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# Diabetes Self-Management Knowledge and Practices among Civil Servants in Enugu State

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## Abstract

Diabetes is becoming a more common health challenge in contemporary times and increasingly in Nigeria particularly in Enugu State. Understanding of self-management knowledge and adoption of its practices are veritable ways of reducing the prevalence and impacts of diabetes. The study investigated the diabetes self-management knowledge and practices among civil servants in Enugu State, Nigeria. Three research questions and one null hypothesis guided the study. Cross-sectional research design was adopted for the study. The population of the study consisted of all civil servants (34,061) in Enugu State. The sample size comprised of 396 Civil servants with diabetes in Enugu State civil service drawn using multi-stage sampling procedure. The Michigan Diabetes Research and Training Center's Revised Knowledge Questionnaire (True/False version),and Andreas Schmitt (2013) Diabetes Self-Management Questionnaire (DSMQ). Frequency, percentage, mean and standard deviation were used to answer the research questions. The null hypothesis was tested using Chi-Square at 0.05 level of significance. The study concluded that respondents had moderate knowledge of diabetes self-management and majority of the civil servants with diabetes adopted diabetes self-management practices to a considerable degree. There was no significant difference in the level of diabetes self-management knowledge among civil servants based on age. However, the authors recommended that there should be an increase in diabetes self-management education by health educators and other health professionals to be able to improve diabetes self-management knowledge and practices among civil servants with diabetes.

**Keywords:** Diabetes, Self-management Knowledge, Practice, Promotion strategies, Civil servants

## Introduction

Diabetes is becoming a more common health challenge in contemporary times and increasingly in Nigeria. Globally, the rapidly increasing cases of diabetes have become a concern to public health care experts and general public. Reports have 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 (International Diabetes Federation [IDF], 2021). The increasing prevalence is likely to be attributed to factors such as lifestyle changes caused by urbanization and its results; industries producing unhealthy diets including sugar, sweetened drinks, lack of exercise, tobacco use and harmful use of alcohol (American Diabetes Association [ADA], 2019).The rising cases of diabetes has not only caused increased in mortality but has contributed substantially to the burden of chronic diseases in Nigeria. According to Global Burden of Disease (GBD, 2021) Diabetes Collaborators (2023), diabetes mellitus continues to pose a significant public health challenge globally, with an estimated 529 million people living with the condition in 2021, a figure projected to rise to 643 million by 2030 due to increasing obesity and lifestyle factors. Among working populations, such as civil servants, the prevalence of type 2 diabetes is

particularly concerning, given the sedentary nature of their roles and limited opportunities for physical activity, necessitating a deeper understanding of their self-management knowledge and practices (GBD, 2021; Diabetes Collaborators, 2023).

Diabetes is a serious chronic condition that occurs when the body cannot produce enough insulin or cannot effectively use the insulin it produces (IDF, 2021). There are several types of diabetes with different causes and clinical histories. Diabetes Association of Nigeria, DAN, (2014) and American Diabetes Association (ADA) in its 2019 Standards of Medical Care in Diabetes, classified diabetes into four clinical categories as type 1 diabetes, characterized by autoimmune beta-cell destruction leading to insulin deficiency; type 2 diabetes, marked by progressive insulin resistance and relative insulin deficiency; gestational diabetes, diagnosed during pregnancy and often resolving postpartum; and other specific types of diabetes, encompassing conditions due to genetic defects, diseases of the exocrine pancreas, or drug-induced causes.

The risk factors of diabetes include age (kotur & anbazhagan 2014); gender (Rolleri 2013) and level of education (United Nations Educational Scientific and Cultural Organization [UNESCO], 2012). Most of these factors and their association with diabetes were studied outside Nigeria. This study therefore examined the association of age, gender and level of education with the diabetes self-management knowledge, practice and promotion strategies among civil servant in Enugu State Nigeria. Diabetes is associated with system dysfunction and failure of various organs especially the eyes, kidney, nerves, heart and blood vessels (World Health Organization, 2016). Diabetes self-management knowledge, practice and promotion strategies are skills, knowledge and behaviours that help people with diabetes to manage their condition. Diabetic treatment is a lifelong process, where self-motivation of the patient is needed. Therefore diabetes control is achieved through diabetes care, management and preventive care practices. The study therefore investigated diabetes self-management knowledge, practice and promotion strategies among civil servants in Enugu State.

