# SELF-MANAGEMENT AND SUPPORT SYSTEM AMONG PEOPLE LIVING WITH TYPE II DIABETES IN A GENERAL HOSPITAL IN NORTH CENTRAL NIGERIA

**Samuel Segun ABEGUNDE**

Faculty of Nursing Sciences, College of Medicine and Health Sciences, Afe Babalola University, Ado Ekiti, Nigeria;
College of Nursing Science, Kwara State, Ilorin, Nigeria;

**Oluwaseyi Abiodun AKPOR**
Faculty of Nursing Sciences, College of Medicine and Health Sciences, Afe Babalola University, Ado Ekiti, Nigeria;

**Risikat Idowu FADARE**

Faculty of Nursing Sciences, College of Medicine and Health Sciences, Afe Babalola University, Ado Ekiti, Nigeria;

**Olubukola Esther ABIODUN - OJO**

Faculty of Nursing Sciences, College of Medicine and Health Sciences, Afe Babalola University, Ado Ekiti, Nigeria;

**Anthonia Iyabo OKURUMEH**

Faculty of Nursing Sciences, College of Medicine and Health Sciences, Afe Babalola University, Ado Ekiti, Nigeria;

**Corresponding Author's Email: abiodun-ojooe@abuad.edu.ng**

**Abstract**

**Introduction:** Globally, DM is the fourth cause of deaths in both genders with an average of 6.4% of people living with diabetes and it is becoming a concern in many parts of the world. Diabetes mellitus (DM) has been considered a risk factor for cardiovascular and renal diseases most especially in the developing nations. The rising number of persons diagnosed with type 2 diabetes is a global concern as it accounts for around 90% of all diabetes cases. The study investigated the use of self-management and support system among people living with type II diabetes (PLWD) in a General Hospital, Ilorin, Northcentral Nigeria.

**Methods:** A descriptive and cross-sectional research designs was adopted. Two hundred and forty (240) participants were purposively recruited and a structured questionnaire, designed from previous studies and literature was used for data collection. Data was analysed using descriptive and inferential statistics.

**Results:** Findings from the study revealed that 87.9% of the participants were females, 68.3% were married, 41.3% have hypertension as comorbidity while over 50% have family history of diabetes. Almost all (95.4%) of participants had poor practice of self-management of diabetes and support system. Highest barriers to self-management mentioned by the participants were choice of food, availability of food, finance and limited educational materials.

**Conclusion:** Hence, healthcare professionals especially nurses need to ensure continuous advocacy at the community level so as to encourage family and community involvement in the care of PLWD thereby improving their treatment adherence and minimize complications.

**Keywords**: Diabetes, self-management, support system, practice, barrier, knowledge

## INTRODUCTION

Diabetes mellitus (DM) is a metabolic disease that results from the inability of the body to sufficiently deliver insulin or due to insensitivity of the body cells to available insulin [Kuo et al., 2003; Savoca & Miller, 2001]. Globally, DM is the fourth cause of deaths in both genders and has been considered a risk factor for cardiovascular and renal diseases [Green et al., 2017]. Diabetes mellitus is a perplexing and ongoing metabolic problem related to various complexities and inabilities which add to expanded mortality as well as low quality of life among people living with diabetes (PLWD) [Okurumeh et al., 2022; Kahn et al., 2014; Mokdad et al., 2000]. Prevalence of diabetes is continually expanding from one side of the planet to the other, and this contributes to a significant well-being challenge globally with an estimated 7.8% possible constant increment by 2030 [Kahn et al., 2014; Mokdad et al.,2000; Abouammoh& Alshamrani, 2020]. The weight is higher in non-industrial nations, including Nigeria where

over 80% of individuals reside with diabetes [Okurumeh et al., 2022; Kahn et al., 2014; Odili & Eke, 2010].

Self-management by PLWD contribute to an improved quality of life, long life and healthy lifestyle. Self-management refers to the patient's learning and adoption of behaviours directed towards adequate control of glycaemia, prevention of complications, limiting limitation as well as rehabilitation as diabetes mellitus progresses and evolves [Bhandari et al., 2020]. The majority of diabetes care is handled by patients and their families thus, trustworthy and effective self-care methods are critical for diabetes self-organization. Diabetes self-care management are ways of behavioural approach embraced by PLWD or in danger of diabetes to effectively curtail the disease by their personal efforts thereby preventing or reducing co-morbidities and mortality related to DM [Prabawati & Natalia, 2020].

There are seven fundamental activities that are expected of PLWD so as to anticipate better blood glucose control. These include smart dieting, being dynamic, blood glucose monitoring, being consistent with medications, great critical thinking abilities, sound adapting abilities and appropriate lifestyle behaviour [Shrisvastava et al., 2013]. These seven fundamental activities are shown to result in great glycemic control, decrease complications and improvement in personal satisfaction [Calvert et al., 2022]. Diabetes self-management requires the patient to make numerous alterations in diets and lifestyles [Bonner et al., 2016; Shrisvastava et al., 2013]. It is opined that embracing self-management by PLWD may not be reliable as many patients may not adhere to prescribed management such as glucose monitoring, diets and medication adherence [Burkholder et al., 2016]. Diabetes can also be considered as a genetic disease as people that have the history of the disease in their family are at higher risk. Also, its control has an impact on the entire family system [Caro-Bautista, 2019; Dezii, 2002]. As such, emotionally and supportive network, particularly from families and friends are considered to be an essential part in the successful control of diabetes. An emotionally supportive network is

a multi-layered idea alluding to helping a patient see and get from their interpersonal organisation like loved ones such as family members and friends [Caro-Bautista, 2019; Dezii, 2002; Rad et al., 2013].

