The role of religion, spirituality and fasting in coping with Diabetes among Indian Australians: a qualitative exploratory study

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Abstract:

Australia has a high proportion of migrants, with an increasing migration rate from India. While many factors influence diabetes self-management among Indian migrants, very little is known about the influence of religious beliefs and spirituality. This study explored the religious beliefs of Indian migrants in Australia and the influence of those beliefs on their diabetes self-management. Semi-structured interviews were conducted with a convenience sample of 23 Indian migrants. All interviews were audio-recorded, transcribed verbatim and thematically analyzed. Most participants believed that prayers helped them alleviate stress and improve diabetes management participants also believed that receiving blessings/prayers from religious leaders prevent or cure diseases including diabetes. There were mixed views on beliefs about using insulin obtained from animal sources. Some participants were concerned about the use of animal-based insulin as it was against their religious beliefs and teachings. Some participants believed that religious fasting does not have any impact on their diabetes while others believed that it can be detrimental to their health. Religious beliefs therefore played an important role in how Indian migrants managed their diabetes. Healthcare professionals should consider their patients' religious beliefs during consultations, enlist support, such as religious scholars, to better address people's misconceptions, and identify strategies for effective diabetes management that consider religious beliefs.

Keywords: Fasting in diabetes; Indian migrants; Insulin; Religion and spirituality; Type 2 diabetes

Introduction:

According to the International Diabetes Federation (IDF Diabetes Atlas, 2019), there are 463 million individuals with diabetes worldwide, a number projected to rise to 700 million by 2045 (IDF Diabetes Atlas, 2019). It has been estimated that the global health expenditure due to diabetes will grow from USD $760 billion to $845 billion between 2019 and 2045 (Williams et al., 2020). In Australia, diabetes mellitus (DM) is a leading cause of morbidity and mortality with approximately 1.2 million people affected. Approximately 280 Australians develop DM every day (Diabetes in Australia, 2019). If the trend continues, approximately 3 million Australians over the age of 25 years will suffer from diabetes by the year 2025 (Shaw & Tanamas, 2012).

Australia, traditionally, has a high proportion of migrants. According to the 2018 census, 29% of the Australian population were born overseas, with a substantial number of Indian born migrants. Currently, there are approximately 660,000 Indian migrants in Australia, comprising approximately 2.6% of the Australian population (Ahmad, 2021; Australia's Population, 2018–2019). A report by the Centre for Epidemiology and Research suggests that there is a higher prevalence of DM among Indian born migrants (14.8%) compared to the Australian born population (7.1%) (Centre for Epidemiology and Research, 2010). Furthermore, the rate of hospitalization due to diabetes and its complications is also higher in Indian migrants (New South Wales Health, 2008). The Australian National Diabetes Strategy (2016–2020) identified Indian migrants as one of the high-risk communities to develop diabetes and called for actions to reduce the burden of diabetes among Indian migrants (Australian National Diabetes Strategy, 2016–2020).

Indians follow different religious practices such as Hinduism, Islam, Christianity, Sikhism, Buddhism and Jainism (Pew Research Centre, 2018). A recent survey showed that religion is very important for 8 out of 10 Indians (Pew Research Centre, 2018), and religiousness and spirituality are essential parts of their life (Pew Research Centre, 2018). Furthermore, spiritual healing is also an integral part of the Indian health belief system (Bassett et al., 2012). Spiritual beliefs influence daily activities such as diet, exercise, work and health-related decision-making such as medication taking. Spiritual healing involves meditations, praying or seeking help from religious leaders to transmit healing energies, and unify mind, body and spirit (Celik et al., 2021; Powell et al., 2003).

The health locus of control (HLC) is an important concept that has been used to understand health behavior. HLC reflects individuals' beliefs about who or what is responsible for the management of their health condition (Wallston & Wallston, 1982). HLC can influence a person's health behaviors and can therefore influence health outcomes (Nazareth, 2016). The HLC theory introduces two aspects of external or internal control. There are two external dimensions. One is the chance dimension, where a person believes that the health outcome they have is related to chance or fate; and powerful others dimension, where they believe that their health outcome is influenced by a powerful other (Debnam et al., 2012). In internal control, an individual believes that a person can control his or her health conditions and health-related outcomes, and these are contingent on a person's behaviors and actions. Internal HLC has been associated with positive health outcomes, such as reduced disease burden, increased self-rated health and adherence to medications and improved general health (Nazareth, 2016). People with a high internal locus of control believe that they control their health outcomes by behaving in a certain way. A study from India concluded that those with high internal HLC tend to manage their diabetes better and suffer fewer complications (Hameed, 2014). Another study from Iran reported higher adherence to medication among people with positive internal HLC (Morowatisharifabad et al., 2010).

