Assessment of Perceived Stress, Stressors, and Coping Strategies among Undergraduate Dental Students at Obafemi Awolowo University, Ile-Ife, Nigeria

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ABSTRACT

Background
Dental education is widely recognized as a highly stressful experience that can adversely affect students' mental health, academic performance, and professional development. The impact of factors such as age, gender, and educational level remains unclear. This study aimed to determine the level of perceived stress, identify key stressors in the dental student environment, examine coping strategies, and assess the relationship between sociodemographic factors and stress levels among undergraduate dental students at Obafemi Awolowo University, Ile-Ife, Nigeria.

Methods
A cross-sectional study was conducted among 123 dental students during the 2020/2021 academic year using a structured questionnaire. The Dental Environment Stress (DES) questionnaire was used to assess specific stressors, and the Perceived Stress Scale (PSS) was used to measure the overall perceived stress level.

Results
Of the participants, 62.6% were male and 37.4% were female, with a mean age of 22.31 ± 3.31 years. The overall mean stress score was 23.32 ± 5.95. Female students reported significantly higher stress levels than males (P = 0.034). The most frequently reported stressors were workload (3.79 ± 1.01) and performance pressure (3.63 ± 1.00). Students residing in the hospital hostel or receiving a mid-range allowance reported higher stress levels. Religious coping was the most frequently utilized coping strategy.

Conclusion
Perceived stress within the dental environment remains relatively high, particularly among female students. No clear association was found between income and perceived stress level. The major stressors identified were workload and performance pressure. The primary coping strategies for managing these stressors were religion, active coping, and planning.

Keywords:

INTRODUCTION

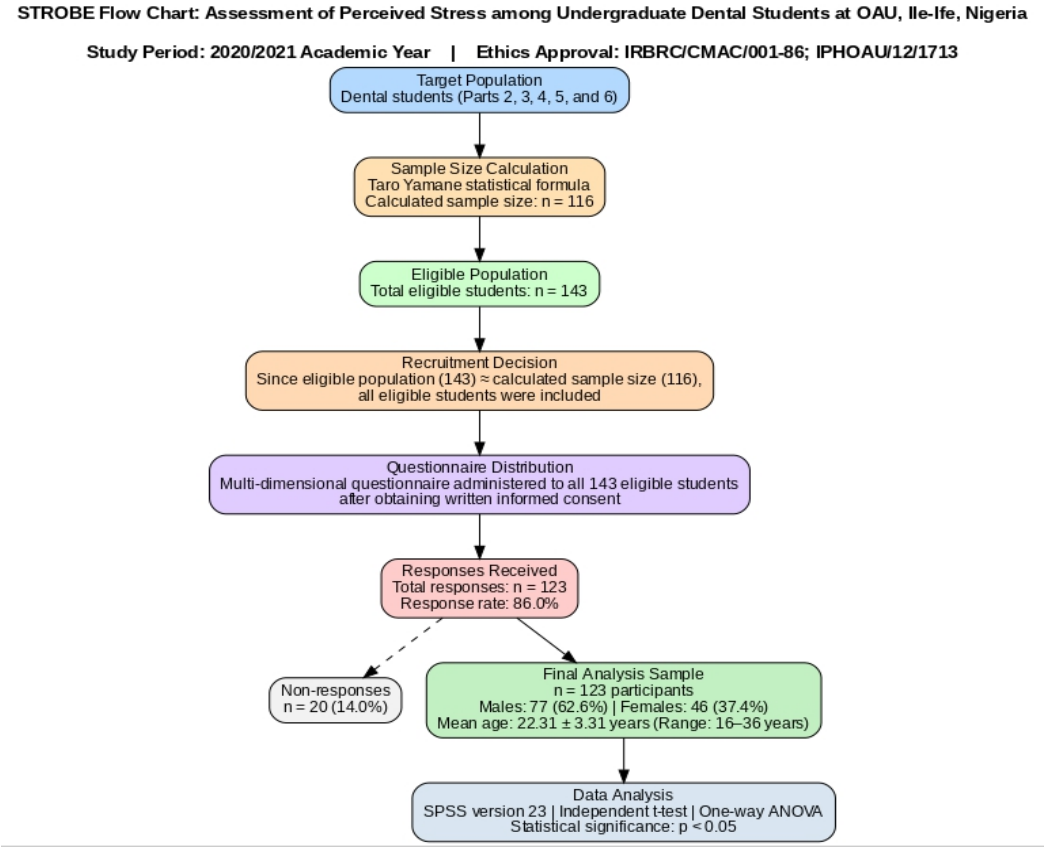
Stress has been defined in various ways. According to Atkinson et al.,[1] stress refers to external demands—whether physical or mental—placed on an individual's physical and psychological well-being. It is not merely a stimulus or a response, but a dynamic process through which individuals perceive and respond to environmental threats and challenges.[2–4] Stress remains a significant concern among clinical students, particularly within dental education, where academic and clinical demands are uniquely rigorous.[5-10] As reported by Lugassy et al.,[11] dental students experience greater psychological disturbance compared to other student populations. Unaddressed chronic stress can adversely affect academic performance, impair clinical judgment, and contribute to burnout and mental health disorders.[12,13] Elevated perceived stress has been associated with psychological morbidity and professional burnout.[2,11,14-16] Similarly, Bathla et al.[17] documented increased anxiety, depression, and suicidal intent resulting from various stressors among undergraduate dental students. Anxiety levels in this group have been reported to approach norms observed in U.S. psychiatric outpatients.[11,15] A study from Poland also found a significant positive

