Volume: 3, Issue: 2
Page: 160 - 174
2022

ISSN: 2709-9911 (Online), ISSN: 2710-236X (Print)
International Journal of Medicine, Nursing & Health Sciences (IJMNHS) ®
(IJMNHS.COM)

# Knowledge and Self-Care Management Practices of People Living with Diabetes Mellitus in Selected Hospitals, Benin-City, Edo State, Nigeria

**Author(s),** NWABUDIKE, Enifome (RN, RM, BNSc),
DR. NWAOMAH Esther Esobuneta

**Abstract:**

Effective glycemic control and healthy living within the limit of diabetes illness is the state of health envisaged by people living with diabetes. This can be achieved through deliberate involvement in appropriate self-care management practices that is influenced by the level of knowledge of the disease entity. Therefore, this study assessed knowledge and self-care management practices of people living with diabetes mellitus in selected hospitals in Benin-city, Edo state. The study adopted a descriptive survey design that involved a population of (968) people living with diabetes attending the outpatient clinic of the selected hospitals. A total sample of 311 was determined using the Slovin's formula. Multi stage sampling procedure involving criteria-based (purposive) and simple random sampling was utilized to select the hospitals, while a convenience sampling was used to select the respondents. A self-constructed and validated questionnaire was used for data collection from the respondents. Cronbach's Alpha Coefficient for each of the variables ranged from 0.78 to 0.83. A response rate of 96.5% for the participant was achieved. Data were analyzed using descriptive and inferential statistics. Results showed that 50.0% of respondents have moderate level of knowledge about diabetes. Overall, 70.0% of respondents had adequate knowledge. Seventy-five (75.0%) of respondents demonstrated good self-care management practices.

**IJMNHS**
Accepted 21 April 2022
Published 29 April 2022
DOI: 10.5281/zenodo.6596477

The findings also showed significant relationship (r =.159, p= 0.006 < α-value 0.05) between knowledge and self-care management practices. The study concluded that respondents have high knowledge which is likely to inform them about specific diabetes self-care management actions. The study recommended that people living with diabetes mellitus should be encouraged and motivated by their care givers, family members, and support group to sustain their self-care management practices of the disease condition.

**Keywords:** Knowledge, People Living with Diabetes, Self-care management Practices,

About Author

## Author(s):

**NWABUDIKE, Enifome (RN, RM, BNSc)**
Department of Adult Health Nursing,
School of Nursing Science,
Babcock University, Ilishan-Remo, Ogun State, Nigeria.

**and**
**DR. NWAOMAH Esther Esobuneta**
Department of Adult Health Nursing,
School of Nursing Science,
Babcock University, Ilishan-Remo, Ogun State, Nigeria.

## Introduction

Diabetes mellitus is a chronic health condition that affects carbohydrate metabolism in the body, currently affecting approximately 537 million adults worldwide, and is expected to affect up to 643 million persons by 2030, and 783 million by 2045 (International Diabetes Federation, 2021). Diabetes disturbs glucose metabolism, resulting in either high or low concentration of glucose in the blood circulation (Nwaomah, et al, 2021). Reports also revealed that there is currently a continuous global increase in diabetes prevalence, confirming diabetes as a significant global challenge to the health and well-being of individuals, families, and societies (IDF, 2021). Once rare in Sub-Saharan Africa, diabetes is becoming a more common health challenge in contemporary times and increasingly so in Nigeria. The health challenges that diabetes mellitus represents for Nigeria is an issue of significance for the countries of the African Union, in which Nigeria is the leading member (Hashim, 2020). The Diabetes Association of Nigeria (DAN) suggests further that the increasing prevalence of diabetes in Nigeria also accounts for the highest mortality rates, where diabetes-related mortality from inadequate management outweighs that of HIV/AIDS, malaria, and cancer in the country.

