Texila International Journal of Academic Research
ISSN: 2520-3088
DOI: 10.21522/TIJAR.2014.12.03.Art029

# Dietary Adherence and its Impact on Glycemic Control among Type 2 Diabetes Patients at Tema General Hospital, Ghana

Aquel Rene Lopez*, Maxline Atsu, Michael Mark Addae
*School of Allied Health Science, Baldwin University College, Accra, Ghana*

***Abstract***

*Type 2 diabetes mellitus (T2DM) is a chronic metabolic disorder with rising prevalence worldwide, particularly in developing countries like Ghana. Dietary adherence is a crucial component of diabetes management and glycemic control. This study aimed to assess the level of dietary adherence and its association with glycemic control among adults with T2DM attending the Tema General Hospital (TGM). A cross-sectional study was conducted among 140 T2DM patients recruit Hospital (e diabetic clinic using convenience sampling. Data were collected using structured questionnaires and laboratory assessments (fasting blood glucose and HbA1c). Descriptive statistics summarized the demographic and clinical characteristics. Chi-square tests and logistic regression models were used to examine associations between dietary adherence and glycemic control. Among the participants, 60% achieved good glycemic control (HbA1c <7%). Although 74% of participants demonstrated good dietary knowledge, only 69% had been referred to a dietician. Patients with good dietary adherence were 12.3 times more likely to achieve optimal glycemic control compared to those with poor adherence (adjusted odds ratio [aOR] = 12.33, 95% CI: 3.64–41.75, p <0.001). Referral to a dietician significantly increased the likelihood of good glycemic control (aOR = 4.20, 95% CI: 1.47–12.01, p =0.007). Dietary adherence and dietician referral are significant predictors of glycemic control among adults with T2DM. Strengthening dietary counseling and patient education should be prioritized to improve diabetes outcomes.*

***Keywords:*** *Dietary Adherence, Dietician Referral, Glycemic Control, Type 2 Diabetes.*

## Introduction

Diabetes mellitus (DM) is a serious, chronic metabolic disorder that arises either when the pancreas fails to produce sufficient insulin, the hormone regulating blood glucose, or when the body cannot effectively utilize the insulin produced [1]. As one of the four priority noncommunicable diseases (NCDs) identified by global health authorities, diabetes represents a growing public health concern. Hyperglycemia, the hallmark of diabetes, leads to classic symptoms such as frequent urination, excessive thirst, increased hunger, and weight loss [2]. The lack or ineffective action of insulin results in elevated blood glucose levels, which define the diabetic state [3].

The World Health Organization classifies diabetes into three main types: type 1 diabetes, type 2 diabetes, and gestational diabetes mellitus [4]. Type 1 diabetes, caused by autoimmune destruction of pancreatic beta cells, has a sudden onset and requires lifelong insulin therapy (International Diabetes Federation, 2015) [2]. While the exact causes of type 1 diabetes remain unknown, environmental, genetic, and dietary factors are implicated [5]. Type 2 diabetes, also known as non-insulin-dependent or adult-onset diabetes, is the most common form and is primarily linked to sedentary lifestyles, obesity, and aging [4, 6]. Gestational diabetes, a temporary condition during pregnancy, increases the risk

***Received: 16.05.2025*** ***Accepted: 21.05.2025*** ***Published on: 31.07.2025***
****Corresponding Author: lonnet2001@yahoo.com***

of developing type 2 diabetes later in life and contributes to pregnancy complications [4, 7].

Type 2 diabetes often presents subtly, with symptoms like thirst, blurred vision, fatigue, slow-healing wounds, and neuropathic sensations in the extremities [10]. If undiagnosed or poorly managed, it can lead to severe complications, including cardiovascular disease, stroke, renal failure, blindness, and limb amputation [8]. Alarmingly, over 50% of individuals with diabetes remain unaware of their condition until complications develop [10].

Globally, diabetes contributes significantly to premature mortality, accounting for approximately 5% of deaths and projected to rise by 50% over the next decade, with 80% of these deaths occurring in low- and middle-income countries [7, 9]. In 2014, 422 million people were living with diabetes, a figure that increased to 425 million in 2017 and is expected to rise to 629 million by 2045 [10].

Sub-Saharan Africa faces a dual burden of infectious and noncommunicable diseases, with an estimated diabetes prevalence of 16% [12]. In Africa, 14A million adults were living with type 2 diabetes in 2017, resulting in over 298,000 deaths (6% of all deaths), and the number is expected to double by 2045 [10]. Ghana, specifically, reported a prevalence of 4% in 2017, with projections estimating nearly one million cases by 2045.[10].

