

**THE PREVALENCE OF TYPE 2 DIABETES MELLITUS IN IFE CENTRAL LOCAL
GOVERNMENT AREA OF OSUN STATE, NIGERIA**

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ABSTRACT

Introduction: The rate at which diabetes mellitus is increasing has become alarming and it is a source of concern to the global health care system, especially in the low and middle income countries all over the world. The aim of this study is centered on evaluating the prevalence of diabetes mellitus among the populace of Ife Central local government area of Osun State, Nigeria. **Materials and Method:** The study was conducted in a medical outreach of Dr. Omolajaiye Foundation (DOF) in May, 2024 at yam sellers' stall area of Odo-Ogbe Market, in Ife Central local government of Osun State, Nigeria. Five Hundred and twenty two participants were involved in this cross-sectional study. The coordinator of the foundation, medical teams and the researcher having gotten the royal consent from the palace of Ooni of Ife and the Iya-loja of the market who in turn informed the subject and the community at large via various means, including, town hall awareness programs, announcements on various Ife community WhatsApp platforms, Television and Radio stations (Orisun Fm) for 4 weeks to help disseminate the information and notify the residents of the medical outreach for this study. Random blood glucose were determined using fine test glucometer and appropriate glucometer strip. **Results:** There were 522 participants out of which (101 Males, 421 Females), (174 Educated, 348 uneducated), (216 married, 48 single, 64 widows, 194 divorced). Majority (441) of the sample population constituting 84.5% are normoglycemic. The current research found a 5.2 % diabetes prevalence (27 participants) with the mode (10 individuals) in the 51-60 years age group followed by (6 individuals) in the age group of 61-70 years. Also, there were 42 participants in pre-diabetic range constituting approximately 8% of the sample population. This study found a total of 9 participants with hypoglycemia, the modal occurrence (5 participants) was seen in the age group 71-80 years, followed by (3) occurrences in the 61-70 age group. **Conclusion:** The findings from this study revealed diabetes prevalence in Ife Central local government area to be 5.2% which was slightly lower than the earlier documented figure of 5.5% in the south western part of the country, this may be due to improved health awareness campaign and lack of vital statistics in the area, misdiagnosis, better attitude to seeking health care delivery and influence/presence of tertiary health care facility in the area under study.

KEYWORDS: Prevalence, Diabetes mellitus, Ife-Central LGA, Osun State.

INTRODUCTION

Diabetes mellitus (DM) is a group of disorders of carbohydrate metabolism, where glucose is both underutilized as an energy source but over-produced due to inappropriate gluconeogenesis and glycogenolysis, causing high glucose level in the blood.^[1] It is also the commonest metabolic disease which occurs as a result of in insulin secretion and/or the activity of insulin, leading to chronic hyperglycemia with defective carbohydrate, fat and protein metabolism.^[3] It is globally associated with high disease burden most especially in developing

countries like Nigeria. DM is a chronic metabolic disease characterized by hyperglycemia, which long term effect leads to serious damage to various organ affections such as; kidneys, liver, brain, the heart and blood vessels, eyes, and nerves. The commonest is type 2 diabetes, usually in adults, which occurs when the body becomes resistant to insulin or insufficient insulin is being produced. In the past 3 decades the prevalence of type 2 diabetes has risen astronomically in countries of all over the world. Access to affordable treatment, including insulin, is critical to the survival of people living with diabetes.

There is a globally agreed target to stop the rise in diabetes and obesity by 2025.^[4] Approximately 422 million persons across the globe live with diabetes, the majority of them are living in low and middle income countries, and 1.5 million deaths are directly attributed to diabetes each year, both the number of cases and the prevalence of diabetes have been steadily increasing over the past few decades. (WHO, 2024). The number of people with diabetes rose from 108 million in 1980 to 422 million in 2014. Prevalence of diabetes has been rising more rapidly in low- and middle-income countries than in high-income countries, diabetes is a major cause of blindness, kidney failure, heart attacks, stroke and lower limb amputation, between 2000 and 2019, there was a 3% increase in diabetes mortality rates by age and in 2019, diabetes and kidney disease due to diabetes caused an estimated 2 million deaths.^[7] DM has poised to affect the developing countries of the world much more than their developed counterparts and has thus assumed pandemic proportions globally.^[18]

