ISSN: 2474-3690

Adijat et al. J Hypertens Manag 2021, 7:062
DOI: 10.23937/2474-3690/1510062
Volume 7 | Issue 1
Open Access

Journal of
Hypertension and Management

REVIEW ARTICLE

The Prevalence and Risk Factors of Diabetes Mellitus among Civil Service Workers in Osogbo, Osun State, Nigeria

OLAYINKA Adeyosola Adijat[1*], ALABI, Elizabeth Folakemi[1], ADEJUMO Adesola[1] and ATOLAGBE James E[2]

[1]*Department of Public Health Adeleke University, Osun State, Nigeria*

[2]*Professor of Public Health and Preventive Care & Prost, CPGS Adeleke University, Osun State, Nigeria*

***Corresponding author:** *OLAYINKA Adeyosola Adijat, Department of Public Health Adeleke University, Osun State, Nigeria*

Abstract

Diabetes mellitus is a silent killer and one of the leading causes of death globally. Its complications include damage to the brain, heart, kidney and the limbs. More than 50% of people living with the disease are oblivious to it especially in Nigeria where poor healthcare, unhealthy diet, sedentary lifestyle and poverty persist. Unfortunately, Civil Service workers in Osogbo, Osun States do not know their diabetic status. Hence, this study, seeks to determine the prevalence and risk factors of diabetes mellitus among Civil Service workers in Osogbo, Osun State, Nigeria. A descriptive study was conducted in selected ministries and agencies. Sampling was done using systematic sampling technique; an Agency/Ministry-based survey was carried out among 216 respondents who are Civil Service workers in Osogbo, Osun State using questionnaire forms. The sample size of 216 was determined by Cochran's sampling formula. The questionnaire forms were administered to the Civil Service workers to obtain information about their bio-data, health status and lifestyle; measurements taken were also recorded in the questionnaire forms. Data obtained were analyzed using frequency, percentage, bar charts, and one-way analysis of variance (ANOVA), SPSS software, version 23. Findings of this study revealed a high prevalence of diabetes, due to the high incidence of high blood pressure and obesity, coupled with consumption of soft drinks, fatty parts of meat, fried meats, and family history of diabetes and blood pressure among the respondents.

Keywords

Diabetes mellitus, Blood pressure, Obesity, Risk factors

Introduction

Background to the study

Diabetes mellitus (DM) is a metabolic disease which occurs as an result of impairment in insulin secretion and/or the activity of insulin, leading to chronic hyperglycaemia with defective carbohydrate, fat and protein metabolism [1]. DM could also be referred to as a diverse group of metabolic disorders with associated high disease burden in developing countries, for example Nigeria [2].

Diabetes is having a blood glucose level of ≥ 126 milligrams per deciliter (mg/dL) after an eight-hour fast (not eating anything), or by having a non-fasting glucose level of ≥ 200 mg/dL along with symptoms of diabetes; or a glucose level of ≥ 200 mg/dL on a two-hour glucose tolerance test, or an hemoglobin A1c of ≥ 6.5% (https://www.who.int/). "In the early nineties, not much was known about DM in Nigeria and traditionally, people related DM to "curses" or "hexes" and it is primarily diagnosed using blood or urine tests for blood glucose content" [2]. It is known as a leading global health problem, and risk factor for blindness, vascular brain diseases, renal failure, and limb amputations, among others [3]. Diabetes has the potential to damage the heart, blood vessels, eyes, kidneys and nerves after a long time (https://www.who.int/). It has been predicted that developing countries would account for 77% of the global burden of the DM epidemics in the 21st century [4]. This could be due to the population

Citation: Adijat OA, Folakemi E, ADEJUMO A, ATOLAGBE James E (2021) The Prevalence and Risk Factors of Diabetes Mellitus among Civil Service Workers in Osogbo, Osun State, Nigeria. J Hypertens Manag 7:062. doi.org/10.23937/2474-3690/1510062

Accepted: December 04, 2021: **Published:** December 06, 2021

growth, consumption of junk foods, obesity and sedentary lifestyles [5].

In Nigeria, the current prevalence of DM among adults aged 20-69 years is 1.7% [6]. There is a general perception that the IDF is highly under reporting the prevalence rate and impact of DM in Nigeria owing to the fact that their data are derived represent assumption form the information gathered from the reported cases from other countries [7]. A prevalence rate of 2% to 12% has been reported in Nigeria by some researchers [7]. A few studies have reported the prevalence rate of DM in Nigeria; the Nigerian National Non-communicable Diseases (NCD) survey in 1992, where DM had a prevalence rate of 2.2% [7], and recently, a prevalence rate of 4.6% among Ijegun-Isheri Osun residents in Lagos State, among others.