The risk factors for type 2 diabetes include unhealthy diets, physical inactivity, obesity, aging, ethnicity, and family history. Glycemic control, achieved through lifestyle modification such as adherence to dietary plans, cessation of smoking, and regular physical activity, is central to diabetes management [3]. Effective dietary management reduces the risk of complications such as diabetic retinopathy, hypertension, stroke, kidney failure, peripheral arterial disease, and amputations [13, 14]. However, despite available evidence, managing diabetes remains a major challenge, particularly in resource-constrained settings like Ghana [15].

## Materials and Methodology

### Study Design

A descriptive cross-sectional study design was used with quantitative methods to determine how adherence to dietary recommendations affects glycemic control in adults with type 2 diabetes mellitus. Dietary adherence implies the process of following a diet plan by means of self-monitoring, maintaining, and preventing relapses [16]. Diet adherence is facilitated by antecedents which comprise motivation, understanding the dietary recommendations, developing appropriate health beliefs, self-efficacy, setting achievable goals, and receiving social support.

### Study Area and Site

The study was conducted at the Tema West Municipal (Tema General Hospital). The Municipal Assembly was carved from the Tema Metropolitan Assembly on March, 2018 and was established with Legislative Instrument (LI) 2317. The Municipal Assembly shares boundaries with Krowor Municipality to the West, Adentan to the North –West, Kpone to the North, Ashaiman Municipality to the North - East, and the Tema to the East, with the Gulf of Guinea sharing the south-eastern boundaries [11]. Community 2 is the District capital of the Tema West Municipal Assembly and is located at the south eastern part of the Municipality, and lies close to the coast. The location of the Municipality makes it economically viable in relation to the many Companies and Industries existing in the area. The total population of the Municipality was 125,046 according to the 2010 Population and Housing Census. This is made up of 48.2% male and 51.8%. female [11].

### Study Population

Both male and female adult patients with type 2 diabetic mellitus seeking healthcare at

the diabetic clinic at Tema General Hospital were enrolled in this study. T2DM patients were identified by using patients' folders where medical physicians have confirmed diagnosis of the condition using consistently high Fasting Blood Sugar (FBS) results greater or equal to 126 mg/dL (7.0 mmol/L) and RBS results greater or equal to 200 mg/dL (11.1 mmol/L).

### Inclusion Criteria

Participants were included in the study if they met the following criteria:

1. Adults aged 30 years or older with a confirmed diagnosis of type 2 diabetes mellitus (T2DM).
2. Provided written informed consent for participation.
3. Had documented glycated hemoglobin (HbA1c) test results or three consecutive fasting blood glucose (FBS) measurements obtained within the three months preceding the study.

### Exclusion Criteria

Participants were excluded from the study if they met any of the following criteria:

1. Presence of cognitive impairment that precluded the ability to provide informed consent.
2. Pregnant women diagnosed with diabetes.
3. Non-ambulatory patients with type 2 diabetes mellitus.

### Sampling Collection and Preparation

After a fasting period of 8 to 14 hours or overnight, peripheral venous blood samples were collected from consenting participants for the determination of Fasting Blood Glucose and HbA1c. The samples were collected into an evacuated EDTA-coated specimen for HbA1c.

## Results

### Background Characteristics of Study Participants

A total of 140 participants participated in the study with females being the majority (71%). The mean age of the participants was 52.26 ± 11.84 years with a minimum age of 30 years and maximum age of 78 years. About half (50.7%) of all study participants were married. Christians constituted a greater majority of the study participants (91.4%).

Findings on disease condition show that most study participants (78%) had lived with T2DM for over 2 years. While 69% of participants reported they had hypertension, 28% reported no disease complication. Other details on participant's sociodemographic and economic characteristics are shown in Table.1.

**Table 1.** Background Characteristics of Study Participants (N = 140)

| Variable | Category | Number (%) |
|---|---|---|
| Age in Years | 30–39 | 22 (15.71) |
| | 40–49 | 21 (15.00) |
| | 50–59 | 57 (40.71) |
| | 60–69 | 32 (22.86) |
| | 70 & Above | 8 (5.71) |
| Sex | Male | 32 (22.86) |
| | Female | 108 (77.14) |
| Marital Status | Married | 71 (50.71) |
| | Single | 12 (8.57) |
| | Separated | 27 (19.29) |
| | Widow/Widower | 30 (21.43) |