Mayberry and Osborn [2012] indicated that one of the most important theories for health behaviour is to change the needs of diabetes self-care performance in such a way that social support is included, and family members are seen as a significant source of social support. Families and friends play an important role since their positive or negative views have an impact on the well-being of PLWD, as well as how they interfere with or promote self-care activities such as food shopping and prescription refilling. Diabetes inconveniences which cover manifestations and complications of the disease such as stroke, kidney failure or visual loss are the significant reasons for dreariness and mortality among PLWD. Managing diabetes inconveniences practically triples the yearly expense of managing diabetes and PLWD are prone to continuous hospitalization owing to unsuccessful self-management [Desalu et al., 2011; Deepa et al., 2005]. The need for systematic assessment of self-management and support system with the ultimate goal of improvement of quality of care and life of diabetic patients becomes imperative. Hence, this study aimed to investigate the self-management and support system among PLWD in a General Hospital in Northcentral Nigeria.

## 1. MATERIAL AND METHODS

### 2.1 Research design, setting and population

This study used a descriptive and cross-sectional research designs. The study setting was an Endocrinology clinic of a General Hospital in Northcentral, Nigeria. The facility was purposively selected due to high influx of diabetic patients. Hospital record for the month of October, 2021 showed an average of 50 clients per clinic which runs twice a week (Tuesday and Thursday) making an average total population of 100 clients per week.

The target population for this study were PLWD attending the endocrinology clinic of the hospital. The total population was 450 patients. The inclusion criteria for the study were people with confirmed Type 2 DM diagnosis, visiting the selected hospital for at least three months and were at least 18 years old, not critically ill and willing to participate in the study.

## 2.2 Sample size and technique

The sample size was determined using Yamane Taro's formula [1973] for the finite population. With the total population of 450, a total of 212 was obtained, however, after adding 10% non-response rate, the final sample size was 234. For better accuracy, the value was approximated to 240. Purposive sampling technique was used to select participants from the endocrinology clinic. For the purpose of this study, all PLWD who met the inclusion criteria and attend the hematology clinics in the months of December, 2021 to February, 2022 were invited to participate.

## 2.3 Instrument and data collection

Data was collected through the use of a structured, questionnaire that was designed based on information adapted from several similar studies [Heisler et al., 2005; Koenig et al., 1976] as well as from relevant literature search. The face and content validity were determined through the scrutiny of the researcher's supervisor, other experts in the field of medicine and pilot testing. Adjustments were made to meet the objectives of the study. The reliability coefficient was calculated, using Cronbach's Alpha (R), to be 0.86.

The Questionnaire was divided into five sections. Section A focused on the demographic characteristics of the participants with the clinical and biophysical profiles (such as the duration of diabetes, family history of diabetes, body mass index, height, weight, random blood glucose, blood pressure, comorbidity, anti-diabetic drug pattern, and presence of physical impairment). Section B assessed the knowledge level of PLWD on self-management. The questions were 11 items with a 3-points Likert scale, with 1= Poor, 2= Good, 3= Excellent. The maximum score

was 33 while the minimum was 11; the scores between 11-18 was termed as poor knowledge, 19-27 good knowledge while 28-33 was excellent knowledge.

Section C assessed the level of practice of self-management of diabetics among PLWD. The section consisted of 16 items on a 5-point Likert scale, 1 = Never, 2 = Sometimes follow recommendations; mostly not, 3 = Follow recommendations about 50% of the time, 4 = usually do this as recommended; occasional lapses, 5 = Always do this as recommended without fail. The maximum score was 80 while the minimum was 16; the score between 16-45 = poor practice, 46-65 = moderate practice while 66-80 = good practice.

Section D investigated the barriers to the practice of self-management of diabetics with 14 items measured on 5-point Likert scale. Strongly agree=5, Agree=4, Disagree=3, Strongly disagree=2, undecided =1. The mid- mean was 3. Means between 0-2.99 was considered a non-barrier while mean of 3 and above was considered a barrier. The final Section (E) assessed the use of the support system with 28 items measured on a 5-point Likert scale. Not at all = 1; not very often = 2; sometimes = 3; very often = 4 and 5 = almost always with a maximum score of 140 and a minimum of 28; 28-67 = poor support; 68-107 = moderate support; 108-140 = good support system. The questionnaire was translated to the local language before it was administered to participants who could not comprehend English language and transcribed back to English language for result interpretation and analysis.

The questionnaire was self-administered after a thorough explanation of the purpose of the study. The researcher visited the clinic on Tuesdays and Thursdays, all the participants were informed about the purpose of the study and instructions were clearly explained in a clear language preferably their local language. The questionnaires were administered to two hundred and forty (240) diabetic patients attending the diabetes clinic, General Hospital Ilorin, Kwara State, and each participant was given enough time to fill the questionnaire. Data was collected

for eight (8) weeks, between December, 2021 and February, 2022. Two hundred and forty (240) questionnaires were retrieved after completion thus ensuring 100% retrieval rate.

