taking it.....

In agricultural work we would not be able to work without eating a good amount of rice. As we are feeling hungry and we don’t have a such situation to take food at right time, we tend to eat a lot of food whenever it is available”.

“We can try varagu (Kodo millet) or kattuyanam rice (unpolished organic red rice variety). But we can’t afford it as it is triple the cost of normal polished rice”

Subtheme 1.7: Self-monitoring

Most of the participants did not show interest in the self-monitoring of blood glucose as they felt that it was not necessary for them. Some of them assured that without testing, based on the symptoms they could say whether it was low blood glucose or high blood glucose and they could adjust the dosage of medications.

“Why it is necessary to use the device as we can ourselves find out high or low blood glucose”

Theme 2: Diabetes prevention

Most of the participants were surprised to hear that diabetes could be prevented. They did not have any idea about this until it was explained to them after the FGD, whereas few others reported that it was not possible to prevent diabetes and thought they needed medications lifelong to keep diabetes under control. Some of them stated that diabetes was preventable if one completely avoided taking sweets and blood glucose.

Some of the participants believed in diet and exercise for diabetes prevention. Two of the participants wished a new vaccination for diabetes prevention like the COVID-19 vaccine would become available. Some of the participants came forward to serve as “Diabetes Ambassadors” as they had the confidence to educate the youngsters on the prevention of diabetes by sharing their life experiences. On the other hand, some of them did not believe youngsters would listen or adhere to any diet or exercise recommendations. Most of the participants trusted the researchers and field workers who they believed were working hard for the prevention of diabetes in rural communities.

“Till one’s death, it is not possible to prevent diabetes even if God comes to the rescue. You should have complete control in all ways”.

“There is no other way to avoid diabetes. Those who do not take too many sweets will not have diabetes”.

New themes that emerged

Diabetes myths

Some of the participants believed that eating sweets caused diabetes and hence they stopped eating sweets and then felt normal even without taking tablets. Another participant reported the habit of drinking cold water while another stated that daily intake of bitter gourd juice helped to control blood glucose levels.

Stress and diabetes

Some participants had reported that they got diabetes due to family disputes and the noncooperation of their relatives and family members. One of them expressed the view that poor understanding of his/her partner’s illness and family disputes had adversely affected his/her health. Many of the women participants had long-term stress. One of them shared their life experiences and said that early marriage with more responsibilities in terms of financial management, children’s education, cattle rearing, agriculture, and all other household chores were the reasons for diabetes. One participant reported abnormal sleep even during the day or while riding a vehicle. This was reported as that participant had stress due to financial difficulties.

“I have given her a lot of stress and because of that her mental status was affected and developed diabetes. Whatever the treatment is given, it would be not of much use. I am the one who gave her all these worries. What kind of treatment I can get her in any hospital?”

“Won’t we be having mental stress and depression? I got married at the age of 16 years. I did not

have children for 5 years. Then 4 children were born.... all four are girls... One of my daughters passed away at the age of 12 due to mental illness”

Diabetes is troublesome

The majority of the participants considered “Diabetes” a problematic disease and felt diabetes was an injustice that had been done to them and were unhappy, that they had to live with this uncertainty lifelong and worried about their future. Emotional responses from family members were also prominent as they needed to manage their challenging daily lives both physically and mentally. In another context, a few of them worried about their inability to do physical activity as they feel giddy when they go out.

“I am getting aged day by day. Kids are too young. I am thinking of their future”.

“People at home worried... saying that why this kind of disease I have got. At home, they feel worried saying that we all are eating all foods but you are not able to eat. I am taking tablets for BP and Blood glucose”.

Fear of diabetes

Few of the participants had a fear of diabetes as it could affect all their internal and external organs in the long term if they stopped medications even for a day. One of the participants shared that still he/she could not come out of the heart-breaking incident that he/she had come across due to improper management of diabetes. Fear of disease got in when he/she witnessed the “death” of his/her aunt who didn’t adhere to the treatment properly. But to his/her utter surprise, when she was taken to the hospital, she was found to be alive and soon sat up.

“If someone with diabetes skips a single pill, it could affect you for the entire life. It affects eyes, ears, nose, legs will become numb and you could lose a sense of feel”

“While all of the rituals performing side by side, she suddenly got up. Then she has been admitted to the hospital and it was said that due to abnormal blood glucose levels, she went into a coma and recovered.”

