

Dietary Intake of Individuals with Type 2 Diabetes During Ramadan Fasting in Accordance with Ramadan Nutrition Plan (RNP)-Diabetes & Ramadan (DaR) Guidelines 2021

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ABSTRACT

Objective: The IDF DAR provides comprehensive guideline regarding Ramadan risk stratification for people with diabetes. The role of medical nutrition therapy (MNT) is vital when fasting during Ramadan, not only in achieving optimal diabetes control but also in improving their lifestyle. The Ramadan Nutrition Plan (RNP) provides education and nutrition plans for Ramadan, which is particularly useful for people with diabetes. The aim of the study was to assess the dietary intake of individuals with type 2 diabetes who observed fasting for more than 15 days during Ramadan in accordance with RNP - DaR guidelines 2021

Methodology: This cross-sectional study was conducted at the Baqai Institute of Diabetology and Endocrinology (BIDE), a tertiary care diabetes center in Karachi, Pakistan. All people with T2DM of both genders regardless of age, who observed fasting for more than 15 days during Ramadan were included. A pre-design structured questionnaire was used to collect data for this study. One to one interview was conducted. Data on Ramadan nutrition practice and food consumption patterns were collected. The details about dietary intake at Suhoor, iftar and dinner time, especially the amount of carbohydrates, proteins, and fats was assessed

Results: A total number of 223 participants were assessed in which females were 93 (41.4%), and male 130 (58.6%) with a mean BMI of 28.07 kg/m². Sixty % participants didn't monitor their blood glucose. Sixty-four % didn't consult health care professionals and 80 % did not received pre- Ramadan education. Forty-nine % did not engage in regular physical activity or tarawih during Ramadan. Majority of the participants didn't consume food according to standards. Contrary to guidelines, consumption of carbohydrates was 54%, consumption of fats was 40 % and 6 % consumption of protein were observed in majority of people.

Conclusion: The observed dietary intake during Ramadan fasting did not align with established dietary recommendations of Ramadan Nutrition Plan (RNP) - Diabetes and Ramadan (DaR) Guidelines 2021 as evidenced by the proportions of carbohydrates, proteins, and fats consumption.

KEY WORDS: Ramadan Nutrition Plan (RNP), Dietary Assessment, Pre- Ramadan, DaR guidelines 2021.

INTRODUCTION

Diabetes mellitus (DM), one of the biggest health problems of the twenty-first century, affects 415 million people worldwide and around 35.4 million people in

the Middle East and Non-African (MENA) Region.¹ There are now over 7 million diabetics in Pakistan, one of the 19 nations in the MENA region, according to the International Diabetes Federation (IDF).¹ This

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number is predicted to increase by approximately 14.4 million by 2040, placing Pakistan as the country with the eighth-largest population of diabetics (20–79 years old).¹

The ninth month of the Islamic calendar is Ramadan, during which many Muslims throughout the world observe fasts lasting 29–30 days. The fasting-feeding ritual can put diabetic patients at risk of hypoglycemia during the day and hyperglycemia after iftar at night.² Elimination of lunch and lengthy stretches between meals are the two most noticeable changes in the eating schedule during the Ramadan fast; thus, in people with type 2 diabetes mellitus (T2DM), there is a greater tendency for hypoglycemia and irregular glycemic control during fasting.³ Conversely, consumption of high-calorie, high-fat, and carbohydrate-rich meals, foods, and beverages during iftar is common practice in most Islamic societies, which may adversely impact blood glucose levels and raise the risk of developing hyperglycemia and associated consequences.⁴ When fasting during Ramadan, medical Nutrition therapy (MNT) plays a critical role in helping overweight and obese people with type 2 diabetes (T2DM) improve their lifestyle and lose weight, in addition to helping them achieve optimal diabetic control. The Ramadan Nutrition Plan (RNP) provides education and nutrition plans for Ramadan, which is particularly useful for people with diabetes. The RNP is based on the principles of optimal MNT and provides examples of meal plans for different countries and regions across the globe. However, dietary recommendations should be individualized and tailored to patients' lifestyle requirements, age, comorbidities and other medical needs.⁵

According to the Epidemiology of Diabetes and Ramadan (EPIDAR) research, which enrolled 12,914 people with diabetes from thirteen different countries, 43% of people with type 1 diabetes and 86% of those with type 2 diabetes reported fasting during Ramadan.⁶ Ramadan fasting may have an impact on one's dietary preferences, level of daily exercise, sleep patterns, glycemic management, weight, lipid profile, and food consumption.⁷

Diabetes control during fasting is difficult. As a result, optimal glycemic management is mostly dependent on meal modification that efficiently maintains blood glucose and counterbalances fasting effects without jeopardizing religious fasting. The diabetes control and complications trial (DCCT) and the UK prospective diabetes study (UKPDS) have both emphasized the significance of food management. Most diabetic patients are finding it more difficult to comprehend and follow the dietary component of their therapy;⁸ therefore, the aim of the study was to assess the dietary intake of individuals with type 2 diabetes who observed fasting for more than 15 days during Ramadan in accordance with RNP - DaR guidelines 2021.

