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Lifestyle during Ramadan fasting among Bangladeshi people with diabetes mellitus

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Abstract

Background: Ramadan fasting affects lifestyle, and alterations may predispose to complications in patients with diabetes mellitus (DM). Data regarding the lifestyle during Ramadan among Bangladeshi people with DM are not adequately reported.

Objectives: To see the dietary, exercise, sleep, and behavioral patterns during Ramadan fasting among Bangladeshi people with DM.

Methods: This cross-sectional survey was done among diagnosed patients of DM who were fasting during the month of Ramadan 2023. Data were collected from four medical colleges, two district hospitals, and nine private chambers in a semi-structured questionnaire from the 8th to the 30th days of Ramadan. Patients filled up the questionnaire by themselves or were assisted if required. Answers were expected considering the lifestyle and behavior of the last 7 days of fasting. Results were reported among the available data.

Results: Among 427 participants (age: 47.4±12.7 years, range: 14-112 years), 41.7% were males and 58.3% were females. The most common food items were different types of rice-made foods, chickpeas, fruits, fried items in the iftar and rice, animal proteins, green leafy, and other vegetables in the suhur. Around 21.4% of participants did extra physical activity other than tarawih and 29.7% in the daytime. A mean sleep duration of 1.2 hours increased during Ramadan. Around 16.5% missed at least one suhur, and 28.9% missed taking their drugs. Around 50.5% self-monitored their blood glucose at least once. Around 26.1% had to break the fast due to various reasons.

Conclusions: The study findings will help clinicians to manage their patients with DM during Ramadan more effectively. *[J Assoc Clin Endocrinol Diabetol Bangladesh, January 2025; 4 (1):15-20]*

Keywords: Ramadan, Fasting, Diabetes mellitus, Lifestyle, Bangladeshi

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Introduction

Fasting from dawn to dusk during the Arabic month of Ramadan is an obligatory ritual for healthy Muslims. However, people with diabetes mellitus (DM) may face a lot of challenges to fast. Not only refrain from drinking and eating during the usual daytime, but people with DM have to abstain from taking their medicines during this time. As a result, there is a huge change in the glycemic status throughout the day. Besides, people have also engaged them in more prayer including tarawih. So, there is an alteration in the timing of meals, fluid

intake, activity patterns, sleep, circadian rhythm, and cardio-metabolic status.[1-4] The homeostatic and endocrine changes due to an adaptation of the alterations in daily life and the timing and dose of antidiabetic drugs may make people vulnerable to acute glycemic complications.[5]

Bangladesh is one of the most densely populated countries in the world. It is also the 3rd in the ranking of the Muslim-populated country in the world.[6] The language, culture, way of life, and cuisine of this nation are all distinctive. Although the area is not large, there are a lot of variations in different aspects among the different regions of the country. However, the whole country observes a festive mood during the iftar time with various food items.[7]

The Diabetes & Ramadan International Alliance (DAR) has created a mobile and web-based Ramadan Nutrition Plan (RNP) to help healthcare professionals and people individualize meal plans during Ramadan.[8] Unfortunately, this is not available for the people of our country. However, this can be incorporated by the contribution of our healthcare professionals. There is a lack of baseline data regarding the lifestyle of Bangladeshi people. Moreover, lifestyle patterns during Ramadan among people with DM are scarce in the literature. This study aimed to observe the diet, physical activity, sleep, behavior, and problems faced by Bangladeshi people with DM during Ramadan.

