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Impact of Twice-Weekly Islamic Fasting on Cardiovascular Risk Factors in Women with Type 2 Diabetes Mellitus

Bachar Afandi[1,2] Juma Al kaabi[1,2] Charu Sharma[3]

[1] Division of Endocrine, Tawam Hospital, Al Ain, United Arab Emirates
[2] Department of Medicine, College of Medicine and Health Science, UAE University, Al Ain, United Arab Emirates
[3] Department of Genetics and Genomics, College of Medicine and Health Sciences, United Arab Emirates University, Al Ain, United Arab Emirates

Address for correspondence Bachar Afandi, MD, Division of Endocrine, Department of Medicine, Tawam Hospital, P. O. Box 15258, Al Ain, United Arab Emirates (e-mail: bafandi@seha.ae).

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Abstract

Introduction Twice-Weekly Islamic Fasting is a unique form of intermittent fasting observed by Muslims on Mondays and Thursdays. While Ramadan and other forms of intermittent fasting have been extensively studied, limited data exist on the clinical impact of Twice-Weekly Islamic Fasting among patients with type 2 diabetes mellitus (T2DM).

Objective This study aimed to determine the prevalence and impact of Twice-Weekly Islamic Fasting on cardiovascular risk factors among Emirati women with T2DM.

Method One hundred Muslim women from the outpatient diabetes clinic at Tawam Hospital, Al Ain, United Arab Emirates, were interviewed face-to-face using a structured questionnaire. Based on their reported observation of Twice Weekly Islamic Fasting practices, participants were categorized into two groups: group 1 ($n = 37$, 37%) were patients who observe this fasting pattern regularly and group 2 ($n = 63$, 63%) included patients who do not. Medical records were reviewed for weight, type and duration of diabetes, body mass index (BMI), type of treatment, blood pressure (BP), glycated hemoglobin (HbA1c), and lipid panel.

Results Among 100 participants, 37% reported observing Twice-Weekly Islamic Fasting regularly. Fasting individuals were older (mean age 62 vs. 56 years, $p < 0.05$) and with longer duration of diabetes (22 vs. 19 years, $p < 0.05$) compared with nonfasting participants. The fasting group showed better glycemic control, with a lower mean HbA1c ($7.59 \pm 2.1\%$ vs. $8.07 \pm 2.0\%$, $p = 0.077$), although the difference was not statistically significant. While BMI, lipid profiles, and BP did not show any statistically significant differences, fasting participants exhibited a slightly lower systolic BP (128 ± 15.7 vs. 132.9 ± 16.4 mm Hg) and a slight improvement in total cholesterol/high-density lipoprotein ratio in participants with a diabetes duration exceeding 10 years.

Conclusion This pilot study found that 37% of Emirati women with T2DM practice Twice-Weekly Islamic Fasting. While statistical significance was not reached, trends suggest potential benefits for glycemic control and weight. Given the widespread

Keywords
- diabetes
- fasting
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- cardiovascular
- women
- intermittent fasting

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observance of this practice, health care providers play a crucial role in guiding patients who choose to fast, ensuring a balance between traditional practices and safe diabetes management. Future research should investigate the long-term impact of Twice-Weekly Islamic Fasting on metabolic and cardiovascular health.

Introduction

Intermittent fasting is considered as a conscious approach to improving health, with various fasting patterns practiced globally, often supported by tradition, culture, or religious beliefs. Numerous studies on different forms of intermittent fasting have reported positive health outcomes, including weight reduction,[1–4] decreased blood glucose and insulin levels,[1,5] improved lipid profiles,[1,6] and cardiac protective effects.[1,4,6] Intermittent fasting has been associated with an increased potential for extended life expectancy.[7] While the precise mechanisms remain speculative, intermittent fasting is hypothesized to exert its effects through metabolic regulation, positively influencing circadian rhythms, gastrointestinal microbiota, and modifiable lifestyle behaviors.[8]

Islamic fasting involves abstaining from food and drink from dawn to sunset. Ramadan fasting, observed annually during the holy month of Ramadan, is obligatory for all healthy adult Muslims and is widely studied for its metabolic improvement, cardiovascular, and mental health impacts.[9,10] Beyond Ramadan fasting, several voluntary forms of intermittent Islamic fasting are widely practiced, including the 6 days of Shawwal fasting, fasting on the three white days (13th, 14th, and 15th of each lunar month), and Twice-Weekly Islamic Fasting on Mondays and Thursdays.