correlation between perceived stress and increased masseter muscle tone among dental students.[18]

In Nigeria, these challenges are compounded by limited institutional resources, high patient volumes in teaching hospitals, and considerable sociocultural expectations, all of which may intensify stress levels.[19,20] In 2015, Obafemi Awolowo University (OAU) implemented a comprehensively revised dental curriculum designed to modernize training and align with contemporary practice requirements. Key additions included aesthetic dentistry, reflecting the growing demand for cosmetic procedures; dental practice management and administration, to equip students with essential business skills; and an introduction to oral health research methods, aimed at strengthening research capacity and promoting evidence-based practice. These updates mark a shift from traditional education toward a holistic model that integrates clinical excellence with professional preparedness. Despite these curricular improvements, there remains a scarcity of data concerning the specific stressors and coping mechanisms among dental students at Obafemi Awolowo University, Ile-Ife. This study therefore aimed to assess perceived stress, identify key stressors, and evaluate coping strategies among undergraduate dental students at the university.

METHODS

This cross-sectional study was conducted during the 2020/2021 academic year among dental students in years 2 through 6. Ethical approval was obtained from the Institute of Public Health and Health Research Ethics Committee (HREC) at Obafemi Awolowo University, Ile-Ife, Nigeria (registration number: IPH/OAU/12/1272) prior to the study's commencement. The sample size was determined using the Taro Yamane formula, yielding a minimum sample of 116 participants. As the target population consisted of 143 students—a figure close to the calculated sample size—all eligible students were invited to participate. A participants' flowchart following STROBE guidelines is provided below.



A multi-dimensional questionnaire was used for data collection, comprising three validated instruments: a modified Dental Environment Stress (DES) questionnaire adopted from Al-Sowygh et al.,[21] the Perceived Stress Scale (PSS) by Cohen et al.,[22] and the Brief COPE inventory (BC) to evaluate coping strategies. After obtaining written informed consent, the questionnaire was distributed to all participating students. No personally identifiable information was collected.

The questionnaire was structured into four sections:

Section A collected sociodemographic and socioeconomic characteristics.

Section B contained the 41-item Dental Environment Stress questionnaire to assess stress levels specific to the dental education environment.

Section C included the 10-item Perceived Stress Scale (PSS), which measured perceived stress levels over the preceding month. The PSS is a well-validated tool that categorizes scores into three distinct levels: Low Stress (scores ≤ 13), Moderate Stress (scores 14–26), and High Stress (scores ≥ 27). These established thresholds were used to classify participants' stress levels.

Section D featured 28 items from the Brief COPE inventory, designed to identify the coping strategies employed by respondents.

