

SPECIAL COMMUNICATION

Medical Management of Diabetes during Ramadan Fasting: Are Physicians Ready for the Job?

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Abstract

Introduction: Fasting during Ramadan is obligatory for all adult Muslims. Physicians have a pivotal role in educating and supporting patients regarding safe fasting. A few studies addressed the Ramadan specific knowledge of medical practitioners and how well equipped they are to be engaged in efficiently providing care to people with diabetes. **Objectives:** We aimed to appraise the knowledge, attitudes, and practices of medical practitioners regarding management of people with diabetes during Ramadan. **Materials and Methods:** The databases of PubMed and Google Scholar were searched using the relevant key search terms. All identified publications were reviewed. Challenges, concerns, and opportunities were identified, and proposals were made to bridge gaps in perceptions and practices. **Emerging concepts:** Many of the reports are either small or lacked depth. There is a remarkable degree of inconsistency in the levels of knowledge, attitudes, and practices among physicians between regions and within the same country. Lack of ethnic-competency was observed in

some studies from the west. The current level of pre-Ramadan educational activities remains patchy, inconsistent and too often mostly “ceremonial” as part of pre-Ramadan festivities organized by pharmaceutical companies. **Recommendations:** The call for improvement and harmonization is timely to translate guidelines into clinical practice. To this end, a widely-shared curriculum of an evidence-based syllabus is strongly recommended as the core education for physicians and other health care professions. These should be delivered by consortia of highly motivated clinicians and academics, organized by professional societies and patient advocacy bodies, accredited by national authorities and unconditionally supported by the pharmaceutical industry.

Keywords: Ramadan, Fasting, Muslims, Diabetes; Doctors, Quality assurance, Continuous Professional Development.

Introduction

Background

Fasting in Ramadan is obligatory for all healthy adult Muslims (1). As with all other Muslim religious obligations, adulthood is defined by the evidence of the first features of puberty rather than on chronological age regarding who should start fasting (1). During Ramadan, no food or drink may be consumed in the period from just before dawn till sunset. Physiologically speaking, the fast of Ramadan is a period of “intermittent fasting” or daily cycles of “alternating” fasting and feeding periods. The periods of the fasting and feeding vary by the geographical locations and by the time of the year. During the month of Ramadan, there are two main meals in most Muslim communities. These are commonly referred to by their Arabic origin, namely the “*Iftar*” (i.e. breaking of the fast immediately after sunset) and “*Sohour*” (i.e. a pre-dawn meal). There are different practices in the proportionate size of the two main meals between different communities in different regions (2). However, the amount of food consumed at night seems to increase, and excessive carbohydrate-rich and fatty foods predominate. As the Islamic calendar year is lunar based, Ramadan (the ninth month) therefore starts approximately 10-11 days earlier each year on the Gregorian calendar. This year, 2017, Ramadan started on the 27th of May.

Certain groups are exempt from fasting temporarily or permanently. These include the sick, the elderly, the travelers, during menstruation, the expecting and nursing mothers (1,2). However, there is a strong passion for observing the fast by all Muslims and even many of those who are exempt, may wish to observe the fast (2).

The increasing interest of the medical profession in Ramadan

Discussions regarding the impact of Ramadan fasting on diabetes and other chronic medical problems can be traced in the literature to the early 1950s (3-5). Perhaps, the seminal work by Sulimani et al. (6) published in *Diabetic Medicine* remains the most notable for its comprehensiveness and balanced approach, despite the lack of substantial evidence to support many of the arguments made. However, a search in PubMed for all related articles revealed over 700 records up to December 2016. There has been an exponential rise in the publications in the last two decades (Figure 1A). Diabetes featured in nearly one-third of these publications (Figure 1B). Also,

many widely-cited articles have been published in journals which are not yet Medline-indexed. Although no formal bibliometric analysis has been published yet, the PubMed records include case reports, observational and experimental trials, review articles, expert opinions, and guidelines-type articles. The field remains dominated by opinions rather than evidence-derived conclusions (7).

