

Prevalence of Selected Risk Factors for Metabolic Syndrome among Staff of the University of Uyo, Nigeria

Opara Dominica C, Bob Dara-Abasi I*

Department of Human Nutrition and Dietetics, Faculty of Allied Health Sciences, University of Uyo,
Uyo, Akwa Ibom State, Nigeria

*Corresponding Author

DOI: <https://doi.org/10.68050/JAMS.2026.601>

Received: 21 Sept 2026; Accepted: 22 Sept 2026; Published: 26 September 2026

ABSTRACT

Background: The prevalence of Metabolic Syndrome (MetS) and its component risk factors is high globally, including in developing countries such as Nigeria. This increasing prevalence may be due to nutrition transition to stage two, characterized by obesogenic environment, sedentariness, increasing earning power and associated shifts in dietary intake to a more westernized pattern. However, there is paucity of empirical studies on university staff in the South-South zone of Nigeria. This study assessed the prevalence of four selected risk factors for MetS among University of Uyo staff and their sociodemographic associations.

Methods: A descriptive cross-sectional study was conducted among 250 academic and non-academic staff aged 25–69 years (129 males, 121 females), recruited by multistage sampling. Weight, height, waist circumference, blood pressure and random blood glucose were measured. Overweight/obesity was defined as BMI ≥ 25 kg/m², abdominal obesity as waist circumference > 102 cm (males) or > 88 cm (females), high blood pressure as $\geq 130/85$ mmHg, and raised glucose as random blood sugar ≥ 140 mg/dL. Chi-square tested associations with sex, age, marital status and cadre.

Results: Overall prevalence of overweight was 39.2% and Obesity 28.0%. Both rates were higher among females (43.8% overweight and 35.5% obese) than males (34.9% overweight and 20.9% obese) respectively. Furthermore, 74.4% had abdominal obesity (53.5% of males; 96.7% of females). High blood pressure was present in 22.4%. Most participants (82.0%) had normal random blood sugar (70–139 mg/dL), while 4.0% had high random blood sugar of >200 mg/dL (as defined by WHO). The differences in BMI by sex, age, marital status and cadre were statistically significant ($p < 0.05$). While the differences in abdominal obesity by sex, age and marital status were statistically significant ($p < 0.05$). High blood pressure measurements showed a statistically significant association with age and marital status. Random blood sugar also showed a statistically significant association with age and cadre.

Conclusion: Overweight/obesity and abdominal obesity were highly prevalent, particularly among women. Age was associated with all four risk factors. Routine workplace screening and targeted lifestyle interventions are recommended.

Keywords: Metabolic syndrome; Overweight and obesity; High blood pressure; Random blood glucose; University staff

INTRODUCTION

Non-communicable Diseases (NCDs) have emerged as one of the foremost public health challenges of the twenty-first century, with low- and middle-income countries (LMICs) bearing a disproportionate share of this burden. Evidence shows that 73% of all NCD deaths and 82% of premature NCD-related deaths globally occur in LMICs¹. At the heart of this epidemic lies metabolic syndrome (MetS), a combination of interrelated cardiometabolic derangements, most notably central obesity, high blood pressure, and dysglycemia, that occur



together far more often than would be expected by chance alone. These collectively amplify an individual's risk of type 2 diabetes mellitus and cardiovascular disease beyond the risk conferred by any single factor in isolation.²

The clinical significance of MetS extends beyond any single diagnostic threshold. The internationally harmonized Joint Interim Statement framework explicitly defines MetS as the co-occurrence of three or more of five specific abnormalities; elevated waist circumference, elevated triglycerides, reduced HDL cholesterol, elevated blood pressure and elevated fasting blood glucose, underscoring that it is fundamentally a clustering phenomenon rather than a single measurable trait.² Reported prevalence of MetS and its components varies considerably across Nigerian and West African settings. A study among native Abuja settlers found a marked sex disparity, with MetS affecting 43.5% of females compared with only 9.3% of males.³

There is some evidence gaps in Nigeria's South-South geopolitical zone, where region-specific, socio-demographically stratified data on cardiometabolic risk factors are few and some are old relative to the volume of work conducted in the South-West and North-Central zones.^{4,5} Closing this gap requires context-specific population data rather than extrapolation from other regions, given the potential influence of local lifestyle, dietary, and socioeconomic patterns on the prevalence of risk factors.

