

Levels of Health Awareness in Diabetic patients during Ramadan 2026: Focus group discussion in Argoo, Northern Sudan

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Abstract: Background: Diabetes mellitus is a major non-communicable disease in Sudan, and Ramadan fasting poses significant health risks for patients with diabetes. In 2025, the International Diabetes Federation (IDF) and the Diabetes and Ramadan (DAR) International Alliance issued updated guidelines for the management of diabetes during Ramadan. This study explored the levels of health awareness among diabetic patients in Argoo, Sudan, regarding these updated guidelines during Ramadan 2026. **Methods:** A qualitative study was conducted using four focus group discussions (FGDs) with 29 participants purposively recruited from Argoo, Sudan. Thematic analysis, following the Braun and Clarke framework, was used to identify and analyze themes related to health awareness. **Results:** Six themes emerged: (1) Limited awareness of 2026 IDF-DAR guidelines; (2) Misconceptions about fasting safety; (3) Reliance on experiential knowledge over clinical advice; (4) Barriers to healthcare access; (5) Role of family and community influence; and (6) Desire for structured education. Participants demonstrated variable awareness, with many relying on informal practices and religious conviction rather than structured medical guidance. **Conclusion:** Diabetic patients in Argoo exhibit suboptimal awareness of updated Ramadan diabetes management guidelines. There is a critical need for community-based health education, culturally sensitive patient counseling, and improved healthcare access to reduce fasting-related complications during Ramadan.

Keywords: Diabetes mellitus, Ramadan fasting, health awareness, IDF-DAR guidelines, Sudan, qualitative research, focus group discussions, Argoo.

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INTRODUCTION

Diabetes mellitus is one of the most prevalent chronic non-communicable diseases globally, affecting approximately 537 million adults worldwide, with projections indicating a rise to 783 million by 2045 [1]. In Sudan, the prevalence of diabetes is estimated to be approximately 19% among adults, with significant regional and socioeconomic disparities [2]. The burden of diabetes is compounded by limited healthcare infrastructure, economic instability, and the impact of prolonged conflict, all of which have severely disrupted health service delivery across the country.

Ramadan, the holy month of fasting observed by Muslims, requires abstinence from food, drink, and oral medications from dawn to sunset. For patients with diabetes, fasting poses significant physiological and clinical challenges, including risks of hypoglycemia, hyperglycemia, diabetic ketoacidosis, and dehydration [3,4]. In 2025, the International Diabetes Federation (IDF) and the Diabetes and Ramadan (DAR) International Alliance released updated guidelines to inform patients and healthcare providers on safe fasting practices. These guidelines emphasize individualized risk assessment, structured pre-Ramadan education, medication adjustment, and self-monitoring of blood glucose [5].

Despite the availability of these guidelines, awareness and implementation at the community level remain limited, particularly in post-conflict and resource-limited settings such as Sudan. Argoo, a locality in Sudan, faces significant healthcare access challenges due to the ongoing humanitarian crisis and systemic fragility of the health system.

Understanding the levels of health awareness among diabetic patients in this context is essential for designing targeted interventions to reduce fasting-related complications and improve health outcomes.

This study aims to qualitatively explore the levels of health awareness among diabetic patients in Argoo, Sudan, during Ramadan 2026, with a particular focus on their knowledge of the 2026 IDF-DAR guidelines and their perceived barriers to safe fasting practices.

MATERIALS AND METHODS

Study Design

This qualitative study employed focus group discussions (FGDs) to explore the lived experiences, beliefs, and awareness levels of diabetic patients in Argoo, Sudan, regarding diabetes management during Ramadan 2026. FGDs were chosen to facilitate dynamic group interaction and elicit collective perspectives on health awareness and cultural practices [6].

Study Setting

The study was conducted in Argoo, Sudan, in February 2026 during the month of Ramadan. Argoo is a locality affected by ongoing humanitarian crises and healthcare system fragility, which significantly impacts the accessibility and quality of health services for chronic disease management.

