

Managing Type 2 Diabetes: Beliefs and Daily Practices in First Generation Asian Indians in the United States

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Abstract

Introduction: Diabetes management and control remain poor in Asian Indians (AI) and is influenced by personal beliefs and cultural practices. Since AIs have a high prevalence of diabetes and are more likely to develop complications earlier than any other ethnic group, understanding their beliefs and practices of diabetes management is essential. The purpose of this study was to examine and understand beliefs and practices about diabetes self-management in first-generation AI Hindus and Sikhs.

Method: Interpretative phenomenology was used to interview 12 first generation AI participants with type 2 diabetes to elicit beliefs and daily self-management practices of diabetes. Interpretative and thematic analysis were completed.

Results: Diabetes self-management was a balancing act influenced by Ayurvedic principles, allopathy and dietary practices; gender roles, insufficient knowledge and culturally inappropriate diabetes education.

Discussion: Culturally appropriate strategies that incorporate Ayurvedic principles, dietary practices, gender roles should be developed to improve diabetes management.

Keywords

Asian Indians, type 2 diabetes, management, beliefs, practices

Introduction

Asian Indians (AIs) have a significantly higher prevalence of diabetes than any other minority group in the United States (Kanaya et al., 2010; Venkataraman et al., 2004) and have additional genetic risk factors (high prevalence of insulin resistance, abdominal obesity and abnormal lipid profiles), which increase the risk for type 2 diabetes at a lower body mass index as compared to whites (Enas et al., 2007). Studies have found that beliefs about diabetes play an important role in illness management (Broadbent et al., 2011; Mc Sharry et al., 2011) and can inform interventions (Hagger et al., 2003). Despite clear evidence that diabetes management (dietary changes, regular exercise, and adherence to appropriate medications) leads to a 53–63% reduction in complications and a 46% reduction in mortality (Gaede et al., 1999; Macisaac & Jerums, 2011) diabetes management and control remain poor in Asian Indians.

Review of Literature

In the United States, AIs are one of the largest immigrant groups and will soon become the largest foreign-born

group by 2055 (Budiman, 2020). Currently there are no studies in the United States that have examined AI beliefs and practices in self-management of diabetes. Understanding beliefs about diabetes are important to know how people make sense of and manage their illness (Harvey & Lawson, 2009). Because AIs experience a high prevalence of diabetes and have a genetic predisposition to develop diabetes and complications earlier than in other ethnic groups, understanding AI's beliefs and practices in managing diabetes are essential. AIs are a large and diverse group in terms of the region of origin in India, religion and cultural beliefs and practices. To describe a coherent set of

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practices we focused only on Hindus and Sikhs who share many cultural beliefs and practices. The purpose of this study was to examine and understand the beliefs and practices of diabetes self-management in first-generation AI Hindus and Sikhs.

Methods

This was an interpretive phenomenology study aimed at understanding AIs' daily practices of managing their diabetes. Interpretive phenomenology is underpinned by Heideggerian philosophy (Dreyfus, 1991) and illuminate's aspects of experiences that may be taken for granted. A key tenet of this approach is that narratives of concrete specific events provide insight to participants engaged and practical activities (Chesla et al., 2018). The method aims to uncover everyday beliefs and understandings that guide action (Chelsa, 1994). Given its focus on background or taken-for-granted understandings in each situation, this method is particularly appropriate to explore participants' cultural concerns, resources, capabilities, actions taken to cope and the subsequent outcomes (Benner, 1994; Benner et al., 2009; Smith et al., 2010).

Participants for this study were recruited from Sikh Temples in Northern California and through snowball sampling. Inclusion criteria included being of Asian Indian origin, first generation, diagnosed with type 2 diabetes for at least 6 months, over the age of 18 and a legal permanent resident of the US. To better understand daily diabetes management participants who were stable with their diabetes and had no hospital admissions in the last 6 months were recruited. The study was approved by the Committee on Human Research, Institutional Review Board. Written consent to participate was obtained from each participant. An interview guide that had been tested in an earlier pilot study was used to conduct private open-ended interviews focused on daily management and practices with each participant; second interviews were conducted with each participant to clarify understanding and complete all study questions. All interviews were audio recorded, translated to English by the first author, transcribed verbatim and checked for accuracy for interpretive phenomenology analysis by the author.