University staff represent an occupational subgroup of concern, with limited data from Universities in the South-South zone of Nigeria. A study among civil servants in Oyo State, Nigeria, explicitly examined the clustering of NCD risk factors and reported a pattern the authors termed the “feminization” of risk, in which multiple co-occurring risk factors were disproportionately concentrated among female civil servants, alongside a generally high prevalence of cardiometabolic risk factors across the working population.⁴ This finding is consistent with more recent evidence from a Nigerian university community in Bauchi, where job cadre was identified as one of several significant correlates of undiagnosed high blood pressure, alongside body mass index, sex, and low physical activity level.⁵ Socioeconomic status itself has also been directly linked to cardiometabolic risk in Nigerian adults: higher socioeconomic status groups have been shown to have significantly higher systolic blood pressure and fasting blood glucose than lower and middle socioeconomic groups.⁶ University work in particular carries an occupational profile, prolonged sedentary desk-based tasks combined with administrative and academic stress, that has been separately linked to dyslipidaemia and adverse lipid profiles among university staff in Southeast Nigeria, and to workplace-stress-driven reductions in physical activity and increased alcohol use among academic staff in Calabar.^{7,8}

Despite this accumulating evidence of occupational vulnerability, many Nigerian studies have examined individual risk factors, such as high blood pressure, obesity, or dyslipidaemia, separately. Assessing several risk factors together gives a fuller picture of the metabolic burden carried by a population, because the co-occurrence of non-communicable disease risk factors is itself recognized as a strong predictor of a future burden of non-communicable disease and associated premature mortality.⁴ Context-specific data on the burden of these risk factors among university staff in Akwa Ibom State have not, to our knowledge, previously been reported.

Therefore, this study was designed to address this gap by determining the prevalence and sociodemographic patterning of four selected risk factors for metabolic syndrome, specifically general obesity, abdominal obesity, high blood pressure, and dysregulated blood glucose, among the academic and non-academic staff of the University of Uyo, Akwa Ibom State. These four components were examined individually rather than combined into a composite MetS diagnosis, and lipid profile, the fifth internationally harmonized diagnostic component, was not assessed due to excessive cost implication. By describing the prevalence of these risk factors and their association with sociodemographic characteristics, this study aims to provide , context-specific evidence to inform the design of targeted workplace wellness policies and institutional health interventions in South-South Nigeria and other population groups with similar demographics.



MATERIALS AND METHODS

Study Design and Setting

A descriptive cross-sectional study was conducted among the workforce of the University of Uyo, a federal university located in Uyo, the capital city of Akwa Ibom State, Nigeria. Geographically, Uyo is in the South-South geopolitical zone of Nigeria, between latitude 5.02° North and longitude 7.93° East. The region is characterized by a humid tropical climate and a rapidly urbanizing environment. The institution serves as a principal tertiary education hub within the South-South geopolitical zone, comprising multiple faculties and a substantial staff strength across multiple campuses.

Study Population and Eligibility Criteria

The target population comprised all full-time academic and non-academic staff members actively employed at the University of Uyo at the time of data collection. Eligible participants were consenting adults aged 25 to less than 70 years with a minimum of one year of active institutional employment. Pregnant women were excluded to avoid gestational confounding of anthropometric and cardiometabolic parameters. Individuals with self-reported debilitating MEDICAL conditions that would substantially alter metabolic measurements were also excluded.