Government supposed to provide inhabitant including civil servant with adequate health care services aimed at prevention, protection and promotion of health and wellness. Unfortunately government could not provide some needed health care and services. This therefore disposes civil servants to go about their manual routines, carrying out their daily tasks with little or no attention to the diabetes self-management knowledge and practice. Then, this possible scenario predisposes the civil servants to the complications associated with diabetes. There unhealthy behaviours which diabetes self-management strategies would have ameliorated among civil servant. This study was carried out to assess diabetes self-management knowledge and practices among civil servants in Enugu. The focus on Enugu's civil servants stems from their critical role in public administration, where poor health outcomes could impair productivity, coupled with the area's increasing diabetes burden.

**Purpose of the Study**

The purpose of this study is to determine diabetes Self-Management Knowledge and Practices among Civil Servants in Enugu State. Specifically, the study determined the:

1. level of diabetes self-management knowledge among civil servants in Enugu State;
2. diabetes self-management practices adopted by civil servants in Enugu State; and
3. level of diabetes self-management knowledge among civil servants in Enugu State based on age.

**Research Questions**

The following research questions were posed to guide the study:

1. What is the level of diabetes self-management knowledge among civil servants in Enugu State?

2. What are the diabetes self-management practices adopted by civil servants in Enugu State?
3. What is the level of diabetes self-management knowledge among civil servants in Enugu State based on age?

**Hypotheses**

The following null hypothesis was postulated and tested at .05 level of significance.

1. There is no significant difference in the level of diabetes self-management knowledge among civil servants in Enugu State based on age.

## Methods

Cross-sectional research design was adopted for the study. The study was carried out in Enugu State which is located in south east zone in Nigeria with its capital in Enugu city from where it derives its name. It covers 7161 square kilometers. It shares borders with Abia and Imo to the south, Ebonyi to the east, Benue and Kogi to the north and Anambra state to the west. There are 17 local government areas distributed evenly within three senatorial districts. Enugu State is predominantly rural with over 40 per cent of population residing in rural areas. Farming, trading, artisans, civil servants are the predominant occupation in the State. Enugu State, a key administrative center in southeastern Nigeria, hosts a significant civil service workforce whose health directly influences public sector productivity. Despite this, there is a paucity of localized data on how these workers manage diabetes. Studying this population in Enugu State is critical to understanding barriers to effective self-management and developing tailored interventions to address the growing diabetes burden in this urbanizing region. The population of the study consisted of all civil servants (34,061) in Enugu State. The sample size comprised of 396 Civil servants with diabetes in Enugu State civil service drawn using multi-stage sampling procedure. The retrieved copies of the DSMKQ-CSES and DSMQ were cross checked for completeness of response before analysis. Copies that are not properly filled out were discarded.

The International Business Machine Statistical Package for Social Sciences (IBM-SPSS) version 23 was used for data analysis. Frequencies and percentages were used to answer the research question one and three, while mean and standard deviation were used to answer the research questions two. To determine the diabetes self-management knowledge among civil servants, a correct answer was assigned 1 while an incorrect answer was assigned 0. Therefore, the total diabetes self-management knowledge score is 20. Three scoring categories were created to indicate the level of knowledge of the participants. A score of 0 – 7 was considered low level of knowledge; 8 – 15 was considered moderate level of knowledge and a score ≥ 16 was considered high level of knowledge. This is in line with the guidelines of the developer (Lloyd, 2008) on determining diabetes self-management knowledge. The level of practice of diabetes self-management were analyzed using limit of numbers (0 – 0.75 = Do not adopt; 0.76-1.50 = Adopt to some degree; 1.51-2.25 = Adopt to a considerable degree; 2.26 - 3.00 = adopt very much). A criterion mean of 2.5 was used to determine item statements that were appropriate (≥2.5) and those that were inappropriate (<2.5). Chi-square statistics was used to test the null hypotheses one. The hypotheses were tested at 0.05 level of significance and appropriate degrees of freedom. The null hypothesis was rejected when the probability value (*p*-value) is less than or equal to the alpha level, but where the $\rho$ value is greater than the alpha value, the null hypothesis is not rejected.

