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Divergent Implications of Job Stress for Male and Female Teaching Staff Performance in Public Universities in Northwest Nigeria

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ABSTRACT

This study examined the implications of job stress for male and female teaching staff performance in selected public universities in Northwest Nigeria. A quantitative cross-sectional survey design was adopted among teaching staff in Federal University Dutsin-Ma, Bayero University Kano, and Kaduna State University. Of 350 questionnaires distributed, 128 valid responses were obtained, representing a 36.6% response rate. Data were analysed using Partial Least Squares Structural Equation Modelling (PLS-SEM), and Partial Least Squares Multi-Group Analysis (PLS-MGA). The findings showed a positive and statistically significant relationship between job stress and teaching staff performance ($\beta = 0.168$, $t = 3.963$, $p < 0.001$). Gender also showed a statistically significant association with teaching staff performance ($\beta = 0.876$, $t = 28.749$, $p < 0.001$), while the gender × job stress interaction was significant ($\beta = 0.102$, $t = 2.562$, $p = 0.010$), indicating moderation in the pooled model. However, PLS-MGA did not show a statistically significant difference between male and female group paths. The results suggest that the observed positive association between job stress and performance may be compatible with a challenge-stressor interpretation in the selected university context, although the cross-sectional design does not establish causality and increasing stress should not be interpreted as inherently beneficial. The study contributes contextual evidence on job stress, teaching staff performance, and gender in Northwest Nigerian public universities. Practically, the findings support balanced workload allocation, stronger institutional resources, staff welfare, research support, and gender-responsive working arrangements. The study concludes that job stress is significantly associated with teaching staff performance, while the evidence on gender differences should be interpreted cautiously in view of the non-significant PLS-MGA result.

Keywords: Gender; Job Stress; Northwest Nigeria; PLS-SEM; Public Universities; Teaching Staff Performance.

1. INTRODUCTION

Public universities across the world are increasingly confronted with the challenge of managing job stress among teaching staff. The contemporary university system demands excellence in teaching, research, community service, postgraduate supervision, grant acquisition, and administrative responsibilities. These expectations have intensified considerably over the last decade, creating substantial psychological and physical pressure on teaching personnel (Adebayo & Okonkwo, 2022; Salau et al., 2023). In many developing countries, including Nigeria, the situation is further compounded by inadequate funding, infrastructural deficiencies, staff shortages, and frequent policy changes, all of which contribute to elevated levels of occupational stress among university lecturers (Muhammad et al., 2021; Yusuf & Ibrahim, 2024).

Northwest Nigeria has a large and expanding public university system, comprising federal and state-owned universities that provide teaching, research, and community service. Institutions such as Federal University Dutsin-Ma (FUDMA), Bayero University Kano (BUK), and Kaduna State University (KASU) have experienced considerable expansion in student enrolment, academic programmes, and institutional responsibilities. While this expansion has improved access to higher education, it has also increased the workload and responsibilities placed on teaching staff. Lecturers are expected to teach large classes, supervise undergraduate and postgraduate students, publish scholarly articles, participate in accreditation exercises, undertake research, secure research grants, and serve on departmental and university committees. The combination of these multiple demands, particularly where institutional resources are limited, may result in heightened levels of job stress among teaching staff (Bello et al., 2022; Ahmad & Suleiman, 2023).

Job stress has been associated with several negative outcomes, including reduced job satisfaction, burnout, emotional exhaustion, decreased organisational commitment, and poor employee performance (Ojo et al., 2021; Hassan & Aliyu, 2024). Within the university environment, excessive job stress may impair teaching effectiveness, reduce research productivity, delay postgraduate supervision, and weaken staff participation in institutional activities. Although previous studies have examined the relationship between job stress and employee performance, many have treated employees or teaching staff as a homogeneous group, thereby providing limited insight into whether the effects of job stress differ according to gender (Ibrahim et al., 2022; Eze & Nwankwo, 2023).

Gender is an important consideration in occupational stress research because male and female employees may experience and respond to workplace demands differently. Female teaching staff may face additional responsibilities associated with childcare, household management, and work– family expectations, which may intensify work– life imbalance. Male teaching staff, on the other hand, may experience considerable pressure associated with financial responsibilities, career advancement, promotion expectations, and institutional performance requirements (Adeyemi & Afolabi, 2021; Musa et al., 2024). These potentially different experiences suggest that the relationship between job stress and teaching staff performance may not be uniform across male and female teaching staff.

Recent international studies have emphasised the importance of gender-sensitive approaches to managing occupational stress in higher education institutions (García-González et al., 2021; Smith & Taylor, 2022). However, empirical evidence from Nigerian public universities remains relatively limited, particularly in the Northwest geopolitical zone. Existing studies have also paid insufficient attention to whether gender significantly changes the relationship between job stress and teaching staff performance. Consequently, there is a contextual and empirical gap concerning how male and female teaching staff experience job stress and whether such stress has different implications for their performance in public universities in Northwest Nigeria.

