

Prevalence and Clinical Correlates of Overweight and Obesity among Staff of Usmanu Danfodiyo University, Sokoto: A Cross-Sectional Study

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Corresponding Author Basiru Shuaibu Department of Physiology, Faculty of Basic Medical Sciences, College of Health Sciences, Usmanu Danfodiyo University, P.M.B. 2346, Sokoto, Nigeria. Article History Received: 18 / 08 / 2025 Accepted: 14 / 11 / 2025 Published: 22 / 11 / 2025	Abstract: Overweight and obesity, disorders of energy metabolism characterized by excess adipose tissue, contribute significantly to global morbidity and mortality. With increasing urbanization and lifestyle shifts, Nigeria faces rising prevalence rates, including among university staff. The study aimed to determine the prevalence and clinical correlates of overweight and obesity among staff of Usmanu Danfodiyo University, Sokoto (UDUS). Descriptive cross-sectional study was used among 109 consenting non-academic and academic staff of UDUS using structured questionnaires to collect socio-demographic and behavioral data. Anthropometric measurements and biochemical assays, including fasting blood glucose, lipid profiles, leptin, and renal function tests, were performed. Data were analyzed by using a logistic regression to identify determinants of overweight and obese, with statistical significance of $p < 0.05$. The prevalence of overweight and obesity combined were 47%, with non-academic staff showing higher risk. Family history of diabetes and medication use was significant which were associated overweight and obesity ($p < 0.05$). Other clinical markers such as hypertension history, lipid parameters, fasting glucose, and leptin levels did not show significant associations. Occupation and fruit consumption frequency independently predicted overweight and obesity after adjusting for age. The high prevalence aligns with prior regional studies and underscores the impact of sedentary work and dietary habits on obesity risk. The paradoxical positive association between fruit consumption and obesity may reflect intake of sugar-rich fruit products. Overweight and obesity remain highly prevalent among UDUS staff, influenced by occupational status and dietary patterns. Workplace health interventions focusing on activity promotion and nutrition education are essential. Keywords: Prevalence, overweight, Obesity, UDUS, clinical correlate.
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How to Cite: Ajiboye, H. O., Shuaibu, B., Saminu, M. & Tunde, O. T. (2025). Prevalence and Clinical Correlates of Overweight and Obesity among Staff of Usmanu Danfodiyo University, Sokoto: A Cross-Sectional Study. *IRASS Journal of Applied Medical and Pharmaceutical Sciences*, 2(11), 19-24.

Introduction

The imbalance between energy intake and expenditure such that excess energy is stored in fat cells is referred to as overweight and obesity (Heymsfield & Wadden, 2017). These are the disorders of energy metabolism involving excess adipose tissues stored in the body and can be associated with medical and psychological morbidities (Heymsfield & Wadden, 2017). The 5th leading risks of death worldwide is the overweight and obesity with at least 2.8 million adults' deaths occurring annually from complications of overweight and obesity. According to World Health Organization (WHO) about 1.9 billion of the world population is overweight while 650 million are obese as of 2016. Moreover, about 44% of diabetes mellitus burden, 23% of ischemic heart diseases, and 7%–41% of certain cancer burdens are attributable to overweight and obesity (WHO, 2021).

In Nigeria, the prevalence of overweight is 27.6%, while that of obesity is 14.5% (Ijezie et al., 2022). A study by Hruby and Hu, stated that nutritional transition, sedentary lifestyle, changing methods of transportation and increasing urbanization are fuelling

non-communicable diseases (Hruby & Hu, 2015). The poor eating habits including increased in consumption of high energy food, high level of sugar, and saturated fats combined with the physical inactivity have led to raise in prevalence of overweight and obesity in many parts of the world (Kleinendorst et al., 2018).

