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PREVALENCE AND PREDICTORS OF DIETARY NON-COMPLIANCE AMONG DIABETIC PATIENTS: A CROSS-SECTIONAL STUDY AT BAYAZID ROKHAN TEACHING HOSPITAL, KABUL, AFGHANISTAN

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Abstract

Background: *Diabetes mellitus poses a rapidly growing public health challenge in Afghanistan, where dietary non-compliance significantly contributes to poor glycemic control and long-term complications. Despite this, data on dietary practices among diabetic populations in Afghan clinical settings remain scarce. This study aimed to assess dietary compliance and its association with socio-demographic and clinical factors among diabetic patients at Bayazid Rokhan Teaching Hospital, Kabul,* ***Afghanistan.***

Methods: *A prospective cross-sectional study was conducted over 12 months (March 2024–February 2025) among 300 adult diabetic patients. Data were collected using a culturally adapted structured questionnaire, clinical assessments, and laboratory tests. Dietary compliance levels, awareness, and socio-demographic characteristics were analyzed using descriptive statistics in SPSS version 26.*

Results: *Among 300 participants (61% male; mean age: 56.8 ± 10.5 years), 35.3% were fully compliant with dietary recommendations, 45.7% were partially compliant, and 19.0% were non-compliant. Compliance decreased with longer diabetes duration: 46.6% among those <5 years versus 20.3% for >10 years. A significant association was found between non-compliance and diabetes-related complications (40.6% non-compliant with complications vs. 11.0% without). Although 70.7% were aware of dietary guidelines, a knowledge-practice gap was observed. Additionally, 71% of participants expressed intent to improve dietary adherence.*

Conclusion: *Dietary compliance among diabetic patients in this study was suboptimal and significantly influenced by duration of illness, complication status, and socio-demographic factors. Despite high awareness levels, behavioral adherence remains low. These findings underscore the urgent need for structured education programs, improved access to nutritional counseling, and culturally tailored interventions to enhance diabetes management and reduce complication risks in Afghanistan.*

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INTRODUCTION

Diabetes mellitus is an endocrine metabolic disorder characterized by elevated blood glucose levels resulting from decreased insulin secretion from the pancreas, insulin resistance, or both. The condition is broadly classified into two primary types: Type 1 Diabetes, which affects 5–10% of diabetic individuals, and Type 2 Diabetes, which accounts for 90–95% of cases (1). If not diagnosed and managed promptly, diabetes can lead to both acute and chronic complications that significantly impact morbidity and mortality.

Globally, approximately 20% of the population is affected by diabetes, with a European prevalence ranging between 2–5% (1). In 2000, an estimated 171 million people lived with diabetes worldwide, a number projected to reach 366 million by 2030. By 2035, it is anticipated that one in every ten individuals globally will be affected by the disease, indicating a growing burden on global health and economic systems (2).

In 2010, India had 50.8 million diabetes cases, expected to rise to 87 million by 2030, positioning it as the country with the highest diabetes burden (3). China and the United States followed with 43.2 million and 26.8 million cases, respectively. Other countries including Pakistan, Brazil, Bangladesh, Germany, and Japan also ranked among the top ten nations with the highest diabetic populations (3). Between 2012 and 2013, diabetes contributed to 1.5 to 5.1 million deaths annually, making it the eighth leading cause of death worldwide. In Iran, the prevalence of diabetes is reported at 6% (4), whereas in Nepal, urban populations over the age of 40 demonstrate significantly higher risk, with approximately 30% affected (3). In Pakistan, a 2023 survey indicated a national diabetes prevalence of 26.3% (5).

Dietary compliance refers to the extent to which individuals with diabetes follow prescribed dietary recommendations as part of their overall disease management plan. It encompasses the consistency, quality, and appropriateness of food intake according to clinical guidelines provided by healthcare professionals. Dietary compliance is considered a cornerstone of diabetes management because it directly influences glycemic control, reduces the risk of acute and chronic complications, and improves overall quality of life (6).

Studies indicate that poor adherence to dietary recommendations is associated with uncontrolled blood glucose levels and a higher risk of complications such as cardiovascular disease, nephropathy, and retinopathy (7, 8). In contrast, consistent dietary adherence significantly improves metabolic outcomes and reduces the need for pharmacological interventions (9, 10).