This study therefore examines the divergent implications of job stress for male and female teaching staff performance in three selected public universities in Northwest Nigeria: Federal University Dutsin-Ma (FUDMA), Bayero University Kano (BUK), and Kaduna State University (KASU). The study focuses on major sources of job stress, including excessive workload, role ambiguity, role conflict, time pressure, and work– life imbalance, and examines their implications for teaching staff performance. By comparing male and female teaching staff, the study seeks to determine whether the relationship between job stress and performance differs significantly across gender groups. The study is anchored on the Job Demands– Resources (JD-R) theory, which posits that excessive job demands can deplete employees' physical and psychological resources, thereby increasing strain and reducing work performance, particularly when adequate organisational resources are unavailable (Bakker & Demerouti, 2007). The theory provides an appropriate framework for explaining how demanding working conditions within universities may affect teaching staff performance. The study extends this perspective by examining whether gender moderates or differentiates the relationship between job stress and teaching staff performance.

Through its comparative and gender-sensitive approach, the study contributes to the literature on occupational stress and employee performance in higher education. It also provides practical insights for university administrators and policymakers in designing appropriate stress-management interventions, improving working conditions, supporting both male and female teaching staff, and ultimately enhancing teaching staff performance and institutional effectiveness in Nigerian public universities.

Research Problem and Gap

Higher education institutions depend heavily on teaching staff to perform core functions such as teaching, research, postgraduate supervision, community service, and academic administration. However, teaching staff in Nigerian public universities increasingly face job stress resulting from heavy workloads, research and publication demands, postgraduate supervision, accreditation activities, administrative responsibilities, time constraints, and inadequate institutional resources. These pressures may be particularly significant in expanding universities such as Federal University Dutsin-Ma (FUDMA), Bayero University Kano (BUK), and Kaduna State University (KASU). Excessive job stress is a concern because it may negatively affect teaching effectiveness, research productivity, postgraduate supervision, community service, and administrative performance. Nigerian studies have identified workload, work pressure, and inadequate organisational support as important sources of teaching staff stress and have linked them to reduced productivity and job performance (Adebayo, 2022; Akah et al., 2022; Faduyile & Orunbon, 2023; Goga et al., 2025). However, previous findings are inconsistent. Other studies found weaker, non-significant, or context-dependent relationships (Akah et al., 2022; Faduyile & Orunbon, 2023). Importantly, teaching staff may not experience job stress in the same way because gender and work– family responsibilities can influence the sources and consequences of stress. Research indicates that female academics may experience greater role overload, career-development stress, and work– family conflict than male academics (Russell, 2020; Ademuyiwa et al., 2020; Adewumi & Duma, 2021). Such differences may influence teaching, research, supervision, and other TSPects of academic performance.

Despite existing research, there is limited empirical evidence on whether the relationship between job stress and teaching staff performance differs significantly between male and female academics in public universities in Northwest Nigeria. This constitutes an important empirical and contextual gap. Therefore, this study examines the divergent implications of job stress for male and female teaching staff performance in FUDMA, BUK, and KASU, focusing on the effect of job stress on performance and whether gender significantly moderates or differentiates this relationship. The findings are expected to support the development of gender-sensitive stress-management strategies, improved staff wellbeing, and enhanced academic performance in public universities in Northwest Nigeria.

Research Objectives

The main objective of this study is to examine the divergent implications of job stress for male and female teaching staff performance in selected public universities in Northwest Nigeria.

To examine the effect of job stress on Teaching Staff Performance in selected public universities in Northwest Nigeria.

To examine the direct effect of gender on Teaching Staff Performance in selected public universities in Northwest Nigeria.

To examine whether gender moderates the relationship between job stress and Teaching Staff Performance in selected public universities in Northwest Nigeria.

Research Questions

What is the effect of job stress on Teaching Staff Performance in selected public universities in Northwest Nigeria?

Does gender have a significant direct effect on Teaching Staff Performance in selected public universities in Northwest Nigeria?

Does gender significantly moderate the relationship between job stress and Teaching Staff Performance in selected public universities in Northwest Nigeria?

Organisation of the Paper

Section 2 reviews the literature and develops the hypotheses. Section 3 explains the research methodology. Section 4 presents the empirical findings. Section 5 discusses the findings and their implications. Section 6 concludes the study and presents the major contributions, limitations, and directions for future research.

2. LITERATURE REVIEW

2.1 Theoretical Background

Job Stress

Job stress refers to the physical and psychological strain that occurs when job demands exceed an employee's ability or available resources to cope. University teaching staff may experience stress from excessive teaching workload, research and publication requirements, postgraduate supervision, administrative duties, accreditation activities, time pressure, and inadequate institutional support. While moderate stress may sometimes enhance motivation, prolonged or excessive stress can result in burnout, emotional exhaustion, reduced commitment, and poor performance.

Teaching Staff Performance

Teaching staff performance refers to the extent to which lecturers effectively accomplish their academic and institutional responsibilities. It includes teaching effectiveness, research productivity, postgraduate supervision, community service, and administrative activities. Excessive job stress may reduce motivation, creativity, productivity, organisational commitment, and psychological well-being, thereby negatively affecting teaching staff performance.

Gender and Occupational Stress

Gender is relevant to occupational stress because male and female teaching staff may experience workplace demands and responsibilities differently. Female lecturers may experience greater work– family pressures because of household and caregiving responsibilities, while male lecturers may experience stress related to career advancement, financial responsibilities, promotion, research productivity, and leadership expectations. Consequently, the sources and effects of job stress may differ between male and female teaching staff.