| | | |
|---|---|---|
| Level of Education | No formal education | 39 (27.86) |
| | Elementary | 48 (34.29) |
| | JHS | 24 (17.14) |
| | SHS Education | 15 (10.71) |
| | Tertiary Education | 14 (10.00) |
| Religion | Christianity | 128 (91.43) |
| | Muslim | 12 (8.57) |
| Occupation | Managers | 5 (3.57) |
| | Professional/Skilled | 33 (23.57) |
| | Retired | 21 (15.00) |
| | Agricultural | 2 (1.43) |
| | Service and Sales | 65 (46.43) |
| | Unemployed | 14 (10.00) |
| Estimated Income Level | < Gh₵200 | 87 (62.14) |
| | Gh₵200 – Gh₵499 | 38 (27.14) |
| | Gh₵500 – Gh₵999 | 12 (8.57) |
| | Gh₵1,000 – Gh₵1,999 | 3 (2.14) |
| Duration of Disease | Within a year | 50 (35.71) |
| | 2 to 5 years | 63 (45.00) |
| | 5 to 9 years | 15 (10.71) |
| | 10 to 19 years | 8 (5.71) |
| | 20 years and Above | 4 (2.86) |
| Disease Complications | Neuropathy (Nerve disease) | 4 (2.86) |
| | No disease complications | 40 (28.57) |
| | Hypertension (High BP) | 96 (68.57) |

**Glycemic Control Among People with T2DM Presenting at the TGH**

The study examined glycemic control among study participants. In all, 60% of study participants had good glycemic control indicated by glycosylated haemoglobin (HbA1c) or mean fasting blood sugar (FBS) less than 7.0% or 7.0mml/L respectively. Good glycemic control <7% and poor glycemic control >8%.

**Association between Background Characteristics and Glycemic Control among People with T2DM Presenting at the TGH**

The study examined the association between socio-economic characteristic and the outcome of interest (glycemic control) among study participants. A chi-square analysis was run comparing each socio-economic characteristic with glycemic control. The results are in Table

2. below. The analysis shows that, none of the socio-economic variables were significantly associated with glycemic control.

**Table 2.** Association between Background Characteristics and Glycemic Control among People with T2DM presenting at the TGH

| Variable | Good Glycemic Control (%) | Poor Glycemic Control (%) | Chi-Square | P-Value |
|---|---|---|---|---|
| Age in Years | | | 6.19 | 0.185 |
| 30–39 | 16 (19.05) | 6 (10.71) | | |
| 40–49 | 15 (17.86) | 6 (10.71) | | |
| 50–59 | 28 (33.33) | 29 (51.79) | | |
| 60 & above | 25 (29.76) | 15 (26.78) | | |
| Sex | | | 0.01 | 0.935 |
| Male | 19 (22.62) | 13 (23.21) | | |
| Female | 65 (77.38) | 43 (76.79) | | |
| Marital Status | | | 1.18 | 0.758 |
| Married | 40 (47.62) | 31 (55.36) | | |
| Single/Separated/Widow/Widower | 44 (52.28) | 25 (53.57) | | |
| Level of Education | | | 2.51 | 0.643 |
| No formal education | 24 (28.57) | 15 (26.79) | | |
| Elementary/JHS | 44 (52.39) | 28 (50.00) | | |
| SHS/Tertiary | 16 (19.04) | 13 (23.21) | | |
| Religion | | | 1.16 | 0.280 |
| Christianity | 75 (89.29) | 52 (94.55) | | |
| Muslim | 9 (10.71) | 3 (5.45) | | |
| Occupation | | | 1.59 | 0.901 |
| Managers/Professional/Skilled | 23 (27.38) | 15 (26.79) | | |
| Retired/Unemployed | 22 (26.19) | 13 (23.21) | | |
| Agricultural | 1 (1.19) | 1 (1.79) | | |
| Service and Sales | 38 (45.24) | 27 (48.21) | | |

## Association between lifestyle Factors and Glycemic Control among People with T2DM Presenting at the TGH

The study collected information on lifestyle factors such as tobacco smoking, alcohol consumption, and utilization of dietetic services, medication and physical activity. From the analysis, none of the study participants smoked tobacco and 81% of them did not consume alcohol at all.

With regards to dietetic services, 69% of participants reported to have been referred to a dietician since they were diagnosed. However, 26% of those who saw a dietician reported that they sometimes miss appointment with their dietician. More than half (55%) of the study participants reported high adherence to medication with only 10% reporting low medication adherence. Over half of the study participants (51%) were found to be physically inactive.