The rising prevalence of diabetes has not only caused increase in mortality, but has resulted to the burden of chronic disease in Nigeria. Ugwu, et al (2020) stated that Nigeria is one of the countries in Sub-Saharan Africa that are currently groaning under a rising prevalence of diabetes mellitus (DM). A recent meta-analysis reported that approximately 5.8% (about 6 million) of adult Nigerians are living with DM (Uloko et al. 2018). This figure has been likened to a tip of an iceberg as it is estimated that two-thirds of diabetes cases in Nigeria are yet undiagnosed. This scenario which applies to most low and middle-income countries of Sub-Sahara Africa has not only increased the burden of diabetes complications and deaths but has also put a significant strain on the already weak health systems in this sub-region (IDF, 2021). People living with diabetes mellitus who are actively involved in their self-care practices management are expected to achieve good glycemic control and maintain healthy living. However, it has been observed that patients do not achieve euglycemic blood glucose level, hence they persistently experience the unpleasant symptoms and complications associated with the disease. Evidence suggests that there is poor adherence to self-care management practices among diabetes patients globally as stated by Garcia-Perez, et al (2017). This could be related to the knowledge about the illness.

This increase in the prevalence of diabetes mellitus in Nigeria constitutes significant health and socioeconomic burden for people living with the illness. This is reflected in premature death and morbidity rates with implications for the healthcare system and the wider economy. According to Mgbahurike, et al, (2017) knowledge of diabetes mellitus can prevent the imminent chronic co-morbidities of diabetes mellitus which impact significantly on the quality of life of the individual. Epidemic of diabetes is increasing around the world and knowledge about this disease is low (World Health Organization, 2018). In Ola, et al, (2021) it was stated that lack of knowledge about diabetes is common among various categories of adult population in Nigeria and many African countries.

According to Addisu, et al (2014), diabetes mellitus is a chronic and irreversible disease that lasts lifelong directly concerns any individual of all ages and their relatives, brings heavy

economic burden, affects self-care activities, and shortens life expectancy due to chronic damages it causes. Patients with chronic illnesses like diabetes mellitus face significant challenges with self-care management activities which include monitoring daily glucose levels, regulating medication, exercise, and diet in the context of their work, home, and leisure lives, weight and stress management, self-monitoring of blood glucose. These activities represent significant challenges for many patients especially those with limited social support, time constraints, and limited health literacy (Hashimoto et al, 2019).

According to Aniedi, et al (2020), self-care management practices are goal-oriented activities that are economical and be carried out by patients themselves to prevent the complications of DM. In the context of DM, these goal-oriented behaviours refer to self-care practices that patients with diabetes need to follow on daily basis including dietary control, physical activity, adherence to medication, foot care, and monitoring of blood glucose level which help to reduce the complications or delay complications thereby increase the quality of life of diabetic patients.

Diabetes mellitus is one of the chronic illnesses that require not just an acute episodic model of care in which healthcare providers are seen as the main actors and patients as passive recipients of care, but also requires the patient to play a crucial role in the management of their illness. It is the patient who makes daily decisions and takes actions that may result in better or worse health and quality of life outcomes. Thus, the patients' Knowledge of diabetes mellitus has a great influence on the coping strategies, self-care management and behaviour the individual adopt in response to the perceived health problem (Van Houtum, et al, 2017). Achieving effective self-care management is complex, as people living with diabetes mellitus have to deal with a variety of symptoms often both medical and non-medical treatments, different health care providers, and physical, emotional and social consequences of being chronic.

Different approaches have been proposed to improve the self-care management practices of people living with diabetes however, they have been shown to have minimal impact and not being sustained by patients in the long term (Abubakar, et al, 2015). Based on the Health Belief Model, health outcomes of patients with chronic conditions are influenced by their knowledge. This enables patients to make sense of their symptoms and may impact health outcomes directly or through their influence on coping actions and self-care management practices.

The level of self-care management practices of patients with DM varies among different countries and regions, of which Benin-city is not an exception. Few studies explored the patient's knowledge and self-care management of diabetes in Benin-city Nigeria; thus, it is of utmost importance to assess these variables in people living with diabetes mellitus in the aforementioned location. This is so, such that interventions can be applied to the outcome of the study. Therefore, the study examined the knowledge and also determines the self-care management practices among people living with diabetes mellitus in Benin-city Edo State, Nigeria. The specific Objectives are to:

1. assess level of diabetes knowledge among people living with diabetes mellitus in Benin-City; and

2. determine self-care management practices among people living with diabetes mellitus in Benin-City.