Data Analysis

The interviews were read several times to understand participants' beliefs and practices about diabetes self-management. All interviews were systematically coded in Atlas *ti*. For this analysis, text coded as "diabetes practices, diabetes management" and the associated narratives were retrieved for further analysis. Interpretive notes were entered into Atlas *ti* for each narrative and were summarized to identify qualitative distinctions and exemplars in daily practices and management of diabetes in AIs.

Results

Sample Characteristics

A sample of 12 adult participants (6 men and 6 women) aged 40–75 years, four Hindus and eight Sikhs were recruited from local temples. The average US residency was 19 years (range 1–43 years) and the average time since diagnosis of diabetes was 10 years (range 1–25 years). All the female participants worked as part-time nannies. Male participants had varied occupations, including small business owners or managerial positions. Three male participants were unemployed.

Diabetes management in AIs is a complex process and was influenced by cultural health and practice beliefs. AIs sought a balance between Ayurveda, diet and allopathy. Ayurveda, which literally means the science of life, is one of the oldest systems of medicine in India (Mukherjee & Wahile, 2006). Ayurveda is understood to promote health and not just treat disease. It uses herbal remedies to balance and harmony, preserve health and life, prevent and treat disease. Common herbs used in the diets of Indians have been identified as having antihyperglycemic properties include bitter melon, curry leaf, fenugreek, coriander, cumin, ginger, turmeric, garlic, okra, cucumber, snake gourd, radish, tomato, plantain, chili, mango seed powder and brinjal (Mathew et al., 2000; Sinha et al., 2003). Participants in this study were trying to strengthen their overall health and balance, as well as trying to treat their diabetes. They used these common desi (Indian) herbs, spices and, also identified missi roti (a flat bread comprised of mixing fenugreek, cilantro with soy flour, pearl millet, chickpea and lentil flour) as an important element in their diet. Some preferred missi roti over plain roti (an Indian staple flat bread made from stone-ground whole wheat flour) to control their diabetes. Drinking tea and alcohol was also reported to affect diabetes control.

Gender roles also influenced the management of diabetes. Female participants found it harder to manage their diabetes. Household chores, family duties and lack of family support influenced how female participants managed their diabetes. Male participants made drastic changes to their diets and their family's diet. Diabetes management was also hindered by insufficient knowledge and access to culturally appropriate information.

A Balancing Act -Ayurveda, Allopathy and Dietary Practices

Participants sought balance and harmony between Ayurveda, allopathic medicine and diet. Several participants controlled their diabetes by blending herbs and modifying their diet and used Western medicine as a last resort. Both male and female participants considered herbs and dietary practices safe and effective with no adverse side effects. They reported achieving control of their daily blood sugar when using

Ayurveda and dietary practices first before resorting to allopathy. One female participant described how she adjusted the amount of diabetes medication she took after she had eaten her herbal supplement.

P101F: I will eat some fenugreek and fennel seed in the morning, my sugar comes way down, and I am able to control it better, it gets low then, I like to to-keep it at 100–130. Then I will take my western medication, instead of two tabs I will take one tab.

Participants typically preferred familiar herbs and flour that were used in the Indian cuisine and were readily available in Indian stores to control their diabetes. They often referred to common Indian herbs used for cooking as “desi” medications and described the different combinations they used. Common herbs such as fenugreek, mustard seed, mustard greens and fennel seed were thought to improve glycemic control. No unique formula of herbs was used by all participants. Rather, each described the various herbal preparations that they took to achieve glycemic control. For example, one woman described how she alternated herbal mixtures, believing that each had a positive effect on her blood sugar.

