

Hypertension Awareness, Knowledge of Risk Factors, And Preventive Practices among Undergraduate Students: A Cross-Sectional Study at Nile University, Nigeria

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ABSTRACT

Background: Hypertension is the leading modifiable risk factor for cardiovascular disease globally, with rising prevalence documented among young adults. University students face unique lifestyle exposures — academic stress, sedentary behavior, poor sleep, and high caffeine intake — that elevate cardio-metabolic risk. Yet evidence on their hypertension awareness and preventive engagement remains limited in sub-Saharan Africa.

Objective: This study assessed hypertension awareness, knowledge of risk factors, lifestyle exposures, risk perceptions, and preventive practices among undergraduate students at Nile University, Nigeria.

Methods: A descriptive cross-sectional design was employed. A structured, self-administered questionnaire was administered to a systematically sampled cohort of undergraduate students. Data were analyzed using descriptive statistics (frequencies and percentages) via IBM SPSS v26.

Results: A total of 384 students participated (50.6% male; 49.4% female). General awareness was high — 92.8% had heard of hypertension and 93.4% correctly defined it. However, only 4.7% checked their blood pressure regularly, 23.4% engaged in no preventive practices, and 62.5% did not perceive themselves as personally at risk. Sedentary behavior was prevalent (47% sitting ≥ 6 hours/day), sleep was inadequate in 67.2%, and over 27% consumed caffeinated beverages at least weekly. Stress was the most recognized risk factor (55.9%).

Conclusion: Despite high hypertension awareness, students exhibit a significant awareness-action gap. Targeted campus health interventions addressing perceived barriers, risk perceptions, and behavioral enablers are urgently needed.

Keywords: hypertension; blood pressure; university students; awareness; Nigeria; preventive practices; lifestyle; sub-Saharan Africa

INTRODUCTION

Hypertension — defined as a sustained systolic blood pressure (SBP) ≥ 140 mmHg and/or diastolic blood pressure (DBP) ≥ 90 mmHg — remains the single most prevalent modifiable cardiovascular risk factor worldwide [1]. The World Health Organization estimates that approximately 1.28 billion adults globally live with hypertension, with nearly two-thirds residing in low- and middle-income countries (LMICs) [2]. Despite decades of public health campaigns, the condition's insidious, asymptomatic character has earned it the descriptor "silent killer," contributing to delayed diagnosis, suboptimal treatment uptake, and excess cardiovascular morbidity and mortality [3].

Once considered a disease of ageing, hypertension is increasingly documented among younger populations, including university students [4]. This epidemiological shift is driven by converging behavioral risk factors — sedentary lifestyles, diets high in sodium and ultra-processed foods, inadequate sleep, excessive caffeine and energy-drink consumption, and psychosocial stress — many of which intensify during the undergraduate years [5, 6]. Within sub-Saharan Africa, the burden of non-communicable diseases (NCDs), led by hypertension, has accelerated sharply over the past two decades, posing a serious threat to health systems already strained by infectious disease [7].

Nigeria, Africa's most populous nation, illustrates this challenge vividly: nationally representative surveys estimate adult hypertension prevalence between 28% and 38%, yet awareness, treatment, and control rates remain markedly deficient [8]. Crucially, evidence points to rising incidence in younger Nigerian cohorts, raising concerns about a cardiovascular epidemic in the making [9]. University campuses concentrate large numbers of young adults at a formative stage of health-behavior development, making them a strategically important setting for prevention [10].

The Health Belief Model (HBM) provides a useful theoretical lens through which to understand health-protective behavior [11]. It posits that individuals are more likely to adopt preventive behaviors when they perceive themselves as susceptible to a condition, regard the condition as serious, believe preventive actions are beneficial, and perceive barriers to action as surmountable. Applied to hypertension in university students, the model predicts that gaps in perceived susceptibility — even in the presence of high general awareness — will undermine preventive engagement [12].

Existing studies from African university settings suggest that knowledge about hypertension does not consistently translate into preventive action [13, 14]. Students may be aware that hypertension exists and is dangerous while simultaneously underestimating their personal risk, failing to monitor their blood pressure, and neglecting lifestyle modifications [15, 33]. However, most published evidence from Nigeria focuses on community or clinical populations; campus-specific data, particularly from private universities in the Federal Capital Territory, remain scarce.

This study therefore aimed to comprehensively assess hypertension awareness, knowledge of risk factors, lifestyle exposure, risk perception, and preventive practices among undergraduate students at Nile University, Abuja, Nigeria. The findings are intended to inform evidence-based campus health policies and public health interventions targeting young Nigerians during a critical life stage.