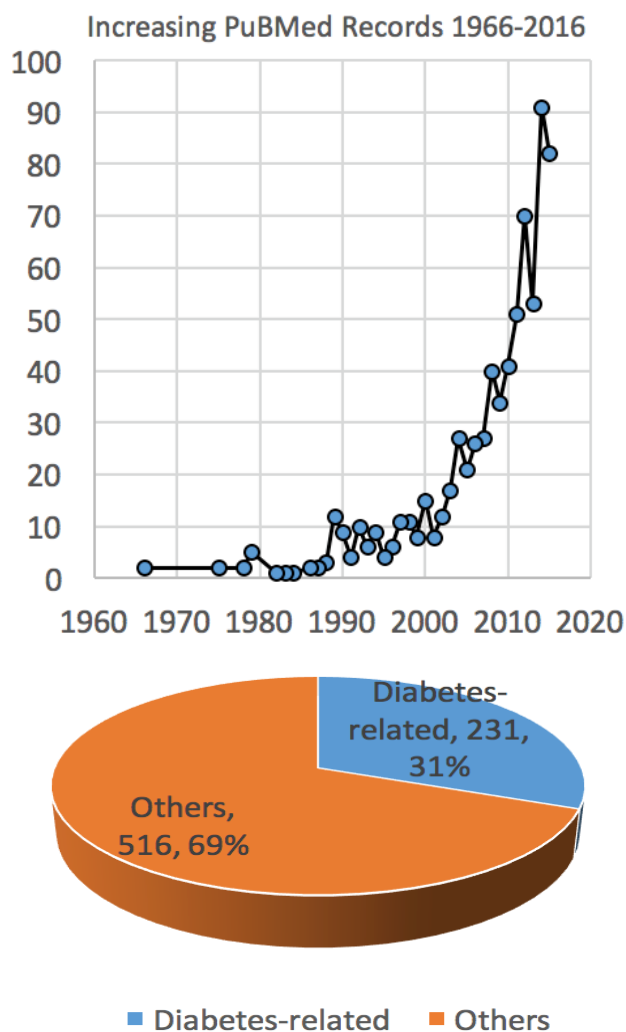


Figure 1. The academic interest in the medical aspects of in Ramadan fasting measured by the volume of work in the international literature (PubMed): The Upper Panel: The increasing number of PubMed records over time (>720 records) and the Lower Panel: The remarkable representation in diabetes.

Epidemiology of diabetes in Ramadan

In a more interconnected and globalized society, in which more and more Muslim patients live in the Western countries, this topic is of high interest also for the general practitioner. The EPIDIAR study was the largest study involving 1,070 patients with type 1 diabetes and 11,173 patients with type 2 diabetes (8). Less than 50% of the whole population changed their treatment and hypoglycemia was the only observed event. The CREED study, a multi-country, retrospective, observational study, supplemented with physician and patient questionnaires, with data captured before, during and after Ramadan (9), described the characteristics and management of patients with diabetes who chose to fast during Ramadan in 2010. A total of 508 physicians in 13 countries enrolled 3777 patients, and a total of 3394 evaluable cases were analyzed. The first report included 3250 patients with T2DM. Oral antihyperglycemic therapy was the predominant pre-Ramadan therapy for three-quarters of patients. The treatment regimen was modified before Ramadan for 39.3% of all patients (34.9% for patients on oral drugs alone, 47.1% for patients on injectable drugs alone). Almost all physicians (96.2%) reported providing fasting-specific advice to patients and 62.6% report using guidelines or recommendations for the management of diabetes during Ramadan. In all, 64% of patients reported fasting every day of Ramadan and 94.2% fasted for at least 15 days. A further report focused on the risk of hypoglycemia in different regions with the view to identify the relative risk in different patients in different regions and on different medications (10). Practicing physicians who are likely to look after fasting patients ought to be familiar with these studies and their implications.

Objectives

There are many studies on the changes observed in clinical, body composition, and biochemical parameters during Ramadan fasting in healthy subjects and various medical conditions such as diabetes. There are also several studies which evaluated specific management modalities in those patients with diabetes who observed the fast. These have been adequately summarized and discussed in previous review articles and expert opinion statements over the last three decades. A further summary and appraisal of these studies are outside the scope of this article.

There are several published guidelines to help physicians manage diabetes from different experts and professional

societies (11-13). It is not clear how uniformly these guidelines are implemented. Some authors addressed the expected roles of physicians in the management of diabetes in the fasting patients (14,15). A few studies addressed the Ramadan-specific knowledge of medical practitioners and how well equipped they are to be engaged effectively in providing care to people with diabetes (16-20). We have endeavored to appraise the knowledge, attitudes, and practices of medical practitioners regarding the management of people with diabetes during Ramadan by conducting a review of these studies. We also propose a practical road map to harmonize the education and quality assurance of physicians' knowledge and practices.