Sample Size Determination

The minimum required sample size was calculated using Cochran's formula for estimating a single proportion, $n = Z^2 p(1 - p) / d^2$, with a 95% confidence level ($Z = 1.96$) and a precision (margin of error) of $d = 0.05$. Because no single prevalence estimate exists for the combined occurrence of the four risk factors examined individually in this study, the expected prevalence of clustered cardiometabolic risk was taken as $p = 23.9\%$, the pooled prevalence of metabolic syndrome (Joint Interim Statement criteria) reported in a systematic review and meta-analysis of sub-Saharan African populations,⁹ and used here as a planning benchmark. This gave a minimum required sample size of 280. Allowing for an anticipated 10% non-response rate, the target enrolment was adjusted to 311. A total of 250 staff members (129 males, 121 females) were recruited and analyzed, representing 80.4% of the adjusted target and 89.3% of the unadjusted minimum. This shortfall reflected the time and staff-availability constraints of the fieldwork period rather than a change in the sampling design, and is acknowledged as a limitation of the study.

Sampling Procedure

A multi-stage sampling technique was employed. In the first stage, faculties were selected from the institutional register by simple random sampling using a balloting method. In the second stage, departments were randomly selected across the chosen faculties using the same balloting method. Within selected departments, convenience sampling was applied to recruit willing and eligible staff members until the target sample size was achieved. Convenience sampling was used at this final stage because the University of Uyo does not maintain a centralized, individually addressable staff register with contact details; eligible staff within each selected department were therefore approached in person during working hours, and those who were available, met the eligibility criteria, and consented were enrolled. This approach was adopted to make data collection feasible within the available fieldwork period and resources.

Data Collection Instruments and Procedure

Data collection was conducted by the primary researcher and trained research assistants following a structured training session covering questionnaire administration, standardized measurement techniques, and ethical protocols including participant confidentiality. A semi-structured, interviewer-administered questionnaire was deployed to collect information on sociodemographic and occupational characteristics, including age, sex, marital status, educational level, monthly household income, and university staff cadre.

Anthropometric Measurements

All anthropometric assessments followed standardized World Health Organization STEPwise measurement protocols.¹⁰ Body weight was recorded to the nearest 0.1 kg using a calibrated digital weighing scale, with participants wearing light clothing and no footwear. Standing height was measured to the nearest 0.1 cm using a portable stadiometer, with participants positioned erect, heels together, and the head aligned in the Frankfurt horizontal plane. Body Mass Index (BMI) was computed as weight in kilograms divided by height in metres squared (kg/m^2). Participants were classified as underweight ($\text{BMI} < 18.5 \text{ kg/m}^2$), normal weight ($18.5\text{--}24.9 \text{ kg/m}^2$), overweight ($25.0\text{--}29.9 \text{ kg/m}^2$), or obese ($\geq 30.0 \text{ kg/m}^2$) per WHO criteria.

Waist circumference (WC) was measured to the nearest 0.1 cm at the midpoint between the lower margin of the last palpable rib and the top of the iliac crest, at the end of a normal expiration, using a flexible, non-stretchable anthropometric tape, with participants standing upright and lightly clothed.¹⁰ Abdominal obesity was defined as a WC exceeding 102 cm in males and 88 cm in females, consistent with internationally recognized cardiometabolic risk thresholds.²

Clinical Measurements

Resting blood pressure was measured in a seated position following a minimum five-minute rest period, using a validated digital blood pressure monitor. Two separate readings were obtained on the left arm at five-minute intervals, and the mean of both readings was recorded for analysis. High blood pressure was defined as a mean systolic blood pressure $\geq 130 \text{ mmHg}$ and/or a mean diastolic blood pressure $\geq 85 \text{ mmHg}$, in accordance with the harmonized metabolic syndrome criteria.² This threshold is lower than the $\geq 140/90 \text{ mmHg}$ used by the World Health Organization to diagnose hypertension, so the term “high blood pressure” rather than “hypertension” is used throughout this article.

Blood glucose was assessed via capillary sampling using a calibrated glucometer. Given that fasting status could not be independently verified for all participants during field data collection, blood glucose values are reported and interpreted as random blood glucose (RBG/RBS) measurements. Blood glucose status was categorized as low ($\text{RBS} < 70 \text{ mg/dL}$), normal ($70\text{--}139 \text{ mg/dL}$), raised ($140\text{--}199 \text{ mg/dL}$), and in the diabetic range ($\geq 200 \text{ mg/dL}$). These are screening categories only; a single random reading cannot establish a diagnosis of diabetes or prediabetes. This represents a study limitation and is addressed in the Discussion.