Despite its importance, dietary compliance among patients with diabetes remains suboptimal across many populations. Factors such as limited nutritional knowledge, cultural eating practices, low income, lack of motivation, and inadequate support from healthcare systems contribute to poor adherence (11, 12). Education tailored to patients' social and cultural contexts, as well as regular follow-up, are essential for improving dietary habits (13).

In **Afghanistan**, the burden of non-communicable diseases (NCDs), including diabetes, is increasing rapidly, particularly in urban areas. Despite this rise, data on dietary behavior and glycemic management among diabetic patients remains limited. Urbanization, shifting dietary habits, and insufficient access to diabetic education are contributing to poor management outcomes in Afghan cities. A nationwide study by the World Health Organization revealed that the prevalence of diabetes in Kabul is approximately **13.3%,** with related risk factors such as obesity (31.2%) and hypertension contributing significantly to disease progression (14). Another study in Kandahar City highlighted significant associations between urban lifestyles and poor dietary habits, further compounding the challenge of diabetes control in urban Afghan populations (15). The lack of structured diabetes education programs and limited access to nutritional counseling services in Afghanistan has been identified as a barrier to dietary compliance (16).

Given these factors, there is a pressing need for context-specific studies to understand and address behavioral patterns among diabetic patients in Afghanistan. This research was therefore conducted at Bayazid Rokhan Teaching Hospital**,** Karte Naw, Kabul**,** Afghanistan with the primary aim of assessing dietary compliance among diabetic patients and

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identifying the influence of socio-demographic factors. The findings are intended to inform health care policy, support targeted education strategies, and ultimately contribute to reducing diabetes-related complications in Afghan healthcare settings.

Methodology

This prospective cross-sectional study was conducted at Rokhan Teaching Hospital, Karte Naw, and Kabul, Afghanistan over a 12-month period from March 2024 to February 2025. The study aimed to evaluate dietary compliance among diabetic patients admitted to or visiting the inpatient ward. The target population included adult patients diagnosed with either Type 1 or Type 2 diabetes mellitus. Participants were enrolled through purposive sampling, and all individuals aged 18 years or older who met the inclusion criteria and provided informed written consent were included. Patients with cognitive impairment or who declined participation were excluded.

Data were collected using a structured questionnaire adapted from Mohammed et al. (17), which was specifically designed to assess dietary knowledge, behavior, and compliance in diabetic individuals. The tool was translated and culturally adjusted for appropriateness within the Afghan healthcare context. Clinical evaluations were conducted to gather vital signs, including blood pressure, body temperature, pulse rate, and respiratory rate. Laboratory tests included complete blood count (CBC), fasting blood sugar (FBS), random blood sugar (RBS), glycated hemoglobin (HbA1c), and urine examination, in accordance with international diabetes management protocols (18).

In addition to clinical information, patients were interviewed to document dietary habits, economic status, demographic details, duration and type of diabetes, and any existing complications. All interviews and assessments were carried out by trained healthcare professionals using standardized equipment, including a digital weighing scale, measuring tape, stopwatch, and BMI calculator.

Ethical approval was obtained from the Research Committee of Bayazid Rokhan Institute of Higher Education, Kabul, Afghanistan and administrative clearance was provided by Rokhan Teaching Hospital. Written informed consent was obtained from all participants. To preserve confidentiality, no identifying patient information was collected or recorded.

Data were entered in Microsoft Excel and analyzed using IBM SPSS Statistics Version 26. Descriptive statistics such as mean and standard deviation were used for continuous variables, while frequencies and percentages were calculated for categorical variables.

Results

In this study, conducted at the Bayazid Rokhan Teaching Hospital, 300 diabetic patients participated. Table 1 presents the distribution of participants based on key socio-demographic variables, including age group, gender, job nature, and residential location. The majority of respondents fall within the 51–60 years age group (30.7%), followed by those aged 41–50 (25%) and 61–70 (23.7%). Participants aged above 70 and below 40 constitute a smaller proportion. In terms of gender, 61% were male and 39% were female. Regarding occupational activity, 58.7% had sedentary jobs while 41.3% were engaged in active work. The residential status indicates a nearly balanced representation, with 51% from urban areas and 49% from rural areas. The youngest participant was 34 years old, and the oldest was 77 years old, with an average age of 56.8 ± 10.5 years.