Methods

This cross-sectional survey was done among diagnosed patients of DM who were fasting during Ramadan 2023. Data were collected conveniently from the outpatient departments of four medical colleges, two district hospitals, and nine private chambers in a semi-structured questionnaire from 8 to 30 days of Ramadan of 1444 (31 March - 21 April 2023) Hijri year. The sample was collected from Dhaka, Gazipur, Mymensingh, Munshiganj, Sherpur, Chittagong, and Khulna districts. It covered people from all eight divisions (Dhaka- 46.1%, Mymensingh- 38.4%, and others- 15.4%) and 30 districts. Patients filled up the questionnaire by themselves or were assisted if required. Answers were expected considering the lifestyle including diet, physical activity, sleep pattern, behavior, and problems they faced in the last 7 days of fasting. Results were expressed in frequency (percent) for qualitative variables and mean ± standard deviation/ median (inter-quartile range) for quantitative variables depending on their distribution among the available data. A paired-t test was done to compare the sleep duration before and during Ramadan. A p-value below 0.05 was considered statistically significant. The study was conducted following good clinical practice and Helsinki's declaration. Informed written consent was taken from each participant.

Results

Among 427 study participants, most were females (58.3%) and more than half were between 40 and 60 years (range: 14 - 112 years). Nearly 50% had educational status below the completion of a secondary school certificate and were housewives by profession. Around 48% had DM less than five years. While 62% took only noninsulin therapy, 3.5% were not taking any type of antidiabetic drugs (Table-I).

Table-I: The baseline characteristics of the study participants (n= 427)

Variables	Value
Age, years	47.4 ± 12.7
<40	110 (25.8)
40 – 60	234 (54.8)
≥60	83 (19.4)
Educational status [422]	
<SSC	217 (51.4)
SSC-HSC	119 (28.2)
>HSC	86 (20.4)
Occupation [402]	
Housewife	204 (50.7)
Service	91 (22.6)
Businessman	58 (14.4)
Others	49 (12.2)
Duration of DM, years [425]	
<5	205 (48.2)
5 – 10	146 (34.4)
>10	74 (17.4)
Type of antidiabetic [424]	
None	15 (3.5)
Noninsulin	262 (61.8)
Insulin	31 (7.3)
Both	116 (27.4)

[Available no.]

The food items in the last seven days at iftar (including the last) and suhur are shown in Table-II. Puffed rice, chickpeas, fruits, and fried foods were the predominant items in the iftar. Fast foods and rich

Table-II: Type of food in iftar and suhur

Food items	Last iftar (n=330)	Last 7-days (iftar)	Last 7-days (suhur)
Rice-made (puffed, flattened)	247 (74.8)	400/426 (93.9)	—
Chickpea	220 (66.7)	396/426 (93.0)	—
Sweets	64 (19.4)	169 (39.7)	—
Fried items	144 (42.4)	388 (91.1)	—
Rice	49 (14.8)	180 (42.3)	416/425 (97.9)
Home-made bread	10 (3.0)	54 (12.7)	31/425 (7.3)
Protein (fish, meat, egg, etc.)	26 (7.9)	178 (41.8)	401/425 (94.4)
Green leafy vegetables	8 (2.4)	142/425 (33.4)	288 (67.8)
Vegetables	46 (13.9)	171/426 (40.1)	343/425 (80.7)
Fruits	190 (57.6)	423 (99.1)	120/425 (28.2)
Milk/ milk-made	18 (5.5)	99/426 (23.2)	181/425 (42.6)
Fast food	7 (2.1)	54/426 (12.7)	3/425 (0.7)
Rich food	6 (1.8)	98/426 (23.0)	45/425 (10.6)

Data were expressed in frequency (%)

foods were less frequently taken by the participants in both iftar and suhur. The predominant food items in suhur were rice, protein from animal sources, and vegetables. Among the drinks in iftar, lemon juice (71.0%), plain water (62.1%), different types of artificial drinks (25.5%), other fruit juice (23.0%), and milk-made drinks (19.2%) were common. The most common fruits taken in the iftar were date (91.8%), watermelon (78.0%), banana (58.5%), apple (46.4%), guava (35.6%), and malta (34.2%). Around 73.9% of the study participants took full iftar before the maghrib prayer, and the rest completed it after the prayer. The combination of rice, milk, and banana was a popular item in suhur. Nearly 16.5% of the participants missed at least one suhur. The median minutes of finishing the suhur was 15 minutes before the last minute of the suhur. Mean water intake was above 6 glasses (1 glass ≈ 250 mL) daily (6.4±2.3).