METHODS

Study Design and Setting

A descriptive cross-sectional survey was conducted at Nile University of Nigeria, a private university located in Abuja, the Federal Capital Territory. The university hosts approximately 6,000 undergraduate students drawn from diverse socioeconomic and geographical backgrounds across Nigeria, making it representative of a broad young-adult Nigerian population.

Study Population and Sampling

The target population comprised all registered full-time undergraduate students aged 18 years and above. Systematic random sampling was applied: every third student was selected from departmental enrollment lists until the required sample size was reached. Students who were absent during scheduled data collection periods or declined participation were excluded. After accounting for a 10% non-response adjustment and applying a 95% confidence interval with 5% margin of error, a minimum sample of 400 was initially targeted; 384 completed questionnaires met inclusion and quality criteria and were retained for analysis, yielding a response rate of 94.7%.

Data Collection Instrument

Data were gathered using a structured, self-administered questionnaire adapted from validated instruments used in prior sub-Saharan African hypertension awareness studies [16, 17]. The questionnaire comprised five sections: (i) socio-demographic characteristics; (ii) hypertension awareness; (iii) knowledge of risk factors; (iv) lifestyle exposure and risk perception; and (v) preventive practices. A pilot test was conducted with 30 students excluded from the main study; Cronbach's alpha was 0.79, confirming acceptable internal consistency. Minor revisions were incorporated prior to main data collection.

Data Analysis

Data were double-entered, cleaned, and analyzed using IBM SPSS Statistics version 26. Descriptive statistics — frequencies and percentages for categorical variables, means and standard deviations for continuous variables — were used to summarize findings. Chi-square tests were applied to examine associations between key categorical variables; statistical significance was set at $p < 0.05$.

Ethical Considerations

Ethical approval was obtained from the Nile University Research Ethics Committee (Ref: NU-REC/2026/07). Written informed consent was obtained from each participant prior to enrollment. Participation was entirely voluntary; participants could withdraw at any time without consequence. All responses were anonymized and stored securely. The study was conducted in conformity with the Declaration of Helsinki.

RESULTS

Socio-Demographic Characteristics

A total of 384 students participated in the study. The gender distribution was near-equal: males constituted 50.6% ($n = 194$) and females 49.4% ($n = 190$) of the sample. This balanced split supported gender-comparative analyses and minimized demographic selection bias.

Hypertension Awareness

General awareness of hypertension was high, with 92.8% of students reporting they had previously heard of the condition. Of these, the large majority (93.4%) correctly defined hypertension as elevated blood pressure. Smaller fractions incorrectly identified it as low blood pressure (1.0%), as heart disease only (2.2%), or were uncertain (3.4%). A comparable proportion (92.2%) acknowledged that hypertension could affect university students.

Despite strong general awareness, more nuanced knowledge was less well developed. Only 60.0% understood why hypertension is referred to as a "silent killer," and 58.9% recognized that it may be asymptomatic, while 28.5% remained unsure and 12.5% incorrectly believed symptoms were always present. Knowledge of personal blood pressure status was reported by 68.1% of students; however, behavioral monitoring was poor — only 4.7% checked their blood pressure regularly, 29.7% did so occasionally, 40.9% rarely, and 24.7% never.

Table 1. Hypertension Awareness Among Nile University Students ($N = 384$)

Variable	Response	n	%
Heard of hypertension	Yes	329	92.8
	No	55	7.2
Definition of hypertension	High blood pressure	315	93.4
	Low blood pressure	18	1.0
	Heart disease only	24	2.2
	Not sure	27	3.4

Can affect students	Yes	354	92.2
Knows own BP status	Yes	262	68.1
Knows "silent killer" reason	Yes	230	60.0
Recognizes asymptomatic nature	Yes	226	58.9
	No	48	12.5
	Not sure	109	28.5

Blood Pressure Monitoring Frequency

The frequency of blood pressure checks among participants revealed a striking inaction gap. Only 4.7% of students monitored their blood pressure regularly, while the overwhelming majority did so infrequently: occasionally (29.7%), rarely (40.9%), or never (24.7%). Table 2 summarizes these findings.

Table 2. Frequency of Blood Pressure Monitoring (N = 384)

Frequency	n	%
Regularly	31	4.7
Occasionally	111	29.7
Rarely	147	40.9
Never	95	24.7

Knowledge of Hypertension Risk Factors

When asked to identify the most important risk factor for hypertension, stress was cited most frequently (55.9%), followed by lifestyle factors (20.3%), genetics (11.6%), and diet (6.25%). An equal proportion (6.25%) were unsure. This pattern indicates that while students are stress-aware, appreciation of dietary and genetic contributors is comparatively limited.