Definition of Risk Factors

The four risk factors examined were: (i) overweight or general obesity ($\text{BMI} \geq 25.0 \text{ kg/m}^2$); (ii) abdominal obesity ($\text{WC} > 102 \text{ cm}$ in males or $> 88 \text{ cm}$ in females); (iii) high blood pressure ($\text{BP} \geq 130/85 \text{ mmHg}$); and (iv) dysregulated blood glucose ($\text{RBS} \geq 140 \text{ mg/dL}$). These components are informed by the internationally harmonized Joint Interim Statement framework for metabolic syndrome.²

Statistical Analysis

Data were cleaned, coded, and analyzed using IBM SPSS Statistics version 26.0 (IBM Corp., Armonk, NY, USA). Categorical variables are expressed as absolute frequencies and percentages. Associations between sociodemographic characteristics and individual metabolic risk factors were evaluated using Pearson's Chi-square test. Statistical significance was set a priori at $p < 0.05$ for all comparisons.

Ethical Considerations

Ethical approval was obtained from University of Uyo Health Research Committee prior to commencement of the study. All participants provided written informed consent after receiving a clear explanation of the study's purpose, procedures, voluntary nature, and confidentiality protections. Participant anonymity was maintained throughout by use of coded identifiers.



RESULTS

Sociodemographic Characteristics of Participants

A total of 250 university staff participated in the study, comprising 129 (51.6%) males and 121 (48.4%) females. The largest proportion of participants were aged 46–55 years (36.8%), followed by those aged 36–45 years (32.8%), while the 25–35 years group was least represented (7.6%). Most participants were married (76.0%), while 13.6% were single, 10.0% widowed, and 0.4% divorced. With respect to staff cadre, senior non-academic staff constituted the largest group (32.0%), followed by professorial cadre (27.2%), assistant lecturer to senior lecturer cadre (24.4%), and junior non-academic staff (16.4%). Over half of participants (56.8%) held a Master's degree or PhD, 34.0% held an OND/HND/BSc/PGD, and 9.2% held only a school certificate. Regarding monthly household income, 48.8% earned ₦100,000–₦200,000, 32.0% earned ₦200,000–₦400,000, 12.0% earned ₦400,000–₦600,000, and 7.2% earned above ₦600,000 (Table 1).

Table 1. Sociodemographic characteristics of participants (N = 250)

Variable	Category	n	%
Age group (years)	25–35	19	7.6
	36–45	82	32.8
	46–55	92	36.8
	56–69	57	22.8
Sex	Male	129	51.6
	Female	121	48.4
Marital status	Single	34	13.6
	Married	190	76
	Divorced	1	0.4
	Widowed	25	10
Staff cadre	Junior non-academic	41	16.4
	Senior non-academic	80	32
	Asst Lect.–Senior Lect.	61	24.4
	Professorial cadre	68	27.2
Education level	School certificate	23	9.2
	OND/HND/BSc/PGD	85	34
	Master's/PhD	142	56.8
Monthly income (₦)	100,000–200,000	122	48.8
	200,000–400,000	80	32
	400,000–600,000	30	12



	>600,000	18	7.2
--	----------	----	-----

Prevalence of Metabolic Risk Factors, by Sex

Among male participants, BMI classification showed that 42.6% had normal weight, 34.9% were overweight, 20.9% were obese, and 1.6% were underweight. Among females, 43.8% were overweight, 35.5% were obese, and 20.7% had normal weight, with no female participant classified as underweight. Abdominal obesity was present in 53.5% of males, compared with 96.7% of females. High blood pressure was identified in 26.4% of males and 18.2% of females. For random blood sugar, 80.6% of males had normal levels, 14.7% had raised RBS, and 4.7% had RBS in the diabetic range; among females, 83.5% had normal levels, 12.4% had raised RBS, 3.3% had RBS in the diabetic range, and 0.8% had low RBS (Table 2).