Duties and obligations of physicians

To fast or not to fast is an individual decision by patients based on their free will as fasting is a faith-based obligation (1). Physicians have the obligation of making this spiritual and religious experience as safe as possible considering the underlying medical conditions. This role becomes pivotal when dealing with patients having chronic medical conditions such as diabetes. This task includes helping them in making an informed choice by education and providing them the support needed to observe the Ramadan fast. Practical management aspects of diabetes during Ramadan should be considered in advance of the fasting month. Diabetes care departments should hold strategy meetings before Ramadan. Seminars with the help of media are of great help as they address much larger audiences. Patients usually form their opinions and establish their amended diabetes management plans from previous personal experience, physicians' role is to help them safely to practice for them based on the clinical/scientific information. Registered patients attending diabetic clinics should be encouraged to seek advice before considering fasting the month of Ramadan. Posters, leaflet, and booklets containing information about Ramadan fasting for people with diabetes ought to be made available in the waiting areas of diabetes clinics at least three months before the month starts. Special classes may need to be considered to enhance self-management during the fasting month. Media health programs and healthcare journalists should prepare their programs in advance. Expert doctors should allow time to give media interviews, preferably jointly with Imams, to provide clear and authoritative views and respond to all frequently asked questions. In the clinical settings, doctors should have a clear understanding

of the religious rulings on fasting to give their advice with confidence and compassion (14).

Physicians' perceptions and practices in the real world:

Several studies were reported recently using different methods and various survey questions. They addressed various aspects of diabetes management during Ramadan (Table 1). The salient findings of these studies are discussed below.

Our group (16) evaluated knowledge, attitudes, and practices of physicians regarding practical management of diabetes during Ramadan using a cross-sectional Internet-based survey of a convenience sample of 236 physicians the study. Responses in the general management knowledge domain varied widely

Over 90% recognized the importance of Ramadan-focused education, 75.1% valued the importance of glycemic control at night time, and 71.2% were aware of the exemption of T1DM. 69.0% were familiar with the time of highest risk of hypoglycemia, and 62.0% knew the rulings regarding exemption of pregnant women with diabetes. Differences between DDP-4 inhibitors and sulphonylureas was known and Nearly two-thirds of respondents were aware of the traditional adjustments of doses and timing of sulphonylureas. Most respondents recognized the importance of prompt management of hypoglycemia, the need and religious permission to monitor blood glucose during the day and that the potential use of GLP1 therapy is supported by experimental evidence. About three quarters recognized the usual practice of reversing the insulin doses when using premixed insulin between day and night but only thirds recognized the possible need to

reduce basal insulin to avoid hypoglycemia. 71% of the respondents stated that they are fully confident or somewhat confident in the management of diabetes during Ramadan.

There was a wide variation in recognition of relevant concerns and risks associated with fasting during Ramadan in people with diabetes. Hypoglycemia was the most highly recognized risk (96%), followed by dehydration (85%). About two-thirds of respondents' associated increased risk of hyperglycemia and diabetic ketoacidosis with fasting. Less than half of respondents recognized the increased risks in pregnancy and that of thromboembolic disease. 41% percent of respondents followed the ADA workshop of 2005 and its updates. Its risk scale was thought to be the most practical by 34% of respondents. 78% confirmed performing a formal stratification, using one of the published guidelines. Younger doctors were not especially competent as compared to their more senior colleagues. Therefore, the physicians demonstrated a variable level of knowledge about the care of patients with diabetes during Ramadan. The self-reported competence was not matched by actual knowledge and treatment practices. Continued education, mentoring and support schemes are required for the physicians and patients with a regular assessment before the Ramadan fasting on an annual basis.

Hassanein et al. (17) explored the viewpoints and attitudes of doctors toward the management of diabetes mellitus during Ramadan fasting. Also, they assessed the awareness of and compliance with available recommendations. According to their results, Ninety-five percent of the physicians believed the type of diabetes to be "important" or "very important" in decision-making for Ramadan fasting. Control of diabetes before Ramadan was noted as "important" or "very important" by 95% of the physicians.