Participants and Sampling

Participants were recruited using purposive sampling from diabetic patients attending local health facilities and community organizations. Inclusion criteria were: (1) diagnosis of type 1 or type 2 diabetes for at least one year; (2) age 18 years or older; (3) ability to communicate in Arabic; and (4) willingness to participate in a group discussion. Exclusion criteria included severe cognitive impairment and pregnancy.

A total of 29 participants were recruited across four focus groups, with group sizes ranging from 6 to 8 participants to ensure manageable discussion dynamics.

Data Collection

Four FGDs were conducted in community health centers and local meeting spaces accessible to participants. Each session lasted 60 to 90 minutes and was facilitated by a trained moderator using a semi-structured interview guide. The guide explored topics including: (1) knowledge of diabetes management during Ramadan; (2) awareness of the 2026 IDF-DAR guidelines; (3) sources of health information; (4) experiences with fasting and complications; (5) barriers to healthcare access; and (6) perceptions of family and community influence on fasting decisions.

All discussions were audio-recorded with participant consent and transcribed verbatim in Arabic. Transcriptions were translated into English by bilingual researchers for analysis. All discussions were audio-recorded with participant consent and transcribed verbatim in Arabic. Transcriptions were translated into English by bilingual researchers for analysis.

Data Analysis

Thematic analysis was conducted following the six-phase framework outlined by Braun and Clarke [17]: (1) familiarization with the data; (2) generation of initial codes; (3) searching for themes; (4) reviewing themes; (5) defining and naming themes; and (6) producing the report. Two researchers independently coded the transcripts using NVivo software (version 14), and discrepancies were resolved through consensus discussions. Trustworthiness was ensured through member checking, peer debriefing, and thick description of the data.

Ethical Considerations

Ethical approval was obtained from the institutional review board. All participants provided written informed consent. Confidentiality was maintained through anonymization of transcripts and secure data storage. Participants were informed of their right to withdraw at any time without penalty.

RESULTS

Participant Characteristics

A total of 29 participants were enrolled in four FGDs. The demographic and clinical characteristics of the participants are summarized in Table 1.



Table 1. Demographic and Clinical Characteristics of Participants (N = 29)

Characteristic	Category	n (%)
Sex	Male	14 (48.3)
	Female	15 (51.7)
Age (years)	18–30	4 (13.8)
	31–45	9 (31.0)
	46–60	11 (37.9)
	> 60	5 (17.2)
Education Level	No formal education	7 (24.1)
	Primary	8 (27.6)
	Secondary	9 (31.0)
	University	5 (17.2)
Diabetes Type	Type 1	6 (20.7)
	Type 2	23 (79.3)
Duration of Diabetes	< 5 years	10 (34.5)
	5–10 years	11 (37.9)
	> 10 years	8 (27.6)
Previous Ramadan Fasting	Yes	26 (89.7)
	No	3 (10.3)
Source of Health Information	Healthcare provider	12 (41.4)
	Family/friends	10 (34.5)
	Religious leaders	5 (17.2)
	Internet/media	2 (6.9)

Thematic Analysis

Six major themes emerged from the analysis:

Theme 1: Limited Awareness of the 2026 IDF-DAR Guidelines

Most participants were unaware of the existence of the 2026 IDF-DAR guidelines. While some had received general advice from healthcare providers about fasting safety, none could identify specific recommendations regarding blood glucose monitoring thresholds, medication adjustments, or criteria for exemption from fasting.

"I never heard of these guidelines. The doctor told me to fast carefully, but he did not give me a paper or anything to read about what I should do." — Participant 3, FGD 2, Male, 52 years, Type 2 diabetes.

"We just know that we should take our medicine when we break the fast. But I don't know if there are new rules for 2025." — Participant 7, FGD 1, Female, 39 years, Type 2 diabetes.

Theme 2: Misconceptions About Fasting Safety

A prevailing belief among participants was that fasting is inherently beneficial for diabetes and that discontinuing medication during fasting is spiritually preferable. Several participants incorrectly assumed that reducing food intake automatically leads to better glycemic control, without considering the risks of hypoglycemia or hyperglycemia due to altered medication timing.

"I think fasting cleans the body. If I eat less, my sugar should go down. So I don't always take my full medication during Ramadan." — Participant 2, FGD 3, Male, 61 years, Type 2 diabetes.