P105F: I take one powder at a time, for example for the first few weeks I will eat fenugreek and fennel seed powder. I usually mix it all up and put it in a bottle and when that finishes then I start my bitter melon powder. I feel that I should finish the powder that I made first before I make another powder. I also use flax seed. I will grind it and put it in my milk sometimes, or in my cereal. I keep doing these types of things because I think they help with my diabetes.

Participants placed great importance on staying healthy and tried to achieve control of their diabetes by balancing herbs, flour blends and allopathy. Although all three modalities were considered essential in achieving and maintaining control of their diabetes, the participants, when questioned did not understand how these practices worked. Rather they followed patterns that were familiar or were recommended by family members or community members. If none of the modalities affected glycemic control, they blamed their fate.

P101F: I take desi medication first and then allopathic medication. If you stop one or the other for some time, then your diabetes worsens. If neither of them worked then it was your “kismet” or fate that it was not meant to work. I don’t know whether homeopathic medications are better or not, it is your body, you don’t know how it is going to react. I take both.

Along with herbal blending, participants experimented with various blends of flour to make roti. Some participants

avoided using whole wheat flour, which they thought contributed to high blood sugar levels. Instead, they used various other blends of flour and herbs to make missi roti to reduce their blood sugar.

P101F: With that my sugar came down when I used soy, pearl millet, black chickpea and green lentil flour – mix all these flours and I would make enough for one or two missi rotis and eat it as soon as I cooked it. It is the best to keep your sugar under control. I will sometimes put fenugreek, cilantro, onions, garlic, salt, chili, and mix my flours – wheat, chickpea flour.

Blended flours which are easily available at Indian stores, made it easier for one participant to make her missi roti. The flour was marketed as a product for people with diabetes.

P105F: It has soybean, chickpea flour and wheat in it. You get it at the Indian store, and it says it is for diabetes. It has little wheat flour in it...Even the Sujatha flour, one is regular, and one is for diabetes.

Bitter melon was used to control blood sugar and for its hypoglycemic effects. This fruit like the herbs and flour, is easily available at Indian stores. One participant, who lacked health insurance due to his immigration status, ate bitter melon every day when he had no medications left to control his blood sugar.

“What do you do if you don’t have access to medications? I still had some medications from India – they finished and then I would eat bitter melons every day”. (P109 M)

He described bitter melon as being as effective as insulin in lowering blood sugar. Each part of the fruit (peel, seeds and juice) was described as therapeutic.

P109M: Bitter melons are stuffed with insulin, even the peels. We should not throw that stuff away. How we make them by taking off the peels and the seeds instead we should eat them. We should eat the peels of the bitter melon that is what has insulin.

Like the herbal mixes and the roti, bitter melon was prepared in several different ways to control blood sugar. For example, one participant squeezed and drank a teaspoon of bitter melon juice to help him lower his blood sugar.

P109M: So, then I ate my bitter melons and with the bitter melon my sugar came down.

A lot of people are surprised when I tell them that I eat bitter melon, I eat them raw.

You take the peel off, take a fistful and squeeze out the juice, you usually will get 1 teaspoon, maybe two – you will get 1 teaspoon. One teaspoon of that is equivalent to two vials of

insulin – it has so much insulin in it. There are at least two vials of insulin in one teaspoon of bitter melon juice.

A female participant, who put small slices of bitter melon in her water overnight and drank it in the morning reported positive effects on her blood sugar.

P111F: I take my pills the one the physician gave me and sometimes I will take herbals too, like.... sometimes bitter melon. I cut it in pieces and put it in the fridge. And then in the nighttime I put it in a bowl of water and then drink the water in the morning and it controls my blood sugar for the whole day.

Overall, herbs, flour blends and bitter melon were considered safe and had no adverse effects and were natural remedies that were beneficial for general health as well as for diabetes.

P110F: These types of remedies are also good for the body. They have no negative effects to the body because they are what we eat.