The health risks associated with obesity include coronary heart disease (CHD) and other cardiovascular diseases like atherosclerotic, stroke, high blood pressure (HBP), with the addition of type 2 diabetes mellitus (T2D), kidney disease, sleep apnoea, osteoarthritis, gallstones, fatty liver disease, stress incontinence, and some gynaecological abnormalities (amenorrhea and menorrhagia) as well as various types of cancer (Adaja & Idemudia, 2018). The study of Sabir and his colleagues have reported that obesity and advancing in age are the major risk factors fuelling an raised in the prevalence of type 2 diabetes mellitus among Nigerian population (Ahmad Sabir et al., 2016). The study of Dankyau and his co-researchers reported a high prevalence of overweight and obesity (31.4% and 23.2% respectively) among tertiary hospital workers in North-Central

Nigeria (Dankyau et al., 2016). A high prevalence of increased in blood pressure was also reported by the study of Owolabi and colleagues (Owolabi *et al.*, 2015) among health-care workers in Nigeria regardless their awareness of the disease. It has also reported that been a well-known fact that high body mass index (BMI) predisposes to certain cancers (Zhu et al., 2005).

The problem of high income countries like USA that is 2/3 of the population is obese and overweight and they are now on the increase in low- and middle-income countries, most especially in the urban dwellers (Iwuala et al., 2015). Energy balance is central to living a healthy life. Energy intake and energy expenditure are therefore needed to be balanced and are therefore the major mechanisms by which energy balance is obtained (Gadde et al., 2018).

Method of the study

Study location

The study was conducted in Sokoto, the capital city of Sokoto State, which is located in Nigeria's North-western region of the country and has a land area of 26,648.48 square kilometres. According to the 2006 National Population Census, Sokoto state has the population of 3.09 million people, with a yearly growth rate of 3.0%. Usmanu Danfodiyo University Sokoto (UDUS) is a research university in Sokoto, Nigeria's northwest region. The university has many faculties spread across the Main Campus (permanent site), City Campus Complex (consisting of College of Health Sciences located in UDUTH and temporary site, also known as City Campus), and has a workforce of approximately 5000 people in both academic and non-academic divisions.

Ethical consideration

The ethical consideration was obtained from Usmanu Danfodiyo University Teaching Hospital (UDUTH), Sokoto Ethical Committees and granted permission to conduct this research under the registration number NHREC/30/012/2019.

Design of the study

We used cross-sectional descriptive study in this our study.

Population

The study included men and women that is working at UDUS, including both academic and non-academic members of the institution's staff.

Criteria for Participants' Selection

(a) Inclusion criteria

In the study, individuals who appeared to be healthy and permanent university employees were recruited for this study.

(b) Exclusion criteria

Some subjects were excluded from this study which include:

1. Non-consenting individuals
2. Severely ill staff
3. Pregnant women

Informed Consent

A participant information slip and a standard informed consent form were distributed to the target population. A structured

questionnaire was given to all consenting members of staff for their socio-demographic information, followed by anthropometric measures of weight, height, as well as waist circumference.

Sample calculation of the study

The sample size used in this study was 109 which was determined according to Cochran, (1999) using a population of <10000 using the formula below:

$$n = z^2 \frac{PQ}{d^2} \text{ (Sharma et al., 2020)}$$

Where:

n = minimum sample size

z = standard normal deviation and probability i.e., 0.05 at 95% confidence interval (1.96).

P = prevalence (20-29.3%), average = 26.5% (Ijezie et al., 2022)

q = 1-p

d = tolerance limit (0.08)

$$n = (1.96)^2 \times (0.265) (1 - 0.265) / (0.08)^2$$

$$0.7482 / 0.006889$$

$$108.6$$

$$n = 109$$

Sampling Technique

Multi stages (probability sampling technique) was used. Faculties in both Permanent Site and City Campus Complex of the University were involved in the research including Faculty of Agriculture, Arts and Islamic Studies, Basic Medical Sciences, Basic Clinical Sciences, Clinical Sciences, Dental Sciences, Engineering and Environmental Design, Education and Extension Services, Law, Management Sciences, Pharmaceutical Sciences, Sciences, Social Sciences, and Faculty of Veterinary Medicine.

Data collection

The questionnaire used in this study included items such as gender, age, occupational grade level, marital status, cigarette smoking status, alcohol intake, current treatment history, family history of obesity, family history of hypertension and diabetes mellitus, dietary patterns, hours of sleep as well as physical activity. The level of education was defined as the highest-grade level attained in school and participants were categorized as Senior Secondary Certificate (SSCE)/Diploma and those with a tertiary education. Participants were categorized based on their grade level into senior and junior staff. Weight and height were recorded using a weight scale and meter rule in line with WHO protocols (WHO, 1995). In addition waist Circumference was also measured in line with WHO protocol using a non-stretch tape measure (WHO, 2018).