Table 2. Prevalence of metabolic risk factors among staff, by sex

Risk factor	Category	Male n (%)	Female n (%)	Total
BMI	Underweight	2 (1.6)	0 (0.0)	2 (0.8)
	Normal	55 (42.6)	25 (20.7)	80 (32.0)
	Overweight	45 (34.9)	53 (43.8)	98 (39.2)
	Obese	27 (20.9)	43 (35.5)	70 (28.0)
Abdominal obesity	Absent	60 (46.5)	4 (3.3)	64 (25.6)
	Present	69 (53.5)	117 (96.7)	186 (74.4)
High blood pressure	Normal	95 (73.6)	99 (81.8)	194 (77.6)
	High	34 (26.4)	22 (18.2)	56 (22.4)
Random blood sugar	Low (<70 mg/dL)	0 (0.0)	1 (0.8)	1 (0.4)
	Normal	104 (80.6)	101 (83.5)	205 (82.0)
	Raised (140–199 mg/dL)	19 (14.7)	15 (12.4)	34 (13.6)
	Diabetic range (≥200 mg/dL)	6 (4.7)	4 (3.3)	10 (4.0)
Total		129 (100)	121 (100)	250 (100)

Association Between Sociodemographic Characteristics and Metabolic Risk Factors

BMI was significantly associated with sex ($\chi^2 = 17.322$, $df = 3$, $p = 0.001$), age ($\chi^2 = 64.262$, $df = 9$, $p < 0.001$), marital status ($\chi^2 = 40.787$, $df = 9$, $p < 0.001$), and staff cadre ($\chi^2 = 19.118$, $df = 9$, $p = 0.024$).

Abdominal obesity showed a strong, statistically significant association with sex ($\chi^2 = 61.194$, $df = 1$, $p < 0.001$), age ($\chi^2 = 22.432$, $df = 3$, $p < 0.001$), and marital status ($\chi^2 = 25.332$, $df = 3$, $p < 0.001$), but not with staff cadre ($\chi^2 = 4.323$, $df = 3$, $p = 0.223$).

High blood pressure was significantly associated with age ($\chi^2 = 19.719$, $df = 3$, $p < 0.001$) and marital status ($\chi^2 = 12.125$, $df = 3$, $p = 0.007$), but not with sex ($\chi^2 = 2.400$, $df = 1$, $p = 0.121$) or staff cadre ($\chi^2 = 6.633$, $df = 3$, $p = 0.085$).

Random blood sugar was significantly associated with age ($\chi^2 = 41.858$, $df = 6$, $p < 0.001$) and staff cadre ($\chi^2 = 19.489$, $df = 6$, $p = 0.003$), but not with sex ($\chi^2 = 1.222$, $df = 2$, $p = 0.543$) or marital status ($\chi^2 = 8.872$, $df = 6$, $p = 0.181$) (Table 3).

Table 3. Association between sociodemographic characteristics and metabolic risk factors

Sociodemographic variable	BMI χ^2 (df), p	Abdominal obesity χ^2 (df), p	High blood pressure χ^2 (df), p	RBS χ^2 (df), p
Sex	17.322 (3), 0.001*	61.194 (1), <0.001*	2.400 (1), 0.121	1.222 (2), 0.543
Age	64.262 (9), <0.001*	22.432 (3), <0.001*	19.719 (3), <0.001*	41.858 (6), <0.001*
Marital status	40.787 (9), <0.001*	25.332 (3), <0.001*	12.125 (3), 0.007*	8.872 (6), 0.181
Staff cadre	19.118 (9), 0.024*	4.323 (3), 0.223	6.633 (3), 0.085	19.489 (6), 0.003*

*Statistically significant at $p < 0.05$

DISCUSSION

This study examined the prevalence of overweight/obesity, abdominal obesity, high blood pressure, and dysregulated random blood sugar among 250 staff of the University of Uyo, along with their sociodemographic patterning.