Participants were aware that diabetes management required making changes to their dietary practices. Making and maintaining these changes were a struggle because they affected deeply ingrained cultural habits and expressions that were not only dietary but deeply social. For example, tea drinking is an integral aspect of Indian culture. Tea is consumed at breakfast and in the evening. In fact, it is a cultural norm to offer tea to guests and visitors. It is usually prepared by adding milk and sugar to taste. Participants struggled with cutting back on the amount of sugar added when it came to drinking tea. One female participant made gradual changes to her sugary tea consumption.

P101F: So, I said to myself if my father-in-law can drink tea without sugar then so can I. But I can't drink it, I can't bring myself to drink it. Then slowly, slowly I started to drink tea without sugar.

Similarly limiting or avoiding rice and roti which are staple foods that are served with main dishes at Indian meals were difficult for several participants. Instead of avoiding these foods, one participant replaced her white rice and roti with brown rice, brown roti and vegetables. She felt that giving up meat would be easier than giving up her rice and roti.

P111F: Main thing was my eating (laughs) –I mostly eat brown roti, brown rice, and more vegetables -no white. I don't even want to eat meat. I want to quit it. I don't feel like eating it at all. Yes, it is a vegetable we cook all the time. It is better to eat the vegetable. I eat either roti or rice

with vegetables, I can't live without roti or rice. It is our main food.

On her physician's advice, one female participant tried to control her blood sugar by eating fruit that was bitter and by avoiding soda.

P101F: I was told by my doctor that I could eat everything. Even an apple, he told me to eat half of a bitter one and not the whole. Eat bitter stuff he told me. I drank all types of soda; in fact, I drank all the sodas you can imagine. But now I only drink 7 up or Sprite rarely; I don't even bring them for home. Even if I have guests, I don't offer them soda, I tell them have tea or water.

For some participants, avoiding certain foods was not difficult. One woman asserted that she did not bring any Indian sweets home. For snacks, she opted to eat to dry fruits and low sugar Indian cookies, which are readily available at the Indian store.

P105F: It is not hard to stop eating something, especially if it is raising my blood sugar readings. I say to myself, "It is better I don't eat this stuff", and, if I do, I need to eat very little. Like a small piece. I don't even bring any Indian sweets home. I have started dry fruits now, like almonds, walnuts and cashew nuts. I will eat 3–4 of each nut with my tea in the morning or 2 rusks. I get my rusks from the Indian store. They have sugar in them, but less than the other cookies.

Gender Roles Influencing Diabetes Management

Culturally specific gender roles affected daily diabetes management, especially for female participants. Traditionally, Asian Indian women are responsible for household chores, meal preparation, and housekeeping and are often the primary care givers of children and elderly parents (Kaikaya, 2000). In this study, female participants reported overwhelming household responsibilities that negatively impacted their capacity to manage their diabetes and maintain glycemic control. Women lacked time to manage their own dietary needs because they had to cater to elderly parents and family dietary preferences. As one female participant divulged, she had no time to make her own meals because making two separate meals would only increase her household chores. Thus, she ate the parathas (an unleavened Indian wheat flat bread that is usually fried on a griddle) and roti even though they had negative effects on her diabetes.

P108F: I usually like breakfast, I eat toast and peanut butter, and this is usually breakfast, at lunch I eat roti, parathas and because you know my mom, she does not like missi roti – it is

healthy, but she does not want it so then I never make one for myself. It is too much work.

Female participants struggled between cooking meals for the family and managing their own dietary needs. A family's strong preference for traditional Indian food or meals that included meat, posed mealtime challenges and made it difficult to modify meals. Modifying meals for a diabetes diet meant cooking two dishes at every meal, which created more work for female participants. Catering to family meal preferences and activities left no time for female participants to make dietary changes that would benefit their diabetes.

P108F: I must cook for her. Indian food for my mother-in-law, because she likes Indian food... Nobody understands that I am diabetic, that I have to make it like my way - but they don't like it... At supper because I am vegetarian, I must make something vegetarian for myself and for my husband and my son chicken. So I make them a meat dish. It is extremely hard. Two to three dishes every meal, every day.

Families' lack of understanding and knowledge about diabetes led to inadequate support which further hindered diabetes management for several female participants. A female participant described her husband's support as superficial. Although he encouraged her to exercise and take care of her diabetes, he did little to help her with her chores that affected the time available to care for her diabetes.