**Research Hypothesis**

$H_o1$: There is no significant relationship between knowledge and self-care management practices among people living with diabetes mellitus.

**Methodology**

This study adopted a descriptive survey design which utilizes a cross-sectional study method. The target population comprised all patients diagnosed of diabetes mellitus, both males and females attending diabetes clinics in selected private and government-owned hospitals that operate under the National Health Insurance Scheme (NHIS) in the Benin-city metropolis. Presently, there are about seventy-three (73) hospitals that operates under the NHIS, but the researcher chose to focus on ten (10) hospitals that have clinics/outpatient department for people living with diabetes mellitus. The population was obtained by taking a retrospective review of monthly attendance to the outpatient diabetes clinic in the selected hospitals from July to December 2021. This review showed an average monthly attendance in each of the hospitals. The sample size of 311 for the study was obtained from the total population of Nine hundred and sixty-eight (968), using Slovin's Formula as shown below. The researcher employed a multistage sampling procedure to select the hospitals and respondents for the study.

The instrument for the study was a self-constructed questionnaire comprising of four (4) sections, A, B and C with close-ended questions. Section A comprises 8 items of demographic data of the participants, which include the sex, age, religion, marital status, level of education, type of diabetes, and ethnicity. Section B comprises 10 items to measure Knowledge of diabetes among people living with diabetes mellitus. This was rated as high, moderate, and low knowledge according to the responses. Section C comprises 8 items on self-care management practices employed by people living with diabetes, using a 5-point Likert scale, 1-Never (NV), 2- Rarely (RL), 3- Sometimes (SMT), 4- Often (ALW), and 5- Always (ALW), and a criterion mean score of 3.0. The instrument was subjected to both face and content validity. The validity of the instrument was ensured by a consultant endocrinologist at the University of Benin Teaching Hospital and an expert in measurement and evaluation at the University of Benin.

In testing the reliability of the instrument, a pilot study was conducted by administering 10% of the questionnaires (30) to patients with similar characteristics of the proposed sample size. The reliability of the instrument was calculated using Cronbach's Alpha Coefficient. The results show a range of 0.78 to 0.82.

Three research assistants, two nurses (male and female) who work in the outpatient clinics of selected hospitals were recruited. They were trained by the principal researcher on how to administer the instrument. Thereafter, the researcher and research assistants visited the hospitals on the various clinic days to obtain data from the participants, after due explanation of the purpose of the study must have been made to them. Copies of questionnaire were distributed to the participants while waiting for their turn to see the doctor or after seeing the doctor, to ensure that their major purpose of coming to the clinic is not defeated or denied. The filled questionnaire was retrieved from them on the spot.

Data collected from respondents through questionnaire was examined for completeness, collated, coded, and entered into the computer software; Statistical Package for Social Sciences (SPSS) version 23. Descriptive statistics such as frequency counts, percentages, mean scores, and standard deviation was used to analyze the demographic data of participants and the research objectives. Pearson Product Moment Correlation was used for analyzing the only hypothesis at $p < \alpha$-value of 0.05.

**Results**

**Table 1: Showing social-demographic characteristics of the respondents (n = 300)**

| Variable | Variable classification | Frequency | Percent |
|---|---|---|---|
| Sex | Male | 134 | 44.7 |
| | Female | 166 | 55.3 |
| Age | 20-29 | 48 | 16.0 |
| | 30-39 | 69 | 23.0 |
| | 40-49 | 72 | 24.0 |
| | ≥50 | 111 | 37.0 |
| Religion | Christian | 263 | 87.7 |
| | Islam | 19 | 6.3 |
| | Tradition | 18 | 6.0 |
| Marital status | Married | 197 | 65.7 |
| | Single | 72 | 24.0 |
| | Divorced | 15 | 5.0 |
| | Separated | 16 | 5.3 |
| Level of Education | Primary | 31 | 10.3 |
| | Secondary | 120 | 40.0 |
| | Tertiary | 119 | 39.7 |
| | None | 30 | 10.0 |
| Type of Diabetes Mellitus | Type 1 | 122 | 40.7 |
| | Type 2 | 178 | 59.3 |
| Ethnicity | Binis | 126 | 42.0 |
| | Esans | 68 | 22.7 |
| | Etsako | 35 | 11.7 |
| | Akoko Edos | 34 | 11.3 |
| | Others | 37 | 12.3 |