In general, HLC plays an important role in people's decisions to initiate therapy (Isaac et al., 2016). With external control, a person believes that health either depends on others or is controlled by others (Poursharifi & Babapour, 2011). External HLC has been associated with negative health outcomes such as reduced quality of life, increased emergency department visits and decreased acceptance of illness (Nazareth, 2016). Those who believe in external HLC are more likely to have poor health outcomes (Kassianos et al., 2016). Evidence suggests that HLC is linked to religion and spirituality (Nazareth, 2016). Spiritual health locus of control and God locus of health control concepts are being used to understand such perceived sources of health control (Bassett et al., 2012; Nazareth, 2016; Powell et al., 2003; Wallston & Wallston, 1982). These constructs may be relevant for particular populations such as those with strong beliefs in religiosity and/or spirituality.

Currently, there is limited information about the influence of religion and spirituality on the management of diabetes. To the best of our knowledge, only a few studies have investigated the

role of religion, spirituality and HLC in diabetes management (Lynch et al., 2012; Powell et al., 2003). For example, a study (Lynch et al., 2012) was conducted to examine the association between spirituality and depression among people with diabetes. The study showed that high spirituality was associated with less depression, and faith-based diabetes education was likely to improve self-care behaviors and glycemic control (Lynch et al., 2012). A study conducted in the US among African-American men showed that 12 out of 30 patients with diabetes used religion and spirituality as a coping strategy to manage their condition (Namageyo-Funa et al., 2015). They employed various coping strategies such as believing in God, praying and reading holy books (Namageyo-Funa et al., 2015). A study conducted in Qatar among 200 South Asian patients reported that religious factors influence the management of diabetes such as participants felt helpless because they believed in the misconception of fate "no matter what I do, God 's wish will prevail, it is my destiny" and "If it is written that I will live long I will, and if it is written that I will die soon I will" (Mohamed et al., 2017). However, no study has directly investigated how culture, religion and spirituality influence self-management of diabetes in migrant individuals of Indian origin. Therefore, this qualitative study aimed to explore the religious beliefs of Indian migrants in Australia and the influence of those beliefs on the management of diabetes.

Methods:

Research questionnaire

A semi-structured interview questionnaire (Appendix 1) was developed to address the overall research aims. The interview questions were based on previous studies (Ahmad, 2021; Ahmad et al., 2015; Garad & Waycott, 2015; Namageyo-Funa et al., 2015; Sapkota et al., 2018; Sridhar, 2013; Zainudin et al., 2017) and consisted of two sections. The first section included questions about participants' demographics such as age, gender and qualification. The second section consisted of questions that investigated participants' beliefs about religion and spirituality in managing their diabetes.

The interview questions were tested for content and face validity prior to data collection. The testing was conducted with four participants; two were researchers with experience in qualitative methods and who acted as pseudo-patients; another was a general member of the public (Indian migrant); and the fourth person was an Indian migrant with type 2 diabetes. Minor changes were

made based on the feedback provided to improve the clarity of the questions. The data obtained from the pilot testing were not included in the final analysis.

Recruitment of Participants

The study was approved by The University's Human Research Ethics Committee (2018/415). Written consent was obtained from participants before their interview. Participants were included in the study if they were: 18 years or older, diagnosed with type 2 diabetes and using at least one anti-diabetic medicine, Indian born migrant living in Sydney as an Australian citizen or as a permanent resident, not dependent on others to administer their medicine(s), and fluent in English or Hindi. Participants were excluded if they were not on medication for type 2 diabetes, born outside of India, or dependent on others to administer their medication.