Table 1. Physicians' perceptions and practices in the real world studied by surveys in reverse chronological order.

First author	Year	Country/Region	N	Survey themes
Beshyah	2017	Gulf; mostly UAE	236	Fairly comprehensive survey. 16 questions: principles and practice.
Ahmedani	2016	Pakistan	274	Most comprehensive survey. 25 questions; mostly knowledge.
Hassanein	2016	Turkey & Dubai	950*	KAP analysis with a focus on clinical and management approaches.
Ali	2016	USA**	45	Based on practices in dealing with fasting patients
Jaber	2014	Jordan	297	Focus on the question to fast or not to fast? And on medication use.
Gaborit	2011	France**	101	Defined negative attitudes and lack of ethnically-specific skills

* Not all 950 seem to have addressed all the questions.
 ** Addressed needs of ethnic minorities in localities where most of the population are not Muslims.

Moreover, the majority of respondents emphasized on the pivotal role of self-monitoring of blood glucose in the management of patients receiving insulin or sulphonylureas, and to a lesser extent in cases treated with other oral hypoglycemic agents than SUs. 397 confirmed the availability of Ramadan-focused educational programs for their patients. The authors emphasized the need to raise the awareness of both patients and physicians about the importance of Ramadan fasting through structured educational interventions aiming to reduce the health risks associated with fasting in diabetic patients. They also proposed that simplified guidelines and educational materials be dispensed for healthcare providers for related training programs before Ramadan.

Ali et al (18) evaluated the provider practices and knowledge regarding the management of patients with diabetes who fast during Ramadan. A 15-question quality improvement survey was distributed to care providers at the outpatient primary care and geriatric clinics at an inner-city hospital in New York City. Forty-five providers completed the survey. Apparently, most respondents did not ask their Muslim patients with diabetes if they had fasted during the previous Ramadan. Knowledge of fasting practices during Ramadan was variable, and most respondents felt uncomfortable managing patients with diabetes during Ramadan. The authors concluded that there is plenty of room for improvement in educating providers about specific cultural and medical issues regarding fasting for patients with diabetes during Ramadan.

Ahmedani et al. (19) also audited the practice, knowledge, and attitude of general practitioners (GPs) regarding treatment and dietary modifications for people with diabetes that fast during Ramadan in Pakistan. A cross-sectional descriptive study was undertaken among a sample of 274 general practitioners. Data was collected using a 25-question survey covering three domains (Ramadan specific knowledge, diet and physical activity and treatment modification related knowledge and practices of GPs). Seventy percent responded correctly to the questions. A quarter responded incorrectly to questions regarding basic concepts of diabetes and Ramadan, and one third answered incorrectly to the questions on diet. However, almost 40% responded incorrectly to the questions regarding drug dosage adjustment in Ramadan. Over 80% replied in agreement regarding the required alterations in medication timings. The authors warned that for a country with the

majority of the population being Muslims, it was unacceptable that almost one-third of the GPs lack the necessary knowledge required for effective management of diabetes during Ramadan. They called for a structured educational program to improve the knowledge of GPs that should be reflected in their sound clinical practice in the field of diabetes.

Jaber et al. (20) reported a knowledge, attitude, and practice (KAP) study of physicians, specifically regarding the management of medications in Ramadan. They used a self-administered questionnaire given to 297 doctors at a University Hospital and some private clinics in Jordan during 2008. The KAP analysis revealed that management of medications in Ramadan was insufficient. Age, nationality, specialty, country and year of the last qualification seemed to influence the performance ($p < 0.05$). Female physicians and fellows scored better than the other groups regarding knowledge. Most physicians' attitudes and practices were in line with the religious opinion on routes of drug administration that can nullify fasting, indicating that physicians have adequate knowledge in this area.

An earlier study by Gaborit et al. (21) evaluated attitudes of patients and physicians towards Ramadan fasting and diabetes in Marseille, France. A cross-sectional study was conducted during the three months before Ramadan. 101 general practitioners (GPs) were included in the study. The medical knowledge of Ramadan fasting with diabetes was low, leading to medically unjustified negative advice for fasting poor patient education on dose adjustments. This particular situation weakened the patient-physician relationship. The authors concluded that the study confirmed the importance of Ramadan fasting for Muslim patients and that they highlighted the wide cross-cultural gap between GPs and their patients.