Sex Differences in Obesity and Abdominal Obesity

In the present study, BMI-defined overweight and obesity were more prevalent among female staff (43.8% and 35.5%, respectively) than male staff (34.9% and 20.9%), and this difference was statistically significant. This pattern is highly consistent with the Nigerian literature: a national systematic review and meta-analysis estimated obesity prevalence at 19.8% in women compared with 12.9% in men nationally,¹¹ and this national pattern is mirrored in a 2022 Nigeria-wide systematic review and meta-analysis of central obesity, which similarly found that abdominal obesity was markedly more common among women.¹² A separate nationwide analysis of Nigerian women further found that higher education, higher wealth index, and urban residence were all significantly associated with a greater likelihood of overweight or obesity.¹³ This recurring sex disparity has been attributed to hormonal influences on fat distribution, lower physical activity levels among women in many Nigerian occupational settings, and the tendency for women to deposit fat more readily around the abdomen and hips, particularly with advancing age.¹²

The sex disparity became even more pronounced for abdominal obesity, which affected 96.7% of female participants compared with 53.5% of males in this study. These proportions are considerably higher than



Nigeria-wide estimates: a 2022 systematic review and meta-analysis of 18 studies and over 21,000 Nigerian adults found that 54% of women were centrally obese compared with only 13% of men by International Diabetes Federation criteria, a sex difference in the same direction as that observed here, although with much lower prevalence in both sexes than in the present study. That review applied IDF cut-offs (94 cm for men and 80 cm for women), which differ from the 102/88 cm thresholds stated in our Methods.¹² The much wider sex gap consistently observed for abdominal obesity relative to general BMI-defined obesity reflects the fact that waist-circumference cut-offs are set lower for women than men in absolute terms, while women also tend to deposit visceral and subcutaneous fat around the abdomen more readily than men, a pattern that has been linked to sex hormone influences on fat distribution.¹²

Age and Risk Factor Burden

Age was significantly associated with all four risk factors in this study, consistent with the well-documented physiological reality that adiposity, blood pressure, and glycaemic control all tend to worsen across the adult lifespan. A 2019 study among urban-dwelling adults in Lagos similarly found a significant positive correlation between both systolic and diastolic blood pressure and age,¹⁴ a finding reaffirmed by a more recent community-based screening study in Lagos, which found that high blood pressure prevalence rose progressively and significantly with advancing age across the adult lifespan.¹⁵ This pattern is mechanistically plausible: progressive arterial stiffening, declining insulin sensitivity, and accumulation of visceral fat over time are well-established contributors to the parallel rise of these four risk factors with age, and Nigerian university staff, who are typically in continuous employment for decades, are not protected from this trajectory simply by virtue of their professional or educational status.

Marital Status

Marital status was significantly associated with BMI, abdominal obesity and high blood pressure in this study, although Table 3 does not show which categories carried the higher burden and the tests were not adjusted for age. In a large nationwide Nigerian survey of 3,782 adults, being married (OR 1.88, 95% CI: 1.41–2.50) or widowed (OR 1.57, 95% CI: 1.05–2.36) was significantly associated with high blood pressure compared with being unmarried.¹⁶ The authors of that survey proposed that this relationship may be explained by greater household and economic responsibility among married individuals, which in some sociocultural contexts is also associated with a more sedentary lifestyle.¹⁶ The same nationwide survey found that this elevated risk among widowed individuals persisted even after adjustment for age, suggesting that marital and bereavement-related socioeconomic and psychosocial factors carry an effect on high blood pressure risk that is at least partly independent of age alone.¹⁶

Staff Cadre and Random Blood Sugar

A notable finding in this study was that staff cadre was significantly associated with BMI and random blood sugar. This pattern is broadly in keeping with evidence from Nigerian workforce studies, although the comparisons are indirect. The Ibadan civil servants study referenced above, which explicitly examined the clustering of non-communicable disease risk factors, identified a clear feminization and clustering pattern among the working population, suggesting that sex and other sociodemographic characteristics shape which combinations of risk factors predominate within a workforce.⁴ A 2022 study among staff of Bauchi State University found that lower job cadre was among the correlates of undiagnosed high blood pressure, alongside a positive family history of high blood pressure, higher BMI, male sex, and low physical activity level. Because that study concerned undiagnosed high blood pressure, for which no association with cadre was found here ($p = 0.085$), it supports a role for occupational grade in cardiometabolic risk only indirectly.⁵