Table 1 shows that 134(44.7%) of the participants were male while 166(55.3%) were female. Majority 111(37.0%) were 50years and above followed by 72(24.0%) who were within 40-49years. Many 120(40.0%) had secondary level of education while 119(39.7%) had tertiary

level of education. 31(10.3%) had primary education level while 30(10.0%) had none. Those with Type 2 diabetes were more 178(59.3%) compare to 122(40.7%) with Type 1. With respect to ethnicity, Binis were more 126(42.0%) followed by Esans 68(22.7%), Etsako 35(11.7%), and Akoko Edos 34(11.3%). Other ethnic groups which include Ibo, Yoruba, Urhobo, and Owan) accounted for 37(12.3%)

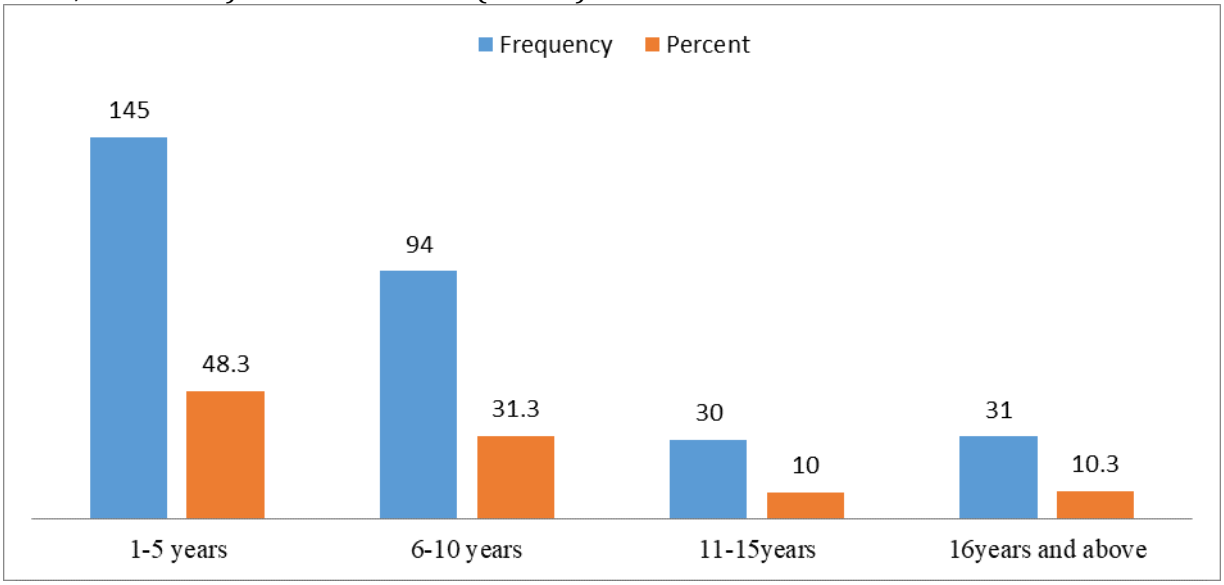


**Figure 1: Showing duration of illness**

Figure 1 show that 145(48.3%) are with the condition for between 1-5years, 94(31.3%) for between 6-10years, 30(10.0%) with the condition 11-15years while 31(10.3%) are with the illness for ≥ 16years.