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Table 1 Distribution of participants according to age, gender, job activity level, and residential area.

	Parameter	Frequency	Percent
Age Group	<30 31-40 41-50 51-60 61-70 > 70	0 27 75 92 71 35	0.0% 9% 25% 30.7% 23.7% 11.6%
Gender	Female Male	117 183	39% 61%
Occupational activity	Sedentary Active	176 124	58.7% 41.3%
Residential status	Rural Urban	147 153	49% 51%

Table 2 summarizes the descriptive statistics for the primary demographic and clinical parameters of the study population. The mean age of the participants was 56.8 years (SD = 10.5), with ages ranging from 34 to 77 years. The average Body Mass Index (BMI) was 27.4 kg/m² (SD = 4.8), indicating that the cohort, on average, fell within the overweight category. The duration of diagnosed diabetes mellitus (DM) ranged from 1 to 25 years, with a mean duration of 9.8 years (SD = 5.4), reflecting a wide variability in disease progression among individuals. Mean systolic blood pressure (SBP) was 140.3 mmHg (SD = 15.6), while diastolic blood pressure (DBP) averaged 85.4 mmHg (SD = 8.7), suggesting that a considerable proportion of the participants had suboptimal blood pressure control. These data provide a baseline profile essential for contextualizing subsequent analyses.

Table 2. Descriptive Statistics of Demographic and Clinical Characteristics of the Study Participants

Parameters	Minimum	Maximum	Mean	Std. Deviation
Age	34	77	56.8	10.5
BMI	18.2	36.5	27.4	4.8
DM Duration	1	25	9.8	5.4
SBP	110	180	140.3	15.6
DBP	70	100	85.4	8.7

In our study conducted at Rokhan Teaching Hospital, a total of 300 diabetic patients were enrolled. Regarding dietary compliance, 106 individuals (35.3%) were fully compliant with dietary recommendations, 137 individuals (45.7%) were partially compliant, and 57 individuals (19.0%) were non-compliant (Figure 1)

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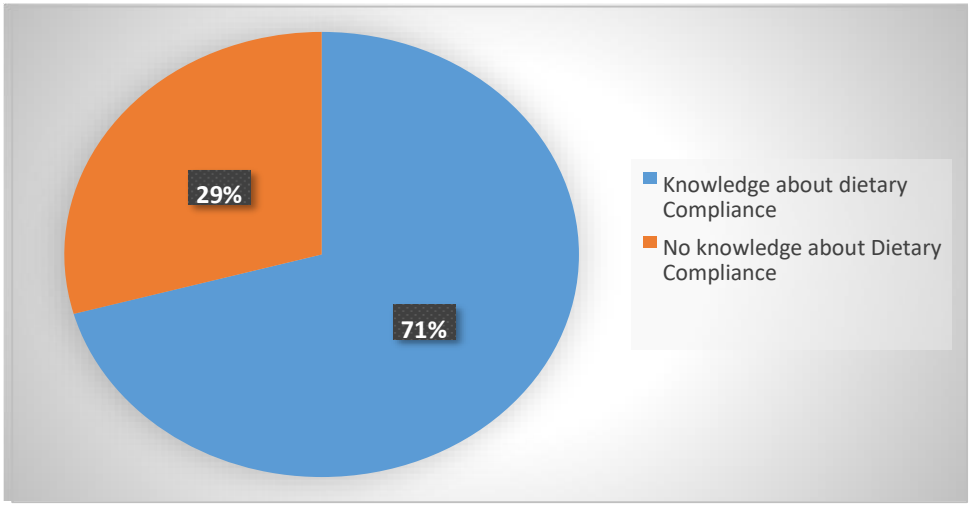

Figure 1 Knowledge of Dietary Compliance

In terms of awareness, 212 participants (70.7%) reported being aware of the importance of dietary compliance in diabetes management, whereas 88 participants (29.3%) lacked awareness of its effects. These findings highlight both the behavioral patterns and knowledge levels concerning dietary practices among diabetic patients and are illustrated in the chart below (Figure 2).