The direction of the cadre–glycaemia association cannot be read from Table 3, and the present study did not measure physical activity, occupational stress or alcohol intake, so any mechanism is speculative. One possibility is that more senior, desk-bound academic and administrative roles are more sedentary. A study of university workers in Nsukka, Southeast Nigeria, reported an overall dyslipidaemia prevalence of 54.5% with female predominance,⁷ and a study of academic staff at the University of Calabar reported that higher occupational stress was associated with more frequent alcohol consumption and lower physical activity.⁸



Socioeconomic status has also been linked to higher systolic blood pressure and fasting blood glucose among Nigerian adults.⁶ These studies are compatible with, but do not test, the suggestion that seniority-related lifestyle differences contribute to glycaemic differences between cadres. Because cadre is strongly related to age, and the tests reported here were not adjusted for age, the association between cadre and random blood sugar may partly reflect age; multivariable analysis is needed to clarify this.

Overall Interpretation

Taken together, these findings position university staff in Akwa Ibom State within a broader pattern already documented among Nigerian civil servants and professional workforces: a population whose occupational stability and relative socioeconomic advantage do not translate into protection from cardiometabolic risk, although this cross-sectional study, which had no comparison group and did not measure occupational or lifestyle exposures, cannot show whether occupation itself contributes to this risk.^{4,6,7,8} The markedly high burden of abdominal obesity among female staff, in particular, echoes a consistent and troubling pattern across Nigerian and African settings and warrants targeted attention in any resulting workplace health policy.

LIMITATIONS

This study has several limitations. First, its cross-sectional design precludes causal inference. Second, it was conducted at a single institution, and the final stage of sampling was by convenience, so the findings may not be representative of all University of Uyo staff or of university staff elsewhere; the sample ($n = 250$) was also smaller than the calculated target of 280 (311 allowing for non-response). Third, blood glucose was measured as random rather than fasting glucose because fasting status could not be verified, so the glycaemic categories are screening categories and cannot establish diabetes or prediabetes. Fourth, blood pressure was measured on a single occasion, and the threshold used ($\geq 130/85$ mmHg) is lower than that conventionally used to diagnose high blood pressure, which limits comparison with other Nigerian studies. Fifth, physical activity, diet, alcohol use, smoking and family history were not assessed in the present analysis, so the mechanisms discussed above remain speculative. Sixth, because this study reports four of the five internationally harmonized diagnostic components of MetS, lipid profile was not measured, so a composite MetS diagnosis could not be made and the true clustering of all five components remains unknown. Finally, the associations reported are unadjusted bivariate tests and may be confounded, particularly by age, and the co-occurrence of risk factors within individuals was not analysed. Future work using fasting samples, multivariable analysis, and a formal analysis of the number of co-occurring risk factors per individual would strengthen these findings.

CONCLUSION

In this sample of University of Uyo staff, overweight and obesity, abdominal obesity and elevated blood pressure were common, and age was significantly associated with all four risk factors examined. Sex, marital status and staff cadre were associated with some, but not all, of the risk factors. These findings support routine workplace screening for blood pressure, anthropometry and blood glucose, and targeted lifestyle interventions for university staff, with particular attention to women and older staff. Longer-term, adjusted analyses that include lifestyle measures are needed to clarify the drivers of these patterns.

DECLARATIONS

Ethical approval and consent: Ethical approval was obtained from the University of Uyo Health Research Committee [UU/CHS/IHREC/VOL.1/115, 5th August, 2025]. All participants provided written informed consent.

Funding: This study received no specific funding.

Conflict of interest: The authors declare no conflict of interest.

Author contributions: Opara D.C. conceived and supervised the study. Bob D.I. collected the data, performed

the statistical analysis, and drafted the manuscript. Both authors critically reviewed and approved the final manuscript.