To determine the association between relevant lifestyle characteristic and glycemic control, X2 statistics was explored comparing

each of the lifestyle variable with glycemic control. Results in Table 3. shows that only 'referred to a dietician after diagnosis' (X2 (1) = 26.630, p<0.0001) was significantly associated with glycemic control. All other factors (smoking, frequency of alcohol consumption, miss dietician appointment, and last visit to a dietician, medication adherence and physical activity) were not significantly associated with glycemic control.

**Table 3.** Association between Lifestyle Factors and Glycemic Control among People with T2DM Presenting at the TGH

| **Variable** | **Good Glycemic Control (%)** | **Poor Glycemic Control (%)** | **Chi-Square** | **P-Value** |
|---|---|---|---|---|
| Smoking | | | | |
| Yes | 0 (0.00) | 0 (0.00) | | |
| No | 84 (100.00) | 56 (100.00) | | |
| Frequency of Alcohol Consumption | | | 2.26 | 0.322 |
| Every Day | 0 (0.00) | 0 (0.00) | | |
| < 3 times a week | 4 (4.76) | 1 (1.79) | | |
| Few times in a month/year | 10 (11.90) | 11 (19.64) | | |
| Not at all | 70 (83.33) | 44 (78.57) | | |
| Referred to a Dietician After Diagnosis | | | 26.63 | <0.0001 |
| Yes | 72 (85.71) | 25 (44.64) | | |
| No | 12 (14.29) | 31 (55.36) | | |
| Miss Dietician Appointments | | | 0.53 | 0.463 |
| Yes | 29 (40.28) | 8 (32.00) | | |
| No | 43 (59.72) | 17 (68.00) | | |
| Last Visit to the Dietician | | | 5.25 | 0.154 |
| One month ago | 6 (8.33) | 5 (20.00) | | |
| Two months ago | 9 (12.50) | 6 (24.00) | | |
| More than three months | 14 (19.44) | 4 (16.00) | | |
| More than six months | 43 (59.72) | 10 (40.00) | | |
| Medication Adherence | | | 0.33 | 0.848 |
| High | 44 (52.38) | 32 (57.14) | | |
| Medium | 31 (36.90) | 19 (33.93) | | |
| Low | 9 (10.71) | 5 (8.93) | | |

## Knowledge on Dietary Recommendations for T2DM Among People with T2DM Presenting at the TGM

The study assessed the knowledge of participants on dietary recommendations for the management of T2DM. With regards to the total knowledge scores, the results show that 66% of study participants had good dietary knowledge. Details of participants' knowledge on dietary recommendations are presented in Table 4.

All study participants knew that fried foods are high in fat but only a half (51%) knew that not all fats and oils increase blood cholesterol levels. More than 80% of participants answered

'No' when asked the question 'Fruit juice can be drunk freely with little effect on BGL' but 11% had no knowledge on the effect of consumption of fruit juice on blood glucose. Although 97% of participants knew that Starchy foods raise blood glucose levels, about 60% of them believed that sugary foods require more insulin than starchy foods regardless of Carbohydrate content.

**Table 4.** Knowledge on Dietary Recommendations for T2DM among People with T2DM Presenting at the TGH

| **Variables** | **Yes (%)** | **No (%)** | **Don't Know (%)** |
|---|---|---|---|
| Restricting salt reduces blood pressure | 123 (87.86%) | 4 (2.86%) | 13 (9.29%) |
| Sugary foods raise BGL | 131 (93.57%) | 4 (2.86%) | 5 (3.57%) |
| Fried foods are high in fat | 140 (100%) | 0 (0.0%) | 0 (0.0%) |
| Pastry/cakes are high in fat | 107 (76.43%) | 9 (6.43%) | 24 (17.14%) |
| Diabetic products can be eaten freely without weight gain | 12 (8.57%) | 52 (37.14%) | 76 (54.29%) |
| Starchy foods raise BGL | 136 (97.14%) | 0 (0.0%) | 4 (2.86%) |
| It is not possible to eat too much protein | 34 (24.29%) | 47 (33.57%) | 59 (42.14%) |
| Any amount of fresh fruit can be eaten with little effect on BGL | 26 (18.57%) | 110 (78.57%) | 4 (2.86%) |
| Fruit juice can be drunk freely with little effect on BGL | 10 (7.14%) | 114 (81.43%) | 16 (11.43%) |
| Alcohol-free wines/lagers have no effect on BGL | 22 (15.71%) | 53 (37.86%) | 65 (46.43%) |
| Cheese/biscuits are less fattening than cake | 20 (14.29%) | 23 (16.43%) | 97 (69.29%) |
| Margarines/spreads have less energy than butter | 51 (36.43%) | 15 (10.71%) | 74 (52.86%) |
| Protein raises BGL | 58 (41.43%) | 37 (26.43%) | 45 (32.14%) |
| People with diabetes need to avoid foods containing any sugar | 73 (52.14%) | 63 (45.00%) | 4 (2.86%) |
| All fats and oils increase cholesterol levels | 72 (51.43%) | 18 (12.86%) | 50 (35.71%) |
| Full-fat foods affect BGL more than low-fat foods | 121 (86.43%) | 2 (1.43%) | 17 (12.14%) |
| Sugary foods require more insulin than starchy foods regardless of CHO content | 80 (57.14%) | 2 (1.43%) | 58 (41.43%) |