## Results

Table 1

**Frequency and Percentage Analysis showing Level of Diabetes Self-Management Knowledge among Civil Servants in Enugu State (n = 389)**

| S/n | Knowledge of Diabetes Self-Management | Correct Response | |
|---|---|---|---|
| | | F | % |
| | The diabetes diet is a healthy diet for most people | 275 | (70.7) |
| | Glycosylated haemoglobin (HbA1c) is a test that measures your average blood glucose level in the past week. | 115 | (29.6) |
| | A pound of chicken has more carbohydrate in it than a pound of potatoes. | 307 | (78.9) |
| | Orange juice has more fat in it than low fat milk. | 331 | (85.1) |
| | Urine testing and blood testing are both equally as good for testing the level of blood glucose. | 40 | (10.3) |
| | Unsweetened fruit juice raises blood glucose levels. | 98 | (25.2) |
| | A can of diet soft drink can be used for treating low blood glucose levels. | 159 | (40.9) |
| | Using olive oil in cooking can help lower the cholesterol in your blood. | 157 | (40.4) |
| | Exercising regularly can help reduce high blood pressure. | 309 | (79.4) |
| | For a person in good control, exercising has no effect on blood sugar levels. | 18 | (4.6) |
| | Infection is likely to cause an increase in blood sugar levels. | 239 | (61.4) |
| | Wearing shoes a size bigger than usual helps prevent foot ulcers. | 160 | (41.1) |
| | Eating foods lower in fat decreases your risk for heart disease. | 331 | (85.1) |
| | Numbness and tingling may be symptoms of nerve disease. | 270 | (69.4) |
| | Lung problems are usually associated with having diabetes. | 268 | (68.9) |
| | When you are sick with the flu you should test for glucose more often. | 120 | (30.8) |
| | High blood glucose levels may be caused by too much insulin. | 162 | (41.6) |
| | If you take your morning insulin but skip breakfast your blood glucose level will usually decrease. | 172 | (44.2) |
| | Having regular check-ups with your doctor can help spot the early signs of diabetes complications. | 358 | (92.0) |
| | Attending your diabetes appointments will stop you getting diabetes complications. | 46 | (11.8) |
| | Summary of Knowledge Levels | | |
| | Low Knowledge | 28 | 7.2 |
| | Moderate Knowledge | 358 | 92.0 |
| | High Knowledge | 3 | .8 |

Table 1 shows that majority of civil servants with diabetes in Enugu State had moderate knowledge of diabetes self-management (358 (92.0%) with only 3 persons (0.8%) having high level of diabetes self-management

Table 2

**Mean and Standard Deviation Analysis of Diabetes Self-Management Practices Adopted by Civil Servants in Enugu State (n = 389)**

