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High Burden of Perceived Stress Among Undergraduate Students in Northern Nigeria: Exploring Coping Strategies and Possible Relationship with Big Five Personality Traits

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Abstract

Background

Burden of perceived stress among university students is rising globally. In sub-Saharan Africa, Nigerian students carry the highest burden. Despite this, there are limited studies on perceived stress, coping strategies, and personality traits among Nigerian university students. Our objectives were: to determine the prevalence of perceived stress; to describe the patterns of coping strategy use; to assess relationship between Big Five personality traits and perceived stress and coping strategies; and to explore predictors of perceived stress and coping strategy use; among undergraduate students in Kano, northern Nigeria.

Methods

We conducted a cross-sectional study involving 392 undergraduate students (Males – 62.5%; M_{age} = 23.52, SD_{age} = 2.53, range: 18–34 years) from three public universities in Kano, Nigeria. Participants were recruited using a convenience sampling technique. We used the 10-item Perceived Stress Scale (PSS) to assess perceived stress, the 28-item Brief COPE questionnaire to assess coping strategies, and the 30-item short Big Five Inventory (BFI-2-S) to assess Big Five Personality traits. Ordinal logistic regression analyses were performed with perceived stress and coping strategies use as dependent variables while sociodemographic characteristics and personality traits were used as independent variables. A $p \leq 0.05$ was set as statistical significance.

Results

77.5% of the participants reported moderate to high perceived stress; emotion-focused coping was the commonly used strategy. Perceived stress had positive correlations with all the three coping strategies. Big Five personality traits had no relationship with perceived stress. However, neuroticism and agreeableness were significant predictors of problem-focused coping, while neuroticism and extraversion were significant predictors of emotion-focused coping. Extraversion was the only significant personality predictor of maladaptive coping. For sociodemographic characteristics, age, sex, and level of study were the significant predictors of perceived stress categories.

Conclusions

There is high burden of perceived stress among undergraduates in northern Nigeria; adaptive coping strategies are the dominant strategies used by the students; and choice of coping strategies is influenced by personality. Age, sex, and level of study are associated with perceived stress; however, personality traits had no association with perceived stress. Targeted mental health interventions are needed in northern Nigerian universities.

BACKGROUND

University life, a means to personal and intellectual development, is associated with significant social, psychological, and emotional challenges. It represents a period of transition from lower level of educational training (with its semi-dependent life) to higher education where, independence, coupled with academic, financial, social, and personal challenges may, individually or collectively, predispose students to considerable levels of psychological stress (Luo et al., 2023). Perception of academic stress, defined as the belief that academic workload exceeds the resources available to students and their coping capacity, has emerged as an important public health issue (Lazarus & Folkman, 1984; Iqra, 2024). Globally, of 58 studies systematically reviewed, 46.6% reported high levels of academic stress among university students (Hadi, Noviekayati, & Suhadianto, 2025). The rising burden of academic stress among university students, if unmitigated, can lead to far-reaching consequences including reduced academic performance, poor motivation, poor sleep quality, depressive tendencies, anxiety disorders, and, in severe cases, substance abuse disorder and suicidal ideation (Pascoe et al., 2020; Brata, Susanto, & Zubaidah, 2025).

In sub-Saharan Africa (SSA), burden of perceived stress among university students is similarly high, and largely under-researched. Recently, a pooled prevalence of 64.72% was reported in a systematic review and meta-analysis of data from 26 studies across SSA (Fentahun et al., 2025). Indeed, local studies from different African countries such as Ghana, Nigeria, Ethiopia, and Sudan have consistently reported rising levels of perceived stress (Awoke et al., 2021; Salih et al., 2025). In a cross-border comparative study involving university students and staff, Ike et al. (2025) reported that Nigerian participants had the highest prevalence of mental health problems, including perceived stress, depression, and anxiety, compared to those from other countries.

Even though a number of studies have reported data on perceived stress among Nigerian university students (Ike et al., 2025), these studies are mainly from the southern part of the country. Data from northern Nigeria, a region with distinct socio-cultural and religious characteristics, remain largely absent from the literature; and, Given that universities in northern Nigeria operate within a different socio-cultural and religious context that may influence how students experience and respond to perceived stress, there is the need for regional data to fill this critical gap.

Coping strategies are a constellation of cognitive and behavioural efforts that individuals use in order to overcome the demands of stressful situations (Lazarus & Folkman, 1984). Within the context of perceived academic stress, coping strategies are classified into three broad categories: problem-focused coping, in which individuals make direct efforts to modify or eliminate the source of stress; emotion-focused coping, in which individuals target the emotional distress that is associated with the stressor; and maladaptive coping, in which individuals avoid, deny, abuse substance, or use other disengagement behaviours that may provide short-term relief but exacerbate the stress over time (Folkman & Lazarus, 1988; Carver et al., 1989). Students deploy different coping strategies in order to deal a stressful situation and this choice can have significant implications on the student's academic performance, psychological state, emotional stability, and overall long-term resilience to stressful situations. Thus, understanding the coping strategies commonly used by a student in response to stressful academic situations could provide basis for designing targeted mental health interventions for students with high level of perceived stress. In a study among Ethiopian university students, Awoke et al., (2021) reported that majority of the participants employed effective coping strategies, with emotion-focused and social support-seeking behaviours predominating. In Nigeria, adaptive coping strategies were favoured over avoidance strategies, in a group of Sandwich undergraduate students (Nwosu et al., 2021).

