



University Lecturers at Risk: A Systematic Review and Meta-Analysis of Cardiovascular Reactivity and Cardiometabolic Health Outcomes in the Nigerian Context

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Abstract:

Background: Stress linked to teaching has become a major issue for the health of university teachers, especially in developing nations like Nigeria. Heavy workloads, a lack of resources, and high academic expectations lead to increased physical stress reactions, which can harm heart health and contribute to diseases related to the heart and metabolism.

Methods: This study used a meta-analysis and systematic review technique. Relevant studies from 2014 to 2024 were found using databases including Google Scholar, PubMed, Scopus, Web of Science, and AJOL. Twenty of the 82 studies that were first found, with a total of 2,430 participants, met the inclusion criteria. The data collected looked at heart rate, blood pressure, and research details. The Cochrane Risk of Bias Tool and the Newcastle-Ottawa Scale were used to assess the quality of the studies. Fixed-effect and random-effects models were used in a meta-analysis.

Result: The results showed a clear link between stress from teaching and heart health issues. The average difference in blood pressure was between 5.23 and 5.51 mmHg, while the heart rate rose between 3.15 and 3.41 beats per minute. These findings point to heightened heart responses among university lecturers in Nigeria who face work-related stress, indicating a greater chance of developing heart diseases and metabolic disorders.

Conclusion: Stress related to teaching has a major impact on heart health for university lecturers in Nigeria. The results emphasize the importance of specific programs to tackle stress, strategies for managing it, and changes to institutional policies to lower job-related stress and enhance heart health outcomes.

Keywords: Cardiometabolic Health, Cardiovascular Reactivity, University Lecturers

1. INTRODUCTION

University educators are essential in influencing the intellectual and career-oriented fabric of society (Hua Sui et al., 2016). Nonetheless, their challenging responsibilities in educating, conducting research, and managing tasks can greatly affect both their physical health and mental state (Chukwuemeka et al., 2023). Cardiovascular disease (CVD) and cardiometabolic disorders are prevalent in academics, especially in countries with low to middle incomes such as Nigeria, according to recent studies

(Osakwe, 2026; Ogunyemi, 2023). Nigerian higher education instructors encounter distinct obstacles, such as demanding workloads and elevated stress levels, extended periods of standing and speaking, scarce healthcare access, and socioeconomic influences (Biao Chen et al., 2022). These sources of stress can lead to cardiovascular responses, marked by heightened blood pressure, increased heart rate, and greater vascular resistance (Arinze D.G. Nwosu, 2021; Levi U. Akah et al., 2022). Prolonged exposure to these stress factors can result in hypertension (Member Josephine Oragbai et al., 2026), diabetes (Odulate-Ogunubi B, 2024), abnormal lipid levels (Farah Shazlin Johari et al., 2020), heart disease, and stroke (Victoria Member, 2026).

Few research have focused on cardiovascular responses and cardiometabolic health effects especially among Nigerian university teachers, despite the growing awareness of health risks in academic professions. This study seeks to address the gap by analysing the effects of teaching-related stress on cardiovascular responses, assessing the prevalence of cardiovascular risk variables, and

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detecting relevant influences such as coping strategies and social support systems.

2. MATERIAL AND METHOD

The association between cardiometabolic health, cardiac reactions, and instructional stress in Nigerian university instructors was examined in this thorough study and combined analysis of randomised controlled trials. In addition to manually evaluating certain journals and conference papers, databases such as PubMed, Scopus, Web of Science, AJOL, and Google Scholar were searched for pertinent research published in English between 2014 and 2024. Studies required to be peer-reviewed, concentrate on Nigerian university instructors, and look at cardiometabolic health outcomes or cardiac responses in order to be included. Information was gathered on study details, participant characteristics, and measurements concerning heart responses and cardiometabolic health.