Blood Sample collection

A 5ml disposable syringe was used to collect 5 ml of blood from each patient's cubital vein in the arm. One ml of the blood was quickly transferred into anticoagulant free (plain) bottles for fasting blood sugar (FBS), and the remaining 4mls were transferred into plain tubes. The serum was separated after the sample in the plain tubes clotted and was centrifuged. The total cholesterol, triglycerides, the high-density lipoprotein (HDL), the low-density

lipoprotein (LDL), glomerular filtration rate (GFR), and leptin levels were all determined using serum samples. Biochemical Analyses was carried out from the Department of Chemical pathology, UDUS.

Data analysis

The data was analysed using the SPSS® version 25 (IBM Corp, Armonk, NY, USA). The categorical variables have their data presented as both frequency and proportions (%). Determinants of overweight and obesity were assessed by computing odds ratios (ORs) using univariate logistic regression, multivariate ORs and their 95% confidence intervals (95% CIs) using multivariate analysis of regression. A logistic regression model analysis, with age as a covariate, was utilised to determine the individual attributes that contribute to overweight and obesity. In this study, the statistical significance was considered as a p-value of less than 0.05.

Results

Sociodemographic information of the Respondents

The total number of 114 questionnaire was administered to the participants, however, only 109 submitted and found suitable for analysis. Thus, giving a response rate of 95.6%. A total of 109 respondents consisting of 85 (78.0%) male and 24 (22.0%) of the female were recruited for the study. Majority of the respondents were Hausa/Fulani 73 (67.0 %) by tribe, majority had tertiary education (89.9%), 85 (78.0%) were married, 91 (83.5%) were Muslims, 101 (92.7%) lived in urban area (92.7%), 65 (59.6) were non-academic staff, 50 (45.9%) had above average monthly salary, and 89 (81.7) used motorcar as means of transport. Many of the participants preferred to eat breakfast 55 (50.5%) other than snacks and fried foods, 73 (67.0%) sometimes eat sweet and chocolate, and beverages 64 (58.7%). Moreover, there is no significant difference ($p = 0.966$) among the participants that watch television for at least 2 hours 53 (48.6) or more 44 (40.4) per week. Meanwhile, the majority of the respondents had no history of hypertension (60.6%), obesity (86.2%), diabetes (68.8%), and were not on any form of medication (69.7%).

Table 1. Simple Logistics Regression (Bivariate) Analysis of the Medical Factors as Determinants of Overweight and Obesity among staff of UDUS

Variable		Crude OR (95% CI)	Wald Statistics (df)	P-value*
History of Hypertension	None	0.761	2.263 (1)	0.105
	Yes (Father only)	(0.546, 1.059)		
	Yes (Mother only)			
	Both Parents			
History of Obesity	None	0.606	2.423 (1)	0.120
	Yes (Father only)	(0.322, 1.139)		
	Yes (Mother only)			
	Both Parents			
History of Diabetes	None	0.651	3.979 (1)	0.046
	Yes (Father only)	(0.427, 0.993)		
	Yes (Mother only)			
	Both Parents			
Medication History	None	0.674	4.650 (1)	0.031
	Antidiabetics	(0.436, 0.961)		
	Antihypertension			
	Others			

Table 2. Simple Logistics Regression (Bivariate) Analysis of the Biochemical Factors as Determinants of Overweight and Obesity among staff of UDUS

Variable		Crude OR (95% CI)	Wald Statistics (df)	P- value*
FBS	Normal	1.212	0.247 (1)	0.619
	Abnormal	(0.567, 2.590)		
Total cholesterol	Normal	0.642	0.687 (1)	0.407
	Abnormal	(0.225, 1.832)		
Triacyl glycerol	Normal	2.600	1.235 (1)	0.266
	Abnormal	(0.482, 14.022)		
HDL	Normal	1.027	0.004 (1)	0.949
	Abnormal	(0.457, 2.310)		
LDL	Normal	1.143	0.057 (1)	0.811
	Abnormal	(0.383, 3.406)		
Leptin	Normal	0.000	0.000 (1)	0.998
	Abnormal	(0.000, 0)		
Serum Creatinine	Normal	0.714	0.539 (1)	0.463
	Abnormal	(0.291, 1.754)		

