

Fasting and feasting safely with type 2 diabetes in the month of Ramadan

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The article covers practical guidance on education for people with type 2 diabetes prior to fasting during the month of Ramadan, so that they can fast, celebrate and enjoy cultural foods without worrying about the impact on their diabetes. Over the last decade, there has been a huge focus on setting up pre-Ramadan education programmes regarding diet, exercise, medication adjustments and greater use of technology, including continuous glucose monitoring, prior to the month of Ramadan. The International Diabetes Federation and Diabetes and Ramadan International Alliance has recently updated its guideline on type 2 diabetes management during the month of Ramadan, including cultural nutrition plans and menus developed for different countries, based on the latest evidence. This provides more up-to-date nutritional guidance for people with type 2 diabetes who are seeking to fast safely during Ramadan.

Ramadan is widely observed across the world. In the 2010 CREED study, 94.2% of participants with type 2 diabetes fasted for at least 15 days of Ramadan and 63.6% fasted for all the days (Babineaux et al, 2015). It is clear that fasting in Ramadan is a very important practice and has a major impact on the management of diabetes in Muslim populations (International Diabetes Federation and Diabetes and Ramadan International Alliance [IDF-DAR], 2021).

This year, Ramadan begins on the 10th/11th March, and it lasts for approximately one month. During Ramadan, the majority of Muslims observe absolute fasting between dawn and sunset throughout the month, abstaining not only from all food and drink but also from other practices such as smoking, and there are significant religious and psychological consequences for the person undertaking the fast (Lessan et al, 2021). The two main meals consumed are known as *Iftar*, the meal to break the fast; and *Suhoor*, the meal before the start of the fast.

The Qur'an allows individuals not to fast if they have an illness or medical condition (Bennakhi et

al, 2021). Healthcare providers, members of the community, individuals with diabetes and their family, friends and carers should be made aware that those who are placed at high risk by fasting can be exempt, but they can also receive spiritual rewards by alternative steps like donations of food or helping the poor with money, also known as *Fidya*.

In the UK, fasting is commonly observed in the South Asian, Arabic and North African communities, and individuals from these communities require tailored medical and dietary advice prior to Ramadan (Hanif et al, 2020).

Ramadan is a festive period for many communities across the globe, and food is also a symbolic part of the fast, and it is common for participants to enjoy meals together and distribute traditional foods and sweets. Traditionally, the fast is ended by having a few dates followed by a lavish spread of foods. Many people will overindulge in foods and drinks that are high in calories and sugar, and can risk hyperglycaemia, when the fast is broken at the end of the day (Ahmed et al, 2012).

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Article points

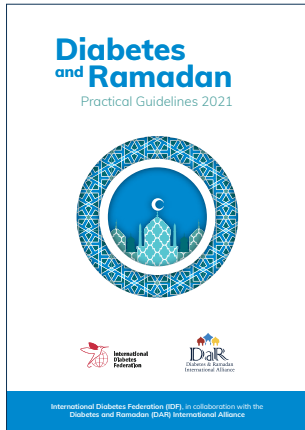
1. Although some at high risk of diabetes complications may be exempt from fasting in Ramadan, the majority of Muslims with type 2 diabetes are obliged or choose to do so.
2. Many diabetes-related risks can be minimised through medication adjustments and tailored nutrition advice. Therefore, it is crucial to increase awareness of these risks to allow safe participation in Ramadan fasting.
3. Prior to Ramadan, education on safe fasting should be provided and a diabetes nutrition plan prepared, in order to reduce the risk of hypo- and hyperglycaemia.

Key words

- Diet and nutrition
- Hypoglycaemia
- Ramadan
- Type 2 diabetes

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Revised practical guidelines on *Diabetes and Ramadan* from the International Diabetes Federation and Diabetes and Ramadan International Alliance are [available here](#).

Risk avoidance during Ramadan

Fasting during Ramadan has a number of physical effects on the body. In people with diabetes, these changes, along with the type of medication being taken to treat diabetes, can contribute to a number of complications (Jabbar et al, 2021). These include:

- Hypoglycaemia, especially during the late period of fasting before the *Iftar* meal.
- Severe hyperglycaemia after each of the main meals (*Iftar* and *Subhoor*).
- Dehydration, especially in years with prolonged fasting hours and countries with hot climates.