Twice-Weekly Islamic Fasting is a unique practice with historical roots, including its adoption by Prophet Muhammad (peace be upon him), and is observed by millions globally for both its religious significance and potential health benefits.[11] In contrast, the 5:2 diet, a popular secular intermittent fasting regimen, involves 5 days of unrestricted eating followed by two nonconsecutive days of calorie restriction (typically around 500–600 calories per day).[12] While distinct from Islamic fasting in intent and structure, the 5:2 diet shares similarities in promoting intermittent periods of energy restriction, leading to overlapping potential health outcomes.[13]

Although health exemptions exist for individuals with unstable medical conditions, many patients continue to fast including both Ramadan and Twice-Weekly Islamic Fasting. The 2021 Diabetes and Ramadan International Alliance guidelines advice against fasting for diabetic individuals with high risk,[14] yet clinical practice observation reveals that 76% of high-risk diabetic patients in our clinical practice elect to fast, against medical advice.[15]

The prevalence of Twice-Weekly Islamic Fasting among diabetic individuals is largely unexplored, despite its potential impact on treatment strategies. Recognizing that a significant proportion of patients observe this practice is critical, as it necessitates tailored clinical strategies, such as medication adjustments on fasting days, to ensure safe glycemic control. While evidence suggests Ramadan fasting benefits glycemic control, lipid profiles, and oxidative stress,[16,17] data on Twice-Weekly Islamic Fasting in diabetes management is scarce.

To the best of our knowledge, this is the first study to examine the prevalence, characteristics, and the impact of Twice-Weekly Islamic Fasting on glycemic control and cardiovascular risk parameters among Emirati women with type 2 diabetes mellitus (T2DM). Understanding how this form of intermittent fasting influences health outcomes in patients with diabetes is crucial, as it can contribute to improved clinical recommendations and better diabetes management strategies.

Patients and Methods

Design and Settings

This was a cross-sectional observational study to investigate the rate and effects of Twice-Weekly Islamic Fasting among Emirati women with T2DM. The study was conducted at the Diabetes Endocrine Center, Tawam Hospital, located in Al Ain City, United Arab Emirates.

Study Population

This study focused exclusively on Emirati women with T2DM to ensure a homogenous study population and minimize confounding variables associated with gender differences in metabolism, hormonal fluctuations, and fasting behaviors. Participants were randomly selected, and the first 100 women who agreed to participate were enrolled, regardless of their fasting practices. Inclusion criteria included Emirati women aged 18 years or older with a confirmed diagnosis of T2DM. There were no specific exclusion criteria, as all eligible and willing participants were included in the study. Participants were categorized into two groups: group 1, consisting of women who practice regular Twice-Weekly Islamic Fasting, and group 2 included women who did not observe this fasting pattern.

Participants were classified based on self-reported fasting practices at the time of data collection. However, the specific duration for which participants had been practicing Twice-Weekly Islamic Fasting was not recorded.

Outcome Measures

Data were collected through face-to-face interviews using a structured questionnaire that captured demographic characteristics, such as age and literacy, duration of diabetes,

treatment types, and fasting practices. In addition, medical records were thoroughly reviewed to obtain clinical parameters, including body mass index (BMI), systolic and diastolic blood pressure (SBP and DBP), glycated hemoglobin (HbA1c), and lipid profile parameters such as low-density lipoprotein (LDL), high-density lipoprotein (HDL), and triglycerides (TGs).

Statistical Analysis

Statistical analysis was performed to assess associations between fasting practices and various health parameters. Descriptive statistics were used to summarize demographic and clinical characteristics, with continuous variables presented as means with standard deviations and categorical variables expressed as percentages. Group comparisons were conducted using independent *t*-tests for continuous variables, with statistical significance set at a *p*-value of less than 0.05.

Results

The study included 100 Emirati women with T2DM. Participants were divided into group 1 ($n = 37$, 37%) who observed Twice-Weekly Islamic Fasting and group 2 ($n = 63$, 63%) who did not. The mean age was significantly higher in group 1 (62 years) compared with group 2 (56 years, $p < 0.05$; ►**Table 1**). The duration of diabetes was also longer in group 1, with an average of 22 years compared with 19 years in group 2 ($p < 0.05$). Additionally, group 1 had a higher illiteracy rate, with 28% of participants classified as illiterate compared with 18% in group 2 ($p < 0.05$). The presence of hypertension was observed in 51% of group 1 and 52% of group 2 (not significant; ►**Table 1**).