## Dietary Adherence Among People with T2DM Presenting at the TGH

Frequency of intake of the food in the various food groups are shown in Table 5. None of the study participant reported consumption of sweets as dessert over the last month. Less than 50% of the participants reported eating a portion of vegetables more than five times to everyday in a week with about 33% eating vegetables once a week or less often over the last month. However, with fruit consumption, only 22% of participants reported to eating a

portion of fruit more than five times to everyday in a week with about 50% of respondent consuming fruits less often in a month. Majority of study participants (76%) never consumed sugary drinks over the last month and 70% of participants never ate 'fast foods' like fried rice, pizza or burgers over the last month. With regards to the total dietary adherence, the results show that 69% of study participants adhered to dietary recommendations.

**Table 5.** Food Frequency and Consumption Behavior among People with T2DM Presenting at the TGH

| **Foods / Dietary Behaviors** | **Never or Very Rarely** | **Once a Week or Less** | **2–4 Times a Week** | **5–6 Times to Everyday** |
|---|---|---|---|---|
| Eat a portion of vegetables | 3 (2.14) | 46 (32.86) | 28 (20.00) | 63 (45.00) |
| Eat a portion of fruit | 20 (14.29) | 69 (49.29) | 20 (14.29) | 31 (22.14) |
| Eat a cake, a sweet pastry | 90 (64.29) | 2 (1.43) | 46 (32.86) | 2 (1.43) |
| Sugary Drinks | 106 (75.71) | 18 (12.86) | 14 (10.00) | 2 (1.43) |
| Full-Fat Spread | 92 (65.71) | 3 (2.14) | 43 (30.71) | 2 (1.43) |
| Full Fat Milk | 93 (66.43) | 6 (4.29) | 33 (23.57) | 8 (5.71) |
| Skimmed Milk | 115 (82.14) | 8 (5.71) | 15 (10.71) | 2 (1.43) |
| Non-Dairy Milk | 125 (89.29) | 4 (2.86) | 3 (2.14) | 8 (5.71) |
| Processed Meat | 84 (60.00) | 28 (20.00) | 26 (18.57) | 2 (1.43) |
| Salty Foods | 116 (87.86) | 13 (9.29) | 11 (7.86) | 0 (0.00) |
| Salty Pastry | 82 (58.57) | 28 (20.00) | 27 (19.29) | 3 (2.14) |
| *Fast Foods | 98 (70.00) | 21 (15.00) | 21 (15.00) | 0 (0.00) |
| Eat some sweets or a bar of chocolate | 127 (91.43) | 1 (0.71) | 10 (7.14) | 2 (1.43) |
| Eat sweets for dessert, apart from fruit | 140 (100) | 0 (0.00) | 0 (0.00) | 0 (0.00) |
| *Eat Oily fish | 23 (16.43) | 24 (17.14) | 46 (32.86) | 47 (33.57) |
| Have 3 or more regular meals in a day | 39 (27.86) | 24 (17.14) | 15 (10.71) | 62 (44.29) |
| Eat breakfast within about 2 hours of waking | 41 (29.29) | 22 (15.71) | 17 (12.14) | 60 (42.86) |
| Snack on high-fat/sugar foods between meals | 91 (65.00) | 24 (17.14) | 12 (8.57) | 13 (9.29) |
| Eat a portion of bread like 1 slice of bread | 17 (12.14) | 14 (10.00) | 23 (16.43) | 86 (61.43) |
| Choose higher fibre breads like wheat bread | 8 (5.71) | 29 (20.71) | 7 (5.00) | 96 (68.57) |
| Eat a bowl of breakfast cereal like porridge | 35 (25.00) | 18 (12.86) | 16 (11.43) | 71 (50.71) |
| Choose higher fibre cereals like oats | 35 (25.00) | 15 (10.71) | 14 (10.00) | 76 (54.29) |