P108F: Nobody understands what diabetes is. So, it is extremely hard... My husband is worried too, and he encourages me, praises me go for walk. He works full time - so I take care of my mother-in-law and the kids, all by myself.

Female participants also reported diabetes management activities themselves, frequently monitoring blood sugar, administering insulin, monitoring food intake all within a busy lifestyle created added stress. As with this participant, some women found the combined responsibilities for the household and their diabetes to be overwhelming.

P108F: Like every day I get up in the morning, I check - I poke myself, check how much it is, then I take my insulin, sliding scale. I don't like it - it is hard. Then again at lunch time and at supper time... And because I must take my son to school, games and practices. Sometimes I don't even eat on time. It is so hard to control, and I think maybe I can't learn how to live with diabetes. It makes it so hard to check my blood sugars and give insulin.

In contrast, for male participants, managing diabetes was easier, because they readily expected overall family habits would change for them, and because their wives were responsible for provision the household and preparing their meals.

One male said that because his wife had diabetes, he could control his diet. She bought the food and prepared his meals.

P106M: My family is supportive - my wife has diabetes too. She understands. She cooks and buys the food I want to eat.

Several male participants implemented dietary changes within their family to achieve glycemic control. One male participant decided that the whole family should switch to whole wheat bread and whole wheat roti.

P112M: And now I am concentrating on brown foods versus white food. Now my whole family eats brown bread. No more white bread in this house!

It is noteworthy that none of the female participants described overhauling the family's diet to address their diabetes requirements.

Although male participants emphasized that they could control their diabetes with drastic

dietary changes, they seemed to lack an understanding of what foods to eat. One described how much he made substantial dietary changes based on casual information from physicians who came to his workplace.

P112M: I changed the whole pattern of how I used to eat. At my workplace I have this one physician who comes occasionally. She tells me what to do. She says your diet is particularly important. Take 10 different types of fruits and vegetables every day in small portions, so that everything is there. She convinced me there is a way out of diabetes, but it is not easy.

Male participants who attributed overeating to be a cause of their diabetes, modified their diet drastically. Several male participants gave up "junk food" (sweets and candy), fried foods, spicy foods and became vegetarians after they were diagnosed with diabetes. Eating meat was considered to have a negative effect on blood sugar. One male participant related how he stopped eating meat and cut back on his roti to manage his diabetes. He ate only salads, pasta and limited the amount of food he ate. He decided that a low calorie, vegetarian diet was necessary to achieve glycemic control.

P103M: I have changed. I don't eat like a sweet, spicy or fried food. I only eat vegetables and pasta. The biggest change is my diet is not eating as much or what I like. I used to eat meat, beef, chicken, mutton, fish and eggs. I used to eat a lot of IN-N-Out burgers and go to steak house. Now I eat salad, and more salad.

Even though male participants made drastic changes to their diet, learning portion sizes and nutritional values took several years. One participant described it was a long,

complicated process which was time-consuming due to the lack of culturally specific dietary information.

P112M: The books told me how many calories each food had. Like one tortilla, fries, half cup of grapes.... so, you get used to that. So, you have to learn it for a couple of times – it is not easy and is difficult to do.

Male participants also emphasized that exercise combined with diet control was essential in managing their diabetes. One man explained it this way:

P107M: Look I think you should avoid junk food. You should pay attention to what you eat. You also need to go to the gym.

In contrast females were largely silent on the issue of physical activity in diabetes management.

Abstinence from alcohol was a challenging for male participants, even though alcohol negatively impacted their blood sugars.

P109M: That is my negative point. I will have some alcohol, eat my dinner and go straight to bed. Everything else, I do well to keep my diabetes under control.