There is an increasing prevalence of diabetes worldwide [8]. Over 5 million people suffer from the disease in Africa and a geometric increase to 15 million by 2025 has been predicted [8]. In Nigeria the prevalence varies from 0.65% to 11.0% [9]. Many cases of diabetes are undiagnosed in Nigeria due to poverty and inadequate access to health care [10]. Fifty percent or more of those with the disease are unaware of their condition (IDF) 2014. However, the purpose of this study is to determine the prevalence rate and risk factors of diabetes mellitus among Civil Service workers in Osogbo, Osun State, Nigeria.

Statement of research problem

Diabetes is a prolonged disease with debilitating effect on man [11], about 415, 14.2 and 1.56 million people are diabetic globally, in Africa and Nigeria, respectively. The Nigerian prevalence rate has been predicted to double by 2040. Diabetics suffer from many health problems because the disease is a risk factor for a number of complications. The disease kills more people every year than breast cancer and AIDS combined. Many individuals who struggle with obesity develop diabetes. It has been reported that everyone in the country could develop diabetes, especially those who have substituted active lifestyles for exhibit sedentary lifestyles (such as hiring others as labour in farming activities, use of machines, and replacement of walking and using bicycles, with using motorcycles and cars). Many have also adopted Western diets. These risk factors are common in urban areas such as Osogbo, characterized with a large number of Civil Service workers. There is, therefore, a need to determine the prevalence of diabetes and its associated risk factors among Civil Service workers in Osogbo.

Objectives of the study

The main objective of is to determine the prevalence rate and risk factors of diabetes mellitus among Civil Service workers in Osogbo, Osun State, Nigeria.

The specific objectives of this study include:

i. To describe the prevalence of diabetes among Civil Service workers in Osogbo, Osun state.

ii. To determine whether risk factors (namely blood pressure and obesity) is associated with diabetes among Civil Service workers in Osogbo, Osun state.

iii. To determine whether risk factors (namely eating habits and lifestyle) is associated with diabetes among Civil Service workers in Osogbo, Osun state.

Research Methodology

The research was carried out within Osogbo metropolis in Osun State Nigeria. This comprises of three Local Governments, which are Osogbo, Olorunda and Egbedore Local Government Areas. A descriptive non-experimental design was adopted for this study, the purpose of which is to determine the prevalence of diabetes among Civil Service workers in Osogbo, and to enable the researcher to discuss and explain the result in simple descriptive and explanatory approach. The target populations are Civil Servants currently working within Osogbo, Osun State. Osogbo, a pre-colonial Yoruba town in the southwestern part of Nigeria, and the capital city of Osun State in 1991. It is located at Longitude 40 34' 0 and Latitude 70 46' 0" North" East. It shares a boundary with Iragbiji, Ikirun, Ilesa, Egbedore, and Ede. The city became a commercial hub in 1907 when the Nigerian railway was founded with rail line transversing the city [12]. The population of Osogbo Local Government Area was estimated to be 187, 693 in 2012 and a total land area of 2,875 square kilometer [12].

Cochran's formula was used to calculate the sample size because of ease of operation.

$$n = \frac{Z^2 pq}{e^2}$$

where,

n = minimum sample size,

Z = 2.326 (for 98% confidence interval),

p = estimated prevalence of diabetes to be 10.0%,

q = 1 - p and

e = margin of error to be 1.5%.

$$n = \frac{2.326^2 \times 10.0 \times (1-10)}{1.5^2}$$

$$n = \frac{5.4103 \times 10.0 \times 9}{2.25}$$

n = 216.412

n = 216

Table 1: Details of respondent at the various ministries and agencies at Osogbo, Osun state.

S/N	Ministry/Agency	Number of Civil Service Workers	Expected Respondents
1	Ministry of Agriculture and Food Security	234	46
2	Ministry of Home Affairs, Culture and Tourism	165	32
3	Ministry of Health	210	41
4	Ministry of Economic Planning and Development	75	15
5	Osun State Agricultural Development Corporation	87	17
6	Osun State Internal Revenue Service	257	50
7	Osun State Property Development Corporation	52	10
8	Osun State Independence Electoral Commission	25	5
	Total	**1105**	**216**

10% of the value of n was added to replace the loss or incomplete questionnaires (10% of n = 21.6 = 22). Therefore, a total of 238 questionnaires were distributed.