Data Analysis

Coded data from the completed questionnaires were entered and analyzed using SPSS version 23. The results are presented as frequencies with proportions or as means with standard deviations (SD), as appropriate. The summary scores for individual domains, as well as the overall scores for the DES, BC, and PSS questionnaires—all presented as means and SDs—were treated as dependent variables. Gender and level of study were defined as independent variables. Differences in scores based on gender were analyzed using an independent samples t-test, while differences across study levels were assessed using a one-way analysis of variance (ANOVA); the choice of test was contingent upon the normality of the data distribution. A p-value of ≤ 0.05 was considered statistically significant.

RESULTS

A total of 123 undergraduate dental students participated in the study, yielding a response rate of 86%. The cohort comprised 77 (62.6%) males and 46 (37.4%) females, with a mean age of 22.31 ± 3.31 years (range: 16–36 years). The vast majority of respondents were single (96.7%), while 3.3% were married. Regarding accommodation, 56% resided off-campus, 48% lived in on-campus housing, and 19% resided in the Glory Land hostel located within the hospital premises (Table 1).

Table 1: Socio-demographic characteristics

Variable	Frequency	Percentage (%)
Sex		
Male	77	62.6
Female	46	37.4
Marital status		
Single	119	96.7
Married	4	3.3
Religion		
Christian	110	89.4
Muslim	13	10.6
Others	0	0
Place of residence		
Campus	48	39
Off campus	56	45.5
Glory land	19	15.5
Study level		
200L	27	21.9
300L	18	14.6
400AL	20	16.3
400BL	12	9.8
500L	24	19.5
600L	22	17.9
First course choice for admission		
Dentistry	94	76.6
Medicine	25	20.2
Others	4	3.2
Age(years)		
<=20	41	33.3
21-23	41	33.3
24-25	19	15.5
26-28	17	13.8
29+	5	4.1
Monthly allowance		
<=10000	28	22.8
10001-15000	27	22.0
15000-24000	21	16.8
24001-35000	21	16.8
35000+	8	6.8
Non respondent	18	14.5

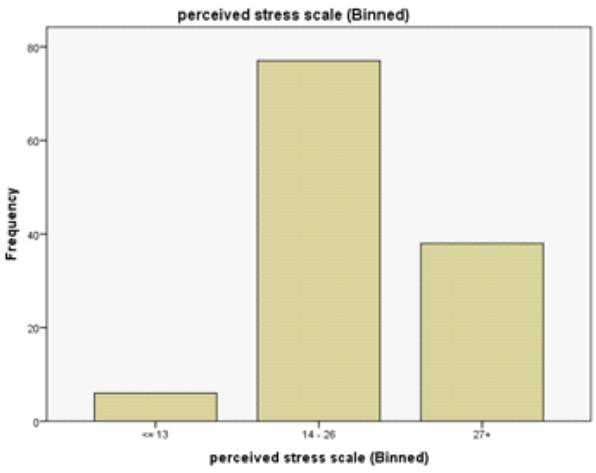
*L = LEVEL; 400AL = New part 4 students; 400BL = Old part 4 students.*The overall mean perceived stress score for the population was 23.32 ± 5.95. The median score was 23.00, with 25th, 50th, and 75th percentile cutoffs at 20.00, 23.00, and 28.00, respectively. Female students reported significantly higher stress levels than males ($P = 0.034$; Table 2).

Students residing in the Glory Land hostel demonstrated higher stress scores compared to their colleagues ($P = 0.030$; Table 2). Old part 4 students recorded the highest mean perceived stress scores among all academic levels. Additionally, students receiving a monthly allowance between ₦15,001 and ₦24,000 reported the highest stress levels (26.0 ± 7.25; Table 2).

Table 2: Perceived stress scale score across years of study and gender distribution.

Variable	N (%)	Mean(SD)	Statistics		
Overall	123(100)	23.32(±5.949)			
Sex					
Male		22.43(±5.752)	P=0.034*		*
Female		24.78(±6.037)			
Study level					
200l		23.85(±6.371)	P=0.224		
300l		22.81(±7.045)			
400al		23.50(±4.072)			
400bl		25.58(±5.017)			
500l		20.83(±4.678)			
600l		24.36(±7.254)			
Age					
<=20		24.32(±5.610)	P=0.240		
21-23		23.40(±5.781)			
24-25		23.82(±6.034)			
26-28		20.36(±7.851)			
29+		20.50(±3.317)			
Monthly allowance					
<=10000		22.15(±5.327)	P=0.139		
10001-15000		21.96(±7.783)			
15001-24000		26.00(±4.050)			
24001-3500		25.06(±5.639)			
35000+		23.88(±3.314)			
Place of residence					
Campus		21.93(±5.743)	P= 0.030*		*
Off campus		24.00(±5.723)			
Hospital Hostel		25.79(±6.294)			