## 2.4 Biophysical measurements

Body mass index was derived by the fraction of the weight in kilogram by the height in meters square and was classified as: underweight ($<18.5 kg/m^2$), ideal weight ($18.5- 24.9 kg/m^2$), overweight ($25.0-29.9 \ kg/m^2$), and obese ($\geq 30 \ kg/m^2$) (Lim et al., 2017). The participants' height was measured with a medical giraffe height measuring stadiometer (Model HMS PL) while weight was measured using a digital weighing scale (Model; Camry DT-602).

Blood pressure was measured using an Accoson mercury digital sphygmomanometer (Accoson UK) while the participants were in a sitting position after a rest of about 5-10 minutes was ensured. Blood pressures were taken on their left arms while the arms were supported to be at the level of their heart by resting them on the consultation table. An appropriate-sized blood pressure cuff was used. The BP recordings were recorded to the nearest whole number. Hypertension was defined as systolic BP $\geq$ 140mmHg and/or diastolic BP $\geq$ 90mmHg or current use of antihypertensive medication according to Fiseha and Tamir, [2020].

**Fasting Blood Sugar** was measured using the Accu-Chek Active blood glucometer after an overnight fast of at least 8 hours was ensured. The fasting blood glucose level was taken in milligram/deciliter to the nearest 0.1. Diabetes is diagnosed when the fasting blood glucose level is 126 mg/dL (7 mmol/L) or higher on two separate tests, or the current use of hypoglycemic medication.

## 2.5 Data analysis

Data were analysed using the Statistical Package for Social Sciences (SPSS) version 25. Data were presented using descriptive and inferential statistics. Descriptive data were presented as

frequencies and percentages while relationships were tested for using the Chi-square test. All analysis were carried out at 95% confidence interval.

**2.6 Ethical considerations**

Before the commence of the study, ethical permission was obtained from the General Hospital, Ilorin Institutional Review Committee with approval number GHI/ADM/134/VOL.II/400. In addition, informed consent was obtained from each participant. Participants were informed that they can withdraw from the study any time they wished without any consequences. Their identities were not required in the questionnaire nor during FGD.  Participants privacy was kept all through data collection periods.

2. **RESULTS**

**3.1 Demographic and clinical characteristics of the participants**

**Table 1: Demographic and clinical characteristics of the participants (N= 240)**

| Demographic characteristics | | Freq. | % | Clinical characteristics | | Freq. | % |
|---|---|---|---|---|---|---|---|
| Age (years) | 20-30 | 107 | 44.6 | Smoking | Yes | 4 | 1.7 |
| | 31-40 | 16 | 6.7 | | No | 236 | 98.3 |
| | 41-50 | 26 | 10.8 | Alcohol in take | Yes | 20 | 8.3 |
| | 51-60 | 36 | 15.0 | | No | 220 | 91.7 |
| | Above 60 | 55 | 22.9 | Diabetes Duration (years) | < 5 | 132 | 55.0 |
| Gender | Male | 29 | 12.1 | | 5-9 | 54 | 22.5 |
| | Female | 211 | 87.9 | | 10-14 | 23 | 9.6 |
| Ethnicity | Yoruba | 206 | 85.8 | | 15-20 | 19 | 7.9 |
| | Ibo | 14 | 5.8 | | > 20 | 12 | 5.0 |
| | Hausa | 14 | 5.8 | Family history of Diabetes | Yes | 119 | 49.6 |
| | Others | 6 | 2.8 | | No | 121 | 50.4 |
| Marital status | Married | 164 | 68.3 | Comorbidity | Hypertension | 99 | 41.3 |
| | Divorced | 31 | 12.9 | | Heart condition | 26 | 10.8 |
| | Widowed | 31 | 12.9 | | None | 101 | 42.1 |
| | Single | 5 | 2.1 | | Others | 14 | 5.8 |
| | Others | 9 | 3.8 | Duration of Diagnosis | Less than 1 year | 82 | 34.2 |
| Religion | Christian | 114 | 47.5 | | 1-3 years | 90 | 37.5 |
| | Moslem | 108 | 45.0 | | 4-6 years | 48 | 20.0 |
| | Traditionalist | 15 | 6.3 | | Above 6 years | 20 | 8.3 |
| | Others | 3 | 1.3 | | One | 29 | 12.2 |

| Highest educational level | No formal education | 68 | 28.3 | No of current daily prescription | Two | 58 | 24.4 |
|---|---|---|---|---|---|---|---|
| | Primary | 25 | 10.4 | | Three | 77 | 32.4 |
| | Secondary | 30 | 12.5 | | Four | 34 | 14.3 |
| | Tertiary | 96 | 40.0 | | Five | 40 | 16.8 |
| | Others | 21 | 8.8 | Pattern of anti-diabetes drugs | Tablet only | 150 | 62.5 |
| Occupation | Self employed | 41 | 17.1 | | Injection | 37 | 15.4 |
| | Artisan | 32 | 13.3 | | Both tablets and injection | 37 | 15.4 |
| | Student | 69 | 28.8 | | Combination of tablets | 16 | 6.7 |
| | Unemployed | 13 | 5.4 | Physical disability | None | 164 | 68.3 |
| | Civil/public servant | 43 | 17.9 | | Amputation | 72 | 30.0 |
| | Retired | 37 | 15.4 | | Blindness | 4 | 1.7 |
| | Others | 5 | 2.1 | Body mass index level | Underweight | 1 | 4 |
| Average monthly income (Naira) | <10,000 | 74 | 30.8 | | Healthy weight | 93 | 38.8 |
| | 10,000-30,000 | 79 | 32.9 | | Overweight | 63 | 26.3 |
| | 31,000-50,000 | 30 | 12.5 | | Obesity | 56 | 23.3 |
| | 51,000-70,000 | 37 | 11.3 | | Class 3 obesity | 27 | 11.1 |
| | >70,00 | 30 | 12.5 | | | | |