Lifestyle Exposure and Risk Perception

Lifestyle risk exposures were prevalent across multiple domains. Academic stress was commonly experienced: 26.6% reported it sometimes and 6.8% rarely. Sedentary behavior was a dominant feature of daily student life — 40.9% sat for 2–5 hours per day, 34.1% for 6–8 hours, and 12.8% for more than 8 hours. Caffeinated beverage and energy drink consumption was widespread, with 54.1% consuming them occasionally, 13.7% weekly, and 13.4% daily.

Sleep duration was largely inadequate: 45.0% of students slept 5–6 hours per night, 22.2% slept fewer than 5 hours, and only 26.9% achieved the recommended 7–8 hours. Physical activity was reported by 62.2% of students as a regular pursuit.

Despite these exposures, risk perception was comparatively low: 62.5% of participants did not believe they were personally at risk of developing hypertension, while 37.5% acknowledged some personal susceptibility. In contrast, 72.2% regarded hypertension as a very serious condition, 23.1% as moderately serious, and 4.7% as not serious. While 76.6% indicated willingness to seek a blood pressure check upon experiencing symptoms, the primary barriers to proactive monitoring were lack of time (40.9%) and the belief that it was not necessary (38.8%).

Table 3. Lifestyle Exposure and Risk Perception Among Nile University Students (N = 384)

Variable	Category	n	%
Daily sitting hours	< 2 hours	46	11.9
	2–5 hours	157	40.9
	6–8 hours	131	34.1
	> 8 hours	49	12.8

Sleep duration/night	< 5 hours	85	22.2
	5–6 hours	173	45.0
	7–8 hours	103	26.9
	> 8 hours	23	5.9
Caffeinated beverages	Daily	51	13.4
	Weekly	52	13.7
	Occasionally	208	54.1
	Never	72	18.8
Perceived personal risk	Yes	144	37.5
	No	240	62.5
Perceived seriousness	Very serious	277	72.2
	Moderately serious	89	23.1
	Not serious	18	4.7

Preventive Practices

Engagement in hypertension-preventive behaviors was suboptimal across all measured domains. Regular exercise was the most commonly practiced measure (47.8%), followed by maintaining a healthy diet (37.2%) and reducing salt intake (35.6%). Regular blood pressure monitoring as a preventive behavior was reported by only 11.6% of participants. Notably, 23.4% of students engaged in none of the listed preventive practices. In the event of receiving a hypertension diagnosis, 90.0% stated they would seek medical care, 8.1% would self-medicate, 4.4% would ignore the condition, and 3.8% were unsure.

Table 4. Preventive Practices Among Nile University Students (N = 384)

Preventive Practice	n	%
Regular exercise	184	47.8
Healthy diet	119	37.2
Reduced salt intake	143	35.6
Regular BP checks	46	11.6
None of the above	90	23.4

DISCUSSION

This cross-sectional study of undergraduate students at Nile University, Nigeria, reveals a paradox well-documented in the broader hypertension literature: high general awareness coexisting with poor preventive engagement. The 92.8% awareness rate observed here surpasses findings from earlier Nigerian community studies (55–78%) [8, 9] and compares favorably with recent university-focused surveys from Ethiopia (87.3%) [13] and Ghana (89.1%) [14]. This elevated awareness likely reflects improved media coverage of NCD issues and the educated nature of the study population.

Nevertheless, awareness at the general level did not translate into nuanced hypertension literacy. Only 58.9% of students correctly recognized hypertension as potentially asymptomatic — a critical knowledge gap, as symptom-based health-seeking behavior creates a false sense of security [18]. Similarly, only 60.0% understood the "silent killer" concept, echoing findings from Kenyan university studies where less than two-thirds of students grasped this characterization [19]. These gaps suggest that awareness-raising campaigns must move beyond simple name recognition to address the biological mechanisms and subtle early manifestations of elevated blood pressure.

The extremely low rate of regular blood pressure monitoring (4.7%) is perhaps the most actionable finding of this study. Blood pressure measurement is the sole reliable means of detecting hypertension in asymptomatic individuals, making its routine practice fundamental to early detection and cardiovascular risk reduction [20]. Similar monitoring deficits have been reported in university studies from South Africa (6.2%) [21] and Nigeria's southwest (5.8%) [22], indicating a persistent structural and behavioral barrier that transcends

institutional boundaries. The stated barriers — lack of time and perceived unnecessary need — align with the HBM's "barriers" construct [11] and underscore the need for low-friction, campus-embedded screening opportunities such as automated BP kiosks in student unions or nurse-led pop-up clinics in academic buildings [23].