400AL = New Year 4 students; 400BL = Old Year 4 students. Perceived Stress Scale categories: Low stress = 0–13, Moderate stress = 14–26, High stress = 27–40. * denotes statistical significance. Seventy-seven (77) respondents, representing the majority, reported moderate stress levels (scores of 14–26). Six respondents (6) reported low stress levels (scores ≤ 13), and thirty-eight (38) reported high stress levels (scores ≥ 27) (Figure 1).



Of the total respondents, 4.9% reported low stress levels, 62.6% were categorized as moderately stressed, and 30.9% were highly stressed, according to established Perceived Stress Scale (PSS) cutoff values (Table 3a; Figure 1).

Table 3a: Total domain scores for each domain and stressors in the dental environment and their mean scores

Domain & Items	Mean (SD)
Self-efficacy beliefs (mean: 3.28 ± 1.06)	
Fear of failing and repeating	3.76 ±1.07
Fear of being unable to catch up with workload	3.64 ±1.04
Lack of confidence to be a successful dental student	2.87 ±0.949
Insecurity concerning professional future	2.96 ±1.13
Lack of confidence in career decision	2.86 ±1.07
Expectation versus reality of dental school	3.56 (±1.08
Faculty and administration (mean: 3.28 ± 1.09)	
Inconsistency of feedback among instructors	3.27 ±1.16
Receiving criticism from supervisors	3.55 (±1.07
Availability of qualified laboratory technicians	3.23 ±1.04
Rules and regulations of the school	2.94 ±1.07
Access to study materials	3.04 ±1.01
Shortage of allocated laboratory time	3.26 ±1.02
Inadequate number of instructors	3.14 ±1.12
Availability of clinical supervisors	3.18 ±1.07
Approachability of staff	3.16 ±1.11
Attitude of faculty towards students	3.40 ±1.08
Conducive environment for study	3.66 ±1.17
Access to clinical practice materials	3.54 ±1.16
Workload (mean: 3.79 ± 1.01)	
Amount of work assigned	4.04±0.934
Difficulty of classwork	3.66 ±0.85
Late-ending classes	3.94 ±1.04
Lack of time for relaxation	3.86 ±1.05
Overloaded feeling due to huge syllabus	4.00 ±1.08
Lack of time for assigned work	3.62 ±1.06
New curriculum topics	3.38 ±1.03
Patient treatment (mean: 3.22 ± 1.00)	
Patients unavailable at scheduled times	3.18 ±1.00
Fear of dealing with patients	3.13 ±1.04
Working on patients with poor oral hygiene	3.34 ±1.10
Clinical training (mean: 3.12 ± 0.96)	
Difficulty learning precision manual skills	3.20 ±0.967
Difficulty learning clinical procedures	3.08 0.967
Responsibility for comprehensive patient care	3.04 ±0.974
Performance pressure (mean: 3.63 ± 1.00)	
Competition with classmates	3.62 ±0.938
Examinations and grades	3.63 ±1.02
Completing clinical requirements	3.60 ±1.05
Social stressors (mean: 3.07 ± 0.82)	
Lack of home atmosphere	3.45 ±1.14
Marital/relationship adjustment problems	2.71 ±0.825
Having children at home	3.18 ±1.06
Dual role of spouse/parent and student	3.19 ±1.06
Relationship with other members of the class	2.82 ±1.03

The highest source of stress originated from the workload domain (mean score 3.79 ± 1.01), followed by performance pressure (3.63 ± 1.00). In contrast, social stressors represented the least significant domain (3.07 ± 0.82). Among individual stressors, "the amount of work assigned" (4.04 ± 0.93) was the most prominent.