The Cochran's sampling formula showed that the study required a minimum of 216 respondents for validity.

The method used to collect data involves the systematic sampling technique from government agencies based on the number of Civil Service workers in each Ministry/Agency. The questionnaire was administered to the respondents and the researcher went back to collect them after they were filled. The respondent was selected by approaching Heads of Government Ministries and Agency. Data obtained from the study was analyzed using statistical package for social service (SPSS) version 23, employing the use of simple frequency, percentages, charts and tables.

According to the Cochran's sampling formula, the expected number of sample for this study is 216; as such, the number of respondent will be ratified in relation to 216 in order to obtain the expected number of respondent (216).

Expected respondent = (Number of staff/total staff in all Agencies and Ministries) × 216

Measurement of blood glucose

One Touch glucometer was used to determine the respondents' blood sugar (RBS) in their capillary blood samples according to the method of Aynalem and Zeleke [13]. The instrument uses a capillary blood sample, which is set to plasma serum standard, showing result in plasma glucose values. This measurement was carried out immediately and the results recorded in the questionnaire.

Measurement of blood pressure

Using digital automatic sphygmomanometer [andom], systolic and diastolic blood pressure of the respondents' was measured in mm/Hg. This measurement was carried out immediately, and the results recorded in the questionnaire.

The weight and height was measured and recorded, body mass index was calculated using the weight in kilograms divided by the square of the height in meters (kg/m^2).

Results

The Demographic characteristics of the respondents as shown in Table 1, Participants in this study are made up of 48% males and 52% females. The highest number of respondent in this study is 90 (40.7%) in the age range of 51-60 years-old, followed by 74 (34.3%) participants with age range of 41-51 years-old, while the least number of respondents were 2 of the age range of 61-65 years-old. Married individuals of 192 (88.9%) dominated the respondents, followed by single individuals of 20 (9.3%), while only 2 (0.9%) of the respondents were either unmarried or separated. More than 90% of the participants had formal education, with 131 (60.6%) has one degree or the other degree, 32 (14.8%), 24 (11.1%) and 12 (5.6%) had secondary, postgraduate and primary education, respectively. Only 17 (7.9%) of the respondent do not have formal education. The total number of respondents of 34 (15.7%), 30 (13.9%), 42 (19.4%), 38 (17.6%) and 38 (17.6%), were obtained from Health, Economic planning and budget, Agriculture, and Culture and tourism, respectively, among others.

This study revealed that 148 (65.5%) of the respondents comprising 62 (28.7%) males and 86 (39.8%) females; 136 (63%) of the respondents which is made up of 48 (22.2%) males and 88 (40.7%) females, 148 (68.5%) (64 (29.6%) male and 84 (38.9%) female, and 118 (54.6%) which comprises 46 (21.3%) and 72 (33.3%), consume vegetables, fruits, fibre-rich food and fatty parts of meat or ponmo, respectively on a regular basis (Table 2). About 40 (18.5%) comprising 22 (10.2%) male and 18 (8.3%) female, and 52 (24.1%) which is made up of 24 (11.1%) male and 28 (13%), represents lower number of respondents who engage in the regular consumption of soft drinks and fried meats, respectively.

It was also observed from the study that 128 (59.3%) use palm oil for cooking their meal, this involve 60 (27.8%) male and 68 (31.5%) female respondents. About 86

Table 2: Demographic characteristics of respondent in the study.

Variables		Frequency	Percentage (%)
Sex	Male	104	48
	Female	112	52
Age group (years)	20-30	16	7.4
	31-40	34	15.7
	41-50	74	34.3
	51-60	90	40.7
	61-65	2	0.9
Marital Status	Single	20	9.3
	Married	192	88.9
	Unmarried	2	0.9
	Separated	2	0.9
Education	No Formal Education	17	7.9
	Primary School	12	5.6
	Secondary	32	14.8
	Degree Holder	131	60.6
	Postgraduate	24	11.1
Ministry/Agency	Health	34	15.7
	Economic Planning and Budget	30	13.9
	Agriculture	42	19.4
	Culture and Tourism	38	17.6
	Others	72	33.3
Monthly Income	30,000-40,000	86	39.8
	41,000-50,000	46	22.7
	51,000-60,000	38	17.6
	61,000-70,000	20	9.3
	71,000 and Above	26	12

Total number of participants = 216

Table 3: Frequency and percentage (%) consumption of some food, fruits and vegetables.