DISCUSSION

This study is one of the first to focus on understanding the perceptions and practices of diabetes prevention and management among individuals with diabetes in rural southern India. FGDs conducted across 30 villages of the TREND study revealed inadequate knowledge about

diabetes, its prevention and complications, less usage of healthcare facilities, irregular follow-up, noncompliance to diet, medications and self-monitoring, poor family support in disease management, financial constraints, family disputes, stress and fear about diabetes. On a positive note, some rural participants were also eager to serve as “Diabetes ambassadors” to work toward diabetes prevention. This could serve as an important resource for taking diabetes prevention and care to the masses.

An earlier study assessing the barriers to self-management of diabetes in rural individuals of Tamil Nadu revealed that culturally inappropriate dietary advice from healthcare providers, poor family support for dietary and medication adherence, physical constraints, and fear of regular exercise were barriers to self-care.^[11] In our study, most of the rural participants had poor knowledge about diabetes and they perceived diabetes as a dangerous disease, while few of them were able to define diabetes correctly as a chronic serious disease associated with low or no response to insulin uptake resulting in the elevation of blood glucose levels. Poor diabetes knowledge may be due to low literacy rates among older people in rural areas. Unsolicited false advice, fear and myths regarding diabetes could further worsen the situation. Many individuals were influenced by others’ experiences due to illness, especially morbidity and mortality. A similar finding was also reported in a study conducted in Iran among diabetes patients, where the majority of the participants considered diabetes as a serious disease, while few of them linked diabetes to stress.^[16]

Though both government and private hospitals are easily available and are within acceptable distance to the rural participants, the choice and usage of public and private healthcare sectors are influenced by socio-economic factors. In this study, the majority of the study participants preferred to opt for public healthcare services due to financial constraints and they were dissatisfied with the offered services which may be attributed to anxiety about the disease, limited treatment, and facilities, and poor doctor–patient communication. Few of the participants opted to get treatment with private doctors for quick and better care. Patient dissatisfaction with public healthcare centers was also reported by the study done by the Government of India in three states including Orissa, Uttar Pradesh, and Haryana. It was found that the majority of the hospital patients were dissatisfied with PHCs, in anticipation of clean infrastructure, medicines, laboratory services, and proper doctor examination.^[17] The same scenario was also observed in another study conducted in rural south India, where dissatisfaction was more in the case of government healthcare providers than private. However, patients continued to use these facilities without

complaining due to the lack of access to better quality health care and financial constraints.^[18]

Nearly half of the participants reported non-adherence to medication. Some of the reasons for the nonadherence to medications were assuming blood glucose levels were normal, negligence due to busy farm work, imaginary belief in blood glucose control, and usage of only traditional medicines. Some of them believed that long-term consumption of allopathic (modern) medicines may cause kidney damage. Whereas some of them shared the fact that they had to continue with medicines life-long. They were afraid of the side effects of medications, and there were several myths and false beliefs about modern medicines, and individuals preferred using “natural” or “traditional medicines” which are often of unproven value. A study assessing self-care and medication adherence among individuals with diabetes in Puducherry showed that nearly 50% of them did not adhere to the anti-diabetic medications and 75% did not adhere to self-care management.^[8] Another study on diabetes medication nonadherence in rural Tamil Nadu revealed that the majority of the participants did not comply with medications due to a lack of literacy, poor satisfaction with government health facilities, perceived poor satisfaction with a doctor–patient relationships, and perceived lack of knowledge about diabetes.^[10]

Family support plays a vital role in lifestyle changes and diabetes management.^[19] Studies have emphasized the vital role of family support in meal planning, medication reminders, glucose monitoring, and exercise that affects the patient’s self-management compliance and the well-being of both the patient and their family.^[20-24] In our study, half of the participants were taken care of by their family members through hospital visits, medicine procurements, dietary, and medication adherence. Though the family members rendered support, many do not know how to provide good, effective, and continued support. Hence family members need to be advised by the healthcare providers to provide proper support that may positively impact treatment outcomes.^[25]

Individuals with diabetes are often advised to modify their lifestyle patterns by following daily food restrictions, and physical activity recommendations, consistently monitoring blood glucose levels, and regular intake of prescribed medicines.^[26] In our study, the participants were poorly adherent to diet and self-monitoring of the blood glucose. Poor dietary adherence in the rural participants was often related to consumption of excess quantity of rice since the majority of them worked in the agricultural fields and felt they needed more rice. A similar study has also revealed that noncompliance to dietary modifications among participants was due to the inability to follow culturally inappropriate dietary advice such as restriction of rice and inclusion of

wheat rotis.^[11] Hence there is an urgent need to encourage the consumption of low-glycemic index and high-fibre foods by simple dietary adjustments, such as switching from polished white rice to brown rice, whole grains, and millet which could play a major role in glycemic control of the individuals with diabetes.^[27]

In our study, several of the study participants had unexplained fear of diabetes due to worsening diabetes complications observed from others' life experiences. We also observed a fear for family and economic situation and a fear of taking long-term medicines. A study on assessing the fear and health needs of diabetes individuals in rural populations revealed similar results, that many of them had the fear of diabetes, and its complications, they also feared for family and had the fear of stigma.^[28] As the diagnosis of diabetes itself causes fear which eventually keeps increasing during the disease, a holistic approach of diabetes management by the healthcare provider which includes exercise, medication, blood glucose monitoring, stress management, sleep patterns, and regular check-ups is recommended.