Job Demands– Resources (JD-R) Theory

This study is anchored on the Job Demands– Resources (JD-R) Theory developed by Demerouti et al. (2001) and supported by the Conservation of Resources (COR) theory developed by Hobfoll (1989). The theories provide a complementary explanation of how job demands and available resources influence employees' stress and work performance, and why the effects of job stress may vary across gender.

The JD-R Theory proposes that every occupation consists of job demands and job resources. Job demands are physical, psychological, social or organisational TSPects of work that require sustained effort and may result in psychological or physical strain when excessive. Job resources, on the other hand, are TSPects of work that help employees achieve their goals, reduce the effects of job demands and enhance motivation and performance.

The theory is particularly relevant to teaching staff because their work involves multiple demands, including teaching workload, student supervision, research and publication, administrative responsibilities, time pressure, conflicting roles and work– family interference. Where these demands are excessive and adequate resources are unavailable, teaching staff may experience increased job stress, which can affect their ability to perform effectively. Conversely, resources such as institutional and supervisory support, autonomy, research facilities, funding and professional development opportunities may help staff manage demanding responsibilities and maintain performance. Research on academics confirms the importance of both job demands and resources in shaping their work experiences (Naidoo-Chetty & du Plessis, 2021; Murtala et al., 2022; Akah et al., 2022). The JD-R Theory therefore provides the primary theoretical basis for examining the relationship between job stress and Teaching Staff Performance in this study. It also provides a basis for examining gender as a possible moderator, since male and female teaching staff may differ in their exposure to work and non-work demands, access to resources and coping circumstances. However, the theory does not assume that such differences must exist; rather, the present study empirically tests whether gender changes the relationship between job stress and Teaching Staff Performance.

Conservation of Resources (COR) Theory

The COR Theory proposes that individuals are motivated to acquire, maintain, protect and develop resources that they value. Stress occurs when valued resources are threatened, lost or insufficient to meet existing demands. Academic staff invest important resources such as time, energy, knowledge and emotional effort in teaching, research, supervision and administrative responsibilities. When these resources are continuously depleted by demanding work conditions without adequate opportunities for recovery or resource gain, job stress may increase and performance may be affected. In the university environment, resources such as institutional support, research funding, autonomy, adequate facilities, mentoring, collegial support and family support can help teaching staff cope with demanding responsibilities. COR Theory therefore complements the JD-R Theory by explaining why inadequate resources may intensify the effects of job demands and why adequate resources may help employees cope with stress.

The theory is also relevant to the gender dimension of the study because male and female teaching staff may experience differences in work– family responsibilities, career demands, institutional support and other resource conditions. Such differences may influence how job stress is experienced and how it relates to performance. Nevertheless, gender differences are treated as an empirical question rather than a predetermined outcome.

Theoretical Integration

Together, the JD-R and COR theories provide a coherent explanation for the present study. The JD-R Theory explains how academic job demands and resources can influence job stress and performance, while COR Theory explains how the loss, protection and acquisition of resources can shape employees' responses to demanding work conditions.

The theoretical relationship can therefore be summarised as:

Job Demands → Job Stress → Teaching Staff Performance

with Job Resources helping to reduce or buffer the effects of demanding work conditions, while Gender is examined as a potential moderator of the job stress– performance relationship.

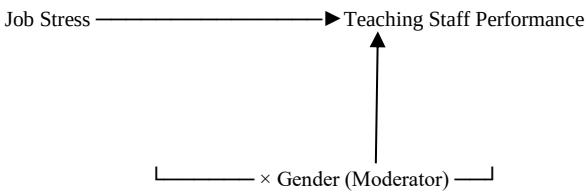
Thus, the framework does not require the empirical findings to conform to a predetermined direction. Instead, it provides the theoretical basis for testing whether job stress affects Teaching Staff Performance and whether its implications differ between male and female teaching staff. This is consistent with the purpose of the study, which is to examine the divergent implications of job stress for male and female Teaching Staff Performance in public universities in Northwest Nigeria.

The two theories complement each other. JD-R explains how excessive job demands generate stress and affect performance, while COR explains how the availability or loss of resources influences employees' ability to cope with those demands. Together, they provide an appropriate theoretical foundation for examining job stress, teaching staff performance, and gender differences.

2.2 Conceptual Framework

The study conceptualises Job Stress as the independent variable and Teaching Staff Performance as the dependent variable, while Gender is examined as a moderating variable. Workload, role ambiguity, role conflict, time pressure, and work–life imbalance provide the conceptual basis for Job Stress. The proposed relationships are: Job Stress → Teaching Staff Performance; Gender → Teaching Staff Performance; and Gender × Job Stress → Teaching Staff Performance.

Figure 1. Conceptual Framework



Source: Authors

2.3 Empirical Review

The empirical literature on job stress and Teaching Staff Performance indicates that the relationship is complex and is influenced by the nature and intensity of job demands, the availability of institutional resources, and employees' ability to manage competing work and non-work responsibilities. In the university environment, teaching staff are required to perform several interrelated roles, including teaching, research and publication, student supervision, administration and community service. Consequently, the effect of job stress on performance may depend not only on the level of stress experienced but also on the specific sources of stress and the resources available to employees. The empirical review therefore focuses on the relationship between job stress and teaching staff performance and on the extent to which gender may shape this relationship.