**Table 2: Level of knowledge of diabetes mellitus among the respondents (n = 300)**

| S/N | | Response | | Remark |
|---|---|---|---|---|
| | | **Correct (%)** | **Incorrect (%)** | |
| 1. | Eating too much sugar and sweet foods is a cause of diabetes | 77(25.7) | 223(74.3) | Low |
| 2. | A common cause of diabetes is lack or insulin resistance in the body | 212(70.7) | 88(29.3) | High |
| 3. | A diabetic diet consists essentially of special foods | 187(62.3) | 113(37.7) | Moderate |
| 4. | The best way to know your blood sugar level is making urine tests | 169(56.3) | 131(43.7) | Moderate |
| 5. | Blood test is more accurate for monitoring blood glucose | 193(64.3) | 107(35.7) | High |
| 6. | Hypoglycemia (low blood sugar) in a diabetic patient is caused by too much food. | 234(78.0) | 66(22.0) | Low |
| 7. | Diabetes can lead to decreased sensitivity of the hands, fingers and feet | 135(45.0) | 165(55.0) | Low |
| 8. | Frequent urination and thirst are signs of | 189(63.0) | 111(37.0) | Moderate |

| | | | | |
|---|---|---|---|---|
| | high blood sugar | | | |
| 9. | Diabetes patient should take special care when cutting the nails. | 189(63.0) | 111(37.0) | Moderate |
| 10. | Persistent blood sugar level of 210mg/dl, in fasting glucose test is considered very high and could indicate diabetes. | 221(73.7) | 79(26.3) | High |

**Mean knowledge score = 53.9%**

Table 2 shows 212(70.7%) correctly stated that a common cause of diabetes is lack or insulin resistance in the body. 187(62.3%) correctly acknowledged that a diabetic diet consists essentially of special foods. 193(64.3%) admitted that blood test is more accurate for monitoring blood glucose. Only 135(45.0%) correctly stated that diabetes can lead to decreased sensitivity of the hands, fingers and feet, while majority 165(55.0%) are of contrary opinion. 189(63.0%) admitted that frequent urination and thirst are signs of high blood sugar while 189(63.0%) admitted that diabetes patient should take special care when cutting the nails. 221(73.7%) agrees that persistent blood sugar level of 210mg/dl, in fasting glucose test is considered very high and could indicate diabetes.