Insufficient Knowledge in Managing Diabetes

Lack of adequate and reliable knowledge influenced daily dietary self-management of diabetes. Participants confessed that lack of knowledge was a challenge to daily diabetes management. One female participant stated that, because she did not know much about diabetes, she was unable to give much advice to any of her family members. She told them to make simple dietary and lifestyle changes; she told her children to avoid negative thoughts that created unwanted stressors. Based on her life experiences, unnecessary stress had caused her diabetes. Limiting stress would prevent diabetes.

P110F: I don't really give them much advice because there is not much that I know about diabetes. I tell them to eat sensibly that is limit the amount you eat, don't take on stress, and don't talk bad or think badly about anyone.

Similarly, a male participant felt that he had insufficient knowledge in diabetes management and yearned for more information although he did not know how to access it.

P103M: Roti, eat more salad and more – I don't know much else to eat. I don't have enough information, maybe only 10–15%. I don't know much about – like I don't go to any classes. If they have some class or seminar, I can attend then I can know more.

Counting or limiting carbohydrates and calories, created further challenges for several participants. One participant described how he controlled his diet by watching his carbohydrate intake, yet when asked how many carbohydrates he consumed he described the number of calories he ate.

P102M: I mean I watch the nutrition, how much carbohydrate there is in there, sugar or fat are in there. Before I never used to watch, I just used to eat.

I: So, you are counting your carbs?

P102M: Yeah, yeah. What I think is I try to eat less than 2,000 calories, at least. For my health like my physician said 1,400 –1,500, like I try to eat under 2,000 calories.

Participants implemented dietary changes based on unreliable sources such as social networks to manage their diabetes. One participant described hearing from an unknown source that eating only two meals a day was recommended for adequate glycemic control. Like several other participants in the study, he limited his food portions and switched to whole wheat flour.

P112M: A recent study in England said two meals a day for diabetes is good. I don't know if you have heard about it or not? But I just heard it 2–3 weeks ago and they said that two meals and that is where I am. I eat only two meals a day. Like afternoon meals is more like a snack, or probably no meal. No meals meaning you just take something which is non-caloric. For breakfast I will have a brown tortilla, roti. Homemade roti – pure brown and not half brown. Not mixed white and brown, some people do that.

Need of Appropriate Diabetes Education

Diabetes education is critical to the success of managing diabetes (Hu, 2011). In the view of one participant, language barriers and lack of culturally appropriate dietary information dissuaded many from attending diabetes education classes.

P101F: There is one thing that I think would really help me with my diabetes and that is getting information on the types of food I eat and how it affects my sugar. My physician told me to go to the diabetes classes and I told her I don't want to. I did not tell her the reason though – I will tell you the reason. I am not a fan of classes and really, I don't understand English that well – so what is the point of going. I will be wasting my time and I don't eat the food they eat. I eat mainly Indian food.

By contrast, a female participant asserted that diabetes classes taught her portion control and other preventative behaviors that improved his glycemic control.

P111F: Yes, I took classes. Diabetes classes. I learned portion control that in those classes and to check my feet all the time. They were helpful.

Discussion

Currently there is little guidance for dietary practices that are tailored to Asian Indians with type 2 diabetes. A study conducted in the Bay Area reported that health care providers did not provide culturally appropriate dietary advice and did not understand AIs dietary preferences (Koenig et al., 2012). In our study cultural beliefs and dietary practices influenced how AIs managed their diabetes. Ayurveda in conjunction with allopathic medication allowed participants to have autonomy in managing their diabetes. Self-treatment was primarily based on knowledge of ayurvedic principles that were deeply rooted in the participants' beliefs and daily cultural practices. Most of the herbs, vegetables and flour used in ayurvedic approaches were readily available in Indian stores and were frequently used to treat general health as well as diabetes. These were believed to be less harmful to the body, with fewer side effects than allopathic medications. Participants believed that bitter melon, daily herbal and flour blends had beneficial effects. Bitter melon was used for its hypoglycemic effects (Liu et al., 2021) and fennel and fenugreek to reduce hyperglycemia (Pereira et al., 2019). If allopathy and Ayurveda did not work, they blamed their fate.