Job Demands, Job Stress and Teaching Staff Performance:

The literature generally identifies job demands as important determinants of teaching staff stress and performance, although the strength and direction of the relationship vary across studies. Academic staff commonly face interconnected demands such as heavy workload, long working hours, role ambiguity, role conflict, and time pressure, suggesting that job stress often results from the combined effect of multiple work demands rather than a single stressor.

Workload is a major source of academic job stress because teaching staff must balance teaching, research, publication, postgraduate supervision, and administrative duties. When these responsibilities exceed available time and resources, they may negatively affect staff performance and wellbeing (Adebayo, 2022; Akah et al., 2022; Murtala et al., 2022). Similarly, role ambiguity and role conflict can increase stress when staff face unclear responsibilities or competing institutional expectations (Adebayo, 2022). Time pressure is also significant because teaching staff must manage overlapping deadlines for lectures, examinations, assessment, supervision, research, publications, and administrative duties, potentially affecting teaching quality, research productivity, and work– life balance (Naidoo-Chetty & du Plessis, 2021).

The literature further suggests that work-life imbalance can intensify the effects of job demands when professional responsibilities interfere with family and personal responsibilities. However, job stress does not necessarily have a universally negative effect on performance. Its consequences may depend on the availability of institutional support, resources, autonomy, and employees' ability to manage work demands. Excessive demands combined with inadequate support may reduce performance, whereas manageable work pressure with adequate resources may coexist with effective performance.

Previous studies also differ in their measures of stress and performance. Some focus on specific factors such as workload and working hours, while others examine broader occupational stress involving role and work– life factors. Performance has similarly been assessed through teaching, research, supervision, and administrative activities. These differences make comparisons difficult and support the need to examine job stress as an overall construct in relation to multiple dimensions of Teaching Staff Performance. Importantly, much of the Nigerian literature has focused on individual institutions or specific stressors and has not sufficiently examined whether the job stress– performance relationship differs by gender, particularly in public universities in Northwest Nigeria. This represents an important contextual and empirical gap.

Gender, Job Stress and Teaching Staff Performance

Gender provides an important dimension for understanding the relationship between job stress and Teaching Staff Performance. Male and female academics may experience different combinations of work demands, work– family pressures, career expectations, and available resources. Nigerian studies indicate that female higher-education staff may experience significant work– family conflict arising from the interaction between academic responsibilities and family or caregiving demands (Ademuyiwa et al., 2020; Adewumi & Duma, 2021). However, gender differences should not be interpreted as meaning that one gender is inherently more vulnerable to stress. Male academics may also experience substantial pressures related to career progression, promotion, research productivity, and institutional expectations. Russell (2020) found gender-related differences in several forms of stress among university faculty, suggesting that the experience and consequences of academic stress cannot be explained through a single gender pattern. Consequently, the important issue is whether the sources, intensity, and effects of job stress differ between male and female teaching staff. Existing findings are not entirely consistent, partly because studies differ in institutional context, academic discipline, workload, family responsibilities, organisational support, and measurement approaches. This suggests that gender may function as a moderating condition in the relationship between job stress and Teaching Staff Performance rather than simply as a direct determinant of performance.

Overall, the literature reveals three key points: Firstly, teaching staff face multiple and interconnected job demands that can generate stress; secondly, the effects of job stress depend partly on available resources and working conditions; and finally, although gender differences in academic work and work– family experiences have been documented, there is insufficient evidence on whether gender significantly moderates the relationship between job stress and Teaching Staff Performance in public universities in Northwest Nigeria. The present study therefore addresses this gap by examining overall job stress, Teaching Staff Performance across key academic responsibilities, and gender as a potential moderator among teaching staff in public universities in Northwest Nigeria.

2.4 Hypothesis Development

Based on the JD-R and COR theoretical perspectives and the reviewed empirical evidence, the study tests whether job stress is associated with teaching staff performance and whether gender is associated with performance and changes the job stress– performance relationship.

H1: Job stress has a significant effect on Teaching Staff Performance in selected public universities in Northwest Nigeria.

H2: Gender has a significant direct effect on Teaching Staff Performance in selected public universities in Northwest Nigeria.

H3: Gender significantly moderates the relationship between Job Stress and Teaching Staff Performance in selected public universities in Northwest Nigeria.

3. RESEARCH METHODOLOGY

3.1 Research Design

The study adopts a quantitative cross-sectional survey research design. This design is appropriate because the study seeks to measure job stress and Teaching Staff Performance, examine the relationship between the two variables, and determine whether gender moderates their relationship. A

quantitative approach enables the researcher to collect standardized numerical data through structured questionnaires and analyse the data objectively using appropriate statistical techniques (Creswell & Creswell, 2018).

The cross-sectional design is suitable because data are collected from teaching staff at a single point in time to assess their current experiences of job stress and performance. It is appropriate for examining relationships among variables without manipulating the respondents or their working environment (Saunders et al., 2019). The survey approach is further justified because it allows standardized information to be obtained from a relatively large number of teaching staff across the selected public universities, thereby facilitating comparison between male and female respondents. The design is also consistent with the study's theoretical framework, particularly the Job Demands– Resources (JD-R) Theory, because it permits the empirical measurement and testing of relationships between job stress, performance and gender. Overall, the quantitative cross-sectional survey design provides an appropriate and systematic basis for addressing the research objectives and testing the study hypotheses.

