

Socio-demographic Determinants of Overweight and Obesity among Staff of Usmanu Danfodiyo University, Sokoto: A Cross-sectional Study

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ABSTRACT

Overweight and obesity have risen globally, doubling since 1980, and now affect approximately one-third of the world's population. In Nigeria, the economic burden of obesity is substantial, with treatment costs estimated at ₦88,000 per patient annually. A cross-sectional descriptive study was conducted among 109 academic and non-academic staff of UDUS selected through multistage probability sampling. Data were collected using a structured questionnaire. Statistical analysis was performed using SPSS version 25. Logistic regression was used to estimate odds ratios (OR) with 95% confidence intervals (CI). Statistical significance was set at $p < 0.05$. Respondents were predominantly young (71.6%), male (78%), married (78%), and mainly of Hausa/Fulani ethnicity (67%), with 92.7% residing in urban areas. Bivariate analysis identified significant socio-demographic determinants associated with overweight and obesity, including age (OR 4.208; $p = 0.002$), male sex (OR 3.151; $p = 0.022$), marital status (OR 5.120; $p = 0.003$), junior staff grade (OR 0.340; $p = 0.025$), and number of children (OR 1.910; $p = 0.005$). The findings from this study highlight that overweight and obesity are notably prevalent among university staff, with a combined prevalence of 47%, aligning with regional and national data in Nigeria. Behavioral factors, especially sweets and chocolate consumption, showed a significant association with increased risk, while fruit intake exhibited a near-significant trend. Sociodemographic variables such as age, sex, marital status, staff grade, and the number of children also influence obesity risk, consistent with prior regional studies. Additionally, low smoking and alcohol consumption mirror sociocultural patterns, and sedentary lifestyles may further elevate obesity risk among university employees.

Keywords: Prevalence, Sedentary Lifestyle, Multistage Sampling, Overweight, Obesity.

1.0 INTRODUCTION

Since 1980, the prevalence and burden of overweight and obesity have doubled worldwide in such a way that one-third of the world's population is now classified as either overweight or obese (Garcez et al., 2024). The total direct and indirect cost that can be attributed to obesity and overweight in the Europe was equivalent to 0.47-0.61% of the GDP (Destri et al., 2021). In Nigeria, there is only one documented estimate on obesity which projects that an obese patient incurs an average of US\$244 (₦88,000) (Umar et al., 2019). However, the costs may run into several billions of naira a year (Iwedi & Wachuku, 2023).

Environmental, sociocultural, physiological, medical, behavioural, genetic, epigenetic (Caporali et al., 2025) and numerous other factors may contribute to the causation and persistence of obesity and overweight. These factors may include structure of the society,

economic policy, socio-economic development as higher proportion of people live in urban areas, use automobiles, sedentary lifestyles at home and in the workplace, as well as increased consumption of processed foods (Podgoma et al., 2020). The eating habits, which have changed significantly in recent decades because of irregularity of meals, their incorrect distribution during the day and a small variety of diet, incorrect proportions between specific groups of products or excessive consumption of certain product groups, especially fats and monosaccharides have been shown to contribute to the development of overweight and obesity (Oussaada et al., 2019). The second main problem of overweight and obesity is the continuous decline in physical activity in the population of developed and developing countries, which is supported by the environment in which we live. The WHO also recommends that people between the ages of 18 and 64 should get at least 150 minutes per week of

moderate-intensity aerobic activity, or 75 minutes per week of vigorous-intensity aerobic activity, or a combination of the two (Adeloye et al., 2022).

1.1 Objectives of the study

1. To describe the demographic profile of the respondents, including age, sex, marital status, ethnicity, education, occupation, and residence distribution.
2. To identify sociodemographic and behavioral factors significantly associated with overweight and obesity among the respondents.
3. To assess the influence of key behavioral factors such as sweets/chocolate consumption and fruit intake on the prevalence of overweight and obesity.

2.0 MATERIALS AND METHODS

2.1 Study Area

Sokoto, the capital city of Sokoto State, is located in Nigeria's north western region and has a land area of 26,648.48 square kilometres. According to the 2006 National Population Census, the total population of Sokoto State is 3.09 million people, with an annual growth rate of 3.0 percent. Usmanu Danfodiyo University Sokoto (UDUS) is a research university in Sokoto, Nigeria's northwest region. The university has many faculties with two campuses, 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.