	Always	**Sometimes**	**Never**
Vegetables	148 (68.5): M - 62 (28.7) F - 86 (39.8)	68 (31.5): M - 38 (17.6) F - 30 (13.9)	
Fruits	136 (63): M - 48 (22.2) F - 88 (40.7)	80 (37.0): M - 52 (24.1) F - 28 (13.0)	
Fibre-Rich Food	148 (68.5): M - 64 (29.6) F - 84 (38.9)	66 (30.6): M - 34 (15.7) F - 32 (14.8)	2 (0.9): M - 2 (0.9) F - 0 (0)
Soft Drink	40 (18.5): M - 22 (10.2) F - 18 (8.3)	156 (72.2): M - 68 (31.5) F - 88 (40.7)	20 (9.3): M - 10 (4.6) F - 10 (4.6)
Fried Neat	52 (24.1): M - 24 (11.1) F - 28 (13.0)	150 (69.4): M - 76 (35.2) F - 88 (40.7)	14 (6.5): M - 2 (0.9) F - 12 (5.6)
Fatty Part of Meat and Ponmo	118 (54.6): M - 46 (21.3) F - 72 (33.3)	86 (39.8): M - 48 (22.2) F - 38 (17.6)	12 (5.6): M - 4 (1.9) F - 8 (3.7)
Cooking Oil	**Vegetable Oil**	**Palm Oil**	**Butter**
	86 (39.8): M - 40 (18.5) F - 46 (21.3)	128 (59.3): M - 60 (27.8) F - 68 (31.5)	2 (0.9): M - 0 (0) F - 2 (0.9)

Total number of participants = 216; M-Male; F-Female

(39.8%) comprising 40 (18.5%) male and 46 (21.3%) female respondents. Only 2 (0.9%) of the respondents which are female cook with butter (Table 3). The result of this study showed that only 8 (3.7%) of the respondents who are all male smoke cigarette, and only 4 (1.9) of them smoke between 2-4 sticks of cigarette per day (Table 4).

Table 4: Lifestyle of respondents in relation to cigarette smoking.

	Yes	**No**
Cigarette Smoking	8 (3.7): M - 8 (3.7) F - 0 (0)	208 (96.3): M- 102 (47.2) F- 116 (53.7)
	2-4 sticks	**4-7 sticks**
Cigarette Sticks/Day	4 (1.9): M - 4 (1.9) F - 0 (0)	2 (0.9): M - 2(0.9) F - 0 (0)

Total number of participants = 216; M- Male; F- Female.

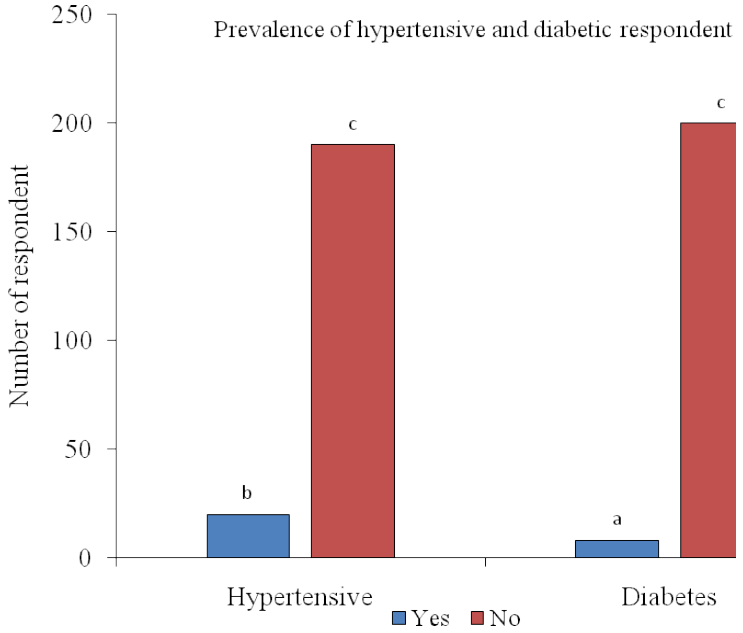

Figure 1: Incidence of hypertension and diabetes among the respondents.