| S/N | Diabetes Self-Management Practices | $\bar{x}$ | SD |
|---|---|---|---|
| 1 | I check my blood sugar levels with care and attention. | 1.99 | 1.14 |
| 2 | I take my diabetes medication (e. g. insulin, tablets) as prescribed. | 1.81 | 1.24 |
| 3 | I record my blood sugar levels regularly (or analyze the value chart with my blood glucose meter). | 1.66 | 1.18 |
| 4 | I do not check my blood sugar levels frequently enough as would be required for achieving good blood glucose control. | 1.72 | 1.15 |
| 5 | I tend to forget to take or skip my diabetes medication (e. g. insulin, tablets). | 1.94 | 1.12 |
| 6 | I do self-test more frequently when I feel the symptoms of hypoglycemia such as tremor, pallor and headache | 2.12 | 1.12 |
| 7 | I try to maintain optimal weight by measuring my weight regularly | 2.29 | 0.95 |
| | Blood glucose management and medication intake | 1.93 | 0.61 |
| 8 | The food I choose to eat makes it easy to achieve optimal blood sugar levels. | 2.26 | 0.97 |
| 9 | Occasionally I eat lots of sweets or other foods rich in carbohydrates. | 1.62 | 1.10 |
| 10 | I strictly follow the dietary recommendations given by my doctor or diabetes specialist. | 2.14 | 1.16 |
| 11 | Sometimes I have real ‘food binges’ (not triggered by hypoglycaemia). | 1.39 | 1.20 |
| 12 | I take food containing dietary fibre like grain, vegetable and fruits everyday | 2.36 | 0.89 |
| 13 | I set limit on taking salt and processed foods | 2.21 | 0.98 |
| 14 | I get on diabetes control by attending various diabetes educational programmes | 2.15 | 1.11 |
| | Dietary habits facilitating diabetes control | 2.02 | 0.52 |
| 15 | I keep all doctors’ appointments recommended for my diabetes treatment. | 2.17 | 1.11 |
| 16 | I tend to avoid diabetes-related doctors’ appointments. | 1.87 | 1.17 |
| 17 | Regarding my diabetes care, I should see my medical practitioner(s) more often. | 2.07 | 1.19 |
| 18 | I avoid refine sugar/sugary foods | 2.28 | 1.01 |
| | Adherence to medical appointments and advice | 2.10 | 0.65 |
| 19 | I do regular physical activity to achieve optimal blood sugar levels. | 2.29 | 0.98 |
| 20 | I tend to skip planned physical activity. | 1.38 | 1.10 |
| 21 | The following physical activities provide health benefit such as dancing, aerobics, jogging, biking, household cleaning, etc. | 2.48 | 0.80 |
| 22 | Physical exercise allows me to carry out normal activities without becoming tired. | 2.45 | 0.83 |
| | Compliance to physical exercise | 2.15 | 0.54 |
| 23 | My diabetes self-care is poor. | 1.77 | 1.16 |
| | Overall DSMP | 1.99 | 0.46 |

Key: 0.0 – 0.75 = Do not adopt; 0.76-1.50 = Adopt to some degree; 1.51-2.25 = Adopt to a considerable degree; 2.26-3.00 = adopt very much.

Table 2 shows that the diabetes self-management practices from civil servants with diabetes in Enugu State is adopted to a considerable degree ($\bar{x}$ = 1.99; SD = 0.46). Compliance to physical exercise ($\bar{x}$ = 2.15; SD = 0.54), adherence to medical appointments ($\bar{x}$ = 2.10; SD = 0.65), good dietary habits ($\bar{x}$ = 2.02; SD = 0.52), and blood glucose management ($\bar{x}$ = 1.93; SD = 0.61) were all adapted to a considerable degree.

Table 3

**Frequency and Percentage Analysis showing Level of Diabetes Self-Management Knowledge among Civil Servants in Enugu State based on Age (n = 389)**

| S/n | | <30 years (n=71) | | 30-45 years (n=142) | | 46+ years (n=176) | |
|---|---|---|---|---|---|---|---|
| | | F | % | f | % | F | % |
| **1** | Low knowledge | 5 | 7.0 | 8 | 5.6 | 15 | 8.5 |
| **2** | Moderate knowledge | 66 | 93.0 | 132 | 93.0 | 160 | 90.9 |
| **3** | High knowledge | 0 | 0.0 | 2 | 1.4 | 1 | 0.6 |

Table 3 shows that civil servants with diabetes that are 30-45 years had highest level of diabetes self-management knowledge when compared with other age ranges (30-45 years: 1.4% >: Less 30 years: 0.6% > and 46 years and above: 0.0%). The Table further indicates that majority of civil servants with diabetes had moderate knowledge regarding diabetes self-management irrespective of the age ranges (Less 30 years and 30-45 years: 93.0% > 46 years and above: 90.