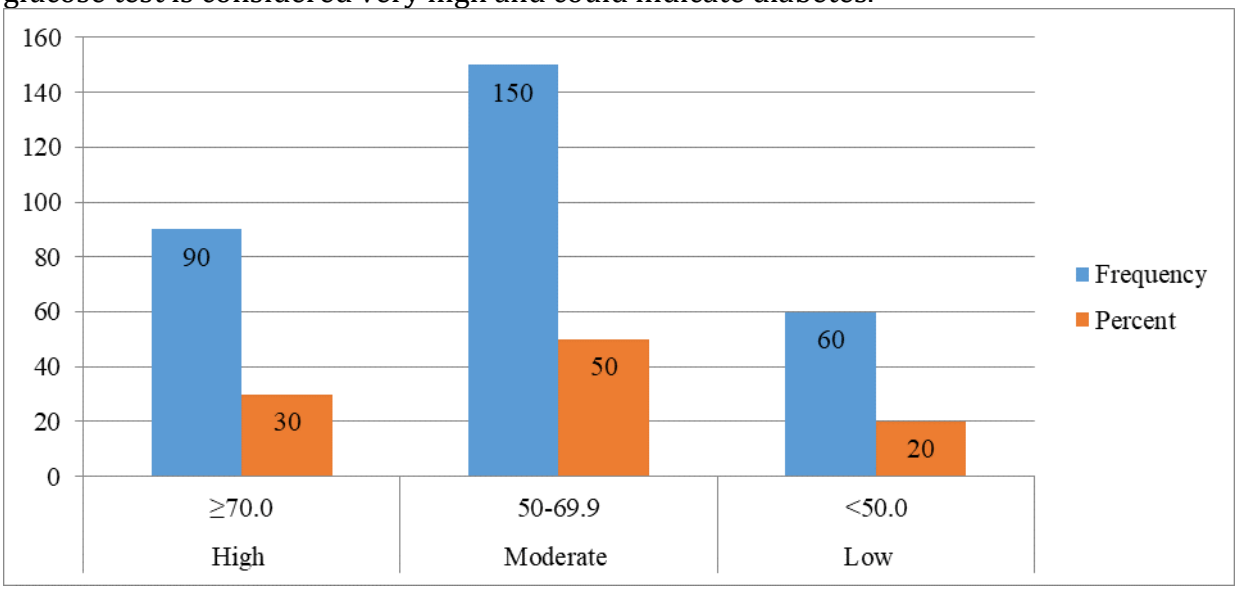


**Figure 2: Showing level of knowledge of diabetes mellitus among the respondents**

Figure 2 shows that 90(30.0%) of the respondents demonstrated high level of knowledge of diabetes mellitus while 150(50.0%) and 60(20.0%) demonstrated moderate and low level of knowledge respectively. Overall mean knowledge score was 53.9%

**Table 3: Showing self- care management practices among the respondents (n = 300, criterion mean = 3.0)**

| SN | Items | Response | | | | | | Remark |
|---|---|---|---|---|---|---|---|---|
| | | NV (%) | RL (%) | SMT (%) | OFT (%) | ALW (%) | Mean ± SD | |
| 1 | Do you follow the recommended eating | 32 (10.7) | 40 (13.3) | 102 (34.0) | 65 (21.7) | 61 (20.3) | 3.28 ± 1.232 | Good |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | plan? | | | | | | | |
| 2 | Do you perform at least 30 minutes of exercise daily? | 33 (11.0) | 59 (19.7) | 93 (31.0) | 76 (25.3) | 39 (13.0) | 3.10 ± 1.185 | Good |
| 3 | Do you check your blood glucose levels daily? | 33 (11.0) | 118 (39.3) | 78 (26.0) | 28 (9.3) | 43 (14.3) | 2.77 ± 1.204 | Poor |
| 4 | Do you check your feet daily when you retire home from work or bussiness | 67 (22.3) | 69 (23.0) | 77 (25.7) | 52 (17.3) | 35 (11.7) | 2.73 ± 1.302 | Poor |
| 5 | Do you consistently take your recommended diabetes medications? | 48 (16.0) | 43 (14.3) | 71 (23.7) | 56 (18.7) | 82 (27.3) | 3.27 ± 1.413 | Good |
| 6 | Are you always eager to see your doctor whenever you experience symptoms of diabetes? | 33 (11.0) | 81 (27.0) | 81 (27.0) | 44 (14.7) | 61 (20.3) | 3.06 ± 1.293 | Good |
| 7 | Do you use herbal/ supplementary remedies to treat your diabetes? | 64 (21.3) | 107 (35.7) | 53 (17.7) | 50 (16.7) | 26 (8.7) | 3.44 ± 1.238 | Good |
| 8 | Do you always keep to your clinic appointments? | 45 (15.0) | 68 (22.7) | 51 (17.0) | 59 (19.7) | 77 (25.7) | 3.18 ± 1.422 | Good |
| | **Grand mean** | | | | | | **3.10 ± 1.286** | |

**Decision Rule: Mean <3.0 = Poor self-care management; Mean >3.0 = Good self-care management**

**Key: NV =Never, RL = Rarely, SMT = Sometime, OT = Often, ALW = Always**

Table 3 shows that 65(21.7%) often follows the recommended eating plan. 76(25.3%) often perform at least 30 minutes of exercise daily, while 39(13.0%) perform it always (mean ± SD = 3.10 ± 1.185). 118(39.3%) rarely check their blood glucose levels daily. 67(22.3%) do not check their feet daily when they retire home from work or business, 69(23.0%) check rarely, 77(25.7%) check only sometimes, 52(17.3%) check often while only 35(11.7%) check always - (mean ± SD = 2.73 ± 1.302). 82(27.3%) consistently take their recommended diabetes medication always (mean ± SD = 3.27 ± 1.413). 77(25.7%) always keep to their clinic appointments. The overall mean of self-management practices is (3.10 ± 1.286)