Several years ago, South Africa and Ethiopia were said to have more diabetes cases than Nigeria. However, currently, Nigeria has the highest incidence of diabetes in sub-Saharan Africa. The WHO estimated a 4.3% prevalence of diabetes in Nigeria in 2016.^[4] whereas this prevalence has snowballed to 5.5% in a more recent study by Uloko *et al.*, 2018. Some local studies conducted in Nigeria found a prevalence between 0.8% and 11%.^[5] A previous study reported that about 4.7 million Nigerians had type 2 diabetes.^[6]

Type 2 diabetes mellitus (T2DM) is predominant among people living with diabetes mellitus patients in Nigeria, accounting for more than 90% of the total cases.^[8] Mortality associated with diabetes was estimated to be more than 40,000 Nigerians in 2015, and such a huge loss is due to nonexistent efficient and effective healthcare delivery. There are millions of Nigerians who are diabetic but are yet to be diagnosed and those diagnosed are not getting proper treatment. The International Diabetes Federation (IDF) projected that about two-thirds of people with diabetes in Africa are undiagnosed. The complications of diabetes are very serious, including stroke, heart attack, kidney failure, blindness, etc. The WHO predicts diabetes to become the seventh leading cause of death in the world by the year 2030.^[9] Approximately 197 million people worldwide are in pre diabetic stage, mostly because of obesity and its accompanying metabolic syndrome.^[5] Over time, diabetes has the potential to cause damage to various parts of the body such as brain, cranial and spinal nerves, the heart, blood vessels, eyes and kidneys. It was predicted that developing countries will bear the majority of the worldwide burden of diabetes epidemics in the 21st century, translating to 77% of cases.^[6] The rise in prevalence could be linked to factors such as increase in population, bad dietary habits and unhealthy foods, obesity, and sedentary lifestyles.^[7] The overall pooled prevalence of DM in Nigeria was 5.77%. The pooled

prevalence of DM in the south-south zone recorded the highest in the six geopolitical zones of the country being 9.8%.^[8]

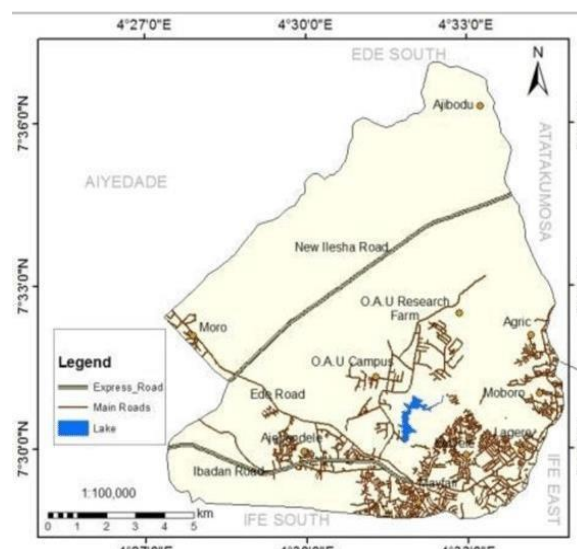


Plate 1: A Map of Ife Central local government showing major geographical points within longitude (7° 30' - 7° 36'N) latitude (4° 27' - 4° 33'E).

Adelokun *et al.*, 2021

Diabetes can be diagnosed by demonstrating increased concentrations of glucose in venous plasma or increased HbA1C in the blood. According to International Diabetes Federation, Diabetes mellitus is diagnosed through various criteria. These include having a blood glucose level of 7.0mmol/L (126 mg/dL) or higher after an eight hour fast, or a non-fasting glucose level of 11.1mmol/L (200 mg/dL) or higher along with symptoms of diabetes.^[10] Also it can be diagnosed if the glucose level is 200 mg/dL or higher on a two-hour glucose tolerance test, or if the hemoglobin A1C level is equal to or greater than 6.5%. A fasting blood glucose level less than 100 mg/dL (5.6 mmol/L) is normal. A fasting blood glucose level from 100 to 125 mg/dL (5.6 to 6.9 mmol/L) is considered pre diabetes. If it is 126 mg/dL (7 mmol/L) or higher on two separate tests, then diabetes mellitus is diagnosed.^[11]

Diabetes is commonly classified into various clinical types (Type 1, Type 2 diabetes, Gestational diabetes mellitus, and other specific types derived from other causes, such as genetic causes, exocrine pancreatic disorders, and medications)⁽²⁾. Diabetes can be treated to prevent or delay its consequences with diet, physical activity, medication, regular screening and treatment for complications. A healthy diet, regular physical activity, maintaining a normal body weight, avoiding alcohol and tobacco use are ways to prevent or delay the onset of type 2 diabetes.