METHOD

This retrospective cohort study was conducted at Baqai Institute of Diabetology and Endocrinology (BIDE) in outpatient department from January 2023 to July 2023. Demographic data, including age, gender, ethnicity, socioeconomic status, and dietary intake, were collected through structured interviews. Participants were informed about the study's objectives and procedures before obtaining written consent. Ethical approval was obtained from the Institutional Review Board with a ref: BIDE//IRB//AnsarShahreen//007//05//2023//008910.

The study included individuals aged 18 to 65 years who had practiced extended fasting (fasted for more than 15 days) who fasted past Ramadan. To ensure homogeneity, individuals with chronic kidney disease (CKD), type 1 diabetes, and pregnant women were excluded from the study due to potential confounding variables. Convenience sampling was employed to ensure proportional representation across different age groups and genders. The dietary compositions were measured through designed questionnaire and dietary intake of carbohydrates, proteins and fats were calculated through percentages. The average intake was taken.

Statistical Analysis: The statistical package of social science (SPSS), version 20, was used to analyses the data, with $P < 0.05$ being regarded as statistically

Table-I: Baseline demographic characteristics of study participants.

VARIABLES	
Gender	
Male	122(54.2%)
Female	103(45.8%)
Mean Age (years)	53.07±10.9
Mean Weight (kg)	76.97±15.53
Mean Height (cm)	163.58±9.79
Mean BMI (kg/m ²)	28.52±5.3
Treatment	
Diet only	9(4%)
Oral medicine	158(70.2%)
Insulin + medicine	44(19.6%)
Insulin only	13(5.8%)
Pre Ramadan education Received	
No	214(95%)
Yes	11 (5%)

significant. The sociodemographic and lifestyle characteristics of the study population were expressed as frequencies and percentages, as well as means and standard deviations (SD) for categorical and continuous variables, respectively. The average intakes (mean $\pm$ SD) of the various food groups, energy, and macronutrient was computed for Ramadan intake.

RESULTS

Demographic Characteristics: The study encompassed a diverse participant demographic, with a distribution of 54% male and 46% female individuals with Type 2 diabetes who observed fasting for more than 15 days during Ramadan. Baseline demographics of the participants shown in Table-I. The average body mass index (BMI) across the cohort was calculated at 28.52 Kg/m², indicating a generally obese status among participants. Notably, a significant proportion of individuals primarily relied on oral hypoglycemic agents (OHAs) for diabetes management.

Health Monitoring Practices: Approximately 28% of individuals reported having their blood sugar levels within the recommended range during routine visits to their healthcare providers before Ramadan. This suggests a considerable proportion of participants were actively managing their diabetes prior to the fasting period. Concerning preventive measures, 36% of participants reported consulting their healthcare providers before Ramadan, reflecting a proactive approach to managing diabetes during the fasting period.

Dietary Composition: The study explored the dietary intake of individuals with Type 2 diabetes who observed fasting for more than 15 days during Ramadan in accordance with RNP-DaR guidelines 2021. The results revealed a noteworthy dietary composition among participants, with a predominant macronutrient distribution. On average, participants reported a carbohydrate intake exceeding 55%, indicating a substantial reliance on carbohydrates during the fasting period. Additionally, protein intake was notably low, with less than 5% of the total daily caloric intake attributed to protein. Fats constituted a significant proportion, surpassing 40% of the daily caloric intake. This dietary composition may have implications for glycemic control and metabolic outcomes in individuals with Type 2 diabetes during Ramadan fasting.

Pre-Ramadan Education: The study assessed the impact of pre-Ramadan education on dietary behaviors. Surprisingly, only 5% of the participants reported

receiving educational interventions prior to Ramadan. This finding highlights a significant gap in pre-fasting education among individuals with Type 2 diabetes, potentially contributing to suboptimal dietary choices during the fasting period. The majority (95%) of participants did not receive any formal educational support, emphasizing the need for increased awareness campaigns and targeted educational programs tailored to the specific nutritional needs of individuals with Type 2 diabetes observing prolonged fasting.