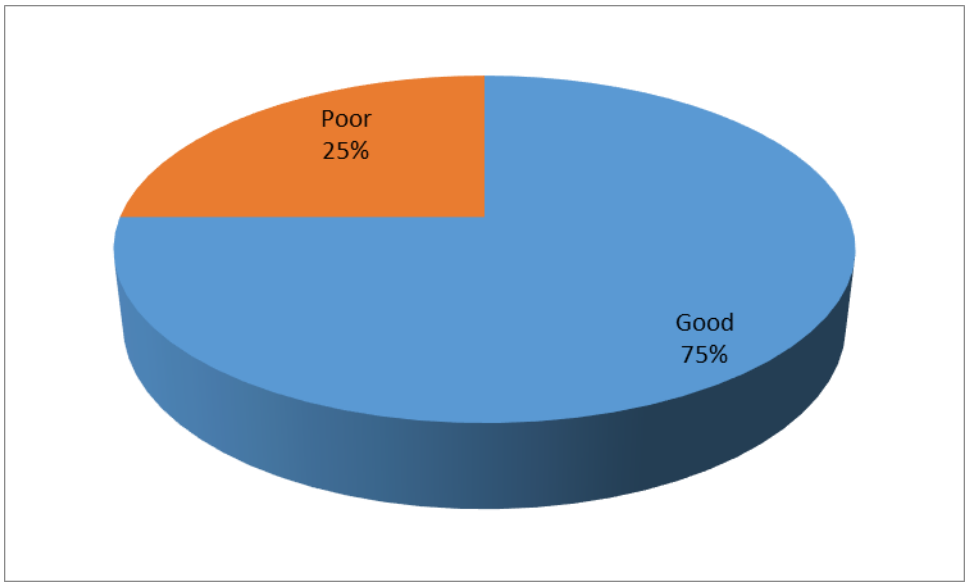


**Figure 3: Showing composite self-care management practices among the respondents**

Figure 3 shows that 225(75.0%) of the participants demonstrated good self-management practices while 75(25.0%) demonstrated poor self-care management practices

**Test of Hypothesis**

**$H_o1$:** There is no relationship between knowledge and self-care management practices among people living with diabetes mellitus.

**Table 4: Showing relationship between knowledge and self-care management practices among people living with diabetes mellitus using Pearson Product-moment correlation**

Correlations

| | | Self-management | Knowledge |
|---|---|---|---|
| Self-care management | Pearson Correlation | 1 | .159** |
| | Sig. (2-tailed) | | .006 |
| | N | 300 | 300 |
| Knowledge | Pearson Correlation | .159** | 1 |
| | Sig. (2-tailed) | .006 | |
| | N | 300 | 300 |

**. Correlation is significant at the 0.006 level (2-tailed).

Table 4 shows Pearson correlation (*p = 0.006*) between knowledge and self-care management practices This means there is statistically significant relationship (*r = .159; p = 0.006 < α-value 0.05*) between knowledge and self-care management practices among people living with diabetes mellitus.

**Discussion of Findings**

A greater number (37.0%) of people living with diabetes mellitus are elderly persons aged 50 and above. This is closely followed by 24.0% who fall within the age of 40-49. This suggests majorly Type 2 diabetes among the participants. With this finding, it become worrisome that

the Type 2 diabetes is becoming prevalent among middle age people. According to the report of International Diabetes Federation (2021), diabetes is currently affecting approximately 537 million adults worldwide, and is expected to affect up to 643 million persons by 2030, and 783 million by 2045. About 40.0% and 39.7% of participants had secondary and tertiary education respectively. This may have accounted for their high level of knowledge about diabetes mellitus. Majority of participants (48.3%) have been with living diabetes mellitus between 1-5 years.

The result from the data analysis in this study shows that the study participants have high level of knowledge about diabetes mellitus, with values showing 70.7%, 64.3% and 73.7% of respondents who correctly answered knowledge questions. These values are above the mean knowledge score of 53.9%. A moderate level of knowledge was also demonstrated about the disease entity by the participants with result showing 62.3%, 56.3%, and 63.0% in other aspects of diabetes knowledge. This implies that the participants have adequate knowledge of diabetes mellitus. It can therefore be deduced that if people living with diabetes deliberately apply the knowledge to their self-care management practices, it will result to good glycemic control, good quality of life and subsequently prevent the occurrence of common complications associated with diabetes mellitus.

