






Research Article

# Knowledge and Awareness of Lifestyle Modifications Among Type 2 Diabetes Patients in a Nigerian Tertiary Hospital

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## Abstract

**Background:** Diabetes Mellitus (DM) is a global health crisis contributing significantly to both illness and mortality. The prevalence of DM in Nigeria has increased from 2.2% in 1997 to 5.77% by 2018 and 7% 2024 in Nigeria. Effective management of this condition demands not only medical interventions but also lifestyle modifications, such as dietary changes and physical activity. **Objective:** To examine knowledge and awareness levels on diet and physical activity among individuals with type 2 diabetes attending a tertiary health institution in North Central Nigeria. **Methods:** This cross-sectional study was conducted at Jos University Teaching Hospital, North Central Nigeria. A sample of 300 patients with T2DM was selected using systematic random sampling. Data was collected using self-administered structured questionnaires encompassing sections on participant demographics, dietary knowledge, physical activity awareness, and self-reported behaviours. Data analysis was performed using SPSS with descriptive statistics and appropriate inferential tests. **Results:** The study revealed that 61.8% of respondents had a good understanding of the role diet plays in managing T2DM, while 38.2% demonstrated poor understanding. Regarding physical activity, 54.8% showed good understanding, while 45.1% fell into the poor understanding category. A majority (59%) were familiar with the recommended weekly physical activity guidelines for individuals with T2DM. Educational attainment was significantly associated with both dietary knowledge and physical activity awareness. Gender was significantly associated with dietary knowledge, with women demonstrating better understanding than men. **Conclusion:** While the majority of T2DM patients demonstrated adequate knowledge of dietary and physical activity recommendations, a significant proportion still lack sufficient awareness. Educational attainment emerged as a key factor influencing knowledge levels. These findings highlight the need for targeted educational interventions to address knowledge gaps, particularly among patients with lower educational backgrounds and male patients.

## Keywords

Type 2 Diabetes Mellitus, Dietary Knowledge, Physical Activity, Awareness, Nigeria

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## 1. Introduction

Diabetes Mellitus (DM) is a global health crisis contributing significantly to both illness and mortality [1]. An estimated 537 million individuals worldwide suffer from diabetes currently, with projections indicating a surge to 643 million by the year 2045 [2]. The prevalence of DM in Nigeria has increased from 2.2% according to a National Survey in 1997, to 5.77% by 2018 and 7% in 2024 [3]. Among factors responsible for the soaring epidemic of DM are the aging population, increasing urbanization, sedentary lifestyle, and obesity.

DM is a chronic, metabolic disease characterized by elevated levels of blood glucose, which leads over time to serious damage to the heart, blood vessels, eyes, kidneys, and nerves [4]. Type 2 DM (T2DM), the most common form, occurs when the body becomes resistant to insulin or doesn't make enough insulin.

Even though pharmacologic interventions are crucial for achieving glycemic control in T2DM, it is essential to recognize the fundamental role of lifestyle modifications in attaining glycemic targets [5]. Studies indicate that dietary intervention and increased physical activity significantly improve metabolic outcomes and reduce the risk of complications [6]. These findings emphasize the importance of integrating lifestyle changes alongside medical treatment to optimize diabetes management [5, 7]. Among various lifestyle modifications, dietary adjustments and exercise hold significant importance in the management of T2DM, offering numerous benefits such as improved glycated haemoglobin (HbA1c) levels and a reduced risk of cardiovascular events.

While there is no specific ideal percentage for the nutritional components in the diet of individuals with T2DM, general recommendations emphasize the importance of consuming non-starchy vegetables, minimizing the intake of added sugars and refined grains, and opting for whole foods instead of highly processed foods [8]. Several eating patterns have been proposed for individuals with T2DM, including the Mediterranean diet, low-carbohydrate diet, fiber-rich diet, intermittent very-low-calorie diet, and vegetarian or plant-based diet [7].

In addition to dietary control, exercise plays an important role in the management of T2DM [9]. Studies have shown that an exercise intervention of at least 8 weeks can lead to an average reduction of 0.66% in HbA1c levels in individuals with T2DM [10]. Regular exercise not only improves blood glucose levels but also reduces cardiovascular risk factors and contributes to weight loss. Current guidelines suggest that most adults with T2DM should engage in at least 150 minutes of moderate to intensive exercise spread over at least 3 days per week [11].