The participants were recruited from the Greater Sydney area and its surrounding suburbs. Three approaches were used for recruitment:

(1) Advertising via social media, Indian news media, Indian supermarkets and restaurants in Sydney.

(2) Advertising via Indian organizations and associations in Australia.

(3) Snowballing.

For recruitment, flyers were advertised on Indian community groups on Facebook, Gumtree and in Indian grocery stores and restaurants in Sydney (with permission of the owner/manager). Additionally, the study advertisement was published in Indian newspapers, such as Indian Link. Interested people were requested to contact the researcher for study information and participation. Each participant was reimbursed AUD $30 for their time and travel expense.

Data Collection

Interviews were conducted between August and October 2018. All interviews were conducted by AA (PhD student). Interviews were conducted at a public venue in Sydney that was convenient to

the participant. Each interview lasted for approximately 40–45 min. The interviews were audio-recorded. The study documents (interview guide, consent form, participant information and demographics questionnaire) were translated into Hindi by an Australian certified translator and cross-checked by a research team member (AA). Twenty-two interviews were conducted in English and one in Hindi, by the primary author (AA). The interviewer is a registered pharmacist in India and trained researcher in qualitative research techniques. Interviews were conducted until data saturation was reached, that is, no new information was generated. Saturation was achieved at the end of the 18th interview; however, five more interviews were conducted to confirm data saturation.

Data Analysis

The interview audio-recordings were transcribed verbatim and thematically (inductively) analysed by AA (Spencer et al., 2013). The phenomenology orientation was used because it is useful in understanding people's lived experiences (Neubauer et al., 2019). Data analysis was performed manually and recorded using Microsoft Word. Initially, two researchers (AA and PA) independently went through some of the transcripts, read and re-read each transcript to familiarise themselves with the data. Then, the emerging concepts that were in line with the study objectives were identified and coded. Similar codes were combined into a concept, which resulted in several themes. The themes were reviewed by the researchers where similar themes were combined to form a broader theme, which was named to reflect the actual data. The themes were finalised by the researchers after multiple rounds of discussion.

The trustworthiness of the qualitative data was demonstrated based on the suggestions proposed by Lincoln (2007). Lincoln and Guba emphasised establishing the credibility, confirmability, dependability and transferability of the qualitative research. In this study, the credibility and dependability were ensured by verbatim recordings and by reviewing all the transcripts. The dependency was established by providing a detailed description of the data. Transferability was established by providing a detailed account of the methods used in this study which could serve as an example for future studies.

The consolidated criteria for reporting qualitative research (COREQ) (Appendix 2) were used to provide transparency in data reporting to improve rigour, comprehensiveness and trustworthiness of the study (Tong et al., 2007).

Findings

Demographics

A total of 23 participants were interviewed for this study. The majority of participants were male (n = 18) and were following Hinduism (n = 17). Most participants were diagnosed with diabetes within the past 5 years (n = 13) and were taking at least one oral anti-diabetic medication (n = 16) (Table 1).

Qualitative Findings

We derived three main themes from the qualitative data; the role of spirituality and religion in managing type 2 diabetes, religious beliefs about insulin and other medications produced from animals, and beliefs about religious fasting and its impact on diabetes self-management (Fig. 1).

The Role of Spirituality and Religion in Managing Diabetes

This theme provides an overview of how Indian migrants reported managing their diabetes through prayers, spirituality and their religious beliefs towards diabetes management. Participants' spiritual and religious beliefs were further categorised into three sub-themes; belief in God and prayers, seeking help from religious leaders and benefits of yoga and meditation.

Belief in God and Prayers

Most participants believed in God and mentioned that praying helped them in managing their diabetes. For example, one participant who followed Hinduism and worshipped regularly on Saturdays and Sundays said that praying made him "stress free" and helped control his blood sugar.

"I follow Hinduism and do prayers, after prayers I feel good, it gives me positive vibes from inside (PD 23)"

Similar trends were observed from participants who were practising Islam. Participants reported that they pray regularly, five times a day, and recite the Holy Quran (divine Islamic book) which gives them inner peace and strength to manage their diabetes.

"Yeah, I recite Quran and do my prayer 5 times a day. For me, it is just straight connection with God, that's all. I recite the Quran as loud as possible. I try to do it every day, and it will give me inner positive strength (PD 21)"

Some participants mentioned that they eat a vegetarian diet due to their religious obligations, and their diet helped them control their diabetes.