Many diabetes-related risks can be minimised through medication adjustments and tailored nutrition advice. Therefore, it is crucial to increase awareness of these risks to allow safe participation in Ramadan fasting. The recently updated [IDF-DAR \(2021\) guideline](#) on diabetes and Ramadan provides both practical information and recommendations to help healthcare professionals optimise care and ensure that people with diabetes who plan to fast during Ramadan can do so safely. This includes a risk stratification table, with guidance on individuals who are at high, medium and low risk of fasting (*Figure 1*).

Risk Element	Risk Score	Risk Element	Risk Score
1. Diabetes type and duration		8. MVD Complications/Comorbidities	
Type 1 diabetes	1	Unstable MVD	6.5
Type 2 diabetes	0	Stable MVD	2
2. Duration of Diabetes (years)		No MVD	0
A duration of ≥ 10	1	9. Renal Complications/Comorbidities	
A duration of < 10	0	eGFR < 30 mL/min	6.5
3. Presence of hypoglycaemia		eGFR 30–45 mL/min	4
Hypoglycaemia unawareness	6.5	eGFR 45–60 mL/min	2
Recent Severe hypoglycaemia	5.5	eGFR >60 mL/min	0
Multiple weekly Hypoglycaemia	3.5	10. Pregnancy*	
Hypoglycaemia less than 1 time per week	1	Pregnant not within targets*	6.5
No hypoglycaemia	0	Pregnant within targets*	3.5
4. Level of glycaemic control		Not pregnant	0
HbA1c levels > 9% (11.7 mmol/L)	2	11. Frailty and Cognitive function	
HbA1c levels 7.5–9% (9.4–11.7 mmol/L)	1	Impaired cognitive function or Frail	6.5
HbA1c levels < 7.5% (9.4 mmol/L)	0	> 70 years old with no home support	3.5
5. Type of treatment		No frailty or loss in cognitive function	0
Multiple daily mixed insulin Injections	3	12. Physical Labour	
Basal Bolus/Insulin pump	2.5	Highly Intense physical labour	4
Once daily Mixed insulin	2	Moderate Intense Physical Labour	2
Basal Insulin	1.5	No physical labour	0
Glibenclamide	1	13. Previous Ramadan Experience	
Gliclazide/MR or Glimepiride or Repaglanide	0.5	Overall negative experience	1
Other therapy not including SU or Insulin	0	No negative or positive experience	0
6. Self-Monitoring of Blood Glucose (SMBG)		14. Fasting hours (location)	
Indicated but not conducted	2	≥ 16 hours	1
Indicated but conducted sub-optimally	1	< 16 hours	0
Conducted as indicated	0		
7. Acute complications		DKA — Diabetic Ketoacidosis	
DKA/ HONC in the last 3 months	3	HONC — Hyperglycaemic Hyperosmolar Nonketotic Coma	
DKA/ HONC in the last 6 months	2	eGFR — Estimated glomerular filtration rate	
DKA/ HONC in the last 12 months	1	MVD — Macrovascular disease	
No DKA or HONC	0		

*Pregnant and breastfeeding women have the right to not fast regardless of whether they have diabetes

SCORE 0 TO 3

LOW RISK

SCORE 3.5 TO 6

MODERATE RISK

SCORE > 6

HIGH RISK

Figure 1. IDF-DAR (2021) Risk score and categories for Ramadan fasting (reused with permission).

Table 1. Potential lifestyle changes, benefits and risks associated with Ramadan fasting (adapted from IDF-DAR, 2021).

Potential lifestyle changes	Potential physical and mental benefits	Potential adverse physical and mental effects
1. Sleeping schedules	1. Sense of fulfilment in participating in all aspects of Ramadan	1. Sleep deprivation and disruption of circadian rhythm leading to increased fatigue and reduced cognition
2. Meal plans and diet	2. Improvements in weight and BMI	2. Glucose excursions causing feelings of being unwell
3. Physical activity patterns	3. Improvements in self-control and ability to resist temptations	3. Greater feelings of lethargy
4. Reduction of adverse behaviours such as smoking	4. Greater sense of empathy with those less fortunate	4. Heightened fear of diabetes-related complications
5. Medication adjustments	5. Participation in <i>Sunnah</i> practices for greater spiritual benefits	5. Temporary changes in weight
	6. Greater sense of community and an opportunity to strengthen relationships	6. Short-term feelings of stress, anxiety, irritability and agitation
	7. Greater a physical and mental wellbeing as a result of stopping adverse behaviours such as smoking	

In the current pandemic, people in the low- or moderate-risk category, who are exposed to people with confirmed COVID-19, are safe to fast as long as they are asymptomatic. Those who develop symptoms whilst fasting should be advised to break the fast (Ahmed et al, 2020).