The mean BMI was slightly lower in group 1 (32.0 ± 5.3 kg/m^2) compared with group 2 (33.2 ± 5.9 kg/m^2), but this difference was not statistically significant ($p = 0.325$; ►**Table 2**). SBP showed a trend toward improvement in group 1, with a mean of 128 ± 15.7 mm Hg compared with 132.9 ± 16.4 mm Hg in group 2 ($p = 0.207$). However, DBP was nearly identical in both groups, with means of 72.6 ± 9.0 mm Hg in group 1 and 73.0 ± 9.3 mm Hg in group 2 ($p = 0.876$; ►**Table 2**).

Group 1 demonstrated a trend toward improved glycemic control, with mean HbA1c levels of 7.59 ± 2.1% compared with 8.07 ± 2.0% in group 2, although this did not reach statistical significance ($p = 0.077$). In lipid profile, the mean LDL levels were higher in group 1 (2.75 ± 1.02 mmol/L) compared with group 2 (2.39 ± 0.93 mmol/L), though this difference was not statistically significant ($p = 0.132$). TGs were comparable, with group 1 reporting 1.24 ± 0.29 mmol/L and group 2 reporting 1.33 ± 0.78 mmol/L. The mean HDL was slightly higher in group 1 (1.24 ± 0.29 mmol/L) compared with group 2 (1.21 ± 0.36 mmol/L; not significant). The total cholesterol (TC)/HDL ratio showed a slight trend toward improvement in group 1, with a mean of 3.82 ± 1.22 compared with 3.70 ± 1.06 in group 2, although this difference was not statistically significant ($p = 0.63$; ►**Table 2**).

Table 1 Patient characteristics

Characteristic	Fasting, $n = 37$	Nonfasting, $n = 63$	*p*-Value
Mean age (y)	62	56	< 0.05
Illiteracy rate (%)	28	18	< 0.05
Duration of diabetes (y)	22	19	< 0.05
Prevalence of hypertension (%)	52	51	NS

Abbreviation: NS, not significant.

Table 2 Clinical parameters of the study participants

Variable	Fasting, $n = 37$	Nonfasting, $n = 63$	*p*-Value
BMI (kg/m^2)	32.0 ± 5.3	33.2 ± 5.9	0.325
SBP (mm Hg)	128 ± 15.7	132.9 ± 16.4	0.207
DBP (mm Hg)	72.6 ± 9.0	73.0 ± 9.3	0.876
HbA1c (%)	7.59 ± 2.1	8.07 ± 2.0	0.077
LDL (mmol/L)	2.75 ± 1.02	2.39 ± 0.93	0.132
TG (mmol/L)	1.24 ± 0.29	1.33 ± 0.78	NS
HDL (mmol/L)	1.24 ± 0.29	1.21 ± 0.36	NS
TC/HDL ratio	3.82 ± 1.22	3.70 ± 1.06	0.63

Abbreviations: BMI, body mass index; DBP, diastolic blood pressure; HbA1c, glycosylated hemoglobin; HDL, high-density lipoprotein; LDL, low-density lipoprotein; NS, not significant; SBP, systolic blood pressure; TC, total cholesterol; TG, triglycerides.

Further analysis stratified participants by diabetes duration of less than 10 years compared with more than 10 years and fasting status. In participants with less than 10 years' diabetes duration, the fasting group showed lower HbA1c levels (6.90 ± 1.58%) compared with the nonfasting group (8.14 ± 2.40%), indicating better glycemic control (►**Table 3**). This trend was not observed in participants with more than 10 years' diabetes duration, where HbA1c levels were slightly higher in the fasting group (8.34 ± 2.42%) compared with the nonfasting group (8.13 ± 1.84%). Additionally, BMI was consistently lower in fasting groups across both durations, while SBP showed notable improvement in the group with more than 10 years' diabetes duration who fasted (124.6 ± 9.6 vs. 133.9 ± 15.2 mm Hg). The TC/HDL ratio was also slightly better in the group with more than 10 years' diabetes duration who fasted (3.43 ± 1.07) compared with the nonfasting group (3.57 ± 0.95; ►**Table 3**).