A one-way analysis of variance (ANOVA) revealed a statistically significant difference in perceived stress levels across student residence groups, F (2, 120) = 4.56, p= .012, η^2 = 0.07. Post-hoc Tukey HSD tests indicated that students residing in the hospital hostel (M = 25.79, SD = 6.29) reported significantly higher stress levels than those living on-campus (M = 21.93, SD = 5.74), with a mean difference of 3.86 points (p = .008, Cohen's d = 0.65). The difference between hospital hostel residents and off-campus students (M = 24.00, SD = 5.72) was not statistically significant (p = .256), nor was the difference between on-campus and off-campus residents (p = .053) (Table 3b).

Table 3b: Analysis of Variance and Post-Hoc Comparisons of Perceived Stress by Residence

Source	Sum of Squares	df	Mean Square	F	p-value	Effect Size (η^2)
Between Group	303.67	2	151.83	4.56	0.012	0.071
Within Groups (Error)	3994.33	120	33.29			
Total	4298.00	122				
Post-hoc Comparison	Mean Difference	SE	Q	p-value	95% CI	Cohen's d
Campus vs. Hospital Hostel	-3.86	0.985	3.92	0.008	(-6.56, -1.16)	-0.65
Off-campus vs. Hostel	-1.79	1.072	1.67	0.256	(-4.62, 1.04)	-0.30
Campus vs. Off-campus	-2.07	0.848	2.44	0.053	(-4.18, 0.04)	-0.36

A descriptive summary of perceived stress levels by residence is as follows:
Campus: n = 48, M = 21.93, SD = 5.74; Off-campus: n = 56, M = 24.00, SD = 5.72; Hospital Hostel: n = 19, M = 25.79, SD = 6.29. Regarding coping strategies, religious coping was the most frequently adopted approach (3.08 ± 0.810), followed by planning (2.96 ± 0.710) and active coping (2.83 ± 0.640) (Table 4).

Table 4: Coping strategies among OAU dental students

Coping Strategy	Item Examples	Mean (SD)
Religion	Finding comfort in religion or spiritual beliefs; praying or meditating	3.08 ±0.810
Planning	Coming up with a strategy; thinking hard about steps to take	2.96 ±0.710
Active coping	Concentrating efforts on solving the problem; taking action	2.83 ±0.640
Positive reframing	Trying to see the situation differently; finding something good in it	2.80 ±0.730
Instrumental support	Seeking help, advice, or guidance from others	2.62 ±0.670
Self-distraction	Turning to activities (TV, reading, shopping) to take mind off stress	2.53 ±0.61
Emotional support	Getting comfort or understanding from others	2.53 ±0.64
Self-blame	Criticizing or blaming oneself	2.53 ±0.71
Venting	Expressing or releasing negative feelings	2.63 ±0.71
Humor	Making jokes or fun about the situation	2.58 ±0.68
Denial	Refusing to believe the situation is real	2.40 ±0.66
Behavioral disengagement	Giving up attempts to cope	2.40 ±0.63
Substance use	Using alcohol or drugs to manage stress	2.78 ±0.81

DISCUSSION

Findings: Workload emerged as the dominant stressor, a pattern consistent with observations in other Nigerian dental programs.[23] The prominence of workload-related stress is unsurprising; the demanding combination of lectures, practical sessions, and clinical responsibilities is widely recognized by those within dental education. Numerous students reported feeling "overloaded," a sentiment understandable given the extensive syllabus. This trend mirrors findings from Sofola and Jeboda's[19] study in Lagos nearly two decades ago, suggesting a persistent issue within dental training. A potential shift, however, may be that contemporary students navigate even denser curricula with fewer breaks and, in some instances, diminished resources.

Performance pressure was another significant stressor. Examinations and clinical requirements carry substantial weight, particularly for students in the Old Year 4 group, for whom this period appears especially tense. This likely stems from simultaneously managing the transition into advanced clinical work and rigorous theoretical assessments, creating a sense of being evaluated on all fronts. Other studies have corroborated that frequent, high-stakes assessments can shift student motivation toward anxiety and exhaustion.[24,25] Concerns regarding self-efficacy—doubts about being "good enough" or ultimately succeeding as dentists—were also notable. This underscores that the issue extends beyond individual confidence and is often linked to structural challenges such as patient shortages, limited supervision, and unclear feedback, which Nigerian dental students have reported for years.[19,23]

Social stressors received the lowest scores, implying that students may be too preoccupied with academic survival to prioritize social concerns, or that they receive sufficient emotional support from family or religious communities to mitigate such pressures. This further emphasizes the academic environment as the primary source of strain.