"I am following Jainism, and I am pure vegetarian because Ahimsa (non-violence) principle encourages us (to) take vegetables. It helps in controlling diabetes (PD 20)"

Seeking Help from Religious Leaders

Some participants believed that blessings/prayers or tawiz (a locket or amulet usually containing verses from the Quran or other prayers and symbols) from religious leaders can prevent certain diseases including diabetes. For example, one Muslim participant mentioned that blessings from an imam (prayer leader or leader of the mosque) or some Ayat (verse) from the Quran in the form of tawiz can prevent diseases or other "evils". Similar beliefs were expressed by participants who followed other religions.

"Yes, I strongly believe in Islam. There are some powers there in Quranic verses that normally given by any Molana or Hafiz (those who have memorised whole Quran). I believe that some Dua (prayer) could resist some of your diseases including diabetes (PD 17, Muslim participant)"

Another Hindu participant also expressed a similar belief.

"It helps in certain way, if any Pujari (priest) who gives you blessings then it might cure disease." (PD 4, Hindu participant)"

Benefits of Meditation and Yoga

Participants who were following Hinduism reported that they controlled their blood sugar through meditation and yoga. Participants mentioned that meditation strengthens their immune system and automatically helps to control their blood sugar.

"Meditation strengthens your immune system if you continue it for several years. During meditation, I tell my mind to be in the present, be always happy, be a good person, no anger and no criticism (PD 5)"

Participants expressed positive beliefs about performing yoga because it helped in managing their diabetes. For example, one participant mentioned that he successfully followed yoga principles of one of the famous Hindu religious scholars to control his blood sugar. However, the participant reported that he was also following the dietary recommendations given by the scholar and taking anti-diabetic medication.

"Yeah, meditation and yoga helps at some point of time. I used to follow yoga. I used to follow this Guru Shri Shri Ravi Shankar's Yoga, and I followed his sudarshan kriya, which really works well. I personally recommend having balance, doing both, like diet and exercise plus meditation. It really works well for me (PD 19)"

Religious Beliefs about Insulin and Other Medications from Animal Sources

Participants showed mixed religious views about insulin and other anti-diabetic medications derived from animal sources. Religious beliefs influenced participants' decision to use insulin and other animal-derived medicines.

Positive Belief about Insulin

Some participants showed positive views on the use of animal-derived insulin. They mentioned that although ingredients obtained from animals such as cow and pork are not permissible to consume, they are willing to use animal-derived insulin if it helps them in managing their diabetes. These views were seen amongst followers of all religions.

"Cow and pork are prohibited in my religion (Hinduism) but if really evidence is there and support that it will work for my diabetes then I don't care, I will take (PD 2)"

"I am Jain by religion and in our religion we are not supposed to have any animal related food but if it's in a form of medicine, I have no problem (PD 4)"

"I don't know from where they produce insulin but if the doctor is prescribing, I'll take it. It is only a medication. Even if there is an ingredient taken from a cow or a pig, we can use it (PD 21)"

Negative Beliefs about Insulin and Other Medications

A few participants showed negative beliefs towards insulin, and other medicines that contain animal-derived ingredients, that is, they were not willing to use insulin that contained animal ingredients because intake of animal flesh and any of its products is prohibited in their religion.

For example, one Hindu participant reported that:

"I do not want to take anything made up from the animal products. In my religion, it's prohibited so I don't want to take (insulin) if produced by animal (PD 23)"

Similarly, a Muslim participant said:

"If some medicines are made from animal sources especially pig then I would avoid taking it because it's prohibited, Haram, in Islam (PD 17)"

Beliefs about Religious Fasting and its Impact on the Management of Diabetes

Participants expressed mixed views on religious fasting and its impact on the management of diabetes. Some participants believed that religious fasting does not harm their diabetic condition, while others mentioned that fasting is not safe for diabetics as it is difficult to control blood sugar while fasting.