**Fast foods: fried rice, pizza or noodles # Oily fish: fresh or tinned salmon, sardine*

## Factors Associated with Good Glycemic Control among People with T2DM Presenting at the TGH

At the bivariate level, no significant association was observed between socio-demographic characteristics (age, sex, marital status, education and occupation), alcohol consumption, medication adherence, physical activity and good glycemic control (p>0.05). Dietary adherence, referral to a dietician after being diagnosed with diabetes and perceived family support were found to be significantly associated with glycemic control (p<0.05). Respondents with good dietary adherence were 19.8 times likely to have good glycemic control as compared with respondents with poor dietary adherence (UOR=19.8, 95% CI: 7.67, 51.06, p<0.001) and the association was significant. Additionally, respondents referred to a dietician after being diagnosed with diabetes were 7.43 times more likely to have good glycemic control compared with those who were not referred (UOR=7.43, 95%CI: 3.32, 16.67; p<0.001). Respondents with high perceived family support were about six times more likely to have good glycemic control than respondents with low perceived family support (UOR=5.95, 95%CI: 2.83, 12.49; p<0.0001).

After controlling for the effect of socio-demographic characteristics (age, sex, marital status, education, occupation and monthly income), alcohol consumption, medication adherence, physical activity, referred to a dietician after diagnosis and family support in the adjusted model, dietary adherence was significantly associated with good glycemic control (p<0.0001). The odds of having good glycemic control was 12.3 times greater among respondents with good dietary adherence compared with those with poor dietary adherence (aOR=12.33, 95%CI: 3.64, 41.75; p<0.001).

After controlling for the effect of socio-demographic characteristics, alcohol consumption, medication adherence and physical activity, a significant association was also observed between referral to a dietician and good glycemic control (p=0.007). Respondents, referred to a dietician after being diagnosed with diabetes were 4.2 times more likely to have good glycemic control compared with those who were not referred (aOR=4.20, 95%CI: 1.47, 12.01; p=0.007). Although high perceived family support was significantly associated with good glycemic control in the crude analysis, its significance disappeared after adjusting for the effect of socio-demographic characteristics and other variables in the adjusted model (aOR=2.05, 95%CI: 0.72, 5.82; p=0.177). Results are shown in Table 6.

**Table 6**. Logistic Regression Model of Factors Associated with Good Glycemic Control Among People with T2DM Presenting at the TGH.

| **Variables** | **UOR** | **95% CI** | **p-value** | **aOR** | **95% CI** | **p-value** |
|---|---|---|---|---|---|---|
| Age | 0.98 | 0.95, 1.02 | 0.409 | 1.01 | 0.95, 1.05 | 0.793 |
| Sex (Ref= Male) | | | | | | |
| Female | 1.03 | 0.46, 2.31 | 0.935 | 0.81 | 0.24, 2.76 | 0.737 |
| Marital Status (Ref= Not married) | | | | | | |
| Married | 0.73 | 0.37, 1.44 | 0.370 | 0.87 | 0.32, 2.42 | 0.802 |
| Education (Ref= No formal education) | | | | | | |
| Basic education | 0.98 | 0.44, 2.18 | 0.965 | 0.72 | 0.22, 2.33 | 0.585 |
| SHS & above | 0.76 | 0.28, 2.04 | 0.598 | 0.67 | 0.14, 3.15 | 0.651 |
| Occupation (Ref= Unemployed) | | | | | | |
| Employed | 0.85 | 0.38, 1.87 | 0.690 | 1.17 | 0.35, 3.86 | 0.788 |
| Alcohol Consumption (Ref= Yes) | | | | | | |
| No | 1.36 | 0.57, 3.21 | 0.479 | 2.43 | 0.69, 8.56 | 0.166 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Referred to a dietician (Ref= No) | | | | | | |
| Yes | 7.43 | 3.32, 16.67 | <0.0001 | 4.20 | 1.47, 12.01 | 0.007 |
| Medication Adherence (Ref= Low) | | | | | | |
| Medium | 0.91 | 0.26, 3.11 | 0.876 | 0.54 | 0.08, 3.50 | 0.522 |
| High | 0.76 | 0.23, 2.49 | 0.656 | 0.43 | 0.07, 2.50 | 0.350 |
| Physical Activity (Ref= Low) | | | | | | |
| High | 1.75 | 0.38, 1.47 | 0.408 | 0.70 | 0.27, 1.81 | 0.464 |
| Dietary adherence (Ref = Poor) | | | | | | |
| Good | 19.8 | 7.67, 51.06 | <0.0001 | 12.33 | 3.64, 41.75 | <0.0001 |
| Perceived Family Support (Ref= Low) | | | | | | |
| High Support | 5.95 | 2.83, 12.49 | <0.0001 | 2.05 | 0.72, 5.82 | 0.177 |

## Discussion

This study explored the relationship between dietary adherence and glycemic control among adults with type 2 diabetes mellitus (T2DM) at Tema General Hospital (TGH). The findings revealed that 60% of participants achieved good glycemic control, which aligns with findings from similar studies in Ghana [22] and Kinshasa [12], highlighting the growing effectiveness of diabetes management interventions in urban health facilities.