Data availability: The data supporting the findings of this study are available from the corresponding author on reasonable request

REFERENCES

1. World Health Organization. Noncommunicable diseases [Internet]. Geneva: World Health Organization; 2025 Sep 25. Available from: <https://www.who.int/news-room/fact-sheets/detail/noncommunicable-diseases>
2. Alberti KG, Eckel RH, Grundy SM, Zimmet PZ, Cleeman JI, Donato KA, et al. Harmonizing the metabolic syndrome: a joint interim statement of the International Diabetes Federation Task Force on Epidemiology and Prevention; National Heart, Lung, and Blood Institute; American Heart Association; World Heart Federation; International Atherosclerosis Society; and International Association for the Study of Obesity. *Circulation*. 2009;120(16):1640-1645.
3. Adediran O, Akintunde AA, Edo AE, Opadijo OG, Araoye AM. Impact of urbanization and gender on frequency of metabolic syndrome among native Abuja settlers in Nigeria. *J Cardiovasc Dis Res*. 2012;3(3):191-196.
4. Olawuyi AT, Adeoye IA. The prevalence and associated factors of non-communicable disease risk factors among civil servants in Ibadan, Nigeria. *PLoS One*. 2018;13(9):e0203587.
5. Bappah BS, Shittu A, Usman JS, Nuhu JM, Sumaila FG, Ahmad AA, Mohammed J. Prevalence and correlates of undiagnosed hypertension among staff of a Nigerian university community. *Pan Afr Med J*. 2022;42:80.
6. Adedoyin RA, Afolabi A, Adegoke OO, Akintomide AO, Awotidebe TO. Relationship between socioeconomic status and metabolic syndrome among Nigerian adults. *Diabetes Metab Syndr*. 2013;7(2):91-94.
7. Okafor AM, Ngwu EK, Ayogu RNB. Prevalence and associated factors of dyslipidaemia among university workers in Southeast Nigeria: a cross-sectional study. *Arch Public Health*. 2021;79:77.
8. Ejemot-Nwadiaro RI, Nwachuku NS, Obiekezie EO, Mwankon JP, Nji EL-B, Enyievi PB, et al. Workplace stress: prevalence, sources, and consequences among academic staff at the University of Calabar, Nigeria. *Front Public Health*. 2026;14:1872922.
9. Jaspers Faijer-Westerink H, Kengne AP, Meeks KAC, Agyemang C. Prevalence of metabolic syndrome in sub-Saharan Africa: a systematic review and meta-analysis. *Nutr Metab Cardiovasc Dis*. 2020;30(4):547-565.
10. World Health Organization. Waist Circumference and Waist-Hip Ratio: Report of a WHO Expert Consultation, Geneva, 8–11 December 2008. Geneva: World Health Organization; 2011.
11. Adeloye D, Ige-Elegbede JO, Ezejimofor M, Owolabi EO, Ezeigwe N, Omoyele C, et al. Estimating the prevalence of overweight and obesity in Nigeria in 2020: a systematic review and meta-analysis. *Ann Med*. 2021;53(1):495-507.
12. Bashir MA, Yahaya AI, Muhammad M, Yusuf AH, Mukhtar IG. Prevalence of central obesity in Nigeria: a systematic review and meta-analysis. *Public Health*. 2022;206:87-93.
13. Kandala NB, Stranges S. Geographic variation of overweight and obesity among women in Nigeria: a case for nutritional transition in sub-Saharan Africa. *PLoS One*. 2014;9(6):e101103.
14. Okubadejo NU, Ozoh OB, Ojo OO, Akinkugbe AO, Odeniyi IA, Adegoke O, et al. Prevalence of hypertension and blood pressure profile amongst urban-dwelling adults in Nigeria: a comparative analysis based on recent guideline recommendations. *Clin Hypertens*. 2019;25:7.
15. Amadi CE, Ale OK, Okorafor UC, Okwah MN, Akanbi PO, Mbakwem AC, Ajuluchukwu JN. Unmasking the contemporary burden of hypertension in Lagos, Nigeria: insights from an opportunistic screening. *BMC Public Health*. 2026;26(1):634.
16. Adeke AS, Chori BS, Neupane D, Sharman JE, Odili AN. Socio-demographic and lifestyle factors associated with hypertension in Nigeria: results from a country-wide survey. *J Hum Hypertens*. 2024;38(4):365-370.