Impact of counseling

Fatima et al. (22) studied clinical, social and demographic factors causing an attitudinal difference in patients and its effect on fasting and diabetes control. They recruited 96 Muslim patients of T2DM, 2-3 weeks prior to Ramadan. Patients were educated about lifestyle, diet, and medications. Awareness regarding diabetes management during fasting was assessed by a scored questionnaire prior to and after Ramadan. The previous year's Ramadan's experiences were recorded for comparison, on a recall basis.

There was an increase in post-Ramadan awareness score, more so in rural than in urban patients. An average number of fasts had a positive correlation with duration of diabetes. There was a significant increase ($p < 0.05$) in the number of fasts kept in the study year particularly in the age group 40-60 year. Fifteen days fast was completed by all patients on diet control, 81.3% patients on OHA and 35.7% on insulin. A lesser number of tobacco addicts could fast for > 15 days. No patient needed hospitalization or emergency care.

Special considerations

There are several other specific situations where extra special knowledge and skills may be required by the physician to be able to provide advice to patients (Table 2). There are summarized below:

Adults and adolescents on insulin pump

Notably, a patient who wishes to fast on insulin pump require to be stable under the care of a team that is competent in insulin pump management as special clinical and technical knowledge is necessary for proper pump

management in young adults (23,24) and adolescents wishing to observe the fast (25,26). Management of diabetes in the adolescents and teens on a pump is particularly sensitive given the lifestyle in this age group as well as the peer pressure. Weight-related issues are also common in young females. Teenagers tend to reverse their activity hours during Ramadan with most of them staying awake till dawn.

Therefore, the basal rate, in particular, needs to be adjusted accordingly. Unless the patient has exhibited a responsible attitude towards the proper utilization of the pump regarding good carb counting skills, taking the correct meal time bolus as well as adequate blood glucose monitoring, fasting during Ramadan can be risky for this particular group.

The advent of the newer generation of pumps with predictive capability towards hypoglycemia now and hyperglycemia shortly, may attenuate the risks but still does not take away the need for a responsible attitude on the part of the patient.

Table 2. Examples of specific situations where special knowledge and skills are required.	
Clinical Scenario	Required special knowledge and skills
Adolescents	Knowledge and expertise in the management of children and adolescent, transfer clinics.
Patients on insulin pump	Clinical and technical skills with the support of pump trainer.
Pregnancy with diabetes	High-level competence in management of diabetes during pregnancy, ideally in joint clinics.
High risk of hypoglycemia	Skilled in management of recurrent hypoglycemia or hypoglycemia unawareness.
Elderly patients.	Combined skills in management of diabetes and care of older adults
Diabetes kidney disease	Knowledge and expertise in management with diabetes and with diabetes and renal impairment.
Patients with poorly controlled DM who insists on fasting.	Extensive diabetes care expertise, knowledge of the physiology of fasting and diabetes, flexible individually tailored therapeutic regimens, preparedness for more close supervision and dedicated educator's support.
<i>The above is by no means an exhaustive list. These examples may be included in interactive sessions of pre-Ramadan professional development programs with clear educational messages and evidence-based or physiologically-sound principles.</i>	

Table 3. Hierarchy-based roles of various classes of health care professional individuals and systems:	
Classes/Bodies	Ramadan-focused diabetes care and education roles
Primary care:	High-level management and education at individual levels.
District specialists:	Care, organization of care, local leadership
Senior endocrinologists	Care, education, regional leadership, research.
Academics	Care, education, guidelines, leadership and research
Clinical units	Personal care
Professional and advocacy	Facilitation, Quality assurance, Collaboration, raising profile
Universities and centers	Education, guidelines, leadership and research
Pharmaceutical industry	Facilitation and unconditional sponsorship

Chronic kidney disease (CKD)

Renal patients who wish to fast present a unique set of challenges including that of dehydration in the current timing of Ramadan during the height of summer which would continue for at least the next few years. Therefore the decision to fast has to be made in conjunction with the nephrologist. Given the delicate balance, most of these patients maintain during the usual days, the religious exemption provided should be utilized. However, there are no guidelines that can help doctors to properly address the issue of patients with CKD fasting in Ramadan and to correctly advise them. A systematic review (26) demonstrated that are recipients of kidney allograft can safely fast during Ramadan; evidence for safety in patients with nephrolithiasis and CKD are instead mixed and controversial. On the other hand, some findings may be not generalizable for various reasons. Consequently, the physicians should carefully monitor their patients during the fasting period with an adequate follow-up.