3.2 Population and Sampling

The study is situated in Northwest Nigeria, covering Jigawa, Kaduna, Kano, Katsina, Kebbi, Sokoto and Zamfara States. The study focuses on three purposively selected public universities: Federal University Dutsin-Ma (FUDMA), Bayero University Kano (BUK), and Kaduna State University (KASU) out of 29 universities in Northwest, Nigeria. These universities were selected because their teaching staff operates in environments characterised by teaching responsibilities, research and publication expectations, postgraduate supervision, accreditation activities, and administrative duties. The selection also provides an opportunity to compare teaching staff experiences across universities with different institutional histories and contexts. The three universities provide comparative coverage across three states and include both federal and state university contexts. The selection also reflects the practical constraints of access, data collection and manageability in a seminar study.

The target population comprises all full-time teaching staff in the three selected universities, with a combined population of 3,969. The population figures were obtained from the Personnel Records Units of the selected universities.

Although the Krejcie and Morgan (1970) table indicated a planned minimum a planned sample of approximately 350 respondents for the population of 3,969 teaching staff, FUDMA with 1,432, BUK 1,805 and KASU 732 staff, the study distributed 350 questionnaires to the selected respondents. Of these, 128 questionnaires were validly completed and returned, representing a valid response rate of 36.6% with total number of male 82 and female 46 respondents. Accordingly, the 128 respondents constitute the achieved sample used for the final analysis, rather than the planned target of 350. 128 respondents constituted the achieved sample and that the reduced sample is an important limitation affecting statistical power and generalizability.

Proportionate allocation was used to determine the planned distribution of the 350 respondents among the three selected universities based on their respective teaching staff populations. The actual usable sample was 128 respondents.

The three universities were purposively selected to provide coverage of public university contexts in Northwest Nigeria. Proportionate allocation was then used to determine the planned number of questionnaires for each university, while convenience sampling was used to approach accessible teaching staff respondents. This distinction is important because university selection, sample allocation, and respondent selection are different sampling decisions.

3.3 Data Collection

A structured online questionnaire was administered to teaching staff in the three selected universities. Of the 350 questionnaires distributed, 128 valid questionnaires were returned and used for analysis, giving a 36.6% valid response rate. The sampling process involved purposive selection of the universities, proportionate allocation of the planned sample, and convenience access to teaching staff respondents.

3.4 Research Instruments

Sources of Questionnaire Items:

Section A: Demographic Information

Section B: Measurement of Study Variables

The major variables in the study are Job Stress (independent variable) and Teaching Staff Performance (dependent variable). Each construct is measured using multiple observable items adapted from established scales in the literature. The use of multiple items provides a more reliable assessment of each underlying construct.

All measurement items in Section B were assessed using a five-point Likert scale, where 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, and 5 = Strongly Agree. Higher scores indicate a higher level of the characteristic being measured. For Job Stress, higher scores represent greater perceived job stress, while higher scores on Teaching Staff Performance represent higher perceived performance. The questionnaire underwent face validity, content validity, and expert review. Three experts in Human Resource Management and Research Methodology evaluated the instrument. Construct validity was assessed through the PLS-SEM measurement model using indicator loadings, composite reliability, AVE, the Fornell– Larcker criterion, and HTMT.

Table 1. Measurement of Study Variables

Construct	Measurement dimensions/indicators	Measurement variables/items
Job Stress	Workload/Work Pressure	Excessive workload; pressure to meet work demands; insufficient time to complete assigned duties
	Role Conflict/Ambiguity	Conflicting work responsibilities; unclear job expectations; uncertainty about work responsibilities
	Work-Related Tension	Feeling tense at work; feeling emotionally pressured; difficulty relaxing after work
	Time Pressure	Working under tight deadlines; insufficient time for teaching and related duties
Teaching Staff Performance	Teaching Effectiveness	Effective delivery of lectures; achievement of teaching objectives; clarity of teaching
	Preparation and Planning	Adequate preparation for classes; effective lesson/course planning; preparation of instructional materials
	Assessment and Feedback	Timely assessment of students; provision of useful feedback; fair evaluation of students
	Student Support	Availability to students; responding to students' academic needs; providing academic guidance
	Professional Responsibilities	Attendance and punctuality; participation in departmental activities; fulfilment of assigned academic responsibilities

All Section B items were measured on a five-point Likert scale from 1 = Strongly Disagree to 5 = Strongly Agree. The instrument underwent face validity, content validity, and expert review. Construct validity was assessed using indicator loadings, composite reliability, average variance extracted (AVE), the Fornell– Larcker criterion, and HTMT.

3.5 Data Analysis

Data were analysed using IBM SPSS and SmartPLS. Descriptive statistics and normality tests were first examined. PLS-SEM was then used to assess the measurement and structural models, including indicator reliability, internal consistency, convergent validity, discriminant validity, collinearity, coefficient of determination, effect sizes, and predictive relevance. Bootstrapping was used for statistical inference. Gender was entered as a binary categorical variable and examined as a moderator, while PLS-MGA was used as a complementary group-comparison procedure.

3.6 Ethical Considerations

The manuscript reports that the questionnaire was administered to teaching staff through an online survey and voluntarily responded with their consent.