The findings of this study align with that of Nwaomah, et al (2020) revealed that participants demonstrated adequate knowledge of diabetes mellitus type 2 with a range of 70% to 100% in different aspects of diabetes. Likewise, Shiferaw, et al (2020) found out that 237 (56.02%) scored above the mean and were considered to have good knowledge. This result of this study negates that of Aniedi, et al (2020) who revealed that 21 (20.4%) had good knowledge while 82(79.6%) had poor diabetes knowledge.

Findings form this study showed that the study participants are more involved in some aspects of diabetes self-care management than others. The results revealed majority of the participants demonstrated good self-care management practices as they are majorly engaged in following the dietary plan with average mean of 3.28, exercise having a mean score of 3.10, medication adherence with mean score of 3.27, visiting the doctor when symptoms aggravate having a mean score of 3.06, and keeping to clinic appointments with mean score of 3.8. However, some of the participants have poor self-care management in the area of daily blood glucose monitoring (2.77 average mean) and foot care with average mean of 2.73.

This study is in line with Nwaomah, et al (2020) who revealed that majority 117(97.5%) of the participants adequately practiced self-care while very few 3 (2.5%) of the participants were poor in the practice of self-care. The results of this study also align with Ugwu, et al (2016) as they revealed that despite the impressive awareness on SMBG, over a third of the patients surveyed in the study did not practice any SMBG, and the majority of those who performed SMBG did so infrequently. The data showed that only 7.9% of the respondents engaged in SMBG at least once daily.

The findings of this study showed a significant and strong relationship between knowledge and self-care management practices of people living with diabetes mellitus ($r = .159$; $p = 0.006 < \alpha = 0.05$). The findings align with Nwaomah et al, (2020) which reported a positive significant and strong relationship between the diabetic patient's knowledge and practice of self-care management ($r = .616$; $p = .000 < .05$). Kugbey, et al (2017) who found out that the

more knowledge patients have about their illness, the more likely they are to comprehend their illness and take up self-care management behaviours such as diet, exercise and blood glucose testing among others. It was observed in the study that, patients who have low knowledge tends to be difficult to accept and understand the information received, such that they become indifferent to new information and feel no need for the information.

**Conclusion**

The study findings revealed that majority of the participants were knowledgeable about diabetes mellitus. The participants are also actively involved in self-care management practices. The knowledge about the illness is likely to inform patients about specific actions in the diabetes management process. Thus, the more knowledge patients have about their illness, the more likely they are to comprehend their illness and take up self-care management behaviours such following the recommended diet, exercise and blood glucose testing among others.

**Recommendations**

Based on the findings, summary and conclusion of the study on knowledge and self-care management practices among people living with diabetes mellitus in selected hospitals, Benin-City Nigeria, the following are recommended;

1. People living with diabetes mellitus should be encouraged and motivated by their care givers, family members, and support group to sustain their self-care management of the disease condition.
2. Patients should be encouraged to put more effort in monitoring their blood glucose level daily, as it serves as yardstick to determine medication dosage, exercise, and dietary intake.
3. Foot observation should be implemented as one of the routine procedures, in the likes of blood pressure and weight monitoring. This is because peripheral sensory neuropathy is common cause of ulceration and amputation in people living with diabetes mellitus.

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**Cite this article:**

**Author(s),** NWABUDIKE, Enifome (RN, RM, BNSc), DR. NWAOMAH Esther Esobuneta, (2022). "*Knowledge and Self-Care Management Practices of People Living with Diabetes Mellitus in Selected Hospitals, Benin-City, Edo State, Nigeria* ", **Name of the Journal**: International Journal of Medicine, Nursing & Health Sciences, (IJMNHS.COM), P, 160 –174. DOI: www.doi.org/10.5281/zenodo.6596477 , Issue: 2, Vol.: 3, Article: 13, Month: April, Year: 2022. Retrieved from https://www.ijmnhs.com/all-issues/

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