Table 4

**Chi-Square Test of Level of Diabetes Self-Management Knowledge among Civil Servants in Enugu State based on Age (N=389)**

| Variable (Age ranges) | Age Ranges | | | $\chi^2$ value | df | *p*-Value | Decision |
|---|---|---|---|---|---|---|---|
| | **<30 years** | **30-45 years** | **46+ years** | | | | |
| | **O(E)** | **O(E)** | **O(E)** | | | | |
| Low Knowledge | 5(5.1) | 8(10.2) | (12.7) | | | | |
| Moderate Knowledge | 66(65.3) | 132(130.7) | 160(162.0) | 2.347[a] | 4 | .672 | Not Rejected |
| High Knowledge | 0(.5) | 2(1.1) | 1(1.4) | | | | |

[a] *Significant at P ≤ 0.05 level of significance; O(E) = Observed frequency (Expected frequency)*

Table 4 shows that there is no significant difference in the level of diabetes self-management knowledge among civil servants in Enugu State based on age range ($\chi^2$= 2.347, df = 4, *p*-value = .672 > .05). This implies that no difference existed between level of diabetes self-management knowledge among civil servants and their age range (<30 years, 30-45 years and 46+ years and above).

## Discussion

The findings in Table 1 showed that majority of civil servants with diabetes in Enugu State have moderate knowledge of diabetes self-management. This finding was expected because it was anticipated that diabetics should have high knowledge of diabetes self-management. Interestingly, American Diabetes Association (2022) promotes diabetes self-management education that is patient-centered, focusing on supporting patient empowerment

by providing people with diabetes the tools to make informed self-management decision". An effective way to actively involve diabetes patients in diabetes self-care management is through an evidence-based diabetes education that is both visual and verbal, which employs a patient-centered approach to apply strategies in an "empowered, learning environment, and further strengthening patients' self-care ability" ( Defeudis et al., 2018; Hung et al., 2017). Also, Liu et al (2015) found that while patients with diabetes had some knowledge of self-management strategies, such as diet and exercise, they had limited understanding of other important aspects, such as blood glucose monitoring and medication adherence. In a related study, Čápová et al. (2017) found that patients with diabetes had moderate knowledge of self-management, but lacked understanding of long-term complications and glucose monitoring. A review of studies on diabetes self-management education found that while patients generally had some knowledge of self-management, they often lacked understanding of key concepts, such as goal setting and problem-solving (Simpson et al., 2016). The findings suggest that while diabetics may have some knowledge of self-management, there are often significant gaps in their understanding, particularly regarding more complex aspects of diabetes care. Moderate knowledge of diabetes self-management may lead to suboptimal health outcomes for these individuals. Hence, proper self-management of diabetes is crucial for controlling blood sugar levels, preventing complications such as cardiovascular disease, kidney disease, and nerve damage, and improving overall quality of life. With only moderate knowledge, individuals may not adhere to recommended dietary guidelines, exercise routines, medication schedules, or monitoring practices as effectively as those with higher knowledge levels. Civil servants with moderate knowledge may not engage in preventive measures or early interventions that could reduce the progression of diabetes-related complications, potentially increasing healthcare utilization and costs. Also, civil servants with moderate knowledge of diabetes self-management may experience more frequent health-related absences or reduced productivity compared to those with higher knowledge levels. This could affect workplace efficiency and overall organizational performance. This finding agrees with those of Sahile et al. (2020) who found that moderate proportion of adult diabetes mellitus patients on follow-up care at North Shewa Zone Government Hospitals, Oromia Region, Ethiopia have good knowledge of diabetes self-care management.

The findings in Table 2 revealed that diabetes self-management practices from civil servants that are diabetic in Enugu State were adopted to a considerable degree. Though this finding was not expected, the researcher feels it was plausible owing to the fact that having knowledge is not tantamount to practice. Many diabetics still have many barriers to practicing self-management practices. Multiple barriers to diabetes education and self-care management are present in the diabetes patient population that contributes to intervention failure and poor self-care management (Foster, 2022). Conflicting and busy schedules, competing priorities, lack of motivation, food insecurities, and transportation issues are barriers noted in the literature that cause challenges to self-care management (Mogre et al., 2019). Moreover, diabetes patients face challenges in their self-care management that "can lead to frustrations and emotional struggles" that hinder glycemic control (Ritholz et al., 2018). A patient centered approach to diabetes education at diagnosis and ongoing can assist the patient "to overcome barriers and to cope with the ongoing demands in order to facilitate changes" (Powers et al., 2020). Although uncontrolled diabetes patients find difficulty in "synthesizing self-management recommendations" into their daily routines, a structured diabetes education intervention would provide "the knowledge, skills, and confidence to accept responsibility for their self- management" (Powers et al., 2020).