For people with type 2 diabetes at high risk, there is emerging evidence that newer technologies, such as isCGM (commonly known as flash), can help them fast with fewer complications (Lessan et al, 2015).

Although certain people with type 2 diabetes can be exempt from taking part in Ramadan, the majority will want to take part (Salti et al, 2004). They should not be deterred from fasting unnecessarily, as there are few harmful effects in the majority of people with diabetes, and Ramadan fasting can also have physical, emotional and spiritual benefits. Potential benefits and risks associated with fasting are listed in *Table 1*.

Diabetes and Ramadan education

Diabetes self-management education and support addresses the practical, clinical, psychosocial and behavioural aspects of care needed for daily self-management, and is essential for safe fasting during Ramadan. The objective of Ramadan-focused education is to raise awareness of the risks associated with diabetes and fasting, and to provide

strategies for effective prevention.

The clear benefits of structured education on many aspects of diabetes in Ramadan have been demonstrated in several studies, in diverse populations. A systematic review revealed a significant reduction in hypoglycaemia risk for fasting participants who received Ramadan-focused education compared with those who received standard care, as well as a significant improvement in HbA_{1c} (Tourkmanani et al, 2020).

Aims of pre-Ramadan education

The aims of structured education in preparation for Ramadan include the following:

- Modification and adjustment of nutrition plans for optimal glucose control during Ramadan.
- Designing nutrition plans that may help weight reduction for those aiming to lose weight during Ramadan.
- Adjustment of glucose-lowering medications to match nutrition and fasting.
- Encouragement to continue daily exercise and work activities.
- Recognition of warning symptoms of dehydration, hypoglycaemia and other possible complications.
- Informing of the need to break the fast if blood glucose falls below 3.9 mmol/L or rises above



Read more online

How to manage diabetes during Ramadan

This quick reference guide outlines what the primary care clinician should discuss with a person with diabetes who is considering fasting during Ramadan, and includes advice for those fasting during the COVID-19 pandemic.

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Diabetes & Primary Care 25: 27–9

[Available here](#)

16.6 mmol/L (Ahmedani et al, 2021).

- Informing of the need to monitor blood glucose regularly (blood glucose testing does not break the fast).
- Encouraging the monitoring of body weight during Ramadan.

The Ramadan Nutrition Plan

Nutrition therapy plays a vital role in diabetes management during Ramadan. Ramadan provides an ideal opportunity for people to channel their strength and discipline into adhering to healthy, nutritious and balanced meals at the *Suhoor* and *Iftar* meals.

An individual's regional beliefs and culture should be considered when preparing their diet plan (Shaltout et al, 2020). Ramadan can result in an extra burden of calories; *Iftar*, the meal taken when the fast is broken at sunset, often turns into a feast, with huge volumes of food laden with sugar and carbohydrates. Since there is cultural variation in the traditional foods eaten at *Iftar*, a well-trained dietitian should be at the centre of the diabetes management and follow-up team. Example tailored meal plans from countries around the world, including Egypt, Malaysia, Indonesia, China, Pakistan and South Africa, are available in the IDF-DAR (2021) guideline.

The structure of the IDF-DAR Ramadan Nutrition Plan has been shown to improve fasting blood glucose and triglyceride levels, and self-monitoring glucose at pre-dawn and pre-bed, than standard care in patients with type 2 diabetes. Indeed, knowledge of individualised meal plans has shown to improve outcomes, by helping to maintain optimal glycaemic control, during the month of Ramadan and throughout the year (Mohd Yusof et al, 2020).

The key concepts of the Ramadan Nutrition plan are summarised in *Box 1*, and are outlined in more detail below.

Foods to recommend during *Suhoor*

For *Suhoor* (the pre-dawn meal), meals needs to be wholesome to provide enough energy to last the long hours of fasting and should include the following foods.