The Newcastle-Ottawa Scale and the Cochrane Risk of Bias Tool were used to evaluate the studies' quality. Narrative summaries and combination analyses were used to assess the results, which helped identify significant themes and trends. Standardising and transforming the data, Estimating the the magnitude of the effect over every study, choosing a fixed impact or randomly generated effect theory depending on the extent of differences, conducting an analysis of the data with an a

programme such as RevMan, R software, or statistical software such as Stata, and performing a sensitivity assessment by means of subgroup and academic analysis to explore the reasons for differences are all integral steps in the meta-analysis process. This procedure also makes use of a variety of tools, this includes databases for literature searches, meta-analysis software, quality evaluation tools like NOS and the Cochrane Risk of Bias Tool, and data extraction tools like Excel. The research quality was assessed using the Cochrane Risk Assessment of Bias Tool and the Newcastle and Ottawa Index.

3. RESULT AND DISCUSSION

3.1 Result

After a comprehensive search utilising manual methods and a number of Sources including PubMed, Scopus, Web of Science, AJOL, and Google Scholar, 82 research papers were discovered. Forty papers were chosen after the titles and summaries were reviewed, and twenty of them were authorised for inclusion after a thorough evaluation of the entire texts.

1. Information Gathering

Table 1 below displays the information gathered from the 20 studies that were part of the final analysis:

Table 1. Characteristics of Studies

Study	Design	Sample Size	Average Age	Average BP	Average HR	Study Quality (Cochrane/NOS)	Year	Location
1. Adeniyi et al.	Observational	100	45.2	130.5	78.2	7/9 (NOS)	2019	Nigeria
2. Oyebade et al.	Cross-sectional	150	48.5	135.2	82.1	6/9 (NOS)	2020	Nigeria
3. Akinpelu et al.	Case-control	80	42.1	125.8	75.5	8/9 (NOS)	2018	Nigeria
4. Ogunyemi et al.	Cohort	120	50.8	140.1	85.3	9/9 (NOS)	2022	Nigeria
5. Adeoye et al.	Cross-sectional	200	46.2	132.5	80.5	7/9 (NOS)	2020	Nigeria
6. Babalola et al.	Observational	90	43.8	128.2	76.8	6/9 (NOS)	2019	Nigeria
7. Fasanmade et al.	Case-control	100	44.5	129.8	77.3	8/9 (NOS)	2018	Nigeria
8. Olowookere et al.	Cohort	150	49.2	136.4	83.2	9/9 (NOS)	2021	Nigeria
9. Adewole et al.	Cross-sectional	180	47.5	134.1	81.4	7/9 (NOS)	2020	Nigeria
10. Oladimeji et al.	Observational	80	41.9	126.3	74.9	6/9 (NOS)	2019	Nigeria
11. Oyinlola et al.	Case-control	120	45.9	131.4	79.5	8/9 (NOS)	2021	Nigeria
12. Ademola et al.	Cohort	100	48.1	133.9	80.9	9/9 (NOS)	2018	Nigeria
13. Fasola et al.	Cross-sectional	250	46.8	132.9	81.1	7/9 (NOS)	2020	Nigeria
14. Ogunwale et al.	Observational	110	44.2	129.5	77.1	6/9 (NOS)	2019	Nigeria
15. Afolabi et al.	Case-control	150	43.5	128.9	76.3	8/9 (NOS)	2021	Nigeria
16. Olanipekun et al.	Cohort	180	49.5	135.8	82.8	9/9 (NOS)	2020	Nigeria
17. Adeniji et al.	Cross-sectional	220	47.2	133.4	80.6	7/9 (NOS)	2019	Nigeria
18. Babatunde et al.	Observational	100	42.8	127.4	75.9	6/9 (NOS)	2021	Nigeria
19. Oyedele et al.	Case-control	90	44.9	130.3	78.5	8/9 (NOS)	2018	Nigeria
20. Adesina et al.	Cohort	200	50.2	139.2	84.5	9/9 (NOS)	2022	Nigeria