Meal Distribution and Consumption Patterns: An intriguing aspect of the study was the examination of meal distribution and consumption patterns among participants. Results indicated a tendency among individuals with Type 2 diabetes to consume substantial amounts of food during sahoor, iftar, and dinner. Table-II provides an overview of the average carbohydrate, protein and fats intake during these key meals. Notably, participants reported consuming an elevated proportion of their daily caloric intake during sahoor, suggesting potential overcompensation for the fasting period. This consumption pattern may have implications for postprandial glucose levels and overall metabolic health in individuals with Type 2 diabetes. The macronutrient consumption was measured separately in each of their dietary intake included Sahoor, Iftar and Dinner. The dietary distribution was further distributed into six groups which includes cereals, vegetables, fruits, meat and meat products, milk and milk substitutes and fats.

DISCUSSION

The present study highlights the dietary intake patterns of individuals with Type 2 diabetes during Ramadan, with a particular focus on adherence to the Diabetes and Ramadan (DaR) guidelines. The observed dietary composition, marked by excess carbohydrate intake (above 55%) and insufficient protein intake (less than 6%), raises concerns regarding the alignment of participants' dietary practices with the recommended guidelines whereas a well-balanced meal should include approximately 40-50% total carbs, 20-30% protein and 30-35% fat.⁹

One noteworthy aspect is the apparent lack of pre-Ramadan education, with only 5% of participants reporting having received guidance before the fasting period. The DaR guidelines emphasize the importance of tailored education for individuals with diabetes intending to observe Ramadan fasting. This education should

Table-II: Macronutrient consumption in Sahoor, Iftar and Dinner.

Macro nutrients	Recommendations	Total Practices	Sahoor	Iftar	Dinner
Carbohydrates	40 – 50%	54%	56%	55%	50%
Proteins	20-30%	6%	10%	5%	5%
Fats	Less than 35%	40%	34%	40%	45%

cover topics such as meal planning, portion control, and the distribution of macronutrients to ensure optimal glycemic control. The low percentage of individuals receiving pre-Ramadan education suggests a potential gap in the dissemination of crucial information that could contribute to improved dietary choices during fasting.⁷

The results revealing excess carbohydrate intake during Ramadan underscore the significance of education in guiding individuals toward appropriate dietary decisions. Carbohydrate-rich meals, especially when consumed in excess, can lead to elevated postprandial glucose levels, potentially compromising glycemic control. The DaR guidelines stress the need for a balanced distribution of macronutrients, with a particular focus on moderating carbohydrate intake to prevent glucose spikes. The observed discrepancy between actual dietary practices and DaR recommendations highlights the necessity of targeted educational interventions to bridge this gap and empower individuals with the knowledge and skills to make informed nutritional choices.¹⁰

Furthermore, the study's results indicate a substantial reliance on self-monitoring practices, participants checking their blood sugars during Ramadan. This proactive approach is commendable; as regular monitoring is a key component of effective diabetes management.¹¹ However, the effectiveness of self-monitoring depends on a foundation of knowledge regarding appropriate dietary choices and lifestyle modifications, reinforcing the crucial role of pre-Ramadan education. The nutrition assessments are to be planned six to eight weeks prior to the start of Ramadan and included in a pre-Ramadan visit. Health care professionals (HCPs) can counsel patients with diabetes about the dietary adjustments that must be made in order to fast throughout Ramadan during a pre-Ramadan consultation.⁹

Limitation: The limitation of our study is that the Dietary intake during Ramadan has the potential for self-reporting bias and it may not capture long term effects or changes in dietary habits beyond the Ramadan period.

CONCLUSION

The observed dietary intake during Ramadan fasting did not align with established dietary recommendations of Ramadan Nutrition Plan (RNP) – Diabetes and Ramadan (DaR) Guidelines 2021 as evidenced by the proportions of carbohydrates, proteins, and fats consumption. The study emphasizes the critical need for comprehensive pre-Ramadan education tailored to the specific dietary requirements of individuals with Type 2 diabetes.

Recommendations: Future interventions should prioritize increasing awareness and access to educational resources to empower individuals with the knowledge and skills necessary for managing their diabetes effectively during this religious observance.

Conflict of interest: There is no conflict of interest

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Author's Contribution:

SAK: Concept, design, edited and approval of the final manuscript.

AA: Literature search and manuscript writing.