Complex carbohydrates: Eat meals based around small portions of carbohydrates. Have wholegrain sources of starchy carbohydrates, such

Box 1. The 10 principles of the Ramadan Nutrition Plan (IDF-DAR, 2021).

- Divide daily calories between *Suhoor* and *Iftar*.
- Ensure meals are well balanced:
 - 45–50% carbohydrate.
 - 20–30% protein.
 - <35% fat (preferably mono- and polyunsaturated).
- Include low-glycaemic-index, high-fibre foods that release energy slowly before and after fasting:
 - e.g. granary bread, beans, rice.
- Include plenty of fruit, vegetables and salads.
- Minimise foods that are high in saturated fat:
 - e.g. ghee, samosas, pakoras.
- Avoid sugary desserts.
- Use small amounts of oil when cooking:
 - e.g. olive, rapeseed.
- Keep hydrated between sunset and sunrise by drinking water or other non-sweetened beverages.
- Avoid caffeinated and sweetened drinks.

as granary bread, wholegrain cereals, lentils, oats, quinoa, buckwheat, bulgur wheat and couscous. These foods release energy slowly, which can help maintain blood glucose levels and make individuals feel less hungry.

Fruits and vegetables: Rich in fibre, fruits and vegetables are essential for fasting as they increase the feeling of fullness and keep the person hydrated. Include fruits such as watermelon and kiwis, and vegetables such as cucumber. Fruits and vegetables provide fibre and reduce risk of constipation. Include more non-starchy vegetables such as green beans, courgettes, aubergines and mushrooms, and fruits including berries.

Protein-rich foods: Include some source of protein, such as eggs, lentils, beans or chickpeas. Protein foods are an essential part of the diet and help to keep people feeling full whilst also having less impact on blood glucose levels.

Dairy foods: Try to include yoghurts or milk-based foods at both *Suhoor* and *Iftar* to ensure sufficient calcium levels. Try plain yoghurts with nuts and fruits such as berries, or use milk and yoghurt to make milky drinks or smoothies with berries. Those who are lactose intolerant can choose lactose-free milk or calcium-fortified soya milk.

Fluids: Drink plenty of water at *Subhoor*. Avoid drinks that contain caffeine, such as tea and coffee, as these can make the person lose more water by going to the toilet more. Avoid sugary drinks such as orange, apple and tropical fruit juice and fizzy drinks. Non-sweetened drinks such as unsweetened lassi or laban are a preferred option.

Foods to recommend during *Iftar*

Iftar (the sunset meal) is the time when the person replenishes energy levels, so every effort should be made to consume foods from all major food groups. *Iftar* also needs to provide a quick release of enough energy. *Iftar* should include the following foods.

Dates: Traditionally during Ramadan, dates are eaten at the start of *Iftar* to symbolise the breaking of the fast. They are a quick source of energy and are high in fibre, calcium and iron. However, the number eaten should be limited as dates are high in sugar.

Complex carbohydrates: It is recommended to eat meals based around small portions of starchy carbohydrates, such as whole grains, rice or flatbread, in small portions. Have wholegrain sources of starchy carbohydrates, such as lentils, quinoa, buckwheat, bulgur wheat and couscous.

Meats and alternatives: Incorporate protein-rich sources, such as lean meat, skinless chicken, fish, eggs, legumes and low-fat dairy products.

Healthy meals: Avoid the usage of deep-fat fryers during Ramadan. When using oil for cooking, try to measure oil and avoid deep frying. Reheating oil increases the amount of *trans*-fatty acids, which are bad for the heart. Limit the number of starters at *Iftar*, especially if based around fried snacks such as samosas. Any starters should be based around salads, fruits, lentils or soups, to leave room for the main healthy meal of the day.

Reduce intake of processed foods: Avoid deep-fried foods and those that contain refined carbohydrates, such as white bread, pastries, biscuits and baklava. Avoid processed meats, burgers, fried chicken and chips. Have small amounts of foods like baklava and halwa (made with semolina, butter and sugar).

Salt: Reduce intake of salt and salted food, including dressings, sauces, salted nuts and crisps. Dehydration is a risk due to limited fluid intake

during the day, and high-salt foods can further increase this risk.