The majority (44.6%) of the study participants were within the age range of 20-30 years while 87.9% were females. More than half (68.3%) were married while 40.0% had tertiary education

With respect to clinical characteristics, over 90% of the participants neither smoked nor take alcohol. A total of 71.7% have had diabetics for three years or less while over 50% have family history of diabetes. In addition, 41.3% of the participants have hypertension as comorbidity. Also, the majority (68.3%) of participants had no physical disability.

**3.2 Participants'' self-management practice of diabetes**

**Table 2: Participants' responses queries on self-management practice of diabetes questions**

| Self-management practices | % Participants | | | | |
|---|---|---|---|---|---|
| | A | B | C | D | E |
| **General Diet** | | | | | |
| Following a healthy diet | 26.3 | 35.4 | 14.2 | 22.1 | 2.1 |
| Following the diet guidance given by a professional | 21.9 | 29.5 | 19.0 | 27.4 | 2.1 |
| **Average** | **24.1** | **32.5** | **16.6** | **24.8** | **2.1** |
| **Specific Diet** | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| Eating five or more servings of fruits and/or vegetables | 41.7 | 14.6 | 18.3 | 20.8 | 4.6 |
| Eating red meat and/or whole milk derivatives | 52.5 | 20.1 | 16.3 | 10.8 | 0.3 |
| Eating sweets | 75.0 | 19.2 | 4.2 | 1.3 | 0.3 |
| **Average** | **56.4** | **18.0** | **12.9** | **11.0** | **1.7** |
| **Physical Activity** | | | | | |
| Performing physical activity for at least 30 minutes | 39.6 | 18.3 | 30.0 | 12.1 | 0 |
| Performing some specific physical exercise (swimming, walking, etc.) | 50.0 | 13.3 | 15.4 | 21.3 | 0 |
| **Average** | **44.8** | **15.8** | **22.7** | **16.7** | **0** |
| **Blood Glucose Monitoring** | | | | | |
| Evaluating blood sugar | 48.3 | 16.7 | 14.2 | 16.3 | 4.6 |
| Evaluating blood sugar, the recommended number of times | 45.4 | 27.9 | 11.7 | 10.4 | 4.6 |
| **Average** | **46.9** | **22.3** | **13.0** | **13.4** | **4.6** |
| **Foot Care** | | | | | |
| Examining the feet | 42.5 | 21.3 | 23.3 | 12.9 | 0 |
| Examining inside shoes before putting them on | 38.8 | 19.6 | 30.8 | 10.8 | 0 |
| Drying the spaces between the toes after washing them | 40.4 | 10.0 | 26.7 | 22.9 | 0 |
| **Average** | **40.6** | **17.0** | **26.9** | **15.3** | **0** |
| **Medication and medical appointment** | | | | | |
| Taking medications as recommended (insulin or tablets) | 20.4 | 19.6 | 21.7 | 31.7 | 6.7 |
| Taking insulin recommended | 35.8 | 11.7 | 1.7 | 26.3 | 4.6 |
| Taking the tablets as recommended | 24.2 | 19.6 | 17.9 | 29.2 | 9.2 |
| Coming in for appointments | 28.8 | 10.8 | 20.8 | 37.5 | 21.1 |
| **Average** | **27.3** | **15.4** | **14.5** | **31.2** | **10.4** |

A, B, C, D and E represent 'Never', 'follow recommendation sometimes', 'follow recommendations 50% of the time', 'follow recommendations most times' and 'follow recommendations all the time', respectively

Self-management practice of diabetes by the participants showed that only 2.1% and 1.7% followed recommendations all the time with respect to general and specific diet, respectively. None of the participants followed recommendations all the time with respect to physical activity or foot care. In the case of glucose monitoring and medical appointment, 4.6% and 10.4% followed recommendations all the time.

**Participants' responses to barriers to diabetes self- management questions**

**Table 3: Participants' responses to barriers to diabetes self- management questions**

| Queries | % Participants | | | |
|---|---|---|---|---|
| | A | B | C | D |
| **Low perception of susceptibility and severity of diabetes** | | | | |
| Doubt about the expected benefits and efficacy of treatment | 13.3 | 53.8 | 16.3 | 16.7 |