Even though there are studies that reported data on stress coping strategies among undergraduate students in Nigeria, the stress coping strategy profiles of undergraduate students in northern Nigeria, and their sociodemographic and personality predictors have not been studied adequately.

Personality traits are stable, long-term, and consistent patterns of behaving, thinking, and feeling. Within the context of Five Factor Model (FFM), they are organized under into five broad domains: neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness (McCrae & Costa, 1987; John & Srivastava, 1999). The traits are implicated in both the perception of stress and the selection of coping strategies. Specifically, neuroticism has consistently been reported to be positively associated with stress perception in western populations, while extraversion, agreeableness, conscientiousness, and openness are negatively associated with stress (Luo et al., 2023). Furthermore, higher neuroticism has been consistently associated with maladaptive and emotion-focused coping strategies, while conscientiousness, extraversion, and openness are linked to problem-focused coping; on the other hand, agreeableness is associated social support-seeking as a coping strategy (Carver & Connor-Smith, 2010; Ringwald et al., 2024). However, despite the elaborate literature on the relationship between the Big Five personality traits, perceived stress, and coping strategies among Caucasians, there are limited African and Nigerian studies examining this relationship among university students.

The objectives of this study were: (i) to determine the prevalence of perceived stress; (ii) to describe the patterns of coping strategy use; (iii) to assess possible relationship between Big Five personality traits and perceived stress and coping strategies; (iv) and to explore predictors of perceived stress and coping strategy use; among undergraduate students in Kano, northern Nigeria.

MATERIAL AND METHODS

Study design and setting of the study

This is a cross-sectional study designed to assess perceived stress, stress coping strategies, and Big Five personality traits among undergraduate students in Kano, Nigeria. Data were collected between January and March, 2026. The study was carried out among undergraduate students from three public universities located in Kano, Nigeria: Bayero University Kano (BUK); Northwest University Kano; and Aliko Dangote University of Science and Technology. These institutions are the major public education institutions in the Kano state and have students from diverse academic socio-demographic backgrounds. Together, the three universities have an undergraduate student population of over 30,000 from different parts of Nigeria.

Participant selection

The study population consisted of registered undergraduate students in the three selected universities during the study period. Participants were included if they were registered undergraduate students of any of the three universities, aged 18 years and above, were in at least second year of study, willing to participate voluntarily, and provided informed consent. Students who submitted incomplete questionnaires or duplicate responses were excluded from the final analysis. Participants were recruited using a convenience sampling technique. This is necessary because of the online nature of the study. A link containing questionnaire on sociodemographic information, perceived stress, stress coping, and Big Five personality traits questionnaires

was created on Google forms and disseminated via multiple online platforms used by the students of these universities, including WhatsApp groups, Telegram channels, departmental and student association platforms. The dissemination of the study link lasted for four weeks. An introductory statement explaining the purpose of the study, assurances for confidentiality, voluntary participation, and informed consent accompanied the questionnaire link. Of the 411 completed questionnaires received, 19 were excluded due to incomplete responses, duplicate submissions, or failure to approve electronic consent form, leaving a final sample of 392 participants.

Sample size determination and power analysis

The minimum sample size was calculated using Cochran's formula for prevalence studies. We used prevalence of perceived academic stress among African university students of 64.72% (Fentahun et al., 2025), 95% confidence interval, and a margin of error of 5%, which gave a minimum sample size of 351. Additionally, for the ordinal logistic regression, a power analysis was performed. We used ten predictors, 80% power, and 0.05 level of significance, which indicated that a sample of 392 participants is sufficient to detect a small effect size ($f^2 = 0.026$).

Data collection

Data were collected using a structured self-administered questionnaire hosted on Google Forms. The questionnaire consisted of sections assessing sociodemographic characteristics, perceived stress, coping strategies, and personality traits.

The sociodemographic section obtained information such as age, sex, university affiliation, level of study, program of study, and marital status.

Perceived stress was assessed using the 10-item Perceived Stress Scale (PSS) (Cohen et al., 1983). The PSS is a standardized self-reporting tool designed to assess the degree to which situations in one's life are perceived as stressful. Items on the scale are rated on a Likert-type scale (0 to 4). Of the ten items of the scale, four items (4, 5, 7, and 8) are positively oriented and are reverse-scored, while the remaining negatively oriented items are scored in the forward direction. Total scores for the scale range from 0 to 40; higher scores indicate greater perceived stress. Participants were categorized into three perceived stress groups based on their total score: 0–13 = mild stress; 14–26 = moderate stress; and 27–40 = high stress (Al-Roomy, 2025).