Pregnancy and breastfeeding

The pregnant and breastfeeding woman, though exempt in principle, different surveys observed that 70-90% pregnant women prefer not to accept this fiqh and thus observe the fast (28). A complex series of metabolic and hormonal changes occur in pregnancy, and this is augmented from fed to the starvation stage during fasting from dawn to sunset. Adaptive metabolism is established by a balance of insulin and other counter-regulatory hormones. Thus in both fasting and fed states high blood glucose, triglycerides, free fatty acids, and ketones are encountered. Unregulated fat catabolism with increased FFA and ketones can alter embryonic and fetal development. There is no clear consensus on how to manage blood glucose during fasting in pregnant women with diabetes. Most workers advocate insulin therapy to manage diabetes.

Pregnant women with diabetes who wish to fast during Ramadan must be aware of symptoms and signs of fetal and maternal distress and must terminate the fast if these occur. The more practical approach, with empathy, might be helpful instead of imposing an absolute ban on fasting in women with pregnancy and diabetes. The decision to dissuade a woman from fasting needs to be made by the entire high-risk pregnancy team in consultation with the physician managing her diabetes with due consideration to the level of therapeutic intervention which can range from

dietary control to multiple daily injections or an insulin pump.

Here again, taking advantage of the religious exemption should be strongly considered. From the quality assurance view point, a more uniform advice and more detailed practical guidelines need to be made available incorporating specific clinical situation and clear criteria to recommend for or against fasting with reasoning thereof.

The poorly controlled patient

Most of the published studies have included fairly well-controlled patients who may not reflect the real world. Patients with poorly controlled diabetes who insists on observing the fast may pose a particular challenge. These are classically on suboptimal therapy, do not attend diabetes clinics regularly and may simply show up just before Ramadan fasting for advice if not the first few days of Ramadan for rescue (29). For these individuals, casually stating that the guidelines stipulate that they should not observe the fast does not work. Extensive diabetes care expertise, knowledge of the physiology of both fasting and diabetes, flexible individually tailored therapeutic regimens coupled with preparedness for more close supervision and dedicated educator's support.

The elderly

Aged Muslim people with diabetes insist on fasting during Ramadan, for obvious reasons. Elderly people, especially frail patients, who fast are at increased risk for many of the recognized acute complications. Therefore, physicians should be able to assess functional capacity, cognition, mental health and comorbidities in elderly people with diabetes in order to evaluate the risk of fasting, individualize the therapy, and adapt care to their needs (30). Indeed, many elderly patients should be recommended not to fast given the higher risk. Physicians dealing with these patients should have knowledge and expertise in dealing with diabetes in older adults as well as knowledge about Ramadan (11-15).

Sickness and travel

Management of diabetes during sick days is overlooked due to lack of understanding of its implication. The patient should be prescribed medication and instruction of their use keeping in view that these individuals might be fasting as well. Also, consideration should be made for fluctuation in

blood glucose, which might happen during this time. Muslims perform Umrah during various times of the lunar year, but the highest number of pilgrims perform Umrah during Ramadan. It must be realized that there are many additional precautions needed for this patient with Diabetes, who are fasting while performing Umrah as well. This requires much more vigilance during this period. Complication like dehydration, diabetic foot, and hypo/hyperglycemia needs special consideration and instruction for these patients similar to those offered during Haj (31).

Final remarks

Review of the literature revealed that there is a significant degree of inconsistency in knowledge, attitudes, and practices among doctors between regions and within the same country. Development and adoption of widely-shared syllabus of an evidence-based curriculum are strongly recommended for physicians (and other healthcare professions). Such comprehensive programs can be provided in a full day activity rather than the token ceremonial presentation in a commercially-motivated event (Appendix 1,2). These can be accredited by national authorities and delivered by consortia of academics, professional societies, and patient advocacy groups, and unconditionally sponsored by the pharmaceutical industry. Continuous, comprehensive assessment of the awareness, knowledge, attitudes and practices of physicians is crucial. This can be built into the educational activities, for example, by being incorporated as a registration pre-requisite for registration or as pre and post-session assessments within the educational event (Appendix 3). A summary of the salient points of the curriculum should be presented as "*The Last Lecture Before Ramadan*" in all clinical institutions serving a majority or substantial minority of Muslim patients. Finally, management of diabetes during Ramadan is and will always be the prime example of ethnically-competent diabetes care and should be an important key performance indicator for such institutions, irrespective of their size or location.