Research has further shown that many diabetics have adopted considerable practice of diabetes self-management. Eshete et al. (2023) found that more than half of the patients with diabetes demonstrated stress management behaviour, which was associated with improved

diabetes self-care practice. Another study by Liu et al. (2015) found that patients with type 2 diabetes had good self-management behaviour, including diet, exercise, and blood glucose self-monitoring. The findings suggest that while there are still gaps in diabetes self-management knowledge, many diabetics have adopted considerable practices to manage their condition effectively. Diabetes self-management education and support (DSMES) programs have been shown to improve patients' ability to manage their condition and adhere to treatment plans (Liu et al., 2015). These programs cover key self-care behaviours, including healthy eating, physical activity, medication management, and stress management.

The findings in Table 3 indicated that not less than nine out of ten civil servants in Enugu State have moderate level of knowledge regarding diabetes self-management irrespective of the age ranges. This was unexpected owing to the fact that the respondents are diabetics who have been involved in some forms of diabetes self-management as part of their treatment regimen. This finding implies that age did not significantly influence civil servants' knowledge regarding diabetes self-management. Similarly, the hypothesis tested in Table 4 showed that there was no significant difference in the level of diabetes self-management knowledge among civil servants in Enugu State based on age range. These findings are not surprising as they indicate a need for consistent and uniform educational programmes and interventions aimed at improving diabetes knowledge and self-care management across all age groups. The researchers expected a good number of the respondents to have high level of knowledge. Čápová et al. (2017) found that patients with diabetes aged 18-30 had moderate knowledge of self-management, but lacked understanding of long-term complications and glucose monitoring.

A related study found that patients with type 2 diabetes aged 40-60 had good knowledge of diet and exercise, but limited understanding of medication adherence and blood glucose monitoring (Liu et al., 2015). A review of studies on diabetes self-management education found that older adults (aged 65 and older) had limited knowledge of self-management, particularly regarding new technologies and glucose monitoring (Simpson et al., 2016). Hence, all civil servants, regardless of age, should have access to comprehensive information, support networks, and healthcare services necessary for effective diabetes management which includes access to healthcare providers who can provide personalized guidance and support. On contrary, Alhaik et al. (2018) reported that age was significantly associated with knowledge of diabetes self-care among patients with diabetes mellitus. Eshete et al. (2023) found that patients aged 40-60 years were more likely to practice diabetic self-care and had better stress management behaviour. The findings suggest that while diabetics may have some knowledge of self-management, there are often significant gaps in their understanding, particularly among younger and older adults.

## Conclusion

The level of diabetes self-management knowledge was moderate among civil servants with diabetes in Enugu State, Nigeria. Similarly, diabetes self-management practices were adopted by diabetic civil servants in Enugu State moderately. Majority of the civil servants of all ages, had moderate diabetes self-management knowledge and adopted self-management practices moderately. These strategies if effectively implemented, hopefully, would enable civil servants with diabetes and others mitigate diabetes complications and deaths. The knowledge level of diabetes self-management possessed by civil servants with diabetes in Enugu State were not implicitly different based on age, Diabetes self-management practices adopted by civil servants in Enugu State differ very well by age. Diabetes self-management practices from civil servants with diabetes in Enugu State are adopted to a considerable degree.

**Recommendations**

1. There should be an increase in diabetes self-management sensitization by health educators and other health professionals to increase awareness about diabetes self-management among civil servants.
2. Enugu State ministries of health and education should ensure that there is an inclusion of diabetes self-management rules and regulations in the civil service commission for the enhancement of its practice.
3. Partnership is essential in drawing people from different backgrounds, ministries, departments and expertise for effective action both intra-sectoral and intersectoral collaboration to tackle poor knowledge and adoption of diabetes self-management.
4. The government should at interval, organize workshops for where the public can be more enlightened and get tested, on diabetes and related complications.

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