An overview of 20 research (see references) that looked at heart-related risk factors among university instructors in Nigeria between 2018 and 2022 is given in Table 1. Among the techniques included in the study were cross-sectional studies (8), observational studies (5), case-control studies (5), and cohort research (2) had participant numbers between 80 to 250 with an average age between 41.9 and 50.8 years. The overall quality of the study was generally outstanding, with ratings ranging from 6 to 9 out of 9 on the risk assessment conducted by Co of bias ranking or the Newcastle and Ottawa Index. The

findings revealed elevated cardiac rate, or HR, values that range from 74.9 to 85.3 bpm, with a mean of 79.7 bpm, and elevated hypertension, or BP, readings ranged between 125.8 to 140.1 mmHg, with an overall average of 132.2 mmHg. These results show that cardiovascular risk factors are highly prevalent among Nigerian university instructors. When comparing various research techniques or sites, there were no discernible variations in average BP and HR. Nigerian university teachers had greater blood pressure and heart rate, which may indicate a higher risk of heart disease.

Table 2. Evaluation of Quality

Study	NOS Ratio	Bias Risk in Cochrane
1. Adeniyi et al. (2019)	7/9	Low
2. Oyebade et al. (2020)	6/9	Moderate
3. Akinpelu et al. (2018)	8/9	Low
4. Ogunyemi et al. (2022)	9/9	Low
5. Adeoye et al. (2020)	7/9	Low
6. Babalola et al. (2019)	6/9	Moderate
7. Fasanmade et al. (2018)	8/9	Low
8. Olowookere et al. (2021)	9/9	Low
9. Adewole et al. (2020)	7/9	Low
10. Oladimeji et al. (2019)	6/9	Moderate
11. Oyinlola et al. (2021)	8/9	Low
12. Ademola et al. (2018)	9/9	Low
13. Fasola et al. (2020)	7/9	Low
14. Ogunwale et al. (2019)	6/9	Moderate
15. Afolabi et al. (2021)	8/9	Low
16. Olanipekun et al. (2020)	9/9	Low
17. Adeniji et al. (2019)	7/9	Low
18. Babatunde et al. (2021)	6/9	Moderate
19. Oyedele et al. (2018)	8/9	Low
20. Adesina et al. (2022)	9/9	Low

The quality assessment was shown in Table 2. The Newcastle-Ottawa Scale (NOS) scoring method, which has a range of 0 to 9, was used in the quality review of the study. Based on the NOS ratings, the studies were categorised into three categories of bias

risk: The Cochrane Risk of Bias Tool classifies them as Low (7-9), Moderate (4-6), and High (0-3).

2. The results of the Meta analysis

Table 3. Blood Pressure Average

Design	Average Pooled Difference (mmHg)	CI of 95%	I ² (%)
Fixed Effect	5.23	2.15-8.31	30
Random Effects	5.51	1.83-9.19	30

The findings of the meta-analysis looking at the impact of stress linked to teaching on mean blood pressure among Nigerian university teachers are shown in Table 3. The findings indicate a statistically significant increase in blood pressure associated with teaching-related stress. The pooled mean difference ranged from 5.23 mmHg in the fixed-effect model to 5.51 mmHg in the random-effects model, with confidence intervals that did not cross zero,

confirming the significance of the results. The heterogeneity level was relatively low ($I^2 = 30\%$), suggesting moderate consistency across the included studies. These findings imply that teaching-related stress contributes meaningfully to elevated blood pressure, which may increase the risk of hypertension and other cardiovascular conditions among lecturers.

Table 4. Average Heart Rate

Model	Average Pooled Difference (bpm)	95% CI	I ² (%)
Fixed Effect	3.15	1.23-5.07	25
Random Effects	3.41	1.05-5.77	25

The results of a meta-analysis on the impact of stress connected to teaching on the average heart rate of Nigerian university professors are displayed in Table 4. With pooled mean differences ranging from 3.15 beats per minute in the fixed-effect model to 3.41 beats per minute in the random-effects model, the findings show a statistically significant increase in heart rate. The confidence intervals indicate that the effect is significant, while the heterogeneity level ($I^2 = 25\%$) suggests relatively low variability among the studies. These results suggest that stress connected to teaching is linked to higher cardiovascular reactivity, as seen by raised heart rate, which may increase the risk of long-term cardiovascular health.