Disclosures

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2. Conflict of interest: None of the authors has any multiplicities of interests that may potentially jeopardize the credibility of this article.

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4. No formal ethical approval was required (Review, Opinion).

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Reviewers

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Appendix 1. Model of continuous professional development (CPD) program for a day course/workshop on diabetes and Ramadan for physicians or multidisciplinary audience.

I. Morning sessions: Plenary

Time	Subject	Speakers
08:00-08:30	Registration	
08:30-09:00	Ramadan and Diabetes: A bioethical consideration	QRS
09:00-09:30	Physiology of fasting during Ramadan in health and disease: Glucose homeostasis, fluid balance, and body composition.	UVW
09:30-10:00	Organizational and educational issues: Diet, Exercise, and monitoring.	XYZ
10:00-10:30	Refreshing and networking break	
10:30-11:00	Pharmacological management of diabetes: Non-insulin	XYZ
11:00-11:30	Pharmacological management of diabetes: Insulin	QRS
11:30-12:00	Special situations	UVW

II. Afternoon sessions: Rotating workshops:

Workshop subjects:

	Subject	Speaker
1	Case-based discussion: complex therapies (including pumps, pregnancy, and elderly/CKD)	XYZ
2	Hypoglycemia in Ramadan: avoidance and management	QRS
3	Insulin modifications (premixed and basal-bolus)	UVW

Workshop rotations:

	Time 14:00 -14:40	14:45 – 15:25	15:30-16:10
Group A	Workshop 1	Workshop 2	Workshop 3
Group B	Workshop 2	Workshop 3	Workshop 1
Group C	Workshop 3	Workshop 1	Workshop 2

Appendix 2. The syllabus for comprehensive health care professional education on management of diabetes during Ramadan fasting.

This is an academic document that communicates course information and defines expectations and responsibilities.

Instructor information:

The core faculty to cover this syllabus should include a 2-3 specialist diabetologists with demonstrable academic interest and clinical experience in the medical aspects of Ramadan fasting for people with diabetes. They should by definition be familiar with latest guidelines and fully aware of the bioethical issues and concerns. More extend faculty could include a dietician and a diabetes nurse educator. All speakers should be on a voluntary basis to cut the cost and conflict of interest.

General course information:

The course will be run on a day a Saturday or a Friday between 8:30-16:00 (up to 17:30 if on a Friday). The morning session will be a series of plenary didactic lectures. The afternoon includes two parallel sessions (mostly interactive) to address the needs of different healthcare professional groups. The course should be run about 6-8 weeks before the starting of Ramadan.

Course objectives:

1. Describe the bioethical aspects and medico-religious rules and regulations governing fasting during Ramadan for the sick as exemplified by diabetes.
2. Review the medical concerns of fasting and the recommended pre-Ramadan evaluation and risk stratification: their basis and implications.
3. Discuss the pharmacological management of the fasting individual with diabetes in general and under specific situations.

Contents:

1. A bioethical consideration of Ramadan and diabetes: Religious rulings and regulations governing exemptions from fasting.
2. Discussion of the physiology of fasting in general and with special reference during Ramadan in health and disease. These should consider the impact on glucose homeostasis, fluid balance and body composition in Ramadan in healthy individuals and some crucial clinical conditions such as diabetes, heart disease, and kidney disease. Rulings governing intake of various medications should be discussed guided by the Casa Blanca and Istanbul Conventions.
3. Organizational issues, lifestyle modifications (diet and exercise) and recommended timings and targets of blood glucose monitoring.
4. Pharmacological management of diabetes: Comprehensive discussion of the use and adjustments of oral antidiabetic drugs
5. Pharmacological management of diabetes: A practical considerations of the use of basal and prandial insulins and non-insulin injectable therapies based on basic pharmacological principles and available evidence related to Ramadan.
6. Hypoglycemia in Ramadan: avoidance and management.
7. Special situations: complex therapies (including pumps, pregnancy, and elderly/CKD, the fasting adolescent diabetic)

Course policies:

The course conduct complies with the CME rules of the country where is conducted. All sponsorship raised for funding of the day should be unconditional and totally independent of the syllabus. No sponsors may be involved in development of the course or choice of speakers.