4. RESULTS / FINDINGS

4.1 Descriptive Statistics and Normality

Table 2. Descriptive Statistics and Normality Test

Construct	Items	Mean	SD	K– S Statistic	K– S p	S– W Statistic	S– W p	Normality Decision
Job Stress (JS)	9	3.67	1.11	0.159	<0.001	0.930	<0.001	Not normal
Teaching Staff Performance (TSP)	6	3.97	0.91	0.082	0.064	0.931	<0.001	Not normal

Job Stress recorded a mean of 3.67 (SD = 1.11), while Teaching Staff Performance recorded a mean of 3.97 (SD = 0.91). The Shapiro– Wilk results were significant for both constructs ($p < 0.001$), indicating departures from normality. The study proceeded with PLS-SEM, which does not require normally distributed data for estimation and uses bootstrapping for inference.

4.2 Measurement Model Assessment

Table 3. Measurement Model Assessment

Construct	Items	Loading Range	A	ρA	Pc	AVE	HTMT value reported	Decision
Job Stress (JS)	9	0.851–0.880	0.923	0.670	0.857	0.749	0.834	Reported
Teaching Staff Performance (TSP)	6	0.789–0.949	0.897	0.902	0.929	0.768	0.891	Reported

Indicator loadings ranged from 0.789 to 0.949. Composite reliability values ranged from 0.857 to 0.929, and AVE values exceeded 0.50, supporting convergent validity. The reported HTMT values were 0.834 and 0.891. The source manuscript notes that the exact JS– TSP HTMT pair should be verified against the SmartPLS HTMT matrix before final submission because the higher value exceeds the stricter 0.85 criterion. One reported outer VIF also exceeded the preferred 5.00 threshold and should be inspected in the final SmartPLS output.

4.3 Structural Model Assessment

Table 4. Structural Model Assessment

Relationship	B	t-value	p-value	f^2	Decision
JS → TSP	0.168	3.963	<0.001	0.174	Significant
GS → TSP	0.876	28.749	<0.001	4.042	Significant
GS × JS → TSP	0.102	2.562	0.010	0.123	Significant moderation

Job Stress significantly predicted Teaching Staff Performance ($\beta = 0.168$, $t = 3.963$, $p < 0.001$). Gender also showed a statistically significant association with Teaching Staff Performance ($\beta = 0.876$, $t = 28.749$, $p < 0.001$). The Gender × Job Stress interaction was significant ($\beta = 0.102$, $t = 2.562$, $p = 0.010$), indicating moderation in the pooled model. The model explained 90.0% of the variance in Teaching Staff Performance ($R^2 = 0.900$; adjusted $R^2 = 0.897$).

4.4 Model Quality and Predictive Assessment

Table 5. Measurement and Structural Model Assessment Summary

Analysis	Statistical Measure	Obtained Result	Recommended Threshold	Decision
Response Rate	Valid Responses	128 (36.6%)	Descriptive response rate	Limitation acknowledged
Descriptive Statistics	Mean Scores	JS = 3.67; TSP = 3.97	Mean > 3.00	Reported
Normality Test	Shapiro–Wilk	$p < 0.05$	Non-normal data acceptable for PLS-SEM	PLS-SEM Appropriate
Indicator Reliability	Outer Loadings	0.789–0.949	≥0.70	Accepted
Internal Consistency	Cronbach's Alpha	0.923–0.891	≥0.70 (0.60 acceptable	Accepted
Internal Consistency	Composite Reliability (ρC)	0.857–0.929	≥0.70	Accepted

Analysis	**Statistical Measure**	**Obtained Result**	**Recommended Threshold**	**Decision**
Convergent Validity	AVE	0.749–0.768	≥0.50	Accepted
Discriminant Validity	Fornell–Larcker Criterion	Satisfied	√AVE > Inter-construct correlations	Accepted
Discriminant Validity	HTMT Ratio	0.834 and 0.891	<0.90; 0.85 stricter criterion	Below 0.90; verify exact JS– TSP pair; 0.891 exceeds 0.85
Collinearity (Measurement Model)	Outer VIF	1.585– 6.587	<5.00 preferred	One indicator exceeds 5; inspect and justify retention
Collinearity (Structural Model)	Inner VIF	1.223– 1.898	<5.00	Accepted
Coefficient of Determination	Adjusted R^2	0.897	Interpret in context; higher R^2 indicates greater explained variance	Substantial explanatory power; verify model specification
Effect Size	f^2	0.123–4.042	0.02 (Small), 0.15 (Medium), 0.35 (Large)	Small to Very Large effects
Direct Effect	Job Stress → Teaching Staff Performance	$\beta = 0.168$, $t = 3.963$, $p < 0.001$	$t > 1.96$; $p < 0.05$	Supported
Direct Effect	Gender → Teaching Staff Performance	$\beta = 0.876$, $t = 28.749$, $p < 0.001$	$t > 1.96$; $p < 0.05$	Supported
Moderating Effect	Gender × Job Stress → Teaching Staff Performance	$\beta = 0.102$, $t = 2.562$, $p = 0.010$	$t > 1.96$; $p < 0.05$	Supported
Confidence Interval	Bootstrapped 95% CI	Bootstrapping used for inference	95% CI should exclude zero for significance	Verify exact SmartPLS CI values in final output
Multi-Group Analysis	PLS-MGA	$p > 0.05$	$p < 0.05$ indicates group difference	No significant gender difference
Predictive Relevance	Q^2	$Q^2 = 0.234– 0.412$	$Q^2 > 0$ indicates predictive relevance	Predictive relevance indicated

The reported Q^2 values ranged from 0.234 to 0.412, indicating predictive relevance because the values were greater than zero. The source manuscript also reports inner VIF values of 1.223– 1.898 and an adjusted R^2 of 0.897. Given the unusually high explanatory power, the final model specification, gender coding, indicator overlap, and common-method bias should be checked before publication.