Coping strategies were assessed using the 28-item Brief COPE questionnaire (Carver, 1997). The Brief COPE is a widely used self-report instrument designed to assess different coping responses deployed during stressful situations. The 28-item Brief COPE subscales were grouped into three coping dimensions: problem-focused coping; emotion-focused coping; and avoidant/maladaptive coping. Responses were scored according to the guidelines by the developer. A previous study among Nigerian university students has reported satisfactory reliability and applicability in assessing coping behaviours (Akinsulore et al., 2020).

Big Five personality traits were assessed using the 30-item short Big Five Inventory (BFI-2-S) (Soto and John, 2017), a standardized and validated instrument that assesses the five major domains of personality: neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness – using six items

per trait. Previous Nigerian studies have also utilized the BFI-2-S in assessing personality traits among undergraduate students (Mukhtar and Omatule, 2024).

Data Analysis

Collected data were exported into Microsoft Excel and analysed using the IBM SPSS v25. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarise sociodemographic characteristics. Pearson's correlation coefficients were used to examine linear relationships among perceived stress, coping strategies, and Big Five personality traits. Chi square test of association was used to assess association between perceived stress categories and stress coping strategies usage. Ordinal logistic regression analysis was conducted to determine the predictors of perceived stress and coping strategies, using sociodemographic characteristic and personality traits as the predictors. Statistical significance was set at $p < 0.05$.

RESULTS

Sociodemographic characteristics

The sociodemographic characteristics of the participants are presented in Table 1 and summarised here. The mean age of the participants was 23.52 ± 2.53 years (18–34 years). Most of the participants were: males (63%); from BUK (50%); studying basic medical science courses; in their third year of study (49%); single (88%); and living off campus (59%).

Reliability and internal consistency of scales

We used three scales, 10-item perceived stress scale, 28- item Brief COPE scale, and the 30-item short form Big Five Inventory (BFI-2-S), to assess perceived stress, stress coping strategies, and Big Five personality traits. Cronbach's alpha coefficients were 0.83, 0.7, and 0.89 for the PSS, Brief COPE, and BFI-2-S, respectively. This indicates good internal consistency of the items in each scale, suggesting that the items reliably measure the same construct.

Perceived stress, stress coping strategies, and the Big Five personality traits

The means scores of the participants on PSS. Brief COPE, and BFI-2-S scales, and the frequencies when the scores were converted into categorical variables, are presented in Table 2. The participants had mean perceived stress of 23.57 ± 6.54 (8–39), indicating moderate perceived stress. When the PSS scores were converted into low, moderate, and high perceived stress categories, 58% of the participants had moderate stress while 20% had high stress. Furthermore, the participants had mean stress coping strategy score of 25.73 ± 4.41 (11–35), implying moderate use of stress coping strategies. The items on the coping strategy scale were grouped into three broad categories: problem-focused, emotion-focused, and maladaptive coping strategies. These broad categories were further divided into low usage, moderate usage, and high usage. About 80% of the participants reported moderate to high usage of problem-focused coping strategy, over 90% reported moderate to high usage of emotion-focused coping strategy, while only about 41% reported moderate to high usage of maladaptive coping strategy. For the personality traits, mean scores of the participants ranged from 2.53 to 3.61.

Correlations between perceived stress, stress coping strategies, and Big Five personality traits

In order to assess possible linear relationship between big five personality traits, perceived stress, and stress coping strategies, Pearson's correlation coefficients were used to determine correlation between big five personality traits on one hand and perceived stress and coping strategies on the other; correlation between perceived stress and stress coping strategies was also assessed. These results are presented in Tables 3, 4, and 5. Big Five personality traits did not correlate with perceived stress, suggesting lack of linear relationship between the two variables among the participants. However, neuroticism ($r = 0.15$, $p = 0.003$; $r = 0.13$, $p = 0.008$; $r = 0.18$, $p < 0.001$), extraversion ($r = 0.21$, $p < 0.001$; $r = 0.11$, $p = 0.023$; $r = 0.17$, $p = 0.001$), and openness ($r = 0.12$, $p = 0.020$; $r = 0.12$, $p = 0.018$; $r = 0.11$, $p = 0.028$) had weak positive correlations with overall coping strategy score, problem-focused coping strategy, and emotion-focused coping strategy, respectively. Agreeableness and conscientiousness were the least correlated with coping strategies with agreeableness demonstrating weak positive correlation with problem-focused coping strategy ($r = 0.17$, $p = 0.001$). Similarly, none of the personality traits correlated with maladaptive coping strategy. On correlation between perceived stress and coping strategies, perceived stress had moderate to weak positive correlations with overall coping strategy score ($r = 0.45$, $p < 0.001$), problem-focused coping strategy ($r = 0.13$, $p = 0.008$), emotion-focused coping strategy ($r = 0.34$, $p < 0.001$), and maladaptive coping strategy ($r = 0.15$, $p = 0.003$).