Female participants reported consistently higher stress levels than males (mean = 24.78 vs. 22.43, *p* = 0.034). This finding is notable, as an earlier Lagos-based study found no gender difference in dental student stress.[19] However, more recent work among Nigerian medical and dental students aligns with our results, indicating that female students tend to report greater stress and are more likely to employ avoidant coping strategies. This may reflect broader sociocultural expectations or gender-based differences in stress perception and expression.[20,26-28]

Financial status and living conditions also appeared influential. Stress was higher among students receiving a mid-range allowance (₦15,001–₦24,000) and those residing in the hospital hostel. While previous Nigerian studies seldom explored these factors, our findings resonate with recent research linking financial strain and accommodation type to elevated stress among health profession students.[26] Financial uncertainty, combined with constrained living conditions, likely exacerbates stress. Living in the hospital hostel proved particularly taxing—potentially due to a lack of social support, inadequate study spaces, or overall inconvenience.

The analysis identified a student's place of residence as a significant factor associated with perceived stress levels. A one-way ANOVA revealed a statistically significant difference across accommodation types, with a small-to-moderate effect size ($\eta^2 = 0.07$), indicating that residence explains approximately 7% of the variance in stress scores. Post-hoc analysis showed that students in the hospital hostel reported significantly higher stress than their on-campus peers, with a clinically relevant, moderate effect size (Cohen's d = 0.65). This suggests that the hostel environment may introduce unique stressors, such as isolation from the campus community, poor study conditions, or proximity to clinical pressures.[29] Although off-campus students' stress levels fell between the two groups, differences were not statistically significant, highlighting the primary contrast between on-campus and hospital hostel residences.

An important finding was the heavy reliance on religious coping, reflecting the broader cultural context in which spiritual practices provide resilience and emotional calm.[23,30,31] This aligns with patterns observed among Nigerian medical students during the COVID-19 pandemic[28] and resonates with studies among dental students in Saudi Arabia and Pakistan.[21,31,32] Faith appears to offer both meaning and a support system during challenging periods. The use of planning and active coping—problem-focused strategies linked to better adjustment in demanding programs—is also encouraging.[7,10] Conversely, low use of denial and disengagement may reflect students' perception that they cannot afford to withdraw academically even when struggling.

Most coping strategies reported were personal (e.g., religion, planning, self-discipline) rather than institutionally facilitated, raising questions about the availability or use of formal support services such as counseling or mentorship. While other factors—such as commuting, clinical workload, and living

conditions—likely contribute to stress, their uniform impact across the student body may mask variation. Well-studied influences like academic performance, pre-existing mental health, personality traits, social support, sleep quality, and substance use were beyond this study's scope but merit future investigation.

Implications: Financial uncertainty, constrained living conditions, and female gender appear to amplify stress and should be considered in future research and policy interventions. The central role of religious coping should also be acknowledged in support strategies.

Trade-Offs (Limitations): Several limitations should be considered. The cross-sectional design precludes causal inference, offering only a snapshot of stress at one point in time. Self-reported measures are susceptible to biases, including social desirability and subjective interpretation of stress. A 14% non-response rate raises the possibility of non-response bias if those who did not participate had different stress experiences. The single-center design limits generalizability to other institutions with differing resources, curricula, and student demographics. Additionally, a 14.5% non-response on the income question may introduce bias, though the 86% overall response rate remains a strength.

Take-Home (Conclusion): Perceived stress among dental students remains relatively high, particularly among females. No clear association was found between income and stress levels. The primary stressors were workload and performance pressure. Religion, active coping, and planning were the most frequently utilized coping strategies.

Expectations for Future Research: Future studies should explore the impact of academic performance, pre-existing mental health conditions, personality traits, social support systems, sleep quality, and substance use on stress in this population.

Recommendations: We recommend that university authorities and curriculum planners re-evaluate the dental curriculum to reduce excessive workload without compromising academic standards. While maintaining secularism and inclusivity, the university should facilitate environments that support students' religious practices. Additionally, administrators should critically assess living conditions and support structures in the hospital hostel, as targeted improvements could effectively mitigate stress for this subgroup.

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