"I do fast in Ramadan for 30 days. I take morning medicines in sehri (before sunrise) that is at 4 am and night medicines at 5:30 o'clock in iftar (after sunset). I am fasting from long time and even after diagnosed with diabetes, same practice, no effect on my health…it is compulsory in Islam, I am doing because of my religion not for diabetes. I also go on morning walk same as normal days and do not feel any weakness during fasting (PD 17; Muslim participant)"

"I stopped fasting long back when I got diagnosed as a diabetic. I know it is not good as you have to eat every two to three hours to control your sugar, so fasting is horrible for a diabetic patient (PD 20; Hindu participant)"

Some participants believed that fasting is an important religious obligation which cannot be skipped; hence they tried to manage their medication during the times of the day when they were allowed to eat. Furthermore, participants who were not in favour of fasting believed that those who fast do so under social pressure and that fasting should be avoided as it is harmful to patients with diabetes.

"I only take coconut water, coffee and fruits during fasts and no other food for 24 h. Managing fasting is a bit difficult…I am doing for several years, not much impact on my health, yes I feel hungrier…I don't know whether it is benefiting or harmful to my diabetes… feel a little bit weak (PD 13; Hindu participant)"

"Fasting is harmful for diabetic patients. I advise people not to fast. People fast because of fear and social pressure and not for religion. Many people I know fast just to show others (PD 21; Muslim participant)"

Discussion

To the best of our knowledge, this is the first in-depth qualitative study which explored the role of religion and spirituality in the management of diabetes among Indian migrants in Australia. Our findings suggest that religious beliefs influence diabetes management in this group. Participants believed that prayers gave them inner strength to manage their diabetes, and that prayers/blessings from religious leaders could help them manage their health conditions including diabetes. Participants who held stronger religious beliefs were not in favour of using insulin or other medication derived from animal sources. These participants also believed that fasting was an important religious obligation which cannot be skipped due to diabetes. In contrast, some participants believed that animal-based medicines were permissible to consume, and fasting could be skipped as it was detrimental to the health and well-being of people with diabetes.

Whilst our study did not set out to investigate the role of religion and spirituality in the management of diabetes based on the health locus of control (HLC), the findings showed some unique behavioural aspects of internal and external health locus of control in diabetes management (Sundstrom et al., 2018).

Role of Spirituality and Religion in the Management of Diabetes

Diabetes is a chronic debilitating condition that needs continuous monitoring and control. The main aim of diabetes treatment is to maintain blood sugar level, improve the quality of life, reduce symptoms and prevent the associated complications (Low et al., 2016). The person with diabetes needs to achieve these goals by adhering to prescribed medications and complying with lifestyle changes such as regular exercise and healthy food habits (Chang et al., 2007; Naja et al., 2014). However, the management of diabetes can be very challenging and is influenced by people's beliefs about religion and spirituality (Mohamed et al., 2017) or powerful others that are external to themselves.

Once diagnosed with diabetes, patients can be overwhelmed in managing their condition and may seek help through prayer, depending on the extent of their religious beliefs. According to religious

theories, individuals' belief in God gives them some hope and expectations to overcome their problems (Dull & Skokan, 1995). Several studies have reported that religiosity plays a positive role in individuals' management of diabetes (Mohamed et al., 2017; Namageyo-Funa et al., 2015; Sridhar, 2013). Prayers and religious activities can promote a healthy lifestyle, improve clinical outcome and general well-being (Sridhar, 2013).

In this study, most participants were practising a religion, mainly Hinduism or Islam. Some of the followers of Hinduism prayed regularly on weekends (Saturdays and Sundays) and followed a vegetarian diet, which they believed reduced their stress and helped them control their blood sugar levels. Other evidence also suggests that patients believe that prayer can reduce stress and bring healing power to medicines (Sridhar, 2013). Furthermore, religious recommendations may involve dietary restrictions which may also help people in managing their diabetes. For example, a strict vegetarian diet is recommended in Hinduism. Vegetarian diets help to control body weight, blood sugar levels and reduce the likelihood of diabetes-related complications (Dull & Skokan, 1995; McMacken & Shah, 2017).