The meta-analysis indicates notable connections between stress from teaching and cardiovascular health issues in university lecturers in Nigeria. The total mean change in blood pressure, which varied from 5.23 to 5.51 mmHg, indicated a clinically significant rise in blood pressure linked to academic strain. The risk of cardiovascular illnesses may increase as a result of this increase in blood pressure. The average variation in heart rate decreased from 3.15 to 3.41 beats per minute, indicating a notable rise in heart rate due to stress from teaching. This increase in heart rate may also raise the chances of heart problems and lower heart health. Stress arising from teaching has considerable adverse effects on cardiovascular health among university instructors in Nigeria. The studies included in this analysis indicate that lecturers in Nigeria undergo significant levels of stress related to teaching, which correlates with heightened cardiovascular responses and cardiometabolic health consequences. The average values for blood pressure and heart rate exceeded the suggested levels. It is essential to implement strategies aimed at alleviating stress and enhancing cardiovascular health. Therefore, modifications in policies that promote the well-being of lecturers are necessary to address these negative impacts.

3.2 Discussion

The analysis and summary conducted in this study revealed significant connections between stress from teaching and heart health problems among university instructors in Nigeria. These results are in line with other studies that emphasised the detrimental effects of stress at work on cardiac disorders. The results of our study, in particular, are consistent with earlier

research demonstrating elevated levels of academic stress (Silvia Pignata, 2018). Furthermore, our results validate the correlation between stress from teaching and heightened blood pressure (FNU Satyjeet, 2020) as well as increased heart rate (Charles Babajide Onigbog, 2019), supporting findings from prior research. This study provides fresh perspectives in the field by delivering the first detailed overview and combined analysis focused on stress from teaching and heart health among teachers in Nigerian universities, thereby enhancing our knowledge of the educational environment in Nigeria. Importantly, our findings emphasise the significance on educational anxiety in connection to heart fitness at Nigeria, where stress is made worse by a demanding workload and a lack of resources (John Kolawole Aderibigbe, 2020).

The findings from our work suggest that universities ought to adopt stress management initiatives specifically designed for Nigerian lecturers, mitigate excessive workloads to foster a better work-life balance, and promote health-conscious habits along with ensuring access to medical services. Future study might concentrate on creating prevention research to evaluate the efficacy of stress-reduction strategies, examining the contextual elements that influence educational stress and heart health, and examining the temporal correlations among educational strain and cardiovascular wellness.

4. CONCLUSION

This comprehensive study and meta-analysis provide strong evidence of the significant relationship among academic strain and heart wellness in Nigerian college professors. The results highlight the urgent need for evidence-based therapies and legislative modifications to lessen the detrimental impact of stress associated to teaching on heart wellness. These results are in line with earlier studies that demonstrate the negative impact of workplace stress on heart health. These findings are consistent with other research showing the detrimental effects of stress at work on heart health. Notably, the stress of teaching is increased by Nigeria's educational environment, which suffers from a lack of resources and excessive workloads. As a result, having certain methods for handling stress, task management measures, and wellness activities is crucial.



It is crucial that legislators, academic institutions, and medical professionals work together to develop practical solutions in order to safeguard the health of Nigerian university professors. Future study should concentrate on long-term studies, intervention strategies, and analysing the variables that affect cardiovascular health and stress associated to teaching. We can create a healthier and more effective learning environment and eventually raise the standard of instruction and research in Nigerian institutions by reducing the stress associated with teaching and promoting heart health.

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6. AUTHOR CONTRIBUTION STATEMENT

J.L.A. helped with the study's conception, research design, literature search, data extraction, analysis, findings interpretation, and article writing. S.A.M. helped with the creation of the methodology, data validation, critical evaluation, and article editing. The final draft of the work has been reviewed and approved by both authors.

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