A significant proportion (66%) of respondents demonstrated good dietary knowledge, particularly regarding the effects of sugar and starch on blood glucose levels. However, gaps were evident in areas such as fat and cholesterol content in foods, similar to findings in Ireland [17]. This suggests a need to intensify education around dietary fats and cholesterol to improve comprehensive dietary literacy.

In terms of adherence, 69% of respondents followed dietary recommendations—a rate consistent with other studies in Nigeria [18] and higher than findings from Ethiopia [19]. This could be attributed to high referral rates to dieticians (69%) and regular access to nutritional counselling at TGH. Moreover, this suggests that professional dietary guidance significantly enhances adherence.

The study found that referral to a dietician was significantly associated with good glycemic control ($p < 0.0001$), reinforcing earlier research [20, 21]. These results underline the importance of structured nutritional care in diabetes management and the need for physician-dietician collaboration.

Although 55% of participants adhered to medication and 81% abstained from alcohol, these factors were not significantly associated with glycemic control. Similarly, physical activity levels were low (only 49% were active), possibly due to environmental constraints and comorbidities such as hypertension, reflecting trends noted in other studies [23, 24].

These results collectively highlight that while medication and general lifestyle factors matter, dietary adherence and timely referral to a dietician are the most influential determinants of glycemic outcomes in this setting.

## Conclusion

The study concludes that dietary adherence and referral to a dietician significantly influence glycemic control among T2DM patients at TGH. Despite good general knowledge and positive medication adherence rates, only these two factors emerged as significant predictors. The findings affirm that nutrition plays a central role in diabetes management and support the rejection of the null hypothesis. Therefore, there is a statistically significant association between

dietary adherence and glycemic control in this population.

## Recommendation

1. Educational sessions on clinic days should focus on deepening understanding of fats, oils, and balanced diets, and target all patients regardless of their perceived knowledge level.
2. Healthcare providers should integrate dietary adherence assessments into routine reviews to promptly identify patients at risk of poor control.
3. Hospital management must enforce and monitor strict compliance with referral protocols between physicians and dieticians to improve patient outcomes.
4. Structured collaboration between dieticians, nurses, and physicians should be institutionalized to offer comprehensive diabetes care.
5. Interventions such as patient counselling and community programs should be developed to tackle physical inactivity, especially among those with hypertension or other comorbidities.

## Conflict of Interest

There is no conflict of interest.

## Acknowledgment

I will like to thank the department of Dietetics and Medical Laboratory Science for their support towards this work**.**

## Reference

[1]. World Health Organization. 2016, Global report on diabetes. Geneva: *WHO Press*.

[2]. International Diabetes Federation. 2015, IDF diabetes atlas (7th ed.). *Brussels: IDF*.

[3]. International Diabetes Federation. 2017, IDF diabetes atlas (8th ed.). *Brussels: IDF*.

[4]. World Health Organization. 2016, Classification of diabetes mellitus 2016. Geneva: *WHO*.

[5]. You, W. P., & Henneberg, M., 2016, Type 1 diabetes prevalence increasing globally and regionally: The role of natural selection and life expectancy at birth. *BMJ Open Diabetes Research & Care*, *4*(1), e000161. https://doi.org/10.1136/bmjdrc-2015-000161

[6]. Sakane, N., Kotani, K., Tsuzaki, K., Tsujita, M., & Ishizaka, N., 2011, Lifestyle interventions for prevention of diabetes: Current and future perspectives. *Journal of Clinical Medicine Research*, *3*(4), 189–192.

[7]. National Diabetes Fact Sheet. 2011, National diabetes fact sheet: National estimates and general information on diabetes and prediabetes in the United States, 2011. Atlanta, *GA: Centers for Disease Control and Prevention*.