4.5 Hypothesis Testing Summary

Hypothesis	**Result**	**Statistical evidence**	**Decision**
H1	Supported	$\beta = 0.168$; $t = 3.963$; $p < 0.001$	Supported
H2	Supported	$\beta = 0.876$; $t = 28.749$; $p < 0.001$	Supported
H3	Supported in pooled interaction model	$\beta = 0.102$; $t = 2.562$; $p = 0.010$; PLS-MGA $p > 0.05$	Moderation supported in pooled model; no significant group-path difference by PLS-MGA

Note: The source manuscript reports a significant interaction but a non-significant PLS-MGA group difference. These procedures answer related but different questions and should not be treated as interchangeable.

5. DISCUSSION

The findings revealed a statistically significant positive relationship between Job Stress and Teaching Staff Performance ($\beta = 0.168$, $t = 3.963$, $p < 0.05$). This finding suggests that, within the public university context examined, higher levels of job stress were associated with higher reported teaching staff performance. The result can be interpreted in relation to the Job Demands Resources (JD-R) perspective, which proposes that job demands do not necessarily have uniformly negative consequences; rather, their effects may depend on the nature of the demand and the resources available to employees to cope with it. In particular, the challenge hindrance stressor perspective distinguishes between challenge stressors, which may provide opportunities for achievement and personal growth, and hindrance stressors, which tend to obstruct goal attainment and performance. Previous research has similarly found that challenge related stress can have positive relationships with work outcomes, whereas hindrance related stress tends to produce negative outcomes (Cavanaugh et al., 2000; LePine et al., 2005). Therefore, the positive coefficient obtained in this study is consistent with the challenge stressor explanation, suggesting that some of the job pressures experienced by teaching staff may stimulate effort, concentration and commitment to meeting teaching responsibilities. However, because the present study measured overall job stress rather than separately measuring challenge and hindrance stressors, the finding should not be interpreted as definitive evidence that all job stress experienced by respondents is beneficial. Rather, it indicates that the observed form and level of stress in the study context were positively associated with performance. This interpretation is important because previous meta-analytic evidence has generally reported negative relationships between several forms of work stressors and job performance, demonstrating that the effect of stress depends on the type and characteristics of the stressor (Gilboa et al., 2008).

The finding is also relevant to the Nigerian academic context. Previous research among teaching staff in tertiary institutions in Nigeria found that gender and stress significantly influenced academic job performance, providing contextual support for the importance of examining stress and performance among university employees (Sofoluwe et al., 2015). The present finding therefore contributes to this body of evidence by showing a positive, although relatively modest, association between job stress and teaching staff performance. The relatively small path coefficient ($\beta = 0.168$) indicates that job stress is not a dominant determinant of teaching staff performance in the present model. Consequently, the finding should not be interpreted to mean that increasing stress will necessarily improve performance. Consistent with the JD-R perspective, excessive or poorly managed job demands may become detrimental when employees lack adequate resources to cope with them. Evidence from academic work environments similarly demonstrates the importance of resources and supportive working conditions in managing the consequences of demanding academic work.

Gender also demonstrated a statistically significant direct relationship with Teaching Staff Performance ($\beta = 0.876$, $t = 28.749$, $p < 0.001$). However, because gender was operationalised as a categorical variable, the coefficient should be interpreted as a difference associated with the coding of the gender variable rather than as a continuous effect of gender. The exact interpretation of the positive coefficient depends on how gender was coded in the SmartPLS dataset and should therefore be verified before the final thesis is submitted. More importantly, the Gender × Job Stress interaction was statistically significant ($\beta = 0.102$, $t = 2.562$, $p = 0.010$). This finding indicates that the strength of the relationship between Job Stress and Teaching Staff Performance differs according to gender. In other words, the estimated interaction term suggests that the association between job stress and performance varies according to the gender coding used of the Job Stress– Teaching Staff Performance relationship. Methodologically, this interpretation is consistent with moderation analysis in PLS-SEM, where an interaction term is used to determine whether a third variable changes the strength or direction of a relationship between an exogenous and endogenous construct (Henseler & Fassott, 2009; Hair et al., 2022).

The significant gender moderation can also be discussed within the broader theoretical argument that employees may respond differently to similar job demands because of differences in work roles, social expectations, family responsibilities and access to resources. Thus, although teaching staff may face similar institutional demands, the extent to which job stress translates into performance may differ across male and female employees. This interpretation is supported by research demonstrating that gender has been considered as a potential moderator of relationships involving work demands and employee outcomes, although empirical evidence is not uniform. For example, Shirom et al. (2008), in a meta-analysis of work-related stressors and job performance, found no overall significant moderating effect of gender, suggesting that gender differences in stress– performance relationships cannot automatically be assumed. Similarly, research using PLS-SEM has found that gender does not necessarily moderate all relationships involving work and performance outcomes. Therefore, the significant interaction observed in the present study represents an empirical finding specific to the sampled teaching staff and should be interpreted cautiously rather than assumed to apply universally to male and female employees.