| | A | B | C | D |
|---|---|---|---|---|
| Choice of food | 35.0 | 53.8 | 9.2 | 2.1 |
| Availability of food | 22.1 | 50.0 | 17.1 | 10.8 |
| **Average** | **23.5** | **52.5** | **14.2** | **9.9** |
| **Inadequate knowledge of self-management** | | | | |
| Misconceptions about diabetes and its management | 16.7 | 47.1 | 13.3 | 22.9 |
| Lack of skills for deciding proper management | 16.3 | 42.5 | 20.0 | 21.3 |
| Limited educational media and booklets | 23.8 | 45.4 | 20.8 | 10.0 |
| **Average** | **18.9** | **45.0** | **18.0** | **18.1** |
| **Lack of motivation to perform the diabetes self-management** | | | | |
| Lack of social support | 20.4 | 42.5 | 16.7 | 20.4 |
| Lack of time | 25.8 | 30.4 | 28.8 | 15.0 |
| Family conflict | 20.0 | 33.3 | 25.0 | 21.7 |
| Lack of finance | 13.8 | 15.8 | 38.8 | 31.7 |
| **Average** | **20.0** | **30.5** | **27.3** | **22.2** |
| **Insufficient manpower** | | | | |
| High workload and job demand on every power | 20.0 | 37.1 | 27.9 | 15.0 |
| Lack of confidence and experience in dealing with diabetes management | 9..2 | 48.3 | 20.0 | 22.5 |
| **Average** | **20** | **42.7** | **24** | **18.8** |
| **Feelings of embarrassment** | | | | |
| Social exclusion due to victim blaming of the disease | 32.1 | 26.3 | 17.9 | 23.8 |
| Social stigma and negative image about disease progression | 32.1 | 26.3 | 17.9 | 23.8 |
| **Average** | **32.1** | **26.3** | **17.9** | **23.8** |

**A, B, C and D indicate 'Strongly agree', 'Agree', 'Disagree' and 'Strongly disagree', respectively**

In the case of barriers to self-management practice, 9.9% and 18.1% of participants strongly disagree with having low perception of susceptibility and severity of diabetes while 18.1% disagreed with having inadequate knowledge of self-management of diabetes. With respect to lack of motivation to perform, insufficient manpower and feelings of embarrassment, 22.1%, 18.9% and 23.8% of participants strongly disagreed, respectively.

**Relationship of participants' demographic characteristics with levels of practice and barrier to self-management of diabetes.**

**Table 4:**

| Variable | | Practice level of self-management practice | | | | Barrier level to self-management | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Poor | Good | $X^2$ | P | Low | High | $X^2$ | P |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Age (years) | 20-30 | 100 | 7 | 3.33 | 0.504 | 49 | 58 | 1.78 | 0.774 |
| | 31-40 | 15 | 1 | | | 8 | 8 | | |
| | 41-50 | 26 | 0 | | | 14 | 12 | | |
| | 51-60 | 34 | 2 | | | 20 | 16 | | |
| | Above 60 | 54 | 1 | | | 30 | 25 | | |
| Gender | Male | 28 | 1 | 0.097 | 0.75 | 15 | 14 | 0.02 | 0.881 |
| | Female | 201 | 10 | | | 106 | 105 | | |
| Ethnicity | Yoruba | 196 | 10 | 1.21 | 0.75 | 110 | 96 | 5.32 | 0.150 |
| | Ibo | 14 | 0 | | | 5 | 9 | | |
| | Hausa | 13 | 1 | | | 4 | 10 | | |
| | Others | 6 | 0 | | | 2 | 4 | | |
| Marital status | Married | 154 | 10 | 3.152 | 0.53 | 77 | 87 | 4.41 | 0.353 |
| | Divorced | 30 | 1 | | | 16 | 15 | | |
| | Widowed | 31 | 0 | | | 18 | 13 | | |
| | Single | 5 | 0 | | | 3 | 2 | | |
| | Others | 9 | 0 | | | 7 | 2 | | |
| Religion | Christian | 112 | 2 | 6.42 | 0.09 | 60 | 54 | 3.40 | 0.334 |
| | Moslem | 99 | 9 | | | 53 | 55 | | |
| | Traditionalist | 15 | 0 | | | 8 | 7 | | |
| | Others | 3 | 0 | | | 0 | 3 | | |
| Highest educational level | No formal education | 66 | 2 | 5.84 | 0.21 | 34 | 34 | 3.57 | 0.468 |
| | Primary | 25 | 0 | | | 16 | 9 | | |
| | Secondary | 30 | 0 | | | 17 | 13 | | |
| | Tertiary | 89 | 7 | | | 43 | 53 | | |
| | Others | 19 | 2 | | | 11 | 10 | | |
| Occupation | Self employed | 41 | 0 | 9.38 | 0.15 | 26 | 15 | 4.72 | 0.580 |
| | Artisan | 31 | 1 | | | 14 | 18 | | |
| | Student | 67 | 2 | | | 36 | 33 | | |
| | Unemployed | 11 | 2 | | | 5 | 8 | | |
| | Civil/public servant | 40 | 3 | | | 21 | 22 | | |
| | Retired | 35 | 2 | | | 17 | 20 | | |
| | Others | 4 | 1 | | | 2 | 3 | | |
| Average monthly income (Naira) | <10,000 | 70 | 4 | 4.72 | 0.32 | 33 | 41 | 4.89 | 0.299 |
| | 10,000-30,000 | 78 | 1 | | | 44 | 35 | | |
| | 31,000-50,000 | 27 | 3 | | | 12 | 18 | | |
| | 51,000-70,000 | 25 | 2 | | | 17 | 10 | | |
| | >70,00 | 29 | 1 | | | 15 | 15 | | |
| **Total** | | **95.4%** | **4.6%** | | | **50.4%** | **49.6%** | | |