Given the importance of lifestyle modifications in diabetes management, it is important to assess the existing levels of knowledge and awareness among patients to pave the way for the formulation of impactful educational campaigns and

support systems. This study aims to examine knowledge and awareness levels on diet and physical activity among individuals with T2DM attending a tertiary health institution in North Central Nigeria.

## 2. Methodology

### 2.1. Study Area

The study was conducted at Jos University Teaching Hospital, a tertiary health institution in North Central Nigeria. It is a 600-bed capacity facility that serves as a referral center for many neighbouring states. The diabetes clinic holds twice a week on Tuesdays and Thursdays with an average of 350 attendees per month.

### 2.2. Study Design

This study utilized a cross-sectional design to determine the knowledge and awareness of T2DM patients concerning diet and physical activity.

### 2.3. Study Population

Participants included individuals diagnosed with T2DM who were under medical care at the healthcare facility.

#### 2.3.1. Inclusion Criteria

This include adults aged 18 years and above diagnosed with T2DM, patients diagnosed for 6 months or more, and patients willing to participate and provide informed consent.

#### 2.3.2. Exclusion Criteria

Those that were excluded are patients less than 18 years of age, patients with T1DM or other forms of DM, newly diagnosed DM (less than 6 months), and those who did not consent to the study.

### 2.4. Sample Size Determination

The sample size was determined using Fisher's formula based on the prevalence of T2DM in the geographic area (3.1%). The final sample size was rounded up to 300 participants.

### 2.5. Sampling Technique

Systematic random sampling was used to select participants from the pool of patients visiting the diabetic clinic. From the list of T2DM patients booked to attend clinic each week (about 90 patients), every 7th patient was selected. This pro-

cess was repeated until the required sample size of 300 was reached.

## 2.6. Data Collection Methods

Self-administered structured questionnaires were utilized to gather data, encompassing sections on participant demographics, dietary knowledge, physical activity awareness, and self-reported behaviours. Healthcare personnel oversaw the distribution and collection of questionnaires, providing necessary explanations and ensuring correct completion.

## 2.7. Data Management/Statistical Analysis

Data analysis involved the use of SPSS (Statistical Package for Social Science). Descriptive statistics were used to summarize demographic characteristics and responses related to diet and physical activity awareness. Knowledge was graded using predefined criteria for different knowledge areas. P-values < 0.05 indicated significant associations or differences, with a confidence interval of 95%.

## 2.8. Ethical Considerations

Ethical approval was obtained from the Institution's Ethical Committee, and permission was obtained from the Department of Internal Medicine. Informed consent was obtained from all participants, and data was treated with utmost confidentiality.

## 3. Results

### 3.1. Demographic Variables of Respondents

The socio-demographic characteristics of the respondents (depicting a response rate of 96%) across various variables as shown in [Table 1](#). Majority (24.3%) of the respondents are within the age range 41-50 years. They are mostly female (51.4%), majority (34.7%) have secondary school education. Most respondents are gainfully employed (38.2%), with the least group being students (9.7%). Majority of the respondents are married (55.6%), with majority (27.8%) having been diagnosed with DM for a duration up to 4-6 years.

**Table 1.** Sociodemographic variables of respondents.

Demographic Variables	Frequency (n = 300)	Percentage
Age Group		
18-30	50	17.4%
31-40	60	20.8%
41-50	70	24.3%
51-60	55	19.1%
61 and above	53	18.4%
Gender		
Male	140	48.6%
Female	148	51.4%
Education Level		
No formal education	20	6.9%
Primary education	60	20.8%
Secondary education	100	34.7%
Tertiary education	80	27.8%
Postgraduate education	28	9.7%
Occupation		
Unemployed	50	17.4%
Self-employed	70	24.3%
Employed (part-time/full-time)	110	38.2%
Retired	30	10.4%

	Demographic Variables	Frequency (n = 300)	Percentage
Marital Status	Student	28	9.7%
	Single	90	31.3%
	Married	160	55.6%
	Divorced	20	6.9%
	Widowed	18	6.2%
Duration of Diagnosis	Less than 1 year	30	10.4%
	1-3 years	70	24.3%
	4-6 years	80	27.8%
	7-10 years	60	20.8%
	More than 10 years	48	16.7%

### 3.2. Degree of Awareness Regarding the Significance of Diet and Physical Activity

A review of [Table 2](#) demonstrates that participants showed different comprehension about how diet affects blood sugar control for T2DM. Most survey participants evaluated their knowledge of diet significance in type 2 diabetes at "Good"

(41.7%) or "Very Good" (20.1%) levels. Research findings show that the selected sample group demonstrated sufficient knowledge regarding T2DM diet management (61.8%).