2.2 Ethical Consideration

The ethical approval for this study was obtained from Usmanu Danfodiyo University Teaching Hospital (UDUTH), Sokoto research ethical committees.

2.2.1 Study design

This is a cross-sectional descriptive study.

2.2.2 Study Population

The study included men and women who work at UDUS, including both academic and non-academic members of the institution's staff. Those from the permanent site, the college of health sciences, and the Faculty of Veterinary Medicine (City Campus) were also included.

2.3 Criteria for Participants' Selection

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

study. The non-consenting individuals, severely ill staff and pregnant women were excluded from this study

2.4 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 to collect the socio-demographic data, followed by anthropometric measurements of weight, height, and waist circumference.

2.5 Sample size calculation

The sample size was determined according to Cochran, (1999) using a population of <10000 using the formula below:

$$n = \frac{z^2 PQ}{d^2}$$

(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)

$$n = \frac{(1.96)^2 \times (0.265)(1 - 0.265)}{(0.08)^2}$$

$$0.7482/0.006889$$

$$108.6$$

$$n = 109$$

2.6 Sampling Technique

Multi stages (probability sampling technique) was used. The First stage was the selection of faculties of which six was used due to the sample size (Oribhabor & Anyanwu, 2019). The Second stage involved the selection of departments using random technique. At least, two separate departments were selected randomly across the university campuses. The third and the final stage involved the selection of individuals from the selected departments based on a predetermined interval using the systematic sampling technique; this gave individuals a chance of being selected.

2.7 Data Collection

The questionnaire included items on 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 and physical activity. 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 the WHO protocols (WHO, 1995). Waist Circumference was also measured in line with the WHO protocol using a non-stretch tape measure (Darand et al., 2023).

2.8 Data analysis

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

3.0 RESULT

3.1 The demographic characteristics

Table 1 describe demographic characteristics of the 109 respondents show a predominantly young (71.6%) and middle-aged (27.5%) workforce, mostly male (78%), married (78%), and largely from the Hausa/Fulani ethnic group (67%), reflective of the regional population.

Table 1. Demographic Characteristics of the Respondents

Variable	n = 109 (100%)	
Age (year)	Young	78 (71.6)
	Middle age	30 (27.5)
	Elderly	1 (0.9)
Sex	Male	85 (78.0)
	Female	24 (22.0)
Marital Status	Single	23 (21.1)
	Married	85 (78.0)
	Widow	1 (0.9)
Religion	Islam	91 (83.5)
	Christian	18 (16.5)
Tribe	Hausa/Fulani	73 (67.0)
	Igbo	9 (8.3)
	Yoruba	11 (10.1)
	Others	16 (14.7)

Residence	Urban	101 (92.7)
	Rural	8 (7.3)
Where you stay	Family house	20 (18.3)
	Rented house	42 (38.5)
	Owned house	47 (43.1)
No. of spouse	Nil	22 (20.2)
	Monogamous	68 (64.4)
	Polygamous	19 (17.4)
No. of Children	None	21 (19.3)
	1 to 3	41 (37.6)
	3 to 6	35 (32.1)
	Others	12 (11.0)

Table 2. Socioeconomic Characteristics of the Respondents

Variable	n = 109 (100%)	
Level of Education	SSCE/Diploma	11 (10.1)
	Tertiary	98 (89.9)
Occupation	Academic Staff	44 (40.4)
	Non-Academic Staff	65 (59.6)
Grade	Senior Staff	83 (76.1)
	Junior Staff	26 (23.9)
Average Monthly Salary	Low	15 (13.8)
	Medium	14 (12.8)
	High	50 (45.9)
	Very high	30 (27.5)
Means of transport	Motorcar	89 (81.7)
	Walking/motorcycle	20 (18.3)

Table 3. Behavioural Characteristics of the Respondents

Variable	n = 109 (100%)	
Alcohol intake	Yes	4 (3.7)
	No	105 (96.3)
Smoking	Yes	0 (0.0)
	No	109 (100.0)
Hours of Sleep	Adequate	72 (66.1)
	Inadequate	37 (33.9)