Similarly, Muslim respondents stated that they were praying five times a day and were following GPs' recommendations to manage diabetes, such as engaging in mild physical exercise and taking their prescribed medications. This mild exercise was in the form of daily praying, which involves standing, bowing, sitting and prostrating. Muslim prayer may help to enhance fitness as a man can lose 80 cal/day if he is 80 kg (Kamran, 2018). The exercise can help to regulate blood sugar, reduce cholesterol and body weight and reduce anxiety (Colberg et al., 2016).

Another important finding of this study is that Muslim participants believed that Tawiz or blessings given by their religious leaders can cure their disease or help in managing their diabetes. In the literature, there are some opinions that verses from holy books of different religions can function as a remedy for human diseases (Kamran, 2018; Rastogi et al., 2020; Romeo et al., 2015). However, there is no clinical evidence on the benefits of such practices among patients with diabetes. Furthermore, the effectiveness of these practices is not conclusive even from the religious perspective as many religious scholars believe that prayers can help by alleviating stress levels,

not by curing disease. However, it is important to initiate and adhere to medication and recommendations made by a physician (Abredari et al., 2015).

Overall, the above findings support the powerful other external HLC, where participants believed that God and religious leaders help them to self-manage, and in some cases treat, their diabetes.

Our findings suggest that people who consider themselves responsible for managing their condition and who therefore are likely to have an inner HLC, are less likely to believe in such religious practices compared to those who believe that others (such as religious leaders) could have a positive impact on their health and well-being. These findings appear to fit well within the concept of the HLC; however, further studies are required to establish the role of HLC in understanding people's beliefs about religion and its impact on their health. These arguments are well-supported by previous studies such as those conducted among 122 Christians in Australia which showed that awareness of God and internal HLC were associated with better psychological health outcomes (Romeo et al., 2015). Another study showed that improving internal locus of control may improve adherence to diabetes medications (Morowatisharifabad et al., 2010). Furthermore, educational interventions such as patient care that lead to the strengthening of internal HLC may improve and strengthen patients' self-care behaviours and their active engagement in following the physician's recommendations (Abredari et al., 2015).

Religious Beliefs about Insulin and Other Medications

Religious belief is an important factor that determines whether a person would initiate and adhere to insulin therapy. This is primarily due to the potential presence of an animal-based ingredient in insulin preparations. A previous study reported that Muslim patients were unwilling to use insulin because they believed that it was obtained from pigs, which is forbidden to consume in Islam (Abredari et al., 2015). However, another study reported that Muslim diabetic patients did not believe that their religion prohibits the use of insulin or any medication regardless of their origin (Lee et al., 2012). Similarly, in Hinduism, killing a cow for consumption is prohibited; however, we found mixed religious views amongst the participants about the use of insulin, which suggests

inconsistency in participants' understanding of their religion's rulings for using insulin and other medicines made from animal-based ingredients. Overall, some participants believed that their diabetes control and health were much more important than following their religion and therefore used insulin for their diabetes. These findings underline the importance of identifying patients' religious beliefs as early as possible in the course of management and devising necessary interventions to improve people's understanding of the use of insulin in the context of religion.

The findings of this study highlight the value of both autonomy (internal locus of control) and other powerful external (God) factor in patients' opinions to use insulin. Those who demonstrated an internal locus of control (Poursharifi & Babapour, 2011), that is, those who believed that they were responsible for their own health were more likely to believe in scientific evidence and willing to initiate and continue using their prescribed anti-diabetic medication. In contrast, those who demonstrated an external HLC gave more importance to their tradition, culture and religion because of the strong influence of external factors. Patients with a strong internal locus of control belief are more likely to engage in positive health behaviours, whereas people with external locus of control beliefs, which are controlled by influential people or by chance, are not likely to engage in positive health behaviours (Chen & Lin, 2014). A study conducted among 285 patients with type-2 diabetes in Taiwan, to study psychosocial factors of health locus of control, self-efficacy, self-care behaviour and depression related to glycaemic control (Chen & Lin, 2014), showed that in people with a high internal HLC there was greater self-efficacy, self-care behaviour and improved glycaemic control, in contrast to those with an external HLC who were more likely to have worse glycaemic control (HbA1c value) (Chen & Lin, 2014).