[8]. Garber, A. J., Abrahamson, M. J., Barzilay, J. I., Blonde, L., Bloomgarden, Z. T., Bush, M. A., ... & Umpierrez, G. E., 2013, American Association of Clinical Endocrinologists' comprehensive diabetes management algorithm 2013 consensus statement. *Endocrine Practice*, *19*(Suppl 2), 1–48. https://doi.org/10.4158/EP13176.CS

[9]. Zheng, Y., Ley, S. H., & Hu, F. B., 2018, Global aetiology and epidemiology of type 2 diabetes mellitus and its complications. *Nature Reviews Endocrinology*, *14*(2), 88–98. https://doi.org/10.1038/nrendo.2017.151

[10]. International Diabetes Federation. 2017b, *IDF diabetes atlas* (8th ed.). *Brussels: IDF*.

[11]. Ghana Statistical Service. 2014, 2010 Population and Housing Census: District Analytical Report - Tema West Municipality. *Accra: GSS*.

[12]. Longo-Mbenza, B., Muaka, M. M., Nzita, V. N., & Mbungu, F., 2008, Risk factors of diabetes mellitus in Central Africa: A 10-year cohort study. *International Journal of Cardiology*, *131*(2), 275–277. https://doi.org/10.1016/j.ijcard.2007.09.004

[13]. Iunes, R. F., Caires de Souza, R. A., Barros, E. A., Bernardino, E., Medeiros, A., & Tavares, M. C., 2014, Effect of educational interventions on primary care for diabetic patients: A systematic review. *International Journal of Environmental Research*

*and Public Health*, *11*(9), 8822–8839. https://doi.org/10.3390/ijerph110908822

[14]. Shah, M., & Mueller, T., 2012, Diet and diabetes control: Review of the literature. *American Journal of Lifestyle Medicine*, *6*(6), 421–428.

[15]. Wagner, E. H., & Brath, H., 2012, A global perspective on diabetes prevention and management. *Preventing Chronic Disease*, *9*, E110. https://doi.org/10.5888/pcd9.110302

[16]. Al-Salmi, N. A., Al-Rashidi, R. S., & Al-Otaibi, F. E., 2022, Factors influencing dietary adherence among patients with type 2 diabetes: A review. *Saudi Journal of Health Science*, *11*(1), 10–17. https://doi.org/10.4103/sjhs.sjhs_110_21

[17]. Breen, C., Ryan, M., Gibney, M. J., O'Shea, D., & O'Sullivan, M., 2016, Diabetes-related nutrition knowledge and dietary intake among adults with type 2 diabetes in Ireland. *British Journal of Nutrition*, *115*(7), 1390–1397. https://doi.org/10.1017/S0007114516000223

[18]. Agofure, O., & Emmanuel, O., 2015, Dietary adherence among patients with type 2 diabetes in Delta State, Nigeria. *Nigerian Journal of Medicine*, *24*(3), 225–230.

[19]. Worku, A., Mekonnen, A., & Tesfaye, H., 2015, Dietary practice and associated factors among type 2 diabetic patients: A cross-sectional hospital based study, Addis Ababa, Ethiopia. *Journal of Diabetes and Metabolism*, *6*(8), 579. https://doi.org/10.4172/2155-6156.1000579

[20]. Coppell, K. J., Kataoka, M., Williams, S. M., Chisholm, A. W., Vorgers, S. M., & Mann, J. I. 2010, Nutritional intervention in patients with type 2 diabetes who are hyperglycaemic despite optimised drug treatment – Lifestyle Over and Above Drugs in Diabetes (LOADD) study: Randomised controlled trial. *BMJ*, *341*, c3337. https://doi.org/10.1136/bmj.c3337

[21]. Alameddine, M., Nasreddine, L., Mourad, Y., Naja, F., & Hwalla, N., 2013, Nutrition knowledge and dietary intake of Lebanese adults. *Public Health Nutrition*, *16*(4), 639–646. https://doi.org/10.1017/S1368980012003010

[22]. Titty, F. V. K., 2010, Glycaemic control, complications and predictors of poor control in Ghanaian diabetics. *Annals of African Medicine*, *9*(1), 5–9.

[23]. Mogre, V., Johnson, N. A., Tzelepis, F., Shaw, J. E., & Paul, C., 2017, Barriers to diabetes self-management: Perspectives of patients and healthcare providers in Ghana. *Journal of Clinical Nursing*, *26*(9–10), 1291–1301. https://doi.org/10.1111/jocn.13411

[24]. Erkocho, M. S., & Adugna, M., 2022, Physical activity and glycemic control among people living with diabetes in Ethiopia: A cross-sectional study. *BMC Public Health*, *22*, 1178. https://doi.org/10.1186/s12889-022-13550-9