MATERIALS AND METHODS

The study was conducted at a medical outreach Organized by Dr. Omolajaiye Foundation (DOF) in May,

2024 at yam sellers' stall area of Odo Ogbe Market, in Ife Central local government area of Osun State Nigeria, as depicted in Plate 1 above. A total of five hundred and twenty-two patients took part in the cross-sectional study using a convenience sampling method. The coordinator, medical teams and the researcher having gotten the royal consent from the palace of His Imperial Majesty Ooni of Ife and the Iyaloja of the market, who in turn informed the subjects and the community at large via various means including; town hall awareness programs, announcements on various Ife community WhatsApp platforms, Television and Radio stations (Orisun Fm) for 4 weeks, for due dissemination of the information and to notify the residents about the medical outreach for this study.

Participants were informed to arrive early at the venue of the program at 8:30 a:m and their random blood glucose were determined using a fine test glucometer with compatible glucose test strips. Forms were issued to collect their biodata, the study included both males and females who were 18 years old and above. The weight was recorded in kilograms to the nearest 0.1 kg using a RGZ-160 weighing scale, and the height was recorded with RGZ-160 attached stadiometer, height was taken in meters to the nearest 0.05 m.

The body mass index (BMI) was calculated as the weight in kilograms divided by the square of the height in meters, according to WHO guideline.^[16]

After the procedure had been explained to the participants, informed consent was gotten from them, swab was used to clean and disinfect the fingertip and a lancet was used to jab the finger, the first drop of blood was wiped off with dry swab and the fingertip slightly squeezed for fresh drop of blood, with the fine test glucometer, being loaded with appropriate glucometer strip, putting the glucometer in a standby mode. The strip on the glucometer was applied to the fresh blood from the fingertip and the value was recorded after 10 seconds. Participants with a fasting blood glucose level from 100 to 125 mg/dL (5.6 to 6.9 mmol/L) is considered prediabetes and a fasting blood glucose level of 126 mg/dL (7.0mmol/L) or higher after an eight-hour fast, or a non-fasting glucose level of 200 mg/dL (11.0mmol/L) or higher is within the diabetic range, IDF criteria.^[1]

Data analysis was performed using MS Excel 2016 and STATA version 15.0. Chi-square test was used to determine the association between Diabetes risk, Body Mass Index, marital status and sex and age group with level of significance set at $P < 0.05$.