Around two-thirds of the participants always took the main meal between the iftar and suhur. Among the 333 respondents, nearly 70% took them after 10 pm (Table-III).

Around 95% of the study participants prayed some tarawih swalat with a mean of 16 rakahs. One out of five of the study participants did some exercise at night and three out of 10 study participants did physical activity on the day (Table-IV).

Nearly 30% of the study participants went to bed after midnight and 60% got up for suhur after 3:30 am. Around 94% also slept after the fazar prayer and 25% slept during the daytime every day—a significantly increased mean sleep duration of around

Table-III: Meals taken in between the iftar and suhur in the study participants

Variables	No. (%)
Meal taken between iftar & suhur	
Always	272 (63.7)
Sometimes	82 (19.2)
No	73 (17.1)
Type of meal [356]	
Main meal	284 (66.5)
Snacks	62 (14.5)
Mixed	10 (2.3)
Usual timing [333]	
Before 10 pm	101 (30.3)
At or after 10 pm	232 (69.7)

Data were expressed in frequency (%)

Table-IV: Physical activity among the study participants

Variables	No. (%)
Tarawih swalat, rakahs [426]	15.5±6.1
No tarawih salat	24 (5.6)
Exercise at night [425]	
No	334 (78.6)
Some days	42 (9.9)
Daily	49 (11.5)
Exercise on day [425]	
No	299 (70.4)
Some days	44 (10.4)
Daily	82 (19.3)

[Available no.] Data were expressed in frequency (%) or mean±SD

Table-V: Sleeping pattern of the study participants

Variables	Value
Sleep timing [426]	
Before 12 am	302 (70.9)
At/after 12 am	124 (29.1)
Get up for suhur [420]	
Before 3:30 am	174 (41.4)
At/after 3:30 am	246. (58.6)
Sleep after fazar prayer [425]	
Daily	339 (93.9)
Some days	9 (2.1)
Sleep during the day [424]	
Daily	99 (23.3)
Some days	120 (28.3)
Sleep duration before Ramadan, hours	6.5±1.5
Sleep duration during Ramadan, hours	7.6±1.5
Mean sleep duration increase	1.2 hours*

[Available no.], Data were expressed in frequency (%) or mean±SD
*Paired t-test

1.2 hours during Ramadan than before Ramadan (Table-V).

Table-VI: Problems of the study participants during Ramadan

Problems	No. (%)
Excessive thirst	183/426 (43.0)
Excessive hunger	61/426 (14.3)
Excessive weakness	188/426 (44.1)
Dyspepsia	151/426 (35.4)
Hypoglycemia	16/426 (3.7)
Break the fast	111/425 (26.1)
Menstruation	20 (18.0)
Hypoglycemia	8 (7.2)
Hyperglycemia	6 (5.4)
To test glycemic status	18 (16.2)
Excess weakness	24 (21.6)
Excess thirst	4 (3.6)
Excess hunger	2 (1.8)
Others	27 (24.3) (different types of illness)
Missed drugs	122/422 (28.9)

Data were expressed in frequency (%)

Less than 50% of the study participants developed excessive thirst, hunger, weakness, and dyspepsia. A small number of the participants developed hypoglycemia. More than one-fourth of the study participants had to break their fasting for different reasons, especially for excess weakness and to test glycemic status. Around 28.9% missed at least one dose of antidiabetic drug. About 50.5% (215/426) did self-monitoring of blood glucose at least once during fasting (Table-VI).