**$X^2$ and p represent chi-square probability values, respectively**

Generally, 95.4% and 4.6% of the participants had poor and good self-management practice of diabetes while 50.4% and 49.6% had low and high barriers to diabetes self-management, respectively. With the exception of religion ($X^2$= 6.42, p= 0.09), which was significantly associated with self-management practice level of diabetes, none of the participants' socio-demographic were significantly associated with practice or barrier level to diabetes management

**Table 5: Relationship of participants' clinical history with levels of practice and barrier to self-management of diabetes**

| Variable | | Practice level of self-management practice | | | | Barrier level to self-management | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Poor | Good | $X^2$ | p | Low | High | $X^2$ | P |
| Smoking | Yes | 4 | 0 | 0.19 | 0.66 | 3 | 1 | 0.98 | 0.321 |
| | No | 225 | 11 | | | 118 | 118 | | |
| Alcohol in take | Yes | 20 | 0 | 1.05 | 0.31 | 9 | 11 | 0.25 | 0.613 |
| | No | 209 | 11 | | | 112 | 108 | | |
| Diabetes duration (years) | < 5 | 127 | 5 | 3.56 | 0.47 | 63 | 69 | 2.73 | 0.603 |
| | 5-9 | 50 | 4 | | | 26 | 28 | | |
| | 10-14 | 21 | 2 | | | 14 | 9 | | |
| | 15-20 | 19 | 0 | | | 12 | 7 | | |
| | > 20 | 12 | 0 | | | 6 | 6 | | |
| Family history of diabetes | Yes | 112 | 7 | 0.91 | 0.34 | 50 | 69 | 6.67 | 0.010 |
| | No | 117 | 4 | | | 71 | 50 | | |
| Comorbidity | Hypertension | 94 | 5 | 1.54 | 0.67 | 45 | 54 | 11.42 | 0.010 |
| | Heart condition | 26 | 0 | | | 21 | 5 | | |
| | None | 96 | 5 | | | 47 | 54 | | |
| | Others | 13 | 1 | | | 8 | 6 | | |
| Duration of diagnosis | Less than 1 year | 78 | 4 | 0.65 | 0.89 | 39 | 43 | 2.49 | 0.77 |
| | 1-3 years | 87 | 3 | | | 47 | 43 | | |
| | 4-6 years | 45 | 3 | | | 22 | 26 | | |
| | Above 6 years | 19 | 1 | | | 13 | 7 | | |
| No of current daily prescription | One | 27 | 2 | 3.05 | 0.55 | 20 | 9 | 15.13 | 0.004 |
| | Two | 55 | 3 | | | 19 | 39 | | |
| | Three | 72 | 5 | | | 46 | 31 | | |
| | Four | 34 | 0 | | | 14 | 20 | | |
| | Five | 39 | 1 | | | | | | |
| Pattern of anti-diabetes drugs | Tablet only | 144 | 6 | 1.99 | 0.57 | 72 | 78 | 4.71 | 0.194 |
| | Injection | 35 | 2 | | | 20 | 17 | | |
| | Both tablets and injection | 16 | 3 | | | 17 | 20 | | |
| | Combination of tablets | 153 | 0 | | | 12 | 4 | | |
| Physical disability | No physical disability | 153 | 11 | 5.34 | 0.07 | 79 | 85 | 6.20 | 0.045 |
| | Amputation | 72 | 0 | | | 42 | 30 | | |
| | Blindness | 4 | 0 | | | 0 | 4 | | |
| **Total** | | **95.4%** | **4.5%** | | | **50.4%** | **49.6%** | | |

**X$^2$ and p represent chi-square probability values, respectively [26]**

Among the participants' clinical characteristics, only physical disability (X$^2$= 5.34, p= 0.07), was observed to be significantly associated with self-management practice of diabetes. In the case of barrier to self-management, physical disability (X$^2$= 6.20, p= 0.045), number of current daily prescription (X$^2$= 15.13, p= 0.004), comorbidity (X$^2$= 11.42, 0.010) and family history of diabetes (X$^2$= 6.67, p= 0.010) showed significant association (Table 5)

**3.3 Support system to self-management of diabetes**

The participants' support system to self-management of diabetes showed 72.8% and 24.2% having poor and good support system, respectively. Among the demographic characteristics of the participants, only age ((X$^2$= 11.64, 0.02) showed significant association with support system to self-management of diabetes. However, among the clinical characteristics of the participants, diabetes duration (X$^2$= 8.57, 0.07), comorbidity (X$^2$= 6.50, 0.09), duration of diagnosis (X$^2$= 10.94, 0.01) and pattern of prescription of anti-diabetic drugs (X$^2$= 11.26, p= 0.01) were observed to be significantly associated with support system to self-management of diabetes (Table 6)**.**