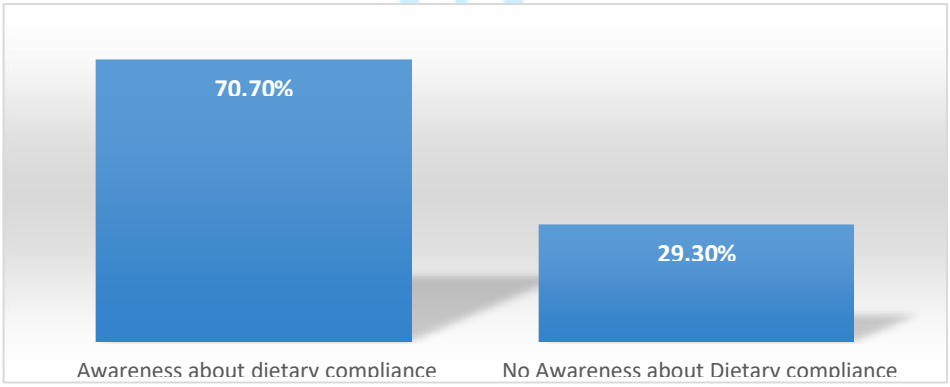

Figure 2 Awareness of Dietary Compliance

Table 3 presents the distribution of dietary compliance among diabetic patients according to the duration of their diabetes. Among patients with a diabetes duration of less than 5 years, 61 individuals (46.6%) were fully compliant, 52 (39.7%) were partially compliant, and 18 (13.7%) were non-compliant. In the 5–10 years duration group, 32 individuals (30.5%) were fully compliant, 51 (48.6%) were partially compliant, and 22 (20.9%) were non-compliant. In contrast, among patients with diabetes for more than 10 years, only 13 individuals (20.3%) were fully compliant, while 25 (39.1%) were partially compliant, and a higher proportion, 26 individuals (40.6%), were non-compliant.

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Table 3 Dietary Compliance in Diabetic Patients Stratified by Duration of Diabetes

Duration	Full compliant	Partial compliant	Non-compliant
<5 years	61 (46.6%)	52 (39.7%)	18 (13.7%)
5-10 years	32 (30.5%)	51 (48.6%)	22 (20.9%)
10<	13 (20.3%)	25 (39.1%)	26 (40.6%)

Among the 300 diabetic patients, 213 (71%) expressed an intention to change their dietary regimen and improve compliance, while 87 (29%) reported no such intention. Regarding meal frequency, 18 patients (6%) consumed one meal per day, 92 (30.7%) consumed two meals, and 190 (63.3%) consumed three meals daily.

Table 4 shows the relationship between dietary compliance and the presence of diabetes-related complications. Patients with complications demonstrated lower full compliance (20.4%) and higher non-compliance (34.4%) compared to those without complications, among whom 40.1% were fully compliant and only 11.0% were non-compliant. This suggests a potential association between poor dietary compliance and the occurrence of complications.

Table 4 Dietary Compliance in Diabetic Patients Based on the Presence of Complications

Presence of complication	Full compliant	Partial compliant	Non-compliant
With complication	19 (20.4%)	42 (45.2%)	32 (34.4%)
Without complication	73 (40.1%)	89 (48.9%)	20 (11.0%)

Discussion

This study assessed dietary compliance and its associated demographic and clinical factors among 300 diabetic patients at Bayazid Rokhan Teaching Hospital. Our findings revealed moderate levels of dietary adherence, significant demographic trends, and a strong association between compliance and the duration of diabetes and complications. These results resonate with international literature, reinforcing the importance of integrated, patient-centered dietary interventions.

Only 35.3% of participants were fully compliant with dietary recommendations, while 45.7% were partially compliant and 19% were non-compliant. This level of adherence is comparable to a study in Bangladesh, where 36% of diabetic patients demonstrated good glycemic control and reported dietary adherence as a major influencing factor (19). Similarly, Aschalew *et al.* (20) reported a 38.5% dietary compliance rate among Ethiopian patients, highlighting global challenges in sustaining proper diabetic nutrition practices. A decline in adherence with increasing diabetes duration—where only 20.3% of patients with over 10 years of diabetes were fully compliant—is consistent with previous reports showing that long disease duration is linked to "compliance fatigue" and treatment burnout (21).

In our study, the average patient age was 56.8 years, with the majority between 51–60 years old. Older adults may experience more comorbid conditions and limited adaptability to dietary modifications, which likely impacts adherence. Previous studies have shown that younger diabetic patients often demonstrate higher levels of dietary compliance, possibly due to better health literacy and motivation for long-term disease control (22).

