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ORIGINAL RESEARCH

# Perceived Stress and Cardiovascular Risk Factors among a University Workforce in Nigeria: A Cross-sectional Study

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**Abstract**

**Background:** Stress has been implicated in the aetiology and rising incidence of cardiovascular diseases across diverse populations.

**Objectives:** To investigate the relationship between perceived stress and the self-reported prevalence of hypertension, diabetes, and cardiovascular risk factors among teaching and non-teaching staff at a privately owned, faith-based university in southwestern Nigeria.

**Methods:** A cross-sectional study was conducted among 275 staff members (112 teaching and 163 non-teaching) at the university. Data were collected using a questionnaire comprising the Perceived Stress Scale, a self-reported cardiovascular disease risk assessment tool (EZ-CVD), and a demographic information sheet. Data were analysed using SPSS version 20. Descriptive and inferential statistics were computed.

**Results:** Perceived stress was not significantly associated with hypertension ($p = 0.239$), diabetes ($p = 0.911$), or cardiovascular risk ($p = 0.157$). The prevalence of self-reported hypertension was 13.1%, 2.2% reported diabetes, and 4.0% had a family history of heart attack. 33.8% of participants experienced low stress, while 63.6% and 2.5% experienced moderate and high perceived stress, respectively. Stress was more prevalent among males than females (13.4% versus 12.8%), among teaching than non-teaching staff (15.2% versus 11.7%), and among those who reside in the town where the university is located than those who reside outside the town (14.1% versus 10.1%).

**Conclusion:** There is a need for adequate implementation of workplace stress management policy in private universities in Nigeria, as most study participants experienced moderate levels of stress.

***Keywords: Cardiovascular Risk, Perceived Stress, Private University, Workforce.***

# Introduction

The prevalence of cardiovascular diseases has doubled between 1990 and 2019, rendering it one of the leading causes of disability and mortality worldwide. [1,2] This escalation has been attributed to inadequate stress management among individuals. [3] Consequently, stress—particularly when originating from the occupational environment—constitutes a significant global health concern. Nonetheless, irrespective of its source, stress has become an inherent aspect of daily human experience and may produce either beneficial (eustress) or detrimental (distress) effects. [4] It is highly prevalent among workers across various fields of endeavour, [5–8] including personnel employed in educational institutions. Stress exerts a considerable impact on individuals' health and well-being. [6 - 8] When it surpasses a specified threshold, it can substantially impair overall health, especially cardiovascular health. Findings from the Lob and Steptoe study have associated chronic stress with the development of cardiovascular diseases. [9] Similarly, extended exposure to stress has been correlated with the aggravation of several risk factors for cardiovascular disease, including diabetes mellitus, hypertension, and obesity. [3]

Due to increased job expectations and a growing labour shortage, workers across a variety of life domains experience varying degrees of stress. [10] The prevalence of stress among workers has worsened globally in recent times because of COVID-19 and the brain drain, especially in middle- and low-income countries like Nigeria. [11,12] The academic environment is not immune to the increasing stress. [8] The challenges presented by the academic workload involving teaching, research, and community service for university academic staff are substantial. Likewise, supporting personnel at universities are also subjected to considerable stress due to numerous activities aimed at supporting students and staff in the pursuit of academic excellence. For instance, the Academic Staff Union of Nigerian Universities and sister unions in Nigeria have reported a mass exodus of academic and non-academic staff from our universities to developed nations in recent times. [13] This has further increased the work burden on university staff. Similarly, there is a massive movement of experienced staff from privately owned universities to government-owned ones due to perceived job security and other benefits available in government-owned universities. [14] These trends have further increased the workload of employees in privately owned institutions; as a result, many private universities in Nigeria face shortages of personnel, including senior academics and less-experienced support staff.

The university environment comprises various categories of personnel, including teaching, research, administrative, and technical staff. Research has documented the prevalence of occupational stress within these groups; [15,16] however, limited information is available regarding its impact on the cardiovascular health of staff in private universities in Nigeria. Furthermore, some studies have examined stress levels across different categories of university personnel. [17,18] Nonetheless, this study aimed to assess perceived stress levels and cardiovascular risks among staff across these diverse categories to address work-related stress among personnel of private universities in Nigeria.