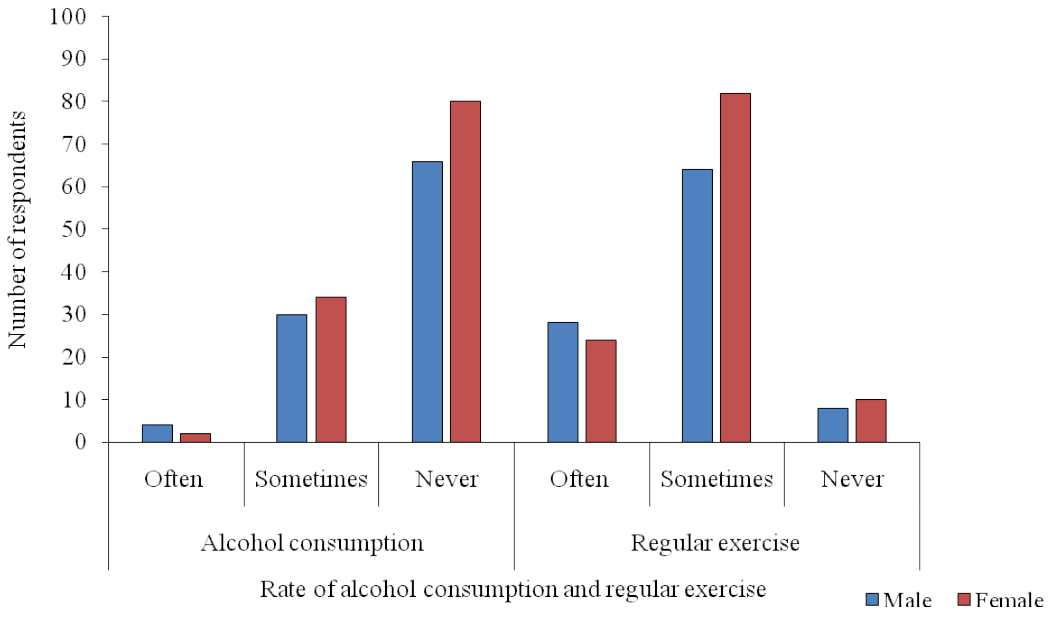

Figure 2: Alcohol consumption and regular exercise by the respondents.

About 6 (2.8%) comprising 4 (1.9%) and 2 (0.9%) of the respondents consume alcohol regularly, while 52 (24.1%) made up of 28 (13%) males and 24 (11.1%) females of the respondents engage in regular exercise (Figure 1).

The result of this study showed that significantly higher number of female respondents 42 (19.4%) were obese in comparison to 18 (8.3%) males among the 60 (27.8%) of the obese respondents (Figure 2). However, the same number of 26 (12%) male and 26 (12%) female respondents have high blood pressure, comparable number of 12 (5.6%) male and 10 (4.6%) have high blood glucose (Figure 3).

Limitations

The study could not cover more ministries and agencies due to time constraints. Also, there poor