Discussion

This pilot study is the first to evaluate the prevalence and impact of Twice-Weekly Islamic Fasting on cardiovascular risk factors among Emirati women with T2DM. Notably, the study showed that older women with longer duration of diabetes are more likely to observe this practice. These findings align with the understanding that older individuals, who may have a longer history of managing diabetes, are

Table 3 Clinical parameters stratified by diabetes duration (< 10 vs. > 10 years) and fasting status

Parameter	< 10 y		> 10 y	
	Fasting	Nonfasting	Fasting	Nonfasting
HbA1c (%)	6.90 ± 1.58	8.14 ± 2.40	8.34 ± 2.42	8.13 ± 1.84
BMI (kg/m^2)	31.12 ± 3.71	33.45 ± 8.17	33.41 ± 4.61	35.08 ± 8.42
SBP (mm Hg)	131.3 ± 21.2	130.3 ± 15.6	124.6 ± 9.6	133.9 ± 15.2
DBP (mm Hg)	75.4 ± 10.4	73.3 ± 7.8	70.2 ± 8.5	72.1 ± 9.4
LDL Ch (mmol/L)	2.92 ± 0.91	2.66 ± 1.00	2.52 ± 1.30	2.17 ± 0.76
TC/HDL Ratio	4.05 ± 1.27	3.90 ± 1.20	3.43 ± 1.07	3.57 ± 0.95

Abbreviations: BMI, body mass index; DBP, diastolic blood pressure; HbA1c, glycosylated hemoglobin; HDL, high-density lipoprotein; LDL, low-density lipoprotein; SBP, systolic blood pressure; TC, total cholesterol; Ch, cholesterol.

often more committed to traditional and cultural practices, including regular fasting.[18]

Understanding the impact of this unique form of intermittent fasting is particularly important in regions like the Middle East, where diabetes prevalence is high and cultural fasting practices are deeply rooted in cultural and religious traditions. Despite clinical guidelines advising against fasting for high-risk diabetic patients, a significant proportion of individuals still choose to fast, highlighting a critical gap between clinical recommendations and real-world patient behaviors.[14,15,19]

A particularly significant finding of this study is that 37% of participants practiced Twice-Weekly Islamic Fasting. This novel observation highlights the widespread adoption of this voluntary form of fasting among women with diabetes. Such prevalence underscores the need for health care providers to identify and address fasting behaviors during routine care. Specifically, treatment regimens, including insulin and oral antihyperglycemic agents, must be carefully adjusted on fasting days to mitigate the risk of hypoglycemia and ensure safe fasting practices.[20]

Our study reveals that Twice-Weekly Islamic Fasting was practiced across participants with diverse educational backgrounds, with a significantly higher proportion of those in the fasting group having lower formal education levels. This widespread adherence, regardless of educational attainment, highlights the cultural and spiritual importance of fasting, which may influence health behaviors and dietary choices. Given the strong commitment to fasting in this population, understanding its potential health implications is crucial. Evidence from other studies suggests that intermittent fasting and time-restricted eating not only enhance longevity but also improve the quality of life by mitigating age-related pathologies.[21] These dietary patterns have been shown to positively influence cardiovascular health and metabolic outcomes by reducing risk factors such as blood pressure, cholesterol levels, and glucose regulation.[22]

While there was no statistically significant difference in BMI, SBP, or lipid profiles, a notable trend toward lower HbA1c levels was seen in the fasting group, suggesting a potential benefit of Twice-Weekly Islamic Fasting on glycemic control. Similar findings have been reported in previous research examining the effects of Monday-Thursday Islamic Fasting on metabolic parameters, where the fasting group exhibited lower average HbA1c levels (76.86 mg/dL) compared with the control group (90.2 mg/dL), though the difference was not statistically significant ($p > 0.05$).[23] While our study focused primarily on BMI, glycemic control, and lipid parameters, a more comprehensive assessment of preexisting conditions such as dyslipidemia, chronic kidney disease (CKD), and diabetes-related complications could provide greater insights into the metabolic impact of Twice-Weekly Islamic Fasting. Future research should incorporate these variables to better delineate the relationship between fasting and overall cardiometabolic health in individuals with T2DM. It remains unclear whether individuals who practice Twice-Weekly Islamic Fasting do so because they are healthier or whether fasting itself leads to improved metabolic outcomes. As this is an observational study, causality cannot be established.