The difference between the significant interaction effect and the reported non-significant PLS-MGA result should also be clearly recognised. These two analyses address related but different questions. The interaction analysis tests whether gender changes the strength of the Job Stress– Teaching Staff Performance relationship within the overall model, whereas PLS-MGA directly compares the estimated path coefficients between the male and female groups. Consequently, a significant interaction effect does not necessarily mean that the difference between the male and female group-specific path coefficients will also reach statistical significance in PLS-MGA. This distinction is important for interpreting the present findings and prevents the moderation result from being overstated.

Finally, the descriptive results showed relatively high levels of both Job Stress ($M = 3.67$, $SD = 1.11$) and Teaching Staff Performance ($M = 3.97$, $SD = 0.91$). The simultaneous presence of relatively high stress and relatively high reported performance is compatible with the challenge-stressor perspective, whereby certain job demands may be experienced as demanding but potentially motivating when employees possess sufficient resources and are able to cope with them (Cavanaugh et al., 2000). Nevertheless, the descriptive statistics alone do not establish that stress causes improved performance. The significant structural relationship provides evidence of association, not proof that increasing job stress will increase performance. From the JD-R perspective, the practical implication is therefore not that universities should increase job stress, but that they should reduce excessive and unnecessary demands while strengthening job resources such as workload support, research facilities, supervisory support, staff welfare and work– life balance. This

approach is particularly important because sustained or excessive demands may eventually produce strain and undermine employee well-being and performance. The findings therefore support a balanced institutional approach in which reasonable performance demands are accompanied by adequate organisational resources.

5.1 Theoretical Implications

The findings provide contextual support for using the JD-R and COR perspectives to explain how demanding academic work and available resources can coexist with differing performance outcomes. The positive Job Stress– Performance coefficient is compatible with a challenge-stressor interpretation, but the study measured overall job stress rather than separately estimating challenge and hindrance stressors; therefore, the result should not be interpreted as evidence that all forms of stress are beneficial.

5.2 Practical and Managerial Implications

Universities should ensure fair and transparent allocation of teaching, supervision, examination, and administrative duties.

Staff welfare measures, including stress-management support and regular staff welfare assessments, should be strengthened.

Research grants, research facilities, conference support, and other academic resources should be improved.

Where feasible, flexible scheduling and work– life balance measures should be considered.

Gender-responsive policies should provide equitable access to workload arrangements, promotion, training, research, and welfare opportunities.

University management should regularly monitor staff stress, workload, and performance and evaluate whether interventions reduce excessive job demands.

5.3 Limitations

5.4 Suggestions for Future Research

11.0 Suggestions for Future Research

Future studies should include larger and more diverse samples across Nigerian universities, adopt longitudinal research designs, and examine additional variables such as organisational commitment, job satisfaction, psychological wellbeing, and resilience. Researchers are also encouraged to use more comprehensive measurement scales and structural equation modelling (SEM) techniques to provide deeper insights into the relationship between job stress and teaching staff performance. Future studies should also report an a priori statistical power analysis and use probability sampling where feasible to strengthen the basis for generalisation.

6. CONCLUSION

The study concludes that Job Stress has a statistically significant positive association with Teaching Staff Performance among teaching staff in the selected public universities in Northwest Nigeria. Gender also showed a statistically significant association with Teaching Staff Performance, and the Gender × Job Stress interaction was statistically significant in the pooled model. However, PLS-MGA did not identify a statistically significant difference in the relevant structural path between male and female groups. The evidence should therefore be interpreted as statistical association rather than causal effect because of the cross-sectional design and self-reported data.

The study contributes to the literature by examining Job Stress as an overall construct, incorporating workload, role ambiguity, role conflict, time pressure, and work– life imbalance as conceptual dimensions, and testing gender as a categorical moderator in a Northwest Nigerian public-university context. For practice, the findings support a balanced approach in which universities reduce excessive and unnecessary demands while strengthening job resources such as workload support, research facilities, supervisory support, staff welfare, and work– life balance.

Future research should use larger and more diverse samples, longitudinal designs, probability sampling where feasible, a priori statistical power analysis, and additional explanatory variables such as organisational commitment, job satisfaction, psychological wellbeing, and resilience. Future studies should also verify the measurement and structural model specifications, including gender coding, HTMT, VIF, common-method bias, and the unusually high R^2 reported in the present analysis.

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Informed Consent Statement: I have been informed about the purpose of this study, which examines the implications of job stress for male and female teaching staff performance in public universities in Northwest Nigeria. I understand that my participation is voluntary, my responses will remain confidential, and the information provided will be used strictly for academic research and publication purposes. I understand that I may withdraw from participation at any time without penalty.

By selecting " I Agree " and proceeding with this questionnaire, I voluntarily consent to participate in this study.

- I Agree to Participate

I Do Not Agree to Participate

Data Availability Statement: The data presented in this study are available from the corresponding author on reasonable request, subject to applicable institutional and confidentiality restrictions.

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