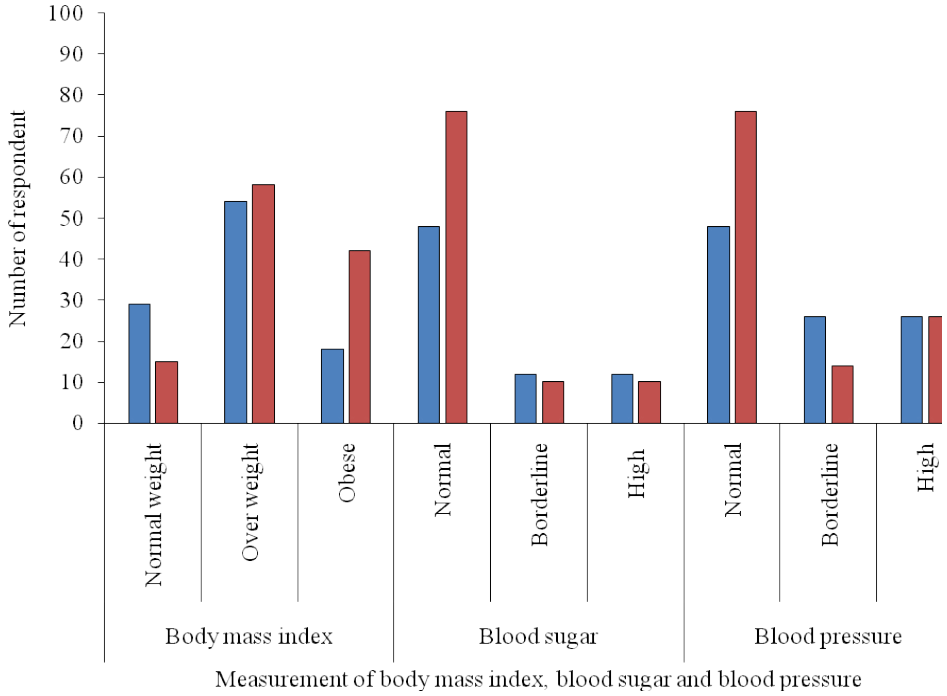

Figure 3: Figure showing the body mass index, blood sugar and blood pressure values of respondents.

participations of workers in the Civil Service which is the case study of this study.

Conclusion and Recommendation

Conclusion

Despite the limitations associated with the research on the prevalence rate and risk factors of diabetes mellitus among Civil Service workers in Osogbo, Osun State, Nigeria, the burden of diabetes mellitus in the general Nigerian population reviewed found that the prevalence of diabetes in the general population is low [11]. However, studies are fragmentary and a nationally-representative rate not available in public domain [11]. The findings of this study shows that there has been a significant increase in the prevalence of DM among the Civil Service workers in Osogbo, Osun State Nigeria, affecting the three Local Governments in Osogbo metropolis Osogbo, Olorunda and Egbedore Local Government Areas, with the highest prevalence noted in these regions and especially the south western part of the country. Conclusively, high blood pressure, obesity and unhealthy lifestyle could predispose someone to diabetes. A healthy lifestyle is recommended for the Civil Service workers in Osogbo, Osun State in order to prevent diabetes and its life-threatening complications.

Recommendation

It is therefore, recommended that government should formulate a diabetes care and prevention policy in order to limit this incessant wave of DM especially the south western geopolitical zone of the country.

References

1. Lebovitz HE (2000) Diagnosis, classification, and pathogenesis of diabetes mellitus. J Clin Psychiatry 27: 5-9.
2. Ogbera AO, Ekpebegh C (2014) Diabetes mellitus in Nigeria: The past, present and future. World J Diabetes 5: 905-911.
3. Chobanian AV, Bakris GL, Black HR (2003) The seventh report of the joint national committee on prevention, detection, evaluation, and treatment of high blood pressure: The JNC 7 report. JAMA 289: 2560-2572.
4. Nandeshwar S, Jamra V, Pal D (2010) Indian diabetes risk score for screening of undiagnosed diabetic subjects of Bhopal city. National Journal of Community Medicine 1: 176-177.
5. Cho EY, Lee YW, Kim HS (2005) The effect of job stress and lifestyle on blood lipid levels in male aircrew personnel. Taehan Kanho Hakhoe Chi 35: 672-679.
6. International Diabetes Federation (2017) IDF Diabetes Atlas: Africa. (8th edn).
7. Uloko AE, Musa BM, Ramalan MA (2018) Prevalence and risk factors for diabetes mellitus in Nigeria: A systematic review and meta-analysis. Diabetes Ther 9: 1307-1316.
8. International Diabetes Federation (2006) IDF Diabetes Atlas.
9. Akinkugbe OO, Akinyanju OO (1997) Final Report. National survey on non-communicable diseases in nigeria. lagos: Federal Ministry of Health 64-90.
10. Hart BL, Spar JA, Jr Orrison WW (1992) Calcification of the trochlear apparatus of the orbit: CT appearance and association with diabetes and age. AJR Am J Roentgenol 159: 1291-1294.
11. Dahiru T, Aliyu AA, Shehu AU (2016) A review of population-based studies on diabetes mellitus in Nigeria. Sub-Saharan Afr J Med 3: 59-64.
12. Farodoye SO, Olawuni P, Oladehinde G, Atoyebi OS, Ayoola LO (2021) Spatial analysis of residents' response to fear of crime in Osogbo, Osun State, Nigeria. Mediterranean journal of social sciences.
13. Aynalem SB, Zeleke AJ (2018) Prevalence of diabetes mellitus and its risk factors among individuals aged 15 years and above in Mizan-Aman Town, Southwest Ethiopia, 2016: A cross sectional study. Int J Endocrinol 2018: 9317987.