RESULTS

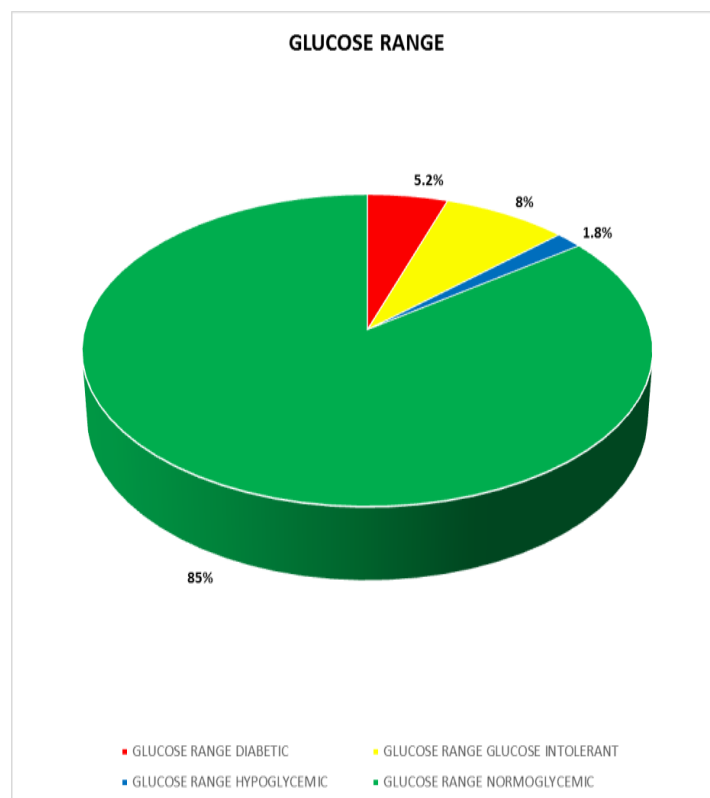


Figure 1: The Pie Chart Showing The Percentages Of Glycemic Indices.

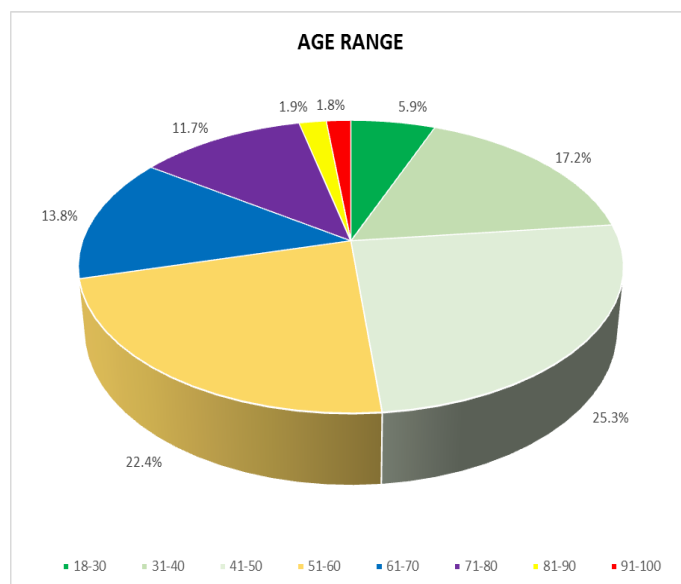


Figure 2: The Pie Chart Showing The Age Range Among The Participants.

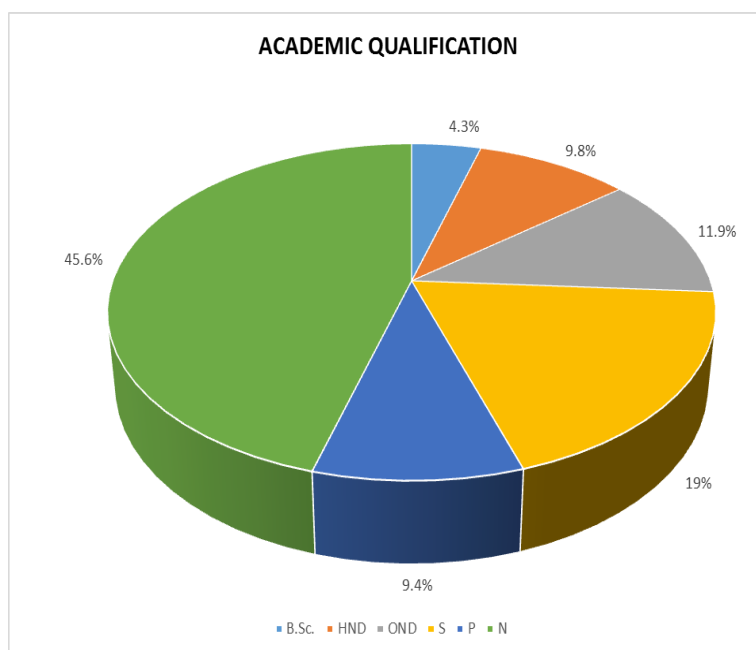


Figure 3: Academic Qualification.