## Methods

This research was undertaken among staff members (both academic and administrative) at a privately owned, faith-based university located in southwestern Nigeria. The institution is among Nigeria's pioneering

private universities and has been operational for over two decades. Situated across two separate campuses, the university comprises seven undergraduate colleges and one postgraduate college, with a total student body of 5,000 and a staff complement of 1,034 (including both teaching and non-teaching personnel), distributed across various colleges, directorates, departments, and units. The university enforces a fully residential policy for its undergraduate students; however, only a limited number of staff members are accommodated on campus, and many commute several kilometres to their workplaces each day.

The study employed a descriptive cross-sectional design with a sample size of 288, calculated using the Taro Yamane formula with an assumed variance of 0.05. In total, 275 staff members participated in the study, comprising 112 teaching and 163 non-teaching staff, resulting in a response rate of 95.49%. Data collection was conducted via a Google Form, the link to which was disseminated through all official university staff WhatsApp groups, following formal approval from the university authorities. The online questionnaire was linked to the staff's official email addresses to ensure that only university employees participated and to prevent multiple submissions; however, the email addresses were neither collected nor stored to preserve anonymity. The data collection process spanned two months. Participants with pre-existing cardiovascular conditions; those who had joined the university within the last six months; staff who had experienced recent stressful life events, such as pregnancy, childbirth, bereavement, or divorce, within the past six months; and staff with approved accumulated leave exceeding one month were excluded from the study.

Administrative approval was sought and obtained from the University's Directorate of Research and Strategic Partnership, and ethical approval was obtained from the appropriate Research Ethics Committee (BUTH/REC-1040). Only staff who consented after a thorough explanation of the study were recruited. Participation was optional, and all information collected was used exclusively for research purposes. Data were collected using a questionnaire consisting of the Perceived Stress Scale [19], the Easy Cardiovascular Disease (EZ-CVD) Risk Assessment Tool [20] and a demographic information sheet. The Perceived Stress Scale is a 10-item Likert-type instrument, with response options: “Never” (0), “Almost Never” (1), “Sometimes” (2), “Fairly Often” (3), and “Very Often” (4). Total scores are calculated by reversing the scores on the four positively worded items. The scale produces a maximum score of 40. Stress levels are classified into three categories: Low Perceived Stress (0 to 13), Moderate Perceived Stress (14 to 26), and High Perceived Stress (27 to 40).

The EZ-CVD risk assessment instrument comprises six essential questions that assess an individual's susceptibility to cardiovascular disease. These questions encompass factors such as age, gender, history of diabetes, hypertension, smoking habits, and a family history of myocardial infarction occurring before the age of 60. The risk assessment employs a self-reported scoring system as follows: Gender (Male=2, Female=0); Diabetes (Present=3, Absent=0); Hypertension (Present=2, Absent=0); Family History of Heart Attack (Present=1, Absent=0); Age (less than 60=0, 60-69=2, 70 and above=3); and Smoking (Yes=2, No=0). (20) [30] A cumulative score of six or more points signifies a heightened risk of developing cardiovascular disease in the future. The data have been securely stored in a password-protected folder on the personal computer of one of the researchers, and

access is restricted to the sole member of the research team. Data were analysed using both descriptive and inferential statistics. Frequencies and percentages were used to analyse all categorical variables, and Chi-square tests were used to examine associations between them; $p < .05$ was considered statistically significant. Data analyses were conducted using the Statistical Package for the Social Sciences (SPSS) version 22.0.

## Results

The majority of participants were female (53.8%) and non-teaching staff (59.3%). Most respondents were permanent employees (82.5%) and of Yoruba ethnicity (95.7%). The majority of respondents (74.9%) lived in the town where the university is located, while 25.1% lived outside the town and commuted approximately 100 kilometres to work each day. A total of 83 participants (30.2%) were currently enrolled in postgraduate programs. The demographic characteristics of the participants are presented in Table I.