**Table 6: Relationship of participants' demographic and clinical characteristics with support system to self-management of diabetes**

| Demographic characteristics | | Poor | Good | $X^2$ | p | Clinical characteristics | | Poor | Good | $X^2$ | P |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Age (years) | 20-30 | 78 | 29 | 11.64 | 0.02 | Smoking | Yes | 4 | 0 | 1.29 | 0.26 |
| | 31-40 | 8 | 8 | | | | No | 178 | 58 | | |
| | 41-50 | 20 | 6 | | | Alcohol In take | Yes | 17 | 55 | 1.00 | 0.32 |
| | 51-60 | 27 | 9 | | | | No | 165 | 28 | | |
| | Above 60 | 49 | 6 | | | Diabetes duration (years) | < 5 | 104 | 28 | 8.57 | 0.07 |
| Gender | Male | 22 | 7 | 0.00 | 0.99 | | 5-9 | 34 | 20 | | |
| | Female | 160 | 51 | | | | 10-14 | 19 | 4 | | |
| Ethnicity | Yoruba | 161 | 45 | 0.13 | 0.11 | | 15-20 | 17 | 2 | | |
| | Ibo | 10 | 4 | | | | > 20 | 8 | 4 | | |
| | Hausa | 7 | 7 | | | Family history of diabetes | Yes | 93 | 26 | 0.69 | 0.40 |
| | Others | 4 | 2 | | | | No | 89 | 32 | | |
| Marital status | Married | 124 | 40 | 1.61 | 0.81 | Comorbidity | Hypertension | 74 | 25 | 6.50 | 0.09 |
| | Divorced | 24 | 7 | | | | Heart condition | 17 | 9 | | |
| | Widowed | 23 | 8 | | | | None | 83 | 18 | | |
| | Single | 3 | 2 | | | | Others | 8 | 6 | | |
| | Others | 8 | 1 | | | Duration of diagnosis | Less than 1 year | 67 | 15 | 10.94 | 0.01 |
| Religion | Christian | 87 | 27 | 5.66 | 0.13 | | 1-3 years | 65 | 25 | | |
| | Moslem | 80 | 28 | | | | 4-6 years | 40 | 8 | | |
| | Traditionalist | 14 | 1 | | | | Above 6 years | 10 | 10 | | |
| | Others | 1 | 2 | | | No of current daily prescription | One | 23 | 6 | 3.26 | 0.51 |
| | No formal education | 53 | 15 | 6.83 | 0.15 | | Two | 46 | 12 | | |
| | Primary | 22 | 3 | | | | Three | 53 | 24 | | |

| Category | | | | X² | p | Category | | | | X² | p |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Highest educational level | Secondary | 21 | 9 | | | | Four | 27 | 7 | | |
| | Tertiary | 74 | 22 | | | | Five | 32 | 8 | | |
| | Others | 12 | 9 | | | Pattern of anti-diabetes drugs | Tablet only | 115 | 35 | 11.26 | 0.01 |
| Occupation | Self employed | 30 | 11 | 8.40 | 0.21 | | Injection | 33 | 4 | | |
| | Artisan | 25 | 7 | | | | Both tablets and injection | 21 | 16 | | |
| | Student | 56 | 13 | | | | Combination of tablets | 13 | 3 | | |
| | Unemployed | 7 | 10 | | | Physical disability | No physical disability | 126 | 38 | 1.88 | 0.39 |
| | Civil/public servant | 33 | 8 | | | | Amputation | 52 | 20 | | |
| | Retired | 29 | 8 | | | | Blindness | 4 | 0 | | |
| | Others | 2 | 3 | | | | | | | | |
| Average monthly income (Naira) | <10,000 | 54 | 20 | 4.62 | 0.32 | | | | | | |
| | 10,000-30,000 | 62 | 17 | | | | | | | | |
| | 31,000-50,000 | 22 | 8 | | | | | | | | |
| | 51,000-70,000 | 24 | 3 | | | | | | | | |
| | >70,00 | 20 | 10 | | | | | | | | |
| Support system level | | **75.8%** | **24.2%** | | | | | | | | |

$X^2$ and p represent chi-square probability values, respectively [26]

## 3. DISCUSSION

Participants demographic characteristics showed that almost half were between ages 20-30 years while majority were females and married. This is contrary to the findings of Hussain et al. [2020] and Heisler et al. [2005] where majority of participants with diabetes were above the age of 40 years. However, majority of their participants were females and also married as revealed in the current study. In in another similar study [Taylor & Barnes, 2018] there were more males with diabetes mellitus nevertheless, the male gender was associated with a higher incidence of co-morbidity such as congestive cardiac failure and peripheral arterial disease. Almost all participants do not smoke cigarette nor take alcoholic beverages. This indicates that some other risk factors could be associated with the occurrence of DM among the participants in this study. This corroborates the result of Hussain *et al.* [2020] in their study where majority of participants neither smoke nor drink alcohol. The risk factors of DM are likely to be multifactorial behavioral problems such as cigarette smoking, sedentary lifestyle, intake of saturated fatty acids and sugar-sweetened beverages which is an indication that the study on such factors will need to be expansive in order to capture wide spectrum of risk factors of this disease.

The most constant factor for developing diabetes is family history of diabetes, especially from first-degree family members [Okurumeh et al., 2022]. Likewise, Colberg [Colberg et al., 2016] stated that there is a high tendency for people with family history of diabetes to develop the condition later in life. Heisler *et al*. [2005] also reported that majority of patients with type 2 DM have affected first-degree relatives with a duration of 5-9 years. These findings are similar to the results of the current study as more than half of the participants had family history of DM. This

further establishes family history as one of the commonest predisposing factor of DM. By implication, such factor need to form a major subject in health education on prevention and control of DM such that those with family history will begin to take necessary steps at every level of prevention.