Association between perceived stress categories and stress coping strategy categories

On the association between perceived stress categories and coping strategies, perceived stress categories were significantly associated with use of problem-focused coping strategies ($\chi^2 = 34.79$, $p < 0.001$), use of emotion-focused coping strategies ($\chi^2 = 56.11$, $p < 0.001$), and use of maladaptive coping strategies ($\chi^2 = 12.86$, $p = 0.012$). Specifically, about 65% and 70% of those that reported moderate and high perceived stress, respectively, were associated with moderate use of problem-focused coping strategy. Similarly, 97% and 100% of those that reported moderate and high perceived stress, respectively, had moderate to high usage of emotion-focused coping strategies. However, only about 40% and 55% of those that reported moderate and high perceived stress, respectively, had moderate to high usage of maladaptive coping strategies.

Predictors of perceived stress strategies

Ordinal logistic regression analysis was performed to identify predictors of perceived stress categories and the results are presented in Table 6. The overall model was statistically significant ($\chi^2 = 21.96$, $p = 0.015$); this indicates that the predictors collectively improved prediction of perceived stress categories compared with the intercept-only model. Goodness-of-fit statistics revealed adequate model fit (Pearson χ^2, $p = 0.349$; Deviance χ^2, $p = 0.716$) and the model explained about 6.4% of the variance in perceived stress categories (Nagelkerke $R^2 = 0.064$). Additionally, the proportional odds assumption, which supports the use of ordinal logistic regression, was satisfied (Test of Parallel Lines, $p = 0.154$). Socio-demographic variables of age, sex, and level of study were the significant predictors of perceived stress. Increasing age (OR = 1.15, 95% CI: 1.05–1.27, $p = 0.003$) was associated with higher odds of belonging to higher perceived stress categories; while female sex (OR = 0.62, 95% CI: 0.40–0.97, $p = 0.038$) and higher level of study (OR = 0.74, 95% CI: 0.56–0.99, $p = 0.044$) were associated with lower odds of belonging to higher perceived stress categories.

Predictors of problem-focused coping strategy categories

Ordinal logistic regression was also performed to determine predictors of problem-focused coping strategy categories use and the results are presented in Table 7. The overall model was statistically significant (χ^2 = 28.73, p = 0.001), indicating that the predictors in the model collectively improved prediction of problem-focused coping strategies use compared to intercept-only model and the Goodness-of-fit statistics revealed adequate model fit (Pearson χ^2, p = 0.548; Deviance χ^2, p = 0.878). The model explained 8.3% of the variance in use of problem-focused coping strategy categories (Nagelkerke R^2 = 0.083); additionally, the proportional odds assumption was satisfied (Test of Parallel Lines, p = 0.359). At predictor level, sex, marital status, neuroticism, and agreeableness were the significant predictors of problem-focused coping strategy use. Specifically, female participants had lower odds of belonging to higher problem-focused coping strategy use compared to males (OR = 0.58, 95% CI: 0.37–0.92, p = 0.019); married participants demonstrated lower odds of belonging to higher problem-focused coping strategy use compared to single participants (OR = 0.41, 95% CI: 0.20–0.82, p = 0.012). However, higher neuroticism (OR = 1.54, 95% CI: 1.04–2.27, p = 0.029) and agreeableness (OR = 1.92, 95% CI: 1.23–2.98, p = 0.004) scores were associated with increased odds of belonging to higher categories of problem-focused coping strategy use.

Predictors of emotion-focused coping strategy use

Ordinal logistic regression was similarly used to determine predictors of emotion-focused coping strategy categories use and the results are presented in Table 8. The overall model was statistically significant (χ^2 = 34.54, p < 0.001), indicating that the predictors collectively improved prediction of emotion-focused coping strategy use compared to intercept-only model and the Goodness-of-fit statistics demonstrated adequate model fit (Pearson χ^2, p = 0.174; Deviance χ^2, p = 1.000). The predictors in the model explained 10.6% of the variance in the emotion-focused coping strategy use (Nagelkerke R^2 = 0.106) and the proportional odds assumption was satisfied (Test of Parallel Lines, p = 0.964). At predictor level, female sex (OR = 0.53, 95% CI: 0.33–0.86, p = 0.010), higher neuroticism (OR = 2.00, 95% CI: 1.31–3.05, p = 0.001), and higher extraversion (OR = 1.60, 95% CI: 1.20–2.11, p = 0.001) scores were significant predictors of higher emotion-focused coping strategy use.

Predictors of maladaptive coping strategy use

Ordinal logistic regression was equally conducted to determine predictors of maladaptive coping strategy use and the results are presented in Table 9. The model was statistically significant (χ^2 = 24.07, p = 0.007), indicating that the predictors improved model fit compared to intercept-only model, but the goodness-of-fit statistics were mixed, with Deviance test indicating adequate fit (p = 1.000), while the Pearson test suggests statistically significant misfit (p = 0.022). Overall, the model explained 7.5% of the variance in maladaptive coping strategy use (Nagelkerke R^2 = 0.075). At predictor level, increase in extraversion was associated with increased odds of belonging to higher maladaptive coping strategy use (OR = 1.72, 95% CI: 1.30–2.28, p = 0.001). Given the mixed goodness-of-fit statistics in the maladaptive coping strategy use model, we performed a sensitivity analysis by collapsing the three-level maladaptive coping strategy categories use into binary variable (by removing the high use category that has sparse cells) and re-running the analysis using binary logistic regression. The results obtained were consistent with those of the ordinal logistic regression model; therefore, we retained and reported the results of ordinal logistic regression.