Factors Associated with Obesity among Staff of UDUS

From multivariate regression analysis, after the adjustment for age of the respondents, only occupation and number of fruits eaten per

week were observed to be statistically significant and independent determinants of overweight and obesity among staff of the UDUS (Table 3).

Table 3. Multiple Logistics Regression (Multivariate) Analysis on Determinants of Overweight and Obesity among Staff of UDUS

Variable		Crude OR ^a (95% CI)	Adjusted OR ^b (95% CI)	Wald Statistics ^b (df)	p value _b
Occupation	Academic staff	0.522	6.281	7.314 (2)	0.026
	Non-academic staff	(0.266, 1.022)	(0.259, 149.266)		
Fruits/week	None	0.672	1.529	14.105 (3)	0.003
	Yes	(0.438, 1.031)	(34.632, 784.396)		
	Lee than 3 times				
	More than 3 times				

^a Simple Logistics Regression, ^b Multiple Logistics Regression, *P*<.05

Discussion

Our present study identified a high prevalence of overweight as well as obesity among UDUS staff, consistent with prior reports in similar populations. Nearly half (47%) of staff were either overweight or obese, aligning closely with earlier studies by Nkwoka and his colleagues (2014), that reported prevalence of 47% among UDUS employees a decade ago. Comparable trends of increasing overweight and obesity have been documented in Nigerian university staff and urban adult populations, reflecting rapid urbanization, lifestyle changes, and socioeconomic factors

(Adetunji, 2019; Nkwoka *et al.*, 2014; Olowookere *et al.*, 2018). The elevated rates among non-academic staff support the recognized association between sedentary occupational roles and increased adiposity risk (Hanna *et al.*, 2019).

The analysis revealed that the family history regarding diabetes and medication history were statistically significant related with overweight and obesity, consistent with the shared genetic and metabolic pathways influencing obesity and its comorbidities (Ng *et al.*, 2014). However, other clinical markers including history of hypertension and obesity showed no significant association, which contrasts with general

epidemiological trends where obesity closely correlates with hypertension and cardiovascular risk (Lean *et al.*, 2018; World Health Organization, 2020). Lipid profile components, fasting blood glucose, and serum leptin levels were also not significantly associated in this study, which may be attributed to sample size, specific population characteristics, or measurement factors (Ng *et al.*, 2014).

Multivariate analysis showed that occupation and frequency of fruit consumption independently predicted overweight and obesity after adjustment for age. Non-academic staff are most likely to be overweight or obese than academic staff, supporting prior findings linking sedentary work environments with obesity risk (Tudor-Locke *et al.*, 2015). The positive association of fruit consumption and obesity is noteworthy and paradoxical; it mirrors evidence that while whole fruits are protective against obesity, consumption of fruit juices or sugar-rich fruit products may contribute to increased caloric intake and weight gain via high monosaccharide content and hepatic lipogenesis (Bray & Popkin, 2014; Shefferly *et al.*, 2016).

Conclusion

The present study highlights a persistently increased prevalence of overweight and obesity among staff of UDUS, affecting nearly half of the population surveyed. Our findings are consistent with some previous research with similar settings, underscoring the public health challenge posed by obesity in this group. The association of obesity with family history of diabetes and medication use reinforces known genetic and metabolic connections, although some expected clinical markers showed no significant links, which may reflect population or methodological nuances. The study further identifies occupational status and fruit consumption frequency as independent determinants, with sedentary non-academic roles and paradoxically higher fruit intake correlating with greater obesity risk. These insights emphasize the complex interplay of socio-demographic, behavioral, and clinical factors in obesity among university staff. Addressing these factors through targeted workplace health programs and nutrition education could mitigate obesity's impact. Future research should investigate the biochemical pathways and lifestyle dynamics in this population to better inform intervention strategies.

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