Overall, 33.8%, 63.6%, and 2.5% reported low, moderate, and high perceived stress, respectively. The prevalence of hypertension, diabetes, and a family history of heart attack was 13.1%, 2.2%, and 4.0%, respectively. With respect to CVS risk, 99.3% of respondents were categorised as low risk, while only 0.7% were categorised as high risk. Sex, staff grade, and place of residence were not significantly associated with CVS risk ($p > 0.05$). The prevalence of perceived stress and some risk factors is presented in Table II.

The association between perceived stress and cardiovascular diseases indicated that perceived stress was not significantly associated with hypertension ($p = 0.239$, $p > 0.05$), diabetes ($p = 0.921$, $p > 0.05$), or cardiovascular risk ($p = 0.157$, $p > 0.05$) (Table III). Similarly, demographic characteristics were not significantly associated with perceived stress ($p > 0.05$). The prevalence of hypertension was higher among males than females (13.4% versus 12.8%), among teaching staff than non-teaching staff (15.2% versus 11.7%), and among individuals residing in the town than those living outside the town (14.1% versus 10.1%) (Table IV).

The prevalence of diabetes mellitus was higher among males than females (2.4% versus 2.0%), among individuals residing outside the town than within the town (2.9% versus 1.9%), and among teaching staff than non-teaching staff (2.7% versus 1.8%). However, none of these differences was statistically significant (Table V).

## Discussion

This study presents novel findings on the association between perceived stress and the self-reported prevalence of hypertension, diabetes, and cardiovascular risk factors across categories of university workers. While these findings provide unique insights across categories of university personnel, a significant limitation is that the prevalence of hypertension and diabetes was self-reported without the aid of clinical diagnostic tools. Nonetheless, self-reported data on hypertension and diabetes are commonly used in projecting prevalence rates. [21] Furthermore, the study offers important preliminary insights that can serve as a foundation for future research in this domain. Stress remains one of the leading causes of morbidity and mortality among individuals. This study examined the association between perceived stress and cardiovascular risk factors among teaching and non-teaching staff at privately owned faith-based universities in Nigeria. Our results indicated a prevalence rate of 13.1% for self-reported hypertension within the study population.

This figure is lower than the previously documented prevalence rate among the Nigerian population. [22–25] For example, more than one in four university employees in Nigeria's northern region were found to have hypertension in a related study, [26] and approximately one in five employees in tertiary educational institutions in the eastern part of the country. [27]

Our findings may not accurately document the actual prevalence rate of hypertension among the participants. While previous studies assessed the prevalence of hypertension through clinical diagnosis and blood pressure measurement, ours utilised a self-reported method. There is a strong likelihood that some individuals in the study population may be hypertensive without their knowledge, as hypertension can be asymptomatic. [28,29] Furthermore, reliance on self-reported data may have introduced reporting bias. In particular, in religious contexts, strict doctrinal teachings emphasising resilience, faith-based endurance, and positive self-assertion may inadvertently prevent individuals from acknowledging vulnerability or psychological distress. These beliefs can create social and internal pressures to demonstrate strength, potentially reducing transparency concerning personal difficulties. Consequently, this phenomenon may lead to the underreporting of stress and related health conditions, thereby obscuring the true extent of stress experienced within these populations. [30] Supporting this significant standpoint, Oparah and colleagues previously identified a discrepancy between the self-reported prevalence of hypertension and diabetes and the actual profiles within the Nigerian population, with reports of diabetes more closely aligning with the true prevalence than hypertension. [31] This may further corroborate the notion that a greater number of individuals are living with hypertension and diabetes unknowingly.