Table 1
Sociodemographic characteristics of the participants

Variable		Mean ± SD, N (%), n = 392
Age (years)		23.52 ± 2.53
Sex		
	Males	245 (62.5)
	Females	147 (37.5)
Institution		
	Bayero University, Kano	196 (50)
	Northwest University Kano	117 (29.8)
	Aliko Dangote University of Science and Technology	79 (20.2)
Program of study		
	Allied health sciences	29 (7.4)
	Agriculture	8 (2.0)
	Basic Medical Sciences	124 (31.7)
	Computer and mathematical sciences	46 (11.8)
	Law	9 (2.3)
	Life sciences	28 (7.2)
	MBBS	29 (7.4)
	Physical sciences and engineering	96 (24.6)
	Social and management sciences	22 (5.6)
Level of study		
	200 level	53 (13.5)
	300 level	192 (49.0)
	400 level	126 (32.1)
	500 level	21 (5.4)
Marital status		
	Single	343 (87.5)
	Married	49 (12.5)
Place of residence		
	On campus	160 (40.8)

Variable	Mean ± SD, N (%), n = 392
Off campus	232 (59.2)

Table 2
Perceived stress score, stress coping strategies, and big five personality traits

Variable		**Mean ± SD, N (%)**
Perceived stress score		23.57 ± 6.54
Perceived stress categories		
	Low stress	88 (22.4)
	Moderate stress	227 (57.9)
	High stress	77 (19.6)
Coping strategy		25.73 ± 4.41
Use of coping strategy		
	Low use	118 (30.1)
	Moderate to high use	274 (69.9)
Problem-focused coping strategy		5.71 ± 1.61
Use of problem-focused coping strategy		
	Low use	86 (21.9)
	Moderate use	233 (59.4)
	High use	73 (18.6)
Emotion-focused coping strategy		13.88 ± 2.90
Use of emotion-focused coping strategy		
	Low use	23 (5.9)
	Moderate use	263 (67.1)
	High use	106 (27.0)
Maladaptive coping strategy		4.17 ± 1.58
Use of maladaptive coping strategy		
	Low use	230 (58.7)
	Moderate use	151 (38.5)
	*High use	11 (2.8)
Neuroticism		3.25 ± 0.53
Extraversion		2.53 ± 0.89
Openness		3.59 ± 0.68
Agreeableness		3.59 ± 0.66

Variable	Mean ± SD, N (%)
Conscientiousness	3.61 ± 0.73

*Note: high use maladaptive coping strategy has sparse cells.

Table 3
Pearson's correlation coefficients between personality traits, perceived stress, and coping strategies

Variable	Neuroticism		Extraversion		Openness		Agreeableness		Conscientiousness	
	r	*p*	r	*p*	r	*p*	r	*p*	r	*p*
PSS	0.08	0.111	0.05	0.331	0.04	0.396	0.03	0.620	0.01	0.801
Coping strategy	0.15	0.003*	0.21	< 0.001*	0.12	0.020*	0.09	0.092	0.08	0.141
Problem-focused strategy	0.13	0.008*	0.11	0.023*	0.12	0.018*	0.17	0.001*	0.09	0.056
Emotion-focused strategy	0.18	< 0.001*	0.17	0.001*	0.11	0.028*	0.05	0.366	0.04	0.421
Maladaptive strategy	-0.06	0.228	0.09	0.060	-0.03	0.550	-0.04	0.380	0.05	0.470

*Statistically significant correlation, PSS = perceived stress score.

Table 4
Pearson's correlation coefficients between perceived stress and coping strategies

Variable	Perceived stress	
	r	p
Coping strategy	0.45	< 0.001*
Problem-focused strategy	0.13	0.008*
Emotion-focused strategy	0.34	< 0.001*
Maladaptive strategy	0.15	0.003*

*Statistically significant correlation.

Table 5
Association of perceived stress with coping strategies

variable		Perceived stress				
		Low (n = 88)	Moderate (n = 227)	High (n = 77)	χ^2	p value
Use of problem-focused strategy					34.79	< 0.001*
	Low use	38 (43.18)	36 (15.86)	12 (15.58)		
	Moderate use	32 (36.36)	147 (64.76)	54 (70.13)		
	High use	18 (20.45)	44 (19.38)	11 (14.29)		
Use of emotion-focused strategy					56.11	< 0.001*
	Low use	16 (18.18)	7 (3.08)	0 (0.0)		
	Moderate use	66 (75.00)	155 (68.28)	42 (54.55)		
	High use	6 (6.82)	65 (28.63)	35 (45.45)		
Use of maladaptive strategy					12.86	0.012*
	Low use	62 (70.45)	133 (58.59)	35 (45.45)		
	Moderate use	23 (26.14)	90 (39.65)	38 (49.35)		
	High use	3 (3.41)	4 (1.76)	4 (5.19)		

*Statistically significant association.