Fluids: Drink plenty of water at *Iftar*. It is recommended to drink at least eight cups of water between *Iftar* and *Subhoor*, so that the body may adjust fluid levels in time for the next day. Again, avoid drinks that contain caffeine, such as tea and coffee, as these can make the person lose more water by going to the toilet more. Avoid sugary drinks such as orange, apple and tropical fruit juice and fizzy drinks. Non-sweetened drinks such as unsweetened lassi or laban are a preferred option.

Eid ul Fitr

After the month of Ramadan, there is the celebration of *Eid ul Fitr*. During this, people with type 2 diabetes should try to minimise or avoid intake of highly processed and fried foods, such as deep-fried snacks including samosas, pakoras, chips and fried potatoes, and minimise the intake of sugar-rich sweets such as baklava, halwa, kheer and Indian sweets.

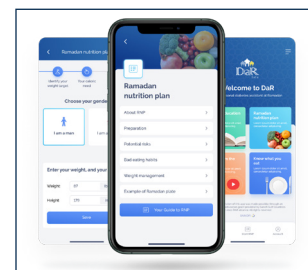
The Ramadan Nutrition Plan (RNP) app

A mobile and web-based application is available from IDF-DAR to provide healthcare professionals with expert information and help them individualise meal plans for people with diabetes during Ramadan. A patient platform is also available that includes the diabetes nutrition plan, example meal plans for different countries and regions, and educational resources. This could be very useful for individuals seeking to fast during Ramadan, particularly for those who do not have access to appropriate care. It is available at: <https://daralliance.me/#random-nutrition>

Physical activity and fasting

People with type 2 diabetes may continue to exercise during the month of Ramadan and continue their daily routine, particularly in morning hours, but they should not exercise excessively one or two hours before *Iftar*. Although rigorous exercise is not recommended during fasting because of the increased risk of hypoglycaemia and dehydration, people with diabetes should be encouraged to take regular light-to-moderate exercise during Ramadan.

Individuals should be reminded that the physical exertions involved in *Tarawih* prayers, such as bowing, kneeling and rising, should be considered



The Ramadan Nutrition Plan online platform and app are [available here](#).

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part of their daily exercise activities. They should also check their blood glucose levels if they feel unwell or faint, during or after exercise (Mohd Yusof et al, 2020).

Ramadan safety tips for people with type 2 diabetes

1. Always carry glucose treatment with you.
2. Test your blood regularly to monitor your glucose (sugar) levels. This will not break your fast.
3. Test your blood glucose level if you feel unwell during the fast.
4. If your blood glucose level is high or low, you must treat this.
5. If your blood glucose is less than 3.9 mmol/L, end the fast immediately and treat the low blood glucose.
6. If your blood glucose is higher than 16.6 mmol/L, end the fast immediately.
7. If you become dehydrated, end the fast immediately and have a drink of water.
8. If you start to feel unwell, disoriented or confused, or if you collapse or faint, you should stop fasting and have a drink of water or other fluid, and check your blood glucose levels.
9. Insulin users should never stop your insulin, but you must speak to your doctor because you may need to change the dose and timing of your insulin injections.
10. Keep meals well balanced and drink plenty of fluids during non-fasting hours.

Conclusions

This review provides an outline of Ramadan-focused structured education and culturally specific nutrition advice to give to people with type 2 diabetes. In recent years, pre-Ramadan nutrition advice has been identified as crucial for safe fasting among people with diabetes. Ramadan-focused diabetes education has a significant impact on hypoglycaemia and glycaemic control, with no significant effect on body weight, blood lipids or blood pressure (Mohd Yusof et al, 2020). The IDF-DAR *Diabetes and Ramadan Practical Guidelines* provide healthcare professionals with the latest evidence-based recommendations, allowing them to deliver the best possible care and support for people with diabetes who wish to fast during Ramadan.

Summary of recommendations

- Adjust nutrition plans for optimal glucose control during Ramadan.
- People with diabetes intending to fast during Ramadan should be categorised into low, moderate and high risk.
- The implementation of guidelines requires effective communication with, and education of, all those involved.
- Education, communication and accessibility are all critical to the success of the guidance provided in this document.
- The Ramadan Nutrition Plan helps people with diabetes to minimise the risks associated with Ramadan fasting, such as hypoglycaemia, hyperglycaemia, and dehydration.
- The Ramadan Nutrition Plan provides examples of meal plans within target caloric levels.
- Design a structured education plan that may help weight reduction for those who aim to lose weight during Ramadan.

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