"Some people say that if you are a good believer, God will protect you from getting sick while fasting. I believe this, but I also know my sugar sometimes goes very low." — Participant 5, FGD 4, Female, 33 years, Type 1 diabetes.



Theme 3: Reliance on Experiential Knowledge Over Clinical Advice

Participants frequently relied on personal experience and advice from family members or peers who also had diabetes. Clinical advice, when available, was often diluted or modified based on experiential narratives shared within the community.

"My brother has diabetes for 15 years and he fasts every Ramadan. He tells me what to eat and when to take my tablets. I trust his experience more than a young doctor who does not have diabetes." — Participant 4, FGD 2, Male, 47 years, Type 2 diabetes.

"Every year I try something different. Last year I stopped my morning medicine and I felt fine. So I will do the same this year." — Participant 8, FGD 1, Female, 55 years, Type 2 diabetes.

Theme 4: Barriers to Healthcare Access

Participants highlighted significant structural barriers to accessing diabetes care, including inadequate supply of medications, high costs of blood glucose monitoring strips, long distances to healthcare facilities, and the impact of conflict on healthcare delivery.

"There is no insulin in the health center most of the time. We have to buy it from the market, and it is very expensive. How can I manage my sugar if I don't even have the medicine?" — Participant 1, FGD 3, Male, 29 years, Type 1 diabetes.

"The hospital is far away and there is no transport. Even if I wanted to go before Ramadan to ask about fasting, I could not afford the trip." — Participant 6, FGD 4, Female, 44 years, Type 2 diabetes.

Theme 5: Role of Family and Community Influence

Family and community norms played a dual role. While family members provided emotional support and practical assistance, they also exerted social pressure to fast, sometimes discouraging patients from seeking medical exemptions. Religious leaders were influential, though their advice was often general and not tailored to individual diabetes risk profiles.

"My mother says everyone in the family fasts, and I should not be the exception. She thinks it is a weakness if I don't fast." — Participant 3, FGD 1, Female, 25 years, Type 1 diabetes.

"The imam said fasting is good for the soul. He did not talk about people who are sick. So I feel guilty if I even think about not fasting." — Participant 7, FGD 3, Male, 58 years, Type 2 diabetes.

Theme 6: Desire for Structured Education

Despite the barriers, participants expressed strong interest in receiving structured, community-based education about diabetes management during Ramadan. Preferred formats included group education sessions, printed materials in local languages, and involvement of trusted community health workers.

"If they came to our village and talked to us about how to fast safely, I would go. We need someone who understands our situation and gives us clear instructions." — Participant 2, FGD 4, Female, 50 years, Type 2 diabetes.

"A booklet with pictures and simple words would help. Not something from the internet that we cannot read." — Participant 5, FGD 2, Male, 63 years, Type 2 diabetes.

DISCUSSION

This qualitative study explored health awareness among diabetic patients in Argo, Sudan, during Ramadan 2025, with a focus on knowledge of the updated IDF-DAR guidelines. The findings reveal suboptimal awareness, significant misconceptions, and substantial structural barriers to safe fasting practices. Six themes emerged that collectively illuminate the complex interplay between health literacy, cultural norms, religious beliefs, and healthcare system fragility in shaping patient behavior during Ramadan.

Awareness of IDF-DAR Guidelines

The near-universal lack of awareness of the 2026 IDF-DAR guidelines among participants is a critical finding. This aligns with regional studies from Egypt, Saudi Arabia, and Pakistan, where awareness of structured diabetes fasting protocols has been similarly limited [4,7,8]. In Sudan, the absence of widespread dissemination of updated guidelines is compounded by the protracted humanitarian crisis, which has disrupted health information systems and weakened non-



communicable disease programming [9]. The IDF-DAR guidelines emphasize that pre-Ramadan education is the cornerstone of safe fasting [5], yet our findings suggest that such education is virtually absent in Argoo.