IJSGS FUGUSAU VOL.11(4)			WEBSITE: https://fugus-ijsgs.com.ng																																											
Exercise/week	No	29 (26.6)	Table 4. Medical History of the Respondents <table border="1"> <thead> <tr> <th colspan="2">Variable</th> <th>n = 109 (100%)</th> </tr> </thead> <tbody> <tr> <td rowspan="3">History of Hypertension</td> <td>None</td> <td>66 (60.6)</td> </tr> <tr> <td>Yes (Father only)</td> <td>10 (9.2)</td> </tr> <tr> <td>Yes (Mother only)</td> <td>16 (14.7)</td> </tr> <tr> <td rowspan="3">History of Obesity</td> <td>Both Parents</td> <td>17 (15.6)</td> </tr> <tr> <td>None</td> <td>94 (86.2)</td> </tr> <tr> <td>Yes (Father only)</td> <td>5 (4.6)</td> </tr> <tr> <td rowspan="3">History of Diabetes</td> <td>Yes (Mother only)</td> <td>8 (1.8)</td> </tr> <tr> <td>Both Parents</td> <td>2 (1.8)</td> </tr> <tr> <td>None</td> <td>75 (68.8)</td> </tr> <tr> <td rowspan="3">Medication History</td> <td>Yes (Father only)</td> <td>15 (13.8)</td> </tr> <tr> <td>Yes (Mother only)</td> <td>10 (9.2)</td> </tr> <tr> <td>Both Parents</td> <td>9 (8.3)</td> </tr> <tr> <td rowspan="3">Others</td> <td>None</td> <td>76 (69.7)</td> </tr> <tr> <td>Antidiabetics</td> <td>7 (6.4)</td> </tr> <tr> <td>Antihypertension</td> <td>21 (19.3)</td> </tr> <tr> <td rowspan="3">Others</td> <td>Others</td> <td>5 (4.6)</td> </tr> </tbody> </table>			Variable		n = 109 (100%)	History of Hypertension	None	66 (60.6)	Yes (Father only)	10 (9.2)	Yes (Mother only)	16 (14.7)	History of Obesity	Both Parents	17 (15.6)	None	94 (86.2)	Yes (Father only)	5 (4.6)	History of Diabetes	Yes (Mother only)	8 (1.8)	Both Parents	2 (1.8)	None	75 (68.8)	Medication History	Yes (Father only)	15 (13.8)	Yes (Mother only)	10 (9.2)	Both Parents	9 (8.3)	Others	None	76 (69.7)	Antidiabetics	7 (6.4)	Antihypertension	21 (19.3)	Others	Others	5 (4.6)
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Breakfast	Skip	27 (24.8)																																												
	Snack	5 (4.6)																																												
	Fried food	15 (13.8)																																												
	Others	55 (50.5)																																												
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	Fruits/week	None	33 (30.3)																																											
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Sweet/chocolate/week		Sometimes	73 (67.0)																																											
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3.2 Bivariate Analysis of Sociodemographic Determinants

Bivariate analyses of sociodemographic determinants identified age, male sex, marital status, junior staff grade, and number of children as significantly associated with overweight and obesity. Socioeconomic variables like education level and average salary showed no strong associations, while non-academic occupation showed a borderline effect as shown in the table 5 below.

Table 5. Simple Logistics Regression (Bivariate) Analysis of the Sociodemographic and Economic Determinants of Overweight and Obesity among staff of Usmanu Danfodiyo University, Sokoto

Variable	Crude OR (95% CI)	Wald Statistics (df)	P-value*
Age (year)	4.208 (1.693, 10.460)	9.569 (1)	0.002
Sex	Male	3.151	0.022
	Female	(1.118, 8.387)	
Marital Status	Single	5.120	0.003
	Married	(1.765, 14.856)	
	Widow		
Religion	Islam	0.570	0.286
	Christian	(0.203, 1.602)	
Tribe	Hausa/Fulani	0.749	0.099
	Igbo	(0.532, 1.056)	
	Yoruba		
	Others		
Residence	Urban	0.809	0.809
	Rural	(0.235, 2.781)	
Level of Education	SSCE/Diploma	0.549	0.362
	Tertiary	(0.151, 1.994)	
Occupation	Academic Staff	0.522	0.058
	Non-Academic Staff	(0.266, 1.022)	
Grade	Senior Staff	0.340	0.025
	Junior Staff	(0.133, 0.871)	