Respondents assigned to the "Poor Understanding" group comprise 38.2% of the survey participants since they judged their dietary knowledge of T2DM as either "Very poor," "Poor," or "Fair."

**Table 2.** Understanding the Importance of Diet in Managing Type 2 Diabetes (T2DM).

Response Option	Frequency	Percentage
Very poor	10	3.5%
Poor	20	6.9%
Fair	80	27.8%
Good	120	41.7%
Very good	58	20.1%
Total	288	100%

Participants provided diverse insights about the role of physical activity in managing type 2 diabetes through data retrieved from [Table 3](#). The survey data shows that 45.1% of participants belong to the "Poor Understanding" (Very Poor, Poor, Fair) grouping while the remaining participants fall

under the "Good Understanding" (Good, Very Good) group. The survey results show that about 45.1% of participants fell into the categories of having a very poor understanding along with poor understanding or only fair understanding about the role of physical activity in managing T2DM.

**Table 3.** Understanding the Importance of Physical Activity in Managing T2DM.

Response Option	Frequency (n = 300)	Percentage
Very poor	15	5.2%
Poor	25	8.7%
Fair	90	31.3%
Good	110	38.2%
Very good	48	16.6%
Total	288	100%

The results on Table 4 demonstrate that most participants at 59.0% have knowledge about the weekly physical activity recommendations for people with T2DM but 41.0% of re-

spondents remain unaware of these recommendations. Almost two-fifths of participants (41.0%) remain unaware about the guidelines that recommend physical activity.

**Table 4.** Familiarity with the Recommended Amount of Physical Activity Each Week for People with T2DM (150 mins of moderate intensity/week).

Response Option	Frequency (n = 300)	Percentage
Yes	170	59.0%
No	118	41.0%
Total	288	100%

## 4. Discussion

One of objective of this study focused on evaluating how T2DM patients understand nutritional needs along with physical exercise. Research findings indicate that 61.8% of patients grasped the role of proper eating in T2DM control as well as 59% understood physical activity guidelines. Many people within the population remain unaware of diet and physical activity requirements because effective educational programs have not been provided.

Among the study participants who answered individually 50% understood the daily recommendation for carbohydrates which should range between 100-150 grams per day equal to 50% of one meal portion. A person must comprehend how carbohydrates affect their blood glucose levels to effectively manage their diabetes. Franz *et al* [12] conducted research which demonstrated that diabetes management enhanced through dietary teaching that focuses on carbohydrate counting. A substantial number of 37.5% of surveyed patients did not know the recommended carbohydrate daily intake (100-150 g/day; 50% of meal portion) which indicates deficient diabetes management information. According to Colberg *et al.* [13], inadequate dietary knowledge will lead to

hindrances in diabetes management.

Many participants held knowledge about the exercise recommendations which indicates they possess some understanding of diabetes care. People with diabetes need exercise as an essential part of their health management plan to monitor blood sugar levels and prevent heart diseases. The widespread lack of knowledge among half the respondents regarding exercise recommendations threatens to impede diabetes care effectiveness. Through their research, Franz *et al* and Plotnikoff *et al* [14, 15] identified numerous type 2 diabetics who fail to understand the necessary exercise quantities. When individuals lack awareness it affects their capability to manage their disease effectively.

The research indicates that women possess superior nutrition-related knowledge than men. It has also be evidenced that females outperform men when it comes to controlling diet and nutrition. According to Shah *et al* [16] most women display higher levels of health awareness as well as nutrition knowledge. Women acquire more diet and nutrition information because they personally focus on health management and the society expects them to do so.