Nearly half of the study participants were not even aware that prevention of diabetes was possible. Others believed that it was the duty of healthcare providers/researchers to prevent diabetes while some of them were ready to serve the society as diabetes ambassadors. Numerous challenges, such as lack of awareness and diabetes knowledge, improper utilization of healthcare sectors, and poor supportive environment are the major stumbling blocks for diabetes prevention, diagnosis, and treatment in India.^[15] Implementing community outreach health education programs in less privileged villages and towns, could create a more informed population in rural India^[29] and help people living with diabetes to manage their condition effectively.

The major strength of this qualitative study is that it provided ground realities and an in-depth understanding of the perceptions of individuals with type 2 diabetes dwelling in rural areas on diabetes prevention and management, which could aid in the development of treatment care regimens and intervention programs. Although a lot of valuable information has been gathered in the selected villages, the results may not be generalizable to other rural settings due to different societal norms and local cultural practices in different parts of India. From this study, it is apparent that it is essential for the healthcare providers to understand the real-life practices of individuals with diabetes to achieve effective diabetes management by exploring the cultural, social, and economic factors of the patient population.

CONCLUSION

The epidemiological transition of India displays the rising prevalence of diabetes in rural areas and those rural

dwellers rely upon primary healthcare services. Hence, there is a necessity to brace the existing noncommunicable disease setup of the primary healthcare system by providing treatments, quality health education, and quality care to promote adherence to lifestyle measures leading to better health outcomes among individuals with diabetes. Findings from this qualitative study could be useful to develop evidence-based diabetes education programs and comprehensive care for diabetes at individual, family, and community levels. Additionally, it provides insights into the need for behavioral change, increase in the availability and accessibility to healthcare services in underserved rural communities in India.

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Conflicts of interest

There are no conflicts of interest.

Ethical approval

This study was approved by the Institutional Ethics Committee of the Madras Diabetes Research Foundation, Chennai, India (MDRF/NCT/04-03/2022).

Informed consent disclosure

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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SUPPLEMENTARY TABLE 1: FOCUS GROUP DISCUSSION TOPIC GUIDE

OPENING QUESTIONS

1. What is your opinion about diabetes? (Probes: Understanding the disease condition, knowledge about the disease)
2. When was it detected? (*Probes: how it was detected, family history of diabetes*)

(i) Diabetes management

a) Availability of health care facilities

3. What are the healthcare facilities available near your locality? (Probes: Private/Government)
4. How often do you check your blood glucose levels? (Probes: Frequency of blood checks)
5. Where do you usually have your routine check-ups? (Probes: Home, health care centers, private hospitals)

b) Usage of health care facilities

6. How easily the place of routine check-ups is accessible for you? (Probes: Distance, place of travel, family member accompanies)
7. How often do you visit the health care centers? (Probes: Frequency of blood checks, regularity of follow-ups, availability of medicines, financial support)

c) Medication adherence

8. Do you take your medicines regularly? (*Probes: compliance/non-compliance reasons*)

d) Family and social support

9. Do any of your family members support your medical treatment? (Probes: In what ways do they support?)

10. Does your health care provider is supportive during your medical visits? (Probes: explaining the current blood values, rapport building with the medical care provider)
11. Other than a family member, does anyone care for your health condition? (Probes: Neighbours, colleagues, friends/ In what ways do they support)
12. Have you experienced discrimination/stigma in your community as you are living with diabetes?

e) Self-monitoring

12. Do you self-monitor your blood glucose levels? (*Probes: if yes: how often, benefits*)

f) Availability of healthy and un-healthy foods

13. Do you have easy access for healthy foods? (Probes: frequency of use)
14. Do you have easy access for unhealthy foods? (Probes: frequency of use)

ii) Diabetes prevention

15. What do you know about the severity of diabetes? (Probes: Health effects of diabetes)
14. Do you think that diabetes can be prevented? (Probes: Yes/No, In what ways diabetes can be prevented?)
15. What could be done in preventing diabetes in rural society? (Probes: Needs, suggestions)

CLOSING QUESTIONS

Great. This has been very helpful.

16. Does anyone have anything else to add to our discussion today?

Thank you for your participation today!