Table 6
Predictors of perceived stress categories

Predictor	95% Confidence interval			
	OR	Lower	Upper	p value
Age	1.15	1.05	1.27	0.003*
Sex	0.62	0.40	0.97	0.038*
Marital status	0.73	0.37	1.46	0.380
Place of residence	0.71	0.47	1.08	0.109
Level of study	0.74	0.56	0.99	0.044*
Neuroticism	1.15	0.78	1.68	0.480
Extraversion	1.19	0.92	1.52	0.185
Openness	1.43	0.89	2.29	0.136
Agreeableness	1.10	0.72	1.70	0.658
Conscientiousness	0.72	0.49	1.07	0.107

Model fitting: χ^2 = 21.96, p = 0.015; Pearson goodness of fit p = 0.349, Deviance goodness of fit p = 0.716; Nagelkerke R^2 = 0.064; test of parallel lines p = 0.154. OR = odds ratio.

Table 7
Predictors of problem-focused coping strategy

Predictor	95% Confidence interval			
	OR	Lower	Upper	p value
Age	1.05	0.95	1.15	0.364
Sex	0.58	0.37	0.92	0.019*
Marital status	0.41	0.20	0.82	0.012*
Place of residence	0.87	0.57	1.32	0.507
Level of study	0.91	0.68	1.22	0.528
Neuroticism	1.54	1.04	2.27	0.029*
Extraversion	1.09	0.84	1.40	0.518
Openness	0.82	0.51	1.32	0.409
Agreeableness	1.92	1.23	2.98	0.004*
Conscientiousness	0.89	0.60	1.32	0.569

Model fitting: χ^2 = 28.73, p = 0.001; Pearson goodness of fit p = 0.548, Deviance goodness of fit p = 0.878; Nagelkerke R^2 = 0.083; test of parallel lines p = 0.359. OR = odds ratio

Table 8
Predictors of emotion-focused coping strategy

Predictor	95% Confidence interval			
	OR	Lower	Upper	p value
Age	1.04	0.94	1.15	0.451
Sex	0.53	0.33	0.86	0.010*
Marital status	0.97	0.46	2.04	0.928
Place of residence	0.65	0.41	1.02	0.062
Level of study	1.04	0.76	1.42	0.817
Neuroticism	2.00	1.31	3.05	0.001*
Extraversion	1.60	1.20	2.11	0.001*
Openness	1.28	0.76	2.15	0.359
Agreeableness	0.80	0.50	1.29	0.362
Conscientiousness	0.98	0.63	1.50	0.910
Model fitting: χ^2 = 34.54, p < 0.001; Pearson goodness of fit p = 0.174, Deviance goodness of fit p = 1.000; Nagelkerke R^2 = 0.106; test of parallel lines p = 0.964. OR = odds ratio				

Table 9
Predictors of maladaptive coping strategy

Predictor	95% Confidence interval			
	OR	Lower	Upper	p value
Age	0.92	0.83	1.02	0.095
Sex	0.93	0.59	1.48	0.771
Marital status	0.74	0.35	1.57	0.437
Place of residence	0.93	0.60	1.44	0.735
Level of study	1.04	0.77	1.41	0.784
Neuroticism	0.80	0.53	1.21	0.285
Extraversion	1.72	1.30	2.28	0.001*
Openness	0.78	0.47	1.31	0.348
Agreeableness	0.65	0.42	1.03	0.066
Conscientiousness	1.37	0.91	2.08	0.135

Model fitting: χ^2 = 24.07, p = 0.007; Pearson goodness of fit p = 0.022, Deviance goodness of fit p = 1.000; Nagelkerke R^2 = 0.075; test of parallel lines p = 0.367. OR = odds ratio.

DISCUSSION

This study examined the burden of perceived stress, described patterns of stress coping strategies use, and assessed their relationship with Big Five personality traits among undergraduate students in northern Nigeria. About 77.5% of the participants had at least moderate perceived stress. This high burden of perceived stress is broadly consistent with the global trend of rising prevalence of perceived stress among university students (Brata, Susanto, & Zubaidah, 2025; Hadi, Noviekayati, & Suhadianto, 2025). Compared to the pooled prevalence of 64.72% in SSA (Fentahun et al., 2025), the observed prevalence in this study is relatively higher. This suggests that students in northern Nigeria have disproportionately higher burden of perceived stress relative to students from other parts of the continent. Indeed, we have previously reported an even higher prevalence of 84.80% among undergraduate students from one of the participating universities (Mukhtar and Bashir, 2024). This high burden of perceived stress calls for urgent mental health interventions in the northern Nigerian university systems. Additionally, efforts should be made to address some of the systemic challenges that may be responsible, directly or indirectly, to this high burden of perceived stress among university students from the region.