A significant comorbidity associated with hypertension is diabetes. [32,33] Our study found that two out of every 100 participants reported diabetes, which is comparable to the unadjusted prevalence of diabetes among individuals over 50 years of age in a northern state of Nigeria. [34] However, this prevalence is lower than previously reported figures in Nigeria. [31,35,36] Furthermore, cardiovascular disease (CVD) remains a leading cause of mortality worldwide, with documented increases in CVD-related deaths in Nigeria and other low- and middle-income countries. [37] Awareness of its risk factors has also been notably low among staff at a Nigerian university. [38] Our study found that four out of every 100 individuals reported a family history of heart attack, a complication of hypertension, and clinical signs of CVD. Overall, fewer than 1% of participants exhibited high cardiovascular risk factors, a prevalence lower than previously documented across various populations in Nigeria. [39,40] Although our findings indicate that the majority of workers have a low risk of CVD, a substantial proportion with a family history of heart attacks continues to pose a significant concern. While stress is known to increase the severity and prevalence of numerous cardiovascular risk factors, [3] this study did not identify a significant association between perceived stress and cardiovascular disease. Similarly, stress was not correlated with hypertension or diabetes. This finding aligns with the systematic review by Vaessen *et al.*, [41] which reported that only 35% of the reviewed studies demonstrated a significant or marginally significant association between self-reported stress and cardiovascular conditions. The study further demonstrated that gender, staff grade, and place of residence were not associated with

cardiovascular risk or the prevalence of hypertension or diabetes.

## Conclusion

Stress continues to be a significant factor affecting employees in Nigerian academic institutions. Our research identified moderate stress levels among these individuals, with a lower self-reported prevalence of hypertension and diabetes compared to prior studies involving similar populations. Therefore, we recommend conducting a more comprehensive investigation across multiple universities, using both self-report measures and clinical diagnostic techniques to assess cardiovascular risk among participants.

**Authors' Contributions**: Conceptualisation: TOA, IVO, MIO. Data curation: TOA, IVO, GOA, VOA, AMA, MIO. **Formal analysis:** TKA. Methodology: TOA, IVO, GOA, TKS, TAA, VIA, AMA, MIO. Project administration: TOA, IVO, MIO. Supervision: TOA, MIO. Writing – original draft: TOA, GOA, TKA, TAA, VOA, AMA, MIO. Writing – review & editing: All authors

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**Table I: Demographics of the participants (n =275)**

| Variables | Characteristics | Frequency | Percentage (%) |
|---|---|---|---|
| **Sex** | Male | 127 | 46.2 |
| | Female | 148 | 53.8 |
| **Staff Grade** | Teaching | 112 | 40.7 |
| | Non- teaching | 163 | 59.3 |
| **Nature of appointment** | Contract | 13 | 4.7 |
| | Permanent | 227 | 82.5 |
| | Temporary | 35 | 12.7 |
| **Age in years** | Less than 60 | 260 | 95.9 |
| | 60-69 | 15 | 4.1 |
| | 70 and above | 0 | 0 |
| **Ethnicity** | Yoruba | 246 | 89.5 |
| | Igbo | 9 | 3.3 |
| | Hausa | 2 | 0.7 |
| | Others | 18 | 6.5 |
| **Place of residence** | Town where the university is located | 206 | 74.9 |
| | Outside the town | 69 | 25.1 |
| **Undergoing post graduate programme** | Yes | 83 | 30.2 |
| | No | 192 | 69.8 |

**Table II: Prevalence of perceived stress and cardiovascular disease indicator components among the participants (n=275)**

| Variable | Number of respondents | Percentage (%) |
|---|---|---|
| **Perceived stress** | | |
| Low stress | 93 | 33.8 |
| Moderate stress | 175 | 63.6 |
| High perceived stress | 7 | 2.5 |
| **Hypertension** | | |
| Yes | 36 | 13.1 |
| No | 239 | 86.9 |
| **Diabetes** | | |
| Yes | 6 | 2.2 |
| No | 269 | 97.8 |
| **Family history of heart attack** | | |
| Yes | 11 | 4 |
| No | 264 | 96 |
| **Sex** | | |
| Male | 127 | 46.2 |
| Female | 148 | 53.8 |
| **Age (years)** | | |
| Less than 60 | 260 | 94.5 |
| 60-69 | 16 | 5.5 |
| **Cardiovascular risk** | | |
| Low risk | 273 | 99.3 |
| High risk | 2 | 0.7 |