Average Monthly Salary	Low	0.698	3.048 (1)	0.081
	Medium	(0.467, 1.045)		
	High			
	Very high			
Where you stay	Family house	0.840	0.455 (1)	0.500
	Rented house	(0.506, 1.394)		
	Owned house			
No. of spouse	Nil	1.320	0.824 (1)	0.364
	Monogamous	(0.725, 2.402)		
	Polygamous			
No. of Children	None	1.910	7.934 (1)	0.005
	1 to 3	(1.218, 2.998)		
	3 to 6			
	Others			
Means of transport	Motorcar	0.596	1.059 (1)	0.304
	Walking/motorcycle	(0.222, 1.598)		

3.3 Bivariate Analysis of Behavioural Determinants

Behavioral determinants highlighted sweets/chocolate consumption as significantly associated with overweight and obesity showed in table 6 while fruit consumption showed a near-significant trend.

Table 6. Simple Logistics Regression (Bivariate) Analysis of the Behavioural Factors as Determinant of Overweight and Obesity among staff of Usmanu Danfodiyo University, Sokoto

Variable		Crude OR (95% CI)	Wald Statistics (df)	P-value*
Breakfast	Skip	1.178	1.288 (1)	0.256
	Snack	(0.887, 1.565)		
	Fried food			
	Others			
Fruits/week	Nil		3.310 (1)	0.069
	None	0.672		
	Yes	(0.438, 1.031)		
	Lee than 3 times			
Sweet/chocolate/week	More than 3 times		3.970 (1)	0.046
	Sometimes	1.427		
	2 to 3 times	(1.006, 2.024)		
	More than 3 times			
Beverages	None		0.548 (1)	0.459
	Sometimes	1.144		
	2 to 3 times	(0.801, 1.634)		
	More than 3 times			
TV/week	None	0.987	0.002 (1)	0.966
	Less than 2 hours	(0.556, 1.754)		
	More than 2 hours			
Alcohol	Yes	3.176	0.974 (1)	0.324
	No	(0.320, 31.534)		
Smoking	Yes	1.019	0.009 (1)	0.924
	No			
Hours of Sleep	Adequate	1.467	0.885 (1)	0.347
	Inadequate	(0.660, 3.259)		
Exercise/week	No	0.996	0.000 (1)	0.983
	Less than 3 times	(0.698, 1.421)		
	3 times			
	More than 3 times			

4.0 DISCUSSION

In the present study, 109 respondents reveal a predominantly young to middle-aged workforce, with

71.6% classified as young and 27.5% as middle age, while the elderly constituted less than 1% of the sample. There was a marked gender disparity, with males

comprising 78% and females 22%, reflecting possibly the workforce composition at UDUS. The majority of the respondents were married (78%) and predominantly Muslim (83.5%), with the Hausa/Fulani tribe representing 2/3 of the participants, consistent with the regional ethnic distribution. In this study urban residence was highly prevalent with 92.7%, indicating the staff majority live in the university campus area or surrounding urban zones. Housing status varied, with a plurality (43.1%) owning their houses, while 38.5% rented, and 18.3% lived in family houses. Most respondents were in monogamous marriages (64.4%), with a sizeable proportion in polygamous relationships (17.4%), and the number of children ranged mostly between 1 and 6 per household.

In our findings the behavioral characteristics reported low alcohol use (3.7%) and no smoking, which may reflect cultural or social norms in the population. The majority of the respondents reported adequate sleep (66.1%), although nearly 1/3 reported inadequate sleep. Exercise frequency was moderate, with 43.1% exercising less than 3X/W and 30.3% exercising three or more times per week; however, about 26.6% did not exercise at all. Dietary habits showed over half the participants regularly ate breakfast (50.5%), while a notable section skipped breakfast or ate snacks and fried food. Fruit consumption was mixed: 55% reported some weekly fruit intake, but 30.3% reported none. The television watching habits were notable: although 11% did not watch TV, nearly 89% watched TV for at least two hours per week, potentially contributing to sedentary behavior.