Religious Fasting and Diabetes

Study findings showed that those who had fasted previously without any difficulties were more likely to fast compared to those who had difficulties in managing their diabetes previously. Evidence from the literature suggests that participants' beliefs about fasting are primarily based on their past experiences (Chen & Lin, 2014; Corley et al., 2018). The findings of this study show mixed views on the religious beliefs of Indian migrants about fasting and its impact on the management of diabetes. Some participants believed that fasting neither has any advantage nor

disadvantage in the context of their diabetes. A previous study conducted among Muslim participants in 13 Islamic countries showed that about 79% of patients with type 2 diabetes fast during the month of Ramadan (Chen & Lin, 2014). Interestingly, a few participants who were against fasting reported that those who fast do so under social pressure, which is consistent with the findings reported in a previous study (Corley et al., 2018). Whilst we did not intentionally explore participants' understanding of the religious ruling on fasting with diabetes, it appeared that participants had limited understanding of what scholars have ruled about fasting with diabetes or other health conditions. Most participants had their own pre-conceived beliefs which may or may not be consistent with the Islamic teachings and principles (Patel et al., 2015).

We found that participants who had negative beliefs towards fasting were more likely to believe in their behaviour as a key to managing their diabetes, consistent with having an internal HLC. In contrast, participants who believed that religious fasting did not pose a risk to their diabetes or health were more likely to also believe in the influence of God, religious leaders and religious beliefs in their diabetes management and health outcomes, consistent with having an external HLC.

A recent study from New Zealand suggested that an intermittent fasting diet may be useful to lower glycated haemoglobin HbA1c (Corley et al., 2018). However, some studies have reported short-term harms involved in fasting such as poor glycaemic control (Al-Arouj et al., 2010; Chen & Lin, 2014), dehydration and ketoacidosis, and long-term harms such as poor quality of life, higher morbidity and mortality rates (Corley et al., 2018). Risk stratification has been developed for physicians to identify patients at low, moderate and high risk of harm, and for physicians, patient education recommendations can be given to reduce the risk of hyperglycaemia, hypoglycaemia and dehydration during fasting (Al-Arouj et al., 2010).

Religious beliefs have a complex impact on diabetes management. In reality, despite difficulties with food and medication taking, many Indian migrants with diabetes will fast. The lack of a conversation with the GP means that patients are probably doing this unsupported. GPs can enable a discussion with these patients and encourage them to disclose and discuss their fasting so that the GPs can provide appropriate support and advice, and ensure that patients are fasting safely.

Limitations

This study has some limitations which should be considered while interpreting the results. First, this study was focused on Indian migrants in Australia, who may be different to Indian migrants elsewhere. Second, our participants were predominantly Hindu, with only a small number of Muslim participants and other religion followers in the study. Third, the interviewer was male, and this may have influenced recruitment of female participants into the study, possibly due to cultural barriers where a female may not have wanted to attend an interview with a man. Finally, the majority of participants were under 40 years of age, which may be due to the fact that participants were recruited through Facebook and were only from Greater Sydney; younger people use Facebook more than older people. The sample therefore is not representative of all ages, socio-demographic and religious backgrounds of Indian migrants in Australia.

Important Future Directions/Implications

Religious beliefs are an important component of health-related decision-making in patients with diabetes. The findings of this study highlight the need for improving the accuracy of religious beliefs among patients with diabetes. Beliefs based on misunderstanding of religious teachings and principles could enhance difficulties for patients in managing their diabetes. Religious leaders may help improve the accuracy of religious beliefs among patients with diabetes. Currently, there is very limited understanding of the effectiveness of involving religious leaders in improving diabetic health outcomes through effective self-management. Future research could investigate if and how religious leaders could be involved to improve health outcomes in diabetic patients.

Conclusions

We found that religious beliefs may play an important role in the self-management of diabetes among Indian migrants living in Australia. However, both positive and negative beliefs were identified regarding praying, using animal-based medicines, and the impact of fasting on the management of diabetes. It appeared that participants had a limited understanding of the rulings and teachings of their religion within the context of diabetes. Religious scholars could be involved

as a member of the diabetic care team to improve the accuracy of religious beliefs among Indian migrants and help them better manage their diabetes.