Social backgrounds affect personal knowledge about healthy choices which leads to dietary understanding. The research shows that educated people achieve greater under-



standing in health matters as well as improved comprehension skills which is similar to the finding of Okunlola *et al* [17]. Knowledge obtained through education enables people to decode complicated health information about nutrition which can serve as an explanatory factor for the connection. Higher-educated people demonstrate critical thinking abilities and follow nutritional standards while selecting their food carefully.

The research data showed that knowledge of physical activity remained equivalent between both male and female participants and members from different age groups and employment types and marital conditions. Understanding of physical activity remains consistent throughout all population groups yet understanding of diet varies widely. The research data shows that multiple characteristics do not affect physical exercise understanding because physical activity knowledge remains consistent across all groups.

Educational background continues to influence a person's system of understanding physical exercise. The level of education someone attains correlates with their knowledge of physical fitness. The research done by Van der Bij *et al.* [18] demonstrates that people with better education demonstrate both higher activity levels and stronger understanding of exercise concepts. The combination of additional health instruction and better understanding capabilities emerge as natural results from higher educational levels.

The absence of statistically important differences among age groups alongside occupational categories and marital status demonstrates that diet and exercise awareness remains unaltered by such factors. The analysis supports teaching methods that welcome all students while discarding targeting by demographics. The strong impact of education requires specific educational programs that address the learning needs of people with minimum formal education.

The research also investigated various elements which influence participants' understanding of diabetes treatment and their awareness about it. The research showed a positive significant relationship between educational background and dietary and physical activity knowledge in managing type 2 diabetes.

The study establishes that education leads to better dietary comprehension and physical exercise understanding. People with higher education levels demonstrate better understanding along with superior knowledge of diabetes control practices. The findings of this study support this relationship because they demonstrated that participants who completed more education gained better understanding of proper diabetic dietary practices. Research has confirmed that better educational standards enhance diabetes patients' food management capabilities as well as their control of blood sugar levels. Individuals who obtain higher levels of education become better knowledgeable about diet patterns and physical activity while gaining better understanding of physical activities. Understanding diabetes management requires educational activities for proper learning. Krogh *et al* [19] demonstrates

that increased education levels enable individuals to understand and practice diet and exercise plans.

The duration patients had their DM diagnosis did not affect their knowledge about diet or physical activity level. Other research studies have indicated that Type 2 diabetics with longer disease durations show improved food and exercise understanding but this outcome differs from the present analysis. Research findings previously demonstrated that increased diabetes duration leads patients to build better education skills and self-management capabilities. [19]

The research data indicated that participant age did not influence their diet and physical activity knowledge or awareness. At this point there is no relationship discovered between subject age and dietary or physical activity knowledge indicating age plays only a marginal role in awareness levels based on the same study results but differs from research studying age-related health knowledge connections. The length of time older individuals have diabetes does not necessarily translate to superior levels of awareness regarding the disease. Despite living with their condition for an extended period older people demonstrate the necessity for continuing educational efforts to gain information.

Knowledge and awareness ratings were unrelated to gender, occupation, and marital status. Knowledge levels may be more affected by schooling and diagnostic time than demographics. In nutritional awareness, women tended to know more about food than men, according to the study. Previous studies show women are more involved in health-promoting activities and grasp nutritional information better. [18, 20]

## 5. Conclusion

The research analyzed the awareness level together with dietary and physical activity knowledge of T2DM patients who seek treatment in a tertiary institution located in North Central Nigeria. Enough knowledge about diet and physical activity recommendations existed among most patients yet many patients lacked enough awareness according to the study findings. Research showed that educational achievement acted as an essential component which determined the understanding of dietary and physical activity suggestions among patients. Highly educated participants demonstrated superior comprehension of these recommendations.

Women displayed superior understanding compared to men when it came to dietary knowledge. The data showed that gender together with age and occupation type and marital status did not cause noticeable differences in physical activity awareness levels. Specific educational programs need to focus on knowledge deficiencies targeting patients whose education level is limited and male individuals.

The research showed that patients who have lived with diabetes for longer periods may still need essential information about disease management despite their experience. Healthcare establishments must establish broad educational programs which patients can approach without difficulty

regardless of what level of education they have received.

## Abbreviation

DM	Diabetes Mellitus
SPSS	Statistical Package for Social Science
T2DM	Type 2 Diabetes Mellitus

## Conflicts of Interest

The Authors declare no conflicts of interest.

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