**Table III: Chi-Square showing an association between perceived stress and cardiovascular diseases**

| Perceived stress | Hypertension | | | Diabetes | | | Cardiovascular risk | | |
|---|---|---|---|---|---|---|---|---|---|
| | Yes | No | P-value | Yes | No | P-value | Low | High | P-value |
| Low stress | 16(14.4) | 77(32.2) | 0.239 | 2(33.3) | 91(33.8) | 0.921 | 92(34.8) | 1(9.1) | 0.157 |
| Moderate stress | 20(55.6) | 155(64.9) | | 4(66.7) | 171(63.6) | | 165(62.5) | 10(90.9) | |
| High stress | 0(0.0) | 7(2.9) | | 0(0.0) | 7 (2.6) | | 7(2.7) | 0(0.0) | |

**Table IV: Association between socio-demographics of the respondents and perceived stress (n=275)**

| | Perceived stress | | | |
|---|---|---|---|---|
| **Variables** | **Low stress** | **Moderate stress** | **High stress** | **P-value** |
| **Sex** | | | | |
| Male | 47(50.5) | 78(44.6) | 2(28.6) | 0.414 |
| Female | 46(49.5) | 97(55.4) | 5(71.4) | |
| **Staff Grade** | | | | |
| Teaching | 39(41.9) | 70(40.0) | 3(42.9) | 0.948 |
| Non- teaching | 54(58.1) | 105(60.0) | 4(57.1) | |
| **Nature of appointment** | | | | |
| Contract | 5(5.4) | 8(4.6) | 0(0.0) | |
| Permanent | 74(79.6) | 146(83.4) | 7(100.0) | 0.707 |
| Temporary | 14(15.1) | 21(12.0) | 0(0.) | |
| **Age (Years)** | | | | |
| Less than 60 | 86(92.5) | 171(97.7) | 7(100.0) | 0.098 |
| 60-69 | 7(7.5) | 4(2.3) | 0(0.0) | |
| 70 and above | 0(0.0) | 0(0.0) | 0(0.0) | |
| **Ethnicity** | | | | |
| Yoruba | 90(96.8) | 149(85.1) | 7(100.0) | |
| Igbo | 0(0.0) | 9(5.1) | 0(0.0) | 0.108 |
| Hausa | 0(0.0) | 2(1.1) | 0(0.0) | |
| Others | 3(3.3) | 15(8.6) | 0(0.0) | |
| **Place of residence** | | | | |
| Town where the university is located | 66(71.0) | 134(76.6) | 6(85.7) | 0.482 |
| Outside the town | 27(29.0) | 41(23.4) | 1(14.3) | |
| **Currently pursuing postgraduate degrees** | | | | |
| Yes | 26(28.0) | 55(31.4) | 2(28.6) | 0.837 |
| No | 67(72.0) | 120(68.6) | 5(71.4) | |

**Table V: Association between gender, staff grade, residence, and cardiovascular diseases (n = 275)**

| | **Hypertension** | | | | **Diabetics** | | | |
|---|---|---|---|---|---|---|---|---|
| **Variables** | Yes | No | Total | P-value | Yes | No | Total | P-value |
| **Sex** | | | | | | | | |
| **Male** | 17(13.4) | 110(86.6) | 127(46.2) | 0.893 | 3(2.4) | 124 (97.6) | 127 (46.2) | |
| **Female** | 19(12.8) | 129(87.2) | 148(53.8) | | 3(2.0) | 145(98.0) | 148(53.8) | 0.85 |
| **Staff grade** | | | | | | | | |
| **Teaching** | 17(15.2) | 95(84.8) | 112(40.7) | 0.64 | 3(2.7) | 109(97.3) | 112(40.7) | 0.64 |
| **Non- teaching** | 19(11.7) | 144(88.3) | 163(59.3) | | 3(1.8) | 160(98.2) | 163(59.3) | |
| **Place of residence** | | | | | | | | |
| **Town of university location** | 29(14.1) | 177(85.9) | 206(74.9) | 0.402 | 4(1.9) | 202(98.1) | 206(74.9) | 0.638 |
| **Outside the town** | 7(10.1) | 62(88.9) | 69(25.1) | | 2(2.9) | 67(97.1) | 69(25.1) | |

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