Use of stress coping strategies is high among the participants of this study. Over 90% of the participants reported moderate to high emotion-focused coping strategy use, approximately 80% reported moderate to high problem-focused coping strategy use, while about 41% engaged in moderate to high maladaptive coping. This indicates that majority of the participants use adaptive stress coping strategies. This is encouraging and is consistent with findings from an Ethiopian study in which university students employed effective stress coping strategies to overcome stress during the COVID-19 pandemic (Awoke et al., 2021). Similar pattern was also observed in Nigerian sandwich students who preferred approach over maladaptive strategies (Nwosu et al., 2021). The predominance of emotion-focused coping strategies in our sample is a clear departure from the patterns commonly observed in Western or East Asian samples, and underscores the relevance of culturally sensitive models of stress coping strategies for this population.

Perceived stress had positive correlations with all three categories of coping strategy use. While the association between higher stress and greater use of adaptive strategies is expected and fits into the transactional model of stress and coping (Lazarus & Folkman, 1984), the simultaneous positive correlation with maladaptive coping strategies deserves further exploration. It is possible that as the burden of stress increases, some students become overwhelmed and therefore broaden their coping repertoire to include both adaptive and maladaptive strategies. Indeed, this pattern, in which increasing level of stress influences greater engagement with all the three coping strategies, has been observed in other student populations and may reflect a “coping saturation” phenomenon, where adaptive strategies alone become inadequate to manage increasing academic demands, prompting students to deploy maladaptive or disengaging behaviours (Folkman & Lazarus, 1988; Carver et al., 1989). The implication of this finding is that students experiencing the highest levels of stress are associated with high risk of maladaptive coping, and hence the need for identification of this group of students for early targeted psychological support.

Despite the widely reported association between perceived stress and Big Five personality traits in Caucasians (Luo et al., 2023; Ringwald et al., 2024), Big Five personality traits were not significant predictors of perceived stress among our participants; and none had significant correlation with perceived stress. The absence of a neuroticism–stress relationship in our sample is particularly surprising given the robustness of this association across numerous samples in Western and Asian contexts (Luo et al., 2023). It is possible that the 30-item Big Five inventory used to measure personality traits, while internally consistent and reliable in this sample (Cronbach's $\alpha = 0.89$), may not be culturally sensitive to capture the specific expressions of these traits in our sample, where sociocultural norms may constrain the behavioural manifestations of traits such as neuroticism or conscientiousness in the academic domain, therefore, replication is needed. Furthermore, our findings on lack of association between perceived stress and personality traits may be due measurement issues, true cultural moderation, other variables not measured in this study. Cross-cultural validation studies on this scale and inclusion of other factors known to influence the personality-stress relationship should be explored in future studies.

In contrast to the lack of significant personality–stress associations, personality traits had significant associations with coping strategies use. Neuroticism and agreeableness were significant predictors of problem-focused coping strategy use. The finding that agreeableness was positively associated with problem-focused coping use is theoretically coherent: agreeable individuals tend to be empathetic, interpersonally oriented, cooperative, and are therefore likely to seek collaborative and constructive solutions to challenges in academic situations (Connor-Smith & Flachsbart, 2007; Carver & Connor-Smith, 2010). However, the positive association between the neuroticism and problem-focused coping use, does not align with mainstream literature that link neuroticism to maladaptive and emotion-focused strategies (Otero-López, Santiago, & Castro, 2021; Burro et al., 2023). A possible explanation of this is that in a high-stress environment where stressors are largely uncontrollable, neurotic students who are highly sensitive to negative outcomes may paradoxically engage in more active problem-solving behaviours as a form of anxiety-driven overcompensation. This anxiety-driven activation of problem-focused strategies has been observed in some contexts where the stressor is perceived as overwhelming (Carver et al., 1989). However, this observation warrants further exploration in future studies among university students in northern Nigeria.

For emotion-focused coping, neuroticism and extraversion were the two significant personality predictors. The association between neuroticism and emotion-focused coping is well-established among Caucasians and it reflects a tendency of high-neuroticism individuals to prioritize emotional regulation in response to perceived stress (Burro et al., 2023; Ringwald et al., 2024). In the context of our participants, this would likely mean resort to prayer, rumination, seeking emotional reassurance from peers, and reliance on religious figures as sources of comfort. The finding that extraversion was positively associated with emotion-focused coping use is rather unexpected, because extraversion is more commonly associated with problem-focused and social support-seeking strategies in Caucasians (Carver & Connor-Smith, 2010; Singh & Sharma, 2021). However, in a setting like that of northern Nigeria, extraversion may primarily manifest as heightened social engagement and communal support-seeking, both of which are themselves forms of emotion-focused coping rather than direct problem resolution.

Our finding that extraversion was the only significant personality predictor of maladaptive coping strategy use is another paradoxical result, theoretically. Extraversion is commonly regarded as a protective trait that is

associated with positive affect, social connectedness, and reduced psychological distress (Luo et al., 2023; Ringwald et al., 2024). It is however worth noting that the maladaptive coping regression model demonstrated mixed goodness-of-fit statistics, with few cells in the high-use category contributing to instability, and the model explained only 7.5% of the variance in maladaptive coping; a sensitivity analysis using binary logistic regression yielded consistent results, suggesting that the extraversion finding is robust, but its modest effect size calls for cautious interpretation and replication.