Participants' practice of diabetes self-management was generally poor as few (one-third) followed a healthy diet sometimes while only 2.1 % adhered to health diet recommendations at all times. More than half of the participants disregard food recommendations whereas none followed recommendations on physical activities all the time. Almost half of the participants do not adhere to blood glucose monitoring, nor follow recommendations on foot care, only 9.2% adhere to medication regimen and 21.1% do keep to appointments. Several barriers to the practice of self-management were mentioned by the participants and these include choice and availability of food, lack of social support and skills in deciding proper management, social exclusion due to victim been blamed for the disease and finance. These results are similar to the findings of Akpor et al. [2022], Didarloo [2021] and Downie [2021] where most frequent reported barriers were lack of knowledge of specific diet plan, lack of understanding of the plan of care, helplessness and frustration, financial resources, comorbidities and social support.

High cost of medications and disease-specific care supplies represents a limitation for the proper management of diabetes in the population [Forouhi et al., 2018]. The stress of the economic disparity increases the chance of poor glucose control and diabetes complications through the incapacity to buy healthy food, partake in exercise, manage capillary glucose at home, and access the health care system to receive proper treatment [Fritz, 2017]. Likewise, financial distress can

cause undesirable weight gain, smoking, and high consumption of alcohol, raising the risk of complications [Frey, 2018; Gao et al., 2020]. The reality of lack of resources to fund appropriate management of DM has become a common experience among a significant proportion of PLWD. This has been a major challenge in prevention and control, improving quality of life and reducing mortality among these set of patients and also suggest areas that needs attention in the wholesome combatting of DM.

Support system is required to enhance self-management of diabetes [Brundrett & Okeya, 2016]. Findings from this study revealed that having someone to cook recommended diet was a good support system enjoyed by majority of the participants. However, participants mentioned poor support system in arears such as having someone who assist in keeping to recommended diet, exercise, blood glucose monitoring and daily foot care. Therefore, participants in the study experienced poor support system. This probably may be the reason for their poor self-management. Support system provided by family as well as the social support system are essential in the self-management of diabetes due to the chronic nature of the disease [Rad et al., 2016; Karimy et al., 2018]. Patients with strong cultural self-care support system will have good self-care and self-management practices which will improve their physical, social and mental health thereby reducing complications [Brundrett & Okeya, 2016]. Improvement of medication adherence in patients with DM was associated with societal support. It indicates that patients with DM may need to be open to assistance from friends, relatives and others [Colberg et al., 2016]. Support system and social support provided by family and friends cannot be underestimated in fighting

diabetes as lack of such system will weaken the spirit of fighting and overcoming the disease [Karimy et al., 2018].

Among the participants' clinical characteristics, only physical disability was observed to be significantly associated with self-management practice of diabetes. While physical disability, number of current daily prescription, comorbidity and family history of diabetes showed significant association with barrier to self-management. These implies that these characteristics had the potential to influence the self-management of patients with type 2 diabetes. Conversely, the results did not align with similar studies conducted by Brundrett and Okeya [2016] where participants' age, marital status, year of diagnosis, and level of education were significantly associated with self-management. Level of education has been shown to have positive correlation with disease management as it is belief that where educational levels were highest, less social support was reported and consequently self-management may be adversely affected.

**Limitation:** This study is was a descriptive cross-sectional study which only obtain data at a given time which restricts appropriately establishing association or/and relationship among variables of interest. A longitudinal study using the same set of variables will provide avenue to further study these variables through observation over a period of them. It will also afford researcher(s) to observe outcomes over the period of stipulated for the study.

**Conclusion**

Majority of the participants in the study had poor practice of self-management of diabetes and barriers to self-management as mentioned include poor finance, inadequate knowledge, lack of motivation and feeling of embarrassment. There is also a significant relationship between

participants' socio-demographic characteristics (religion, physical disability, comorbidity, family history of DM) with self-management of diabetes. While age, duration of disease, comorbidity and pattern of prescription were significantly associated with diabetes support system. The self-management effort used by the participants were dietary and lifestyle modifications, regular exercise, medication adherence, and regular blood sugar monitoring and follow-up. Nearly all the participants experienced financial constraints in the course of self-management of diabetes and had poor support system. Therefore, there is need to intensify efforts to encourage and improve various aspects of self-management and support system among PLWD through strategic and intensified behaviour change communication among other interventions. This will most especially require healthcare professionals especially nurses to enagage in continuous advocacy at the community level so as to encourage family and community involvement in the care of PLWD thereby improving their treatment adherence and minimize complications. This hold the great possibility of reducing the burden of disease as well as improve the relative quality of life of PLWD.

**AREAS FOR FURTHER RESEARCH**

This research could be replicated in a longitudinal study so as to provide avenue to study and establish associations among factors already identified in this study. Also, specific factors and behaviour communication change strategies can be isolated and study among PLWD with the aim of suggesting the best of strategies.

## ETHICS APPROVAL AND CONSENT TO PARTICIPATE

Ethical approval for the study was obtained from the General Hospital, Ilorin Institutional Review Committee with approval number GHI/ADM/134/VOL.II/400.

## HUMAN AND ANIMAL RIGHTS

No animal was used in this study. This research was conducted on humans in accordance with the Helsinki Declaration of 1975, as revised in 2013.

## AVAILABILITY OF DATA AND MATERIALS

The data supporting the findings of the article is available within the article.

## CONFLICT OF INTEREST

The authors declare no conflicts of interest, financial or otherwise.

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