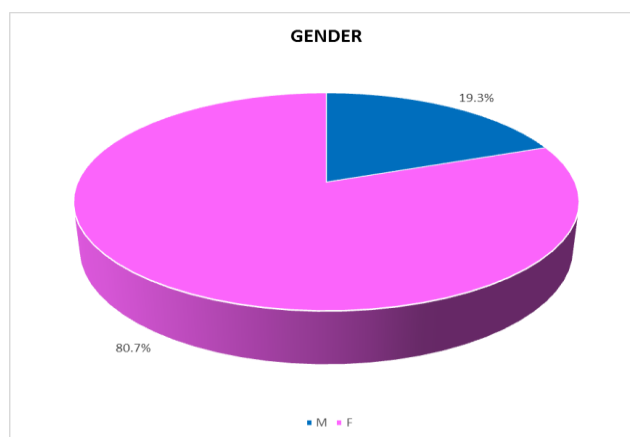


Figure 4: The Pie Chart Showing the Age Range among the Participants

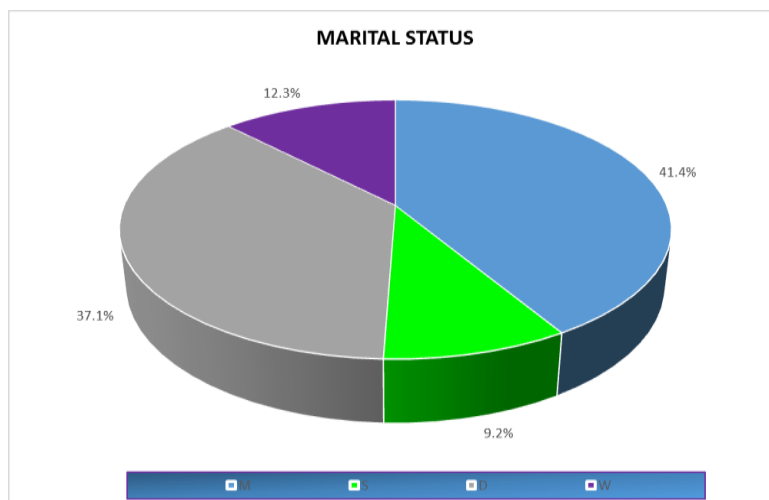


Figure 5: The Pie Chart Representing The Marital Status Among The Participants.

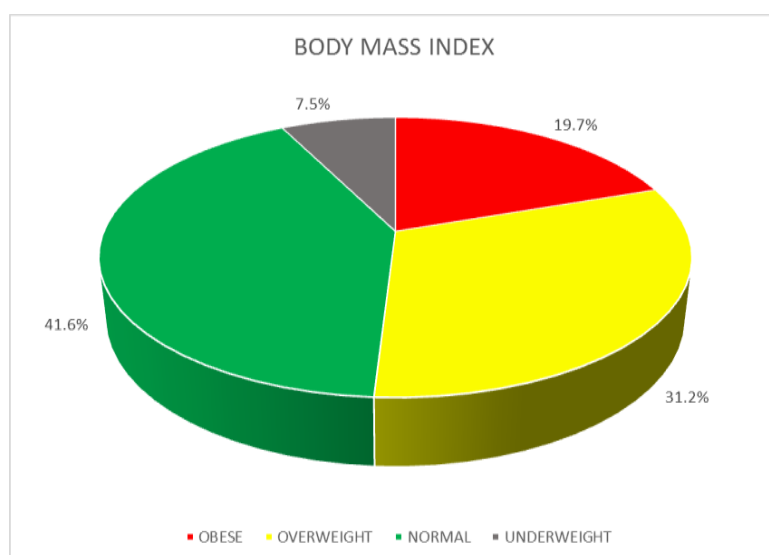


Figure 6: The pie chart showing the body mass index of the participants.

DISCUSSION

Diabetes mellitus is an impaired carbohydrate metabolic disorder with associated wide-range of systemic effects. These effects are the macrovascular angiopathy affecting the brain, heart, liver, feet etc. and microvascular diabetic complications causing, diabetic related nephropathy, retinopathy and neuropathy (Nwafor et al., 2024). This study focuses on the prevalence of this fast rising disease (DM) in the Ife central local government area of the state.

The overall prevalence of diabetes in Nigeria is 5.77%.