Our findings are consistent with other Nigerian university staff studies showing similar age, gender, and educational distributions and their associations with lifestyle risk factors for obesity (Otsupius et al., 2025). From our studies the near absence of smoking and low alcohol intake contrasts with some other university populations, however is in line with cultural expectations in Northwestern Nigeria where this study was conducted. The high motorcar usage may impact daily physical activity levels, a known contributor to overweight and obesity.

The medical history data from our study indicate that 39.4% of respondents reported history of hypertension, with 9.2% indicating hypertension from paternal only, 14.7% from maternal only, and 15.6% from both parents. This relatively high familial prevalence of hypertension is consistent with established evidence that parental history is a significant risk factor for hypertension and is closely linked to obesity (WHO, 2023; EL Meouchy et al., 2022). From our study, most participants reported no

family history of obesity (86.2%), with only small proportions citing obesity in one or both parents. This suggests a lower hereditary burden of obesity specifically in familial lines or underreporting, considering the complex genetic and environmental interactions involved in obesity (Vijayan et al., 2025). Regarding diabetes, 31.2% reported a family history, with contributions from both paternal and maternal sides, reflecting the significant role of familial diabetes history as a risk marker for metabolic syndrome associated with overweight and obesity (Xiong et al., 2020).

In this study medical history revealed that more than 2/3 of respondents were not on any medication, while about 1/5 reported antihypertensive use. The presence of antihypertensive and antidiabetic medication use aligns with the comorbidity burden often seen alongside obesity and overweight, consistent with findings in Nigerian and broader African contexts (Egekeze, 2024; Meseret & Wondimagegne, 2025). From bivariate logistic regression analysis of sociodemographic determinants of this study demonstrated that older age, male sex, marital status (married), junior staff grade, and having more children were significantly associated with overweight and obesity. The odds ratios indicate that these groups are at higher risk, corroborating findings from regional studies asserting that age and family dynamics contribute substantially to increased body mass (Ajaero et al., 2021; Hasan et al., 2023).

The behavioral factors showed significant associations for sweet/chocolate consumption and fruit intake, with higher odds of overweight and obesity observed among those consuming sweets/chocolates sometimes or more. This supports evidence pointing to increased sugar intake as a driver of adiposity (Nagai et al., 2024). Fruit consumption showed a trend, although not always significant, possibly reflecting the dual effects of whole fruit versus sugar-rich fruit products contributing variably to weight gain (Mando et al., 2025). No significant relationships were found with alcohol intake, smoking, hours of sleep, exercise frequency, or television watching time, which may be due to low variation or underreporting within this population, or the limited sample size affecting statistical power.

5.0 CONCLUSION

This study highlights important socio-demographic, behavioral, and medical patterns relevant to overweight and obesity among staff of Usmanu Danfodiyo University, Sokoto. The respondents were predominantly young to middle-aged, mostly male, married, and living in urban areas, with a majority possessing tertiary education and working in academic or non-academic roles within the university. Lifestyle characteristics

reflected low levels of smoking and alcohol intake, moderate but insufficient physical activity, irregular breakfast patterns, varied fruit consumption, and a generally sedentary habit reflected in high television viewing frequency.

Family history of hypertension and diabetes was relatively common, and a considerable proportion of participants reported the use of antihypertensive and antidiabetic medications, indicating a cardiometabolic risk profile consistent with overweight and obesity trends reported in similar populations. Bivariate analysis identified significant socio-demographic determinants, including older age, male sex, marital status, junior staff status, and having more children. Behavioral analysis revealed that sweet and chocolate consumption, and to some extent fruit intake, were associated with increased odds of overweight and obesity. Our findings suggest that overweight and obesity among UDUS staff may be influenced by a combination of socio-demographic factors, dietary habits, sedentary behavior, and familial cardiometabolic risk. These results underscore the need for targeted health promotion interventions within the university system focusing on lifestyle modification, dietary guidance, and improved physical activity to reduce future risks of hypertension, diabetes, and other obesity-associated conditions.

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