Grading and evaluation:

Standard CME evaluation for feedback purposes. No grading required.

Learning Resources:

Before the course/workshop, a couple of review articles can be made available for preparation and after the course, all presentations should be emailed to all delegates.

Appendix 3. Items included in the questionnaire for quality assurance and educational needs assessment with the answer options.

Knowledge (3)	Q1 Regarding the general management of diabetes in patients intending to fast during Ramadan, the following statements are true (Check all that apply): [Special "Ramadan-focused education" is associated with better outcomes and fewer complications; attention should be paid equally to the effects of fasting in the daytime and to feasting in the evening time and after Ramadan; pregnant diabetic women should be advised to avoid observing the fast; most hypoglycemic episodes occur during the last 2-3 hours of the fast ; Patients with type 1 diabetes are NOT exempt from fasting and should NOT refrain from fasting except under special circumstances;
	Q2 In patients with type 2 diabetes intending to fast during Ramadan on oral anti-diabetic drugs, the following statements are true (Check all that apply):[Doses of sulphonylureas have traditionally been reduced and given before the evening meal; patients on metformin and pioglitazone may continue same total daily doses; DDP-IV inhibitors have been shown to lead to less hypoglycemic episodes than sulphonylureas in general; SGLT2 inhibitors need to be used carefully in elderly patients, and those with increased risk of dehydration; all sulphonylureas carry the same hypoglycemic risk potential].
	Q3 In a patient with type 2 diabetes intending to fast during Ramadan on injectable anti-diabetic therapies the following statements are true (Check all that apply): [If a patient who is observing the fast on insulin develops confirmed hypoglycemia, he should break the fast immediately; doses of premixed insulin should be inverted with a higher doses before <i>Iftar</i> (sunset) and reduced doses before <i>Suhoor</i> (dawn); It is prudent to reduce the doses of basal insulin to avoid daytime hypoglycemia; LIRA-Ramadan study concluded that GLP-1 therapy should never be used during Ramadan fasting; patients on any Insulin should NOT monitor their blood glucose during the day time as blood testing breaks the fast].
Attitudes (2):	Q4. How confident are you with the management of diabetic patients who fast during Ramadan? [Fully confident; fairly confident; just confident; not sure; not at all confident].
	Q5. Which of the following do you recognize as relevant concerns/risks associated with fasting during Ramadan in people with diabetes? [Hypoglycemia; Dehydration; Hyperglycemia; Diabetic ketoacidosis; Risk to Pregnancy; Thrombo-embolic disease].
Practices (5):	Q6. Which guidelines do you MOSTLY follow for management of diabetes during Ramadan? [ADA workshop report; South Asian Guidelines, My reading and research of the literature using multiple sources; Expert opinions I heard in recent CME; lectures; Common sense and general good clinical practice as applied to the fasting state]
	Q7. For people with diabetes intending to fast during Ramadan, I find the following risk stratification system most appropriate and most practical (express your view of them whether you are using them or not) [Options: 1. Classes: fasting permitted - relative contraindicated - Absolute Contraindication 2. Classes: Very high Risk - High risk - Moderate risk - Low risk; Classes: Very high risk - High risk - moderate/low Risk 3. Classes: High risk - Moderate risk - Low risk
	Q8. Considering your clinical practice during the month of Ramadan, Do you attempt to formally stratify your patients with diabetes who intend to fast for risk level using any of the published guidelines? [Yes/No]
	Q9. Considering your clinical practice during the month of Ramadan, have you asked your Muslim patients with diabetes if they fast or intend to fast? [Always; Often; Occasionally]
	Q10. Considering your practice during the last month of Ramadan (for Muslim patients with diabetes who is fasting), did you [Make blood sugar monitoring recommendations?; Make food and diet recommendations?; Discuss medical risks of fasting with patient?; Discuss specific circumstances when a patient should break their fast?; Adjust insulin use?; Adjust oral hypoglycemic agents?]

Such questionnaires can be readily made available for hard copy versions but more ideally served using electronic means.