Age, sex, and level of study were significant sociodemographic predictors of perceived stress. Older students had significantly higher odds of belonging to higher perceived stress categories. This finding is consistent with the observation that older students are more likely to carry concurrent financial, family, and occupational responsibilities alongside their academic commitments, amplifying their overall stress burden (Onuoha et al., 2019). The finding that female sex was associated with lower odds of higher perceived stress is however contrasting, as women in many global and other African settings report higher stress than their male counterparts (Awoke et al., 2021; Li et al., 2022). In northern Nigeria, social and cultural factors may explain this pattern, even though we did not assess these social and cultural factors. Female undergraduates in northern Nigeria may be subject to more structured daily routines, closer family supervision, stronger social support networks, and may have different academic and career expectation frameworks compared to their male counterparts, all of which may buffer against perceived stress. Additionally, males in northern Nigeria may face more pronounced pressures related to financial independence, family obligations, and career prospects, which could elevate their stress perception. The negative association between level of study and perceived stress, in which students at higher levels had lower odds of higher stress, may reflect the progressive development of academic coping skills, familiarity with the university environment, and improved stress management capacity that comes as one gain more academic experience (Kaphle et al., 2024). Regarding coping predictors, female sex and married status were both associated with lower odds of problem-focused and emotion-focused coping. This may reflect gender-role expectations and the distinct social resources available to married versus single students in northern Nigeria.

Limitations

The following limitations should be considered when interpreting the findings of this study. The cross-sectional design of the study limits causal inference regarding the relationships between the variables assessed. Although the study participants were from three public universities in Kano, the findings may not be fully generalisable to all undergraduate students in Nigeria because of the socio-cultural and religious diversity of the country, the use of convenience sampling which excluded students without internet, and the fact that students from private universities were not included. The regression models, collectively, explained only a modest proportion of the variance in perceived stress and stress coping strategies use (5.2%–10.6%). This suggests that a substantial proportion of the variance remains attributable to constructs not measured in this study. The maladaptive coping strategy regression model demonstrated mixed goodness-of-fit statistics (Pearson $\chi 2$, $p = 0.022$), due to sparse cells in the high-use maladaptive coping category; although a sensitivity analysis using binary logistic regression yielded consistent results, the findings from this model should be interpreted cautiously. And, finally, the PSS used in this study measures general stress rather than academic stress. Despite these limitations, our study has provided valuable data on the interplay between perceived

stress, stress coping strategies, and Big Five personality traits among university students in northern Nigeria upon which future studies can build.

Conclusions

This study has provided evidence on the burden of perceived stress, stress coping strategy use, and their relationship with personality traits among undergraduate students in northern Nigeria. The findings reveal a high burden of perceived stress among undergraduate students in northern Nigerian. Adaptive stress coping strategies (emotion-focused and problem-focused strategies) use among the students predominate maladaptive strategy. However, unlike in Caucasians, we found no association between perceived stress and personality among the students surveyed. Age, sex, and level of study are the significant sociodemographic predictors of perceived stress, while personality traits — particularly neuroticism, agreeableness, and extraversion — were more relevant to coping behaviour. These findings, collectively, call for multi-level interventions that address high burden of perceived stress among undergraduate students in northern Nigeria. University authorities in northern Nigeria should consider establishing and strengthening accessible student mental health support services. Future researc should employ longitudinal and mixed-methods designs to deepen understanding of the mechanisms linking personality, perceived stress, and stress coping strategies in northern Nigeria.

Abbreviations

BFI
2-S-Big Five Inventory-2-Short Form
BUK
Bayero University Kano
CI
Confidence Interval
FFM
Five-Factor Model
IBM
International Business Machines
MBBS
Bachelor of Medicine, Bachelor of Surgery
OR
Odds Ratio
PSS
Perceived Stress Scale
SHREC
State Health Research Ethics Committee
SPSS
Statistical Package for the Social Sciences
H1
H4-Hypotheses 1 to 4

R^2
Coefficient of Determination
α
Cronbach's Alpha
χ^2
Chi-square statistic
r
Pearson's correlation coefficient
p
Probability value
SD
Standard Deviation
v25
Version 25.0
SSA
Sub-Saharan Africa

Declarations

Ethics approval and consent to participate

Study protocol was reviewed and approved by the Health Research Ethics Committee of Ministry of Health, Kano State, Nigeria (SHREC/2025/6973, dated 31st December, 2025). All participants were made fully aware of the nature and extent of the study and their voluntary participation sought. All participants provided informed consent electronically prior to completing the questionnaire. The study was conducted in accordance with the 2013 Declaration of Helsinki for research involving human participants.

Consent for publication

Not applicable.

Availability of data and materials

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interests.

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Author’s contribution

MIG conceptualised and designed the study. AZI obtained ethical approval and conducted data collection. MIG performed data analysis and interpreted the data. MIG and AZI drafted and critically reviewed the manuscript. All the authors read and approved the final manuscript.

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