Acknowledgements

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Table 1: Demographic information of participants

Characteristics	Variables	N
Age	≤40 years	11
	41-60	7
	≥ 61	5
Gender	Male	18
	Female	5
Religion	Hinduism	17
	Islam	3
	Sikhism	1
	Christian	1
	Jainism	1
Duration In Australia	≤5 year	8
	5 – 10 years	7
	>10 years	8
Duration since diagnosis with diabetes (years)	≤5 year	13
	5 – 10 years	6
	>10 years	4
Types of anti-diabetic medications used	Oral	16
	Oral +insulin	0
	Insulin	2
	Oral+AM	3
	Ayurvedic medicine	2
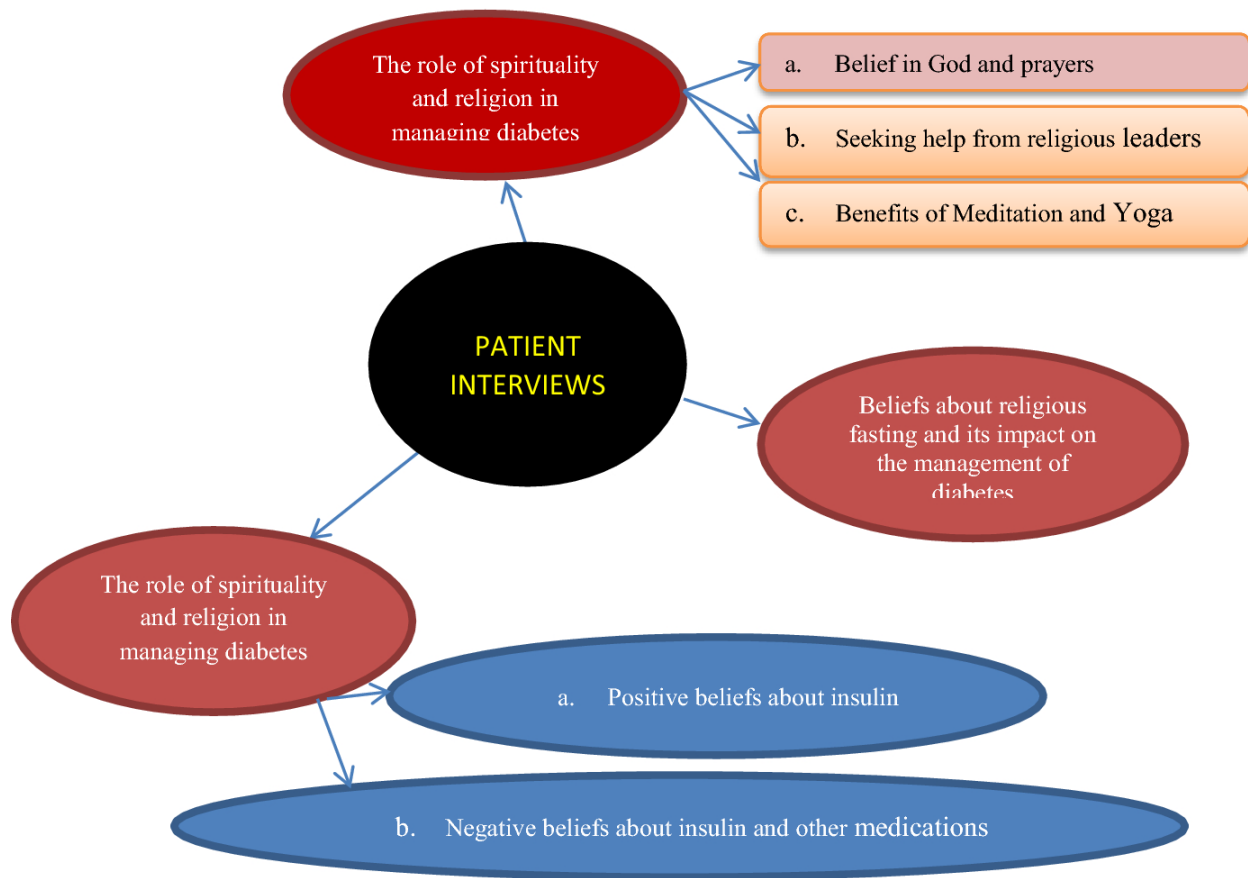
Figure 1: Themes and sub-themes generated from the patients' interviews