Discussion

The dietary habits, physical activity levels, sleep patterns, and issues faced by Bangladeshi individuals with DM during Ramadan were all varied in this study. Although physical activity, sleep duration, food, fluid, and sugar intake remained unchanged in half of the patients, the metabolic outcome may be different in different races.[8,9]

The majority of research participants broke their fast with fruits, fried foods, chickpeas, and puffed rice. A web-based cross-sectional study of 507 university students in Bangladesh revealed that 100% of them consumed fried food despite being aware of its harmful effects, primarily because it satisfied their taste. In line with our research, fried meals often included chickpeas, chop, and piyaju in that study.[10] Dates were the most popular fruit to eat in our study, which was in concordance to Saudi Arabian research.[11] Similarly, a combination of rice with milk and banana is a favorite item for many in suhur. Many people consume different types of proteins and vegetables at suhur. A previous study showed a similar amount of protein but an increased amount of fat intake during Ramadan. Nearly 80% of the calories are consumed at iftar, even though the total amount may be comparable to what it was before Ramadan. Artificial drinks and fruit juice were common drinks during iftar.[12] Previous studies also showed that most of the participants reduced sweet and sugary drinks during Ramadan.[12,13] The dairy and vegetable intake were lower but water intake was similar in our study than in the study conducted in Saudi Arabia.[13]

Although the frequencies of eating out, taking takeout, and snacking were reduced, eating despite not being hungry was increased in Nigerian people.14 Most of our study participants took a main meal between iftar and suhur after 10 pm. Reduction in the frequency of meals was reported in Bangladesh and Saudi Arabia.[7,11,13]

Tarawih swalat contributes to physical activity and nearly all of the study participants performed some of this swalat in our study. A study from Rajshahi showed that around 58% performed religious activities regularly.[14]

In addition, about 21% of people exercised during the day and 29% during the night during Ramadan in our study. A previous study conducted in a tertiary care hospital from Mymensingh showed that nearly 76% reduced their activities.[12] A study conducted among 1981 adults with type 2 DM showed reduced physical activity and restricted daily activity.[7] Reduced physical activities were also reported in Saudi Arabia.[11,16] Along with increased calorie consumption, this may contribute to weight gain.[17]

There is a change in different aspects of sleep including a reduction of around one hour in a meta-analysis.[2] However, we found the opposite finding. This may be due to increased sleep after the fazar prayer. Increased sleep duration during the day was also observed among people of Saudi Arabia.[11]

Ramadan brings about numerous new problems and forces various lifestyle modifications. Nearly half of the study participants felt excessive thirst contributed by the summer. A previous study showed only 4% developed dehydration. More than one-third of patients developed features of dyspepsia. This figure is around half that of a previous study.[15] Only 4% developed features of hypoglycemia. The frequencies are much lower than in previous studies because we took the history only for seven days rather than the full month of Ramadan.[7,12] Around 30% missed at least one antidiabetic drug which is a little bit higher (23.4%) than a previous study.[7] At last 26% of the study participants had to break fasting due to various reasons. Apart from menstruation, monitoring glycemic status by blood testing is an important avoidable cause. This indicates a need for Ramadan-focused education and motivation before Ramadan. Another area of improvement is SMBG, as only 50% measured their glucose during fasting. In a nationwide study of 3835 persons with type 2 diabetes, nearly 37% thought that pricking their fingers might break their fast. Despite hypoglycemia, about 18% of people would not break their fast.[18] In our study, hypoglycemia and hyperglycemia caused about 7% and 5% respectively, to force participants to break their fast.

Our study is limited by its cross-sectional nature, subjective assessment of the lifestyle in a qualitative manner, and absence of data according to the type of DM. Despite these shortcomings, this study tried to describe the lifestyle of Bangladeshi people with DM as a whole.

Conclusions

In conclusion, fasting during Ramadan imposed many changes in lifestyle including diet, exercise, and sleep patterns among Bangladeshi people with DM. As a result, people faced many problems. These findings may help our physicians to educate and prescribe our patients. Quantitative assessment of the lifestyle of a large sample size from all over the country before, during, and after Ramadan may provide more comprehensive information and ultimately help to formation of a web-based tool of RNP for Bangladeshi people with DM.

Conflict of interest

The authors have no conflicts of interest to disclose.

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Data Availability

Any inquiries regarding supporting data availability of this study should be directed to the corresponding author and are available from the corresponding author upon reasonable request.

Ethical Approval and Consent to Participate

Informed written consent was obtained from each participant in the study.

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