The south west region of the country has pooled prevalence of 5.5%, North west has the lowest prevalence of diabetes estimated at 3.0 %, while the south-south region of Nigeria has the highest prevalence of diabetes in Nigeria, which was recorded at 9.8% when compared with other geopolitical zones in the country, (Uloko et al., 2018). Epidemiology and prevalence of diabetes mellitus have been reported nevertheless no data

exists on the prevalence of diabetes in Ife central local government area of Osun State, Nigeria. Therefore there is a need for a demographic data and vital statistics of this medical condition. Figure 2 above showed that, there were more middle aged (41-50 yrs) and (51-60) participants who took part in this study than the extreme age groups, that is youths (18-30) and aged participants (81-90 and 91-100 yrs), 65% of the participants living with diabetes were in the middle age groups, while 78.5% of the hypoglycemic cases were noticed among the aged. From Figure 4 above, there were more female 421 (80.7%) in this study compared to male 101 (19.3%), there were 73.5 % female and 26.5 % male participants among the people living with diabetes, which is contrary to the previous study which stated that male individuals are more commonly affected by type 2 diabetes than female David et al., (2023).

Also, there are more individuals that participated in this study who have any form of formal education (54.4%) compared to individuals who do not have any formal

education (45.6%), according to Figure 3. Diabetes is more prevalent among participants with formal education (68.8%) compared to participants with no formal education (31.2%), although the total no of the individual with formal education who took part in the study was more than the people with no formal education. However, keen comparison between people who have only primary or secondary formal education and individuals that have formal education to tertiary level recorded relatively lower prevalence of diabetes mellitus when compared to the former, this is in keeping with the work done by Mathisen *et al.*, (2020) who posited that, the number of individuals with type 2 diabetes was higher in groups with lower educational level and markedly higher in groups with high BMI. The reasons being reduced level of awareness and adherence among these individuals, it has also been documented in various findings that low education is directly linked to poor health outcomes and lower self-confidence which negatively impacts health behaviors, also that higher educational attainment is associated with a shorter diagnostic time for type 2 diabetes, therefore there is a gradient inverse association between the education level and the risk of type 2 diabetes mellitus. More importantly is the correlation between body mass index (BMI) and the prevalence of type 2 diabetes mellitus, in Figure 6 of this study, there were 7.5% of the participants who were underweight out of which 0.19% were diabetic, there were also 41.6% participants who were of normal body mass index out of which 0.9 % were diabetic, there were 31.2% individuals who were overweight and 1.5% of them were diabetic, while 19.7% were obese out of which 2.5% were diabetic, it is obvious from the above statistics that body mass index above normal has a direct relationship with diabetes mellitus, this corroborates the previous finding, which stated that rising rates of obesity is a public health concern as it serves as an important risk factor for development of many chronic illnesses including type 2 diabetes mellitus Strings *et al.*, (2023).

This work is also in keeping with the work done by European Society for Cardiology, 2020 which posited that body mass index is a more powerful risk factor for diabetes mellitus than genetics.

Finally, the overall prevalence of diabetes in this study according to figure 2 above showed 5.2% of the participants to be diabetic which is slightly less than the statistics obtained in the national epidemiology undertaken by Uloko *et al.*, who put the statistics of diabetes mellitus in the south west region at 5.5%, the reason being increased level of awareness, campaign on healthy diet, regular physical exercise, frequent health talk and medical outreach programs such as the one of this present study.

CONCLUSION

It can be concluded from the findings of this study that, the prevalence of type 2 diabetes in this local

government area is key at this period of time, when the scourge of the disease has become a global concern. The prevalence value gotten from this study which is lower than the value earlier documented for the south western region is a good indicator of the influence of presence of ivory tower and the teaching hospital in the area via regular information dissemination, through various media outlets as well as accessibility to health care services including counselling. Government should do more by provision of special facilities for this sect of patients, make fund available, encouraging screening program and subsidizing antiglycemic medications. All these measures if put in place will drastically reduce the prevalence more and prevent fast rising incidence of this disease.

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CONFLICT OF INTEREST

The Authors declare no conflict of interest.

AUTHORS' CONTRIBUTIONS

ABE: Conceptualization of the study, writing of the manuscript, literature review DOF: provision of the fund for this research. AAS: literature review, field work, data analysis. AO: Data collection. ASB: Data collection, field work.

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