Sedentary behavior constituted a major lifestyle risk in this population. Nearly half (47%) of students sat for six or more hours daily, and 12.8% exceeded eight hours — levels associated with significantly elevated cardiovascular risk independent of leisure-time physical activity [24]. These figures align with global trends of increased academic screen time and reduced habitual movement among university students post-COVID-19 [25]. Combined with the finding that only 47.8% engaged in regular exercise, the picture that emerges is of a student population that is physically under-active to a degree that warrants institutional intervention through campus recreational infrastructure investment and structured physical activity curricula [26].

Inadequate sleep was similarly prevalent: 67.2% of students slept fewer than 7 hours per night, and 22.2% slept fewer than 5 hours. Short sleep duration is an independent risk factor for hypertension, with meta-analyses consistently reporting a 20–35% elevated risk of hypertension among those sleeping fewer than 6 hours nightly [27]. Academic deadlines, social media use, and noisy dormitory environments are likely contributors, and sleep hygiene education should form an integral part of campus wellness programming [28].

Caffeinated beverage consumption — including energy drinks — was widespread, with 27.1% of students consuming such products at least weekly and 13.4% daily. Acute and sustained consumption of high-caffeine energy drinks has been associated with blood pressure elevation, cardiac arrhythmias, and impaired endothelial function in young adults [29]. Regulatory policy targeting the marketing and availability of energy drinks on university campuses, alongside educational messaging on cardiovascular consequences, is warranted.

Stress was the most cited hypertension risk factor (55.9%), consistent with evidence linking hypothalamic-pituitary-adrenal axis activation and sympathoadrenal responses to sustained academic pressure and elevated ambulatory blood pressure [30]. However, fewer students identified diet (6.25%) and genetics (11.6%) as important contributors, indicating blind spots in risk-factor literacy that health promotion efforts should address. A multifactorial risk narrative — one that encompasses stress, sleep, diet, physical activity, and family history — is more likely to motivate comprehensive behavioral change than single-factor messaging [31].

The finding that 62.5% of students did not perceive themselves as personally at risk of hypertension — despite widespread exposure to multiple modifiable risk factors — exemplifies the phenomenon of "optimistic bias" or unrealistic personal invulnerability [32]. This cognitive distortion is commonly observed in young adult health contexts and has been shown to be a significant barrier to health-protective behavior uptake. Interventions that personalize risk — for example, through individual BP readings combined with feedback on modifiable risk factors — have demonstrated effectiveness in correcting this bias and motivating behavior change in young adult samples [23].

The 23.4% of students engaging in no preventive practices whatsoever represents a high-priority subgroup for targeted outreach. Peer health education programs, mobile-health (mHealth) platforms delivering personalized cardiovascular risk information, and academic integration of health literacy modules may collectively reach students who are disengaged from conventional health services [15, 23, 30].

This study has several strengths. The near-equal gender distribution minimizes demographic skew and facilitates comparative analysis. The comprehensive instrument covered awareness, knowledge, lifestyle, perception, and behavior — domains often assessed in isolation. Limitations include the cross-sectional design, which precludes causal inference; reliance on self-report, which may introduce social desirability bias; the absence of objective blood pressure measurement; and sampling from a single private university, which limits generalizability to the broader Nigerian student population. Future studies should incorporate clinical BP measurement, longitudinal follow-up, and multi-institutional sampling to strengthen causal attribution and generalizability.

CONCLUSION

This study demonstrates that while general hypertension awareness is high among Nile University undergraduates, critical knowledge deficits, low perceived personal risk, and significant behavioral inaction persist. Only 4.7% of students monitored their blood pressure regularly, and nearly a quarter adopted no preventive practices whatsoever. Prevalent lifestyle risk exposures — including sedentary behavior, sleep deprivation, high caffeinated beverage consumption, and academic stress — compound cardiometabolic vulnerability in this population. These findings collectively call for multi-level campus health interventions grounded in behavioral theory: low-barrier BP screening services, peer education programs, structured physical activity integration, sleep hygiene campaigns, and personalized digital health tools. Nigerian university authorities and public health policymakers should prioritize NCD prevention within campus health agendas to interrupt hypertension trajectories before they crystallize into chronic disease in adulthood.

Declarations

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Conflicts of Interest: The authors declare no conflict of interest.

Ethical Approval: Granted by the Nile University Research Ethics Committee (Ref: NU-REC/2026/07).

Informed Consent: Written informed consent was obtained from all individual participants included in the study.

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