Misconceptions and Health Literacy

The misconceptions identified—particularly the belief that fasting universally lowers blood glucose and that faith alone can prevent complications—reflect deep gaps in health literacy. These beliefs are not unique to Sudan; qualitative studies in Morocco, Bangladesh, and Indonesia have documented similar narratives where religious conviction supersedes biomedical understanding [10,11]. However, in Argoo, these misconceptions are rendered more dangerous by the absence of countervailing clinical information. The IDF-DAR guidelines specifically recommend that patients with a history of severe hypoglycemia or poor glycemic control be advised against fasting [5], yet participants in our study who met these criteria were often unaware of such exemptions.

Reliance on Experiential Knowledge

The reliance on experiential knowledge over clinical advice is a recurrent theme in diabetes self-management literature, but it takes on particular urgency in resource-limited settings where formal care is inaccessible. Peer advice, while socially valuable, can propagate dangerous practices such as unsupervised medication discontinuation. This finding underscores the need for community-based participatory interventions that leverage local social networks while anchoring them to evidence-based clinical guidance [12].

Structural Barriers to Healthcare Access

The barriers to healthcare access described by participants—medication shortages, cost, transportation, and conflict-related disruptions—are well-documented in Sudan's health system literature [13,14]. The IDF-DAR guidelines recommend that patients have access to self-monitoring of blood glucose (SMBG) at least twice daily during fasting [5], yet the cost and availability of glucose strips in Argoo make this recommendation practically unachievable for most patients. Without addressing these structural determinants, guideline dissemination alone will be insufficient to improve outcomes.

Family and Community Influence

Family and community influence emerged as a double-edged sword. While social support is a recognized protective factor in diabetes management [15], social pressure to fast can override medical advice. In Sudan, where communal religious practice is deeply embedded in social identity, the stigma of not fasting may be more salient than biomedical risk. This finding suggests that interventions leaders, providing them with culturally tailored information to shift social norms around fasting exemptions [16].

Desire for Education and Community Engagement

The strong desire for structured education among participants is a promising finding. It indicates that, despite barriers, patients are receptive to health information when it is accessible and culturally appropriate. This aligns with the IDF-DAR recommendation for community-based, culturally tailored education programs [5]. Formats such as visual booklets, group sessions led by trusted community health workers, and pre-Ramadan workshops could bridge the awareness gap identified in this study.

Implications for Clinical Practice and Policy

These findings have direct implications for healthcare practice in Sudan and similar settings. Clinicians should prioritize pre-Ramadan consultations that include individualized risk assessment, medication adjustment planning, and explicit discussion of fasting exemptions. Ministries of health and non-governmental organizations should invest in community-based diabetes education that accounts for local literacy levels, cultural norms, and healthcare access constraints. Furthermore, the integration of religious leaders into health messaging—emphasizing that Islamic jurisprudence explicitly exempts sick individuals from fasting—may help reduce social stigma and empower patients to make safer decisions.

Strengths and Limitations

The strengths of this study include its qualitative richness, the use of a validated thematic framework, and its focus on a post-conflict, under-researched region. Limitations include the small sample size, which limits generalizability, and the reliance on self-reported data, which may be subject to recall and social desirability bias. Additionally, the study was conducted in a single locality (Argoo), and findings may not fully reflect the diversity of Sudan's diabetic population. The translation of transcripts from Arabic to English, while conducted rigorously, may have introduced subtle linguistic nuances.



CONCLUSION

Diabetic patients in Argoo, Sudan, demonstrate limited awareness of the 2026 IDF-DAR Ramadan guidelines, with significant misconceptions, reliance on informal knowledge, and substantial structural barriers to safe fasting. There is an urgent need for community-based, culturally tailored diabetes education, improved healthcare access, and engagement of family and religious stakeholders to reduce fasting-related complications and align local practices with international standards of care.

Declarations

Ethics Approval and Consent to Participate:

Ethical approval was obtained from the relevant institutional review board. All participants provided written informed consent prior to participation. The study was conducted in accordance with the Declaration of Helsinki.

Consent for Publication: Not applicable.

Availability of Data and Materials: The datasets generated and analyzed during the current study are available from the corresponding author upon reasonable request.

Competing Interests: The authors declare that they have no competing interests.

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Authors' Contributions

All authors contributed to the conceptualization, methodology, and writing of this manuscript. All authors have read and approved the final manuscript.

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