Our study suggests that daily dietary diabetes management was influenced by gender, family roles and insufficient knowledge. Family responsibilities, caregiving activities and a lack of family support had a negative impact on the capacity to care for their diabetes in female participants. They also lacked personal time to manage their diabetes because they had to cater to the needs of their children, husband and elderly parents. There seemed to be no family discussion about the disease or alterations in family habits when is affected women. In contrast AI men reported having better control of their diabetes because their wives prepared their meals. Although male participants made drastic changes to their diets such as avoiding roti, meat and alcohol, implementing these changes within their families was hindered by their children who lacked motivation.

Poor diet is a major risk factor (Dixit et al., 2011) and dietary changes are known to improve risk in AIs in India (Ramachandran et al., 2006) and the United States (Kandula et al., 2007). AI participants lacked knowledge of culturally specific diabetes dietary information that could be employed in managing their disease more effectively. Although they made dietary changes, such as limiting portion sizes, and avoiding carbohydrates, meat and sugar, AIs lacked access to a culturally appropriate dietary advice. Most of their information was based on familiar cultural practices and social networks.

Implications for Practice

Ayurveda, use of herbal and flour blends are common AI practices that are thought to control diabetes, but the

number of studies that have examined their effects have been limited (Lim et al., 2019; Misra et al., 2018). To provide culturally appropriate care for AIs with diabetes, more research should be conducted on common everyday AI dietary practices. Health care providers should assess the herbal and flour blends that are believed to be salutary for diabetes control. As additional information is developed, these practices can be incorporated into the care and treatment of diabetes in this population. Until such scientific information is developed, patients can be encouraged to test their pre- and post-prandial blood sugar to see how they respond to using Ayurveda self-treatments and vegetarianism. For example, the dietary practices and behavior, such as eating a missi roti, herbs and bitter melon should be incorporated into preventive programs. Limiting excessive sweet tea and alcohol should also be discussed with AIs with diabetes.

Strategies to provide greater support for AI women such as local support groups and dietary information sessions are needed to empower them to achieve control of their disease. More information on available resources for the care of elderly parents would be ideal and might decrease the span of responsibilities that female participants report. Developing culturally specific ways to engage family members, especially spouses and children, in understanding the disease process and how to support female patients must be developed.

Even though AIs are familiar with diabetes and often passively accept it, they lack knowledge of the disease and its complications. Acknowledging the lack of knowledge could facilitate open discussion and communication between health care providers and AIs, providing an opportunity to educate this population and address their concerns. Preventive programs that couple information about risk with data on positive outcomes that can be achieved by changing health behaviors are likely to be the most efficacious (Ho et al., 2012). Understanding AI dietary practices and implementing culturally specific strategies would help build the partnerships that are essential in improving knowledge and increasing motivation to prevent diabetes and its complications.

Table 1. Demographic Characteristics of Asian Indian Participants.

| Participants | n = 12 |
|---|---------------|
| Women | 6 |
| Age, yrs. | |
| Women | 57.5 ± 9.8 |
| Men | 56.2 ± 7.5 |
| Length of time residing in the US, yrs. | 19.3 ± 9.9 |
| Diabetes diagnosis, yrs. | 10.3 ± 6.2 |
| Religion (n) | |
| Hindu | 4 |
| Sikh | 8 |

Conclusions

Findings from this study provide a preliminary understanding of daily self-management practices in AIs with T2DM. Because the rate of developing diabetes is so high among AIs, culturally appropriate dietary strategies should be implemented as early as possible. Setting goals within the cultural context that consider gender roles, dietary practices and Ayurveda, should be incorporated into strategies to improve diabetes management.

Limitations

Because this study described diabetes self-management of first-generation AIs (i.e., Sikhs and Hindus) who were recruited from local temples, findings cannot be generalized to other AI groups (i.e., Muslims and Christians), AIs that do not go to the temple or second-generation AIs. Furthermore, all the participants had type 2 diabetes; thus, findings cannot be applied to persons with type 1 diabetes. Finally, most of the participants self-reported A1Cs that were within normal control, but there was no way of verifying that.

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Conflicts of Interest

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