The subanalysis based on diabetes duration revealed distinct trends in glycemic and lipid outcomes. Patients with less than 10 years of diabetes experienced greater reductions in HbA1c compared with nonfasters, suggesting that the benefits of Twice-Weekly Islamic Fasting on glycemic control may be more pronounced in early-stage diabetes. In contrast, those with more than 10 years of diabetes showed only a modest difference in HbA1c, indicating a potentially diminished effect of fasting in advanced disease. Similarly, lipid profile findings varied by diabetes duration. While fasting participants with shorter diabetes duration had slightly higher LDL levels, those with a longer duration of diabetes demonstrated modest enhancements in the TC/HDL ratio, suggesting potential cardiovascular benefits. These findings are in line with an earlier study reporting that fasting on Mondays and Thursdays can effectively reduce cholesterol levels in patients with T2DM, reinforcing the need for individualized fasting recommendations.[18] Moreover, our findings align with prior research on intermittent fasting, including Ramadan fasting, which have demonstrated improved metabolic outcomes in specific diabetes populations. However, the higher LDL levels in certain fasting participants highlight the importance of further investigating dietary patterns and metabolic adaptations during fasting.[24,25]

The findings of this study carry important clinical and public health implications, particularly in communities

where Twice-Weekly Islamic Fasting is widely practiced. The observed trends suggest that structured intermittent fasting may be a beneficial lifestyle intervention for patients with diabetes, provided it is implemented under appropriate medical supervision.[3,13,26]

Health care providers should actively engage in shared decision-making with patients who choose to fast, ensuring they are adequately educated on potential risks and strategies for maintaining glycemic control. This includes adjustments to medication regimens, dietary advice, and the importance of regular blood glucose monitoring. Intermittent fasting has shown strong potential as one of the nonpharmacological interventions in managing and preventing prediabetes and T2DM and their associated complications.[7,13,26,27]

These results underscore the importance of integrating culturally tailored strategies into diabetes management guidelines, as traditional fasting practices are deeply rooted in the lives of many patients, particularly in the Middle East.[28,29] The higher LDL levels observed in this study among fasting individuals further underscore the need for personalized lipid management during fasting periods. Future research should investigate the long-term effects of Twice-Weekly Islamic Fasting on cardiovascular outcomes to better refine clinical guidelines and empower patients to balance cultural practices with optimal diabetes care. This study provides valuable insights that could inform health care providers in delivering more culturally sensitive and evidence-based recommendations for patients with diabetes.

This study has several limitations. Data on preexisting conditions such as dyslipidemia, CKD, and diabetes-related complications were unavailable for all participants. Additionally, the duration of Twice-Weekly Islamic Fasting practice was not verified, limiting our ability to assess its long-term effects. The relatively small sample size may limit its generalizability, and potentially explaining the lack of significance in certain parameters, such as HbA1c and lipid profiles. Furthermore, many confounders that may have influenced outcomes, including dietary intake, work patterns, physical activity, and medication adherence, were not evaluated. The reliance on self-reported fasting practices introduces potential recall bias. Lastly, as the first study examining this fasting practice in this population, the findings should be interpreted cautiously and serve as an exploratory step. Future studies with larger, more diverse populations and better control of confounding factors are needed to validate these findings and explore the long-term metabolic implications of Twice-Weekly Islamic Fasting.

Conclusion

This pilot study found that 37% of Emirati women with T2DM practice Twice-Weekly Islamic Fasting. While statistical significance was not reached, trends suggest potential benefits for glycemic control and weight, indicating that this commitment may be a relevant lifestyle factor for individuals with diabetes.

Health care providers play a crucial role in guiding patients who choose to fast, ensuring a balance between traditional practices and safe diabetes management. Individualized treatment strategies, including medication adjustments and dietary guidance, should be integrated into clinical care. By engaging in shared decision-making, clinicians can support patients in making informed choices that align with both their health needs and cultural preferences. Future research should investigate its long-term impact on metabolic and cardiovascular health.

Compliance with Ethical Principles

The study received approval # 380/15 from the Clinical Research Department in Tawam Hospital, Al Ain City, United Arab Emirates.

Authors' Contributions

B.A. and J.A. contributed toward conception and data collection. All authors contributed to writing and final approval of the manuscript.

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None.

Conflict of Interest

None declared.

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