Gender analysis indicated a predominance of male participants (61%), but the literature often suggests that **female patients** show better adherence to dietary regimens due to stronger health-seeking behavior and family involvement (23). Occupational status also played a role in our cohort: 58.7% held sedentary jobs, which may contribute to higher BMI and related complications, reinforcing findings from Shah et al. (24), who linked inactivity with poor disease control in diabetics.

Interestingly, 70.7% of patients were aware of dietary compliance's role in diabetes management, but only about half acted on that knowledge. This "knowledge–practice gap" is widely documented, especially in low-resource settings, where access to

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dietitians and culturally adapted educational tools is limited (25). Alrahbi (26) further emphasizes that health literacy, especially regarding nutrition labels and portion control, plays a critical role in dietary adherence.

Our results also reveal a clear relationship between dietary non-compliance and diabetes-related complications. Patients with complications had much lower full compliance (20.4%) compared to those without complications (40.1%). Non-compliance was also significantly higher (34.4% vs. 11%). These trends mirror findings by Baig et al. (27), who reported that inadequate dietary adherence is a significant predictor of complications such as neuropathy, nephropathy, and cardiovascular disease.

Meal frequency analysis showed that most participants (63.3%) ate three meals daily. However, frequency alone does not determine compliance; quality, portion control, and food choices are more impactful. Notably, 71% expressed willingness to improve dietary practices. While this intention is promising, behavioral theories like Ajzen's (28) Theory of Planned Behavior suggest that intention alone is insufficient without environmental and social support systems.

Innovative approaches may help bridge this gap. For example, a recent systematic review highlighted the potential of artificial intelligence (AI) tools in supporting dietary monitoring and personalized nutrition for metabolic disorders, including diabetes (29). Such technologies, integrated with mobile health platforms, could empower patients to sustain dietary compliance.

Limitations

Despite the strengths of this study, several limitations must be acknowledged. First, the single-center setting at Bayazid Rokhan Teaching Hospital may limit the generalizability of the findings to broader populations. Second, the cross-sectional design restricts the ability to establish causal relationships between dietary compliance and related factors such as complications or disease duration.

Conclusion

This study provides valuable insights into the patterns of dietary compliance among diabetic patients at Bayazid Rokhan Teaching Hospital. Despite a majority of patients being aware of the importance of dietary management in diabetes, only 35.3% were fully compliant with dietary recommendations. The level of compliance was significantly influenced by the duration of diabetes, with longer disease duration associated with lower adherence rates. Additionally, the presence of diabetes-related complications was closely linked to poor dietary compliance, emphasizing the clinical consequences of non-adherence.

Demographic factors such as age, occupational activity, and residential status also played a role in shaping dietary behaviors. While most participants consumed three meals per day, meal quality, portion control, and intent to modify dietary habits appeared more relevant in determining compliance. Encouragingly, a substantial proportion of patients (71%) expressed a willingness to improve their dietary practices, indicating a potential area for intervention.

Overall, these findings underscore the need for targeted nutritional education, continuous counseling, and structured behavior change strategies tailored to individual patient profiles. Future interventions should also integrate digital and community-based tools to reinforce long-term dietary adherence and reduce complication rates among diabetic populations.

Recommendations

Based on the study findings, the following recommendations are proposed for patients, healthcare providers, and system-level stakeholders to improve dietary compliance and diabetes management:

For Patients and Caregivers

- Attend regular medical consultations to receive dietary guidance and monitor glucose levels.
- Maintain consistent adherence to dietary recommendations, especially for long-term diabetics.
- Communicate any difficulties with dietary compliance to healthcare providers for support.

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For Healthcare Professionals

- Educate patients on the importance of dietary adherence in managing diabetes and preventing complications.
- Incorporate regular follow-ups to assess and support dietary compliance.
- Reinforce dietary guidance as a core part of diabetes treatment.

For Health System Leaders

- Launch public awareness campaigns on the role of diet in diabetes control.
- Deploy community nutrition teams to deliver education in rural and underserved areas.
- Integrate nutrition counseling into routine primary healthcare services.

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Conflict of Interest

The authors declare that they have no conflict of interest related to this study.

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