Academic-related stress and prevalence of migraine and tension-type headaches amongst undergraduates of Delta State University, Abraka, Nigeria.

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Abstract

Objective: This study aimed at determining the prevalence of migraine and tension-type headaches amongst undergraduates of Delta State University (DELSU), Abraka, Delta State, Nigeria and its relationship with academic related-stress.

Methods: A cross-sectional survey among 432 undergraduate students across the eleven Faculties of DELSU, Abraka, Nigeria, using questionnaires to determine the prevalence of migraine headache (MH) and tension-type headache (TTH). The data extrapolated were analyzed with SPSS statistical software (version 20).

Results: MH was shown to have a high prevalence (198, 45.8%) among student of DELSU. Photophobia accompanied most MH episodes more than phonophobia, nausea, vomiting. Similarly, TTH was also very prevalent 237 (54.9%) amongst students of DELSU with females being more vulnerable than male. Spearman's correlation analysis revealed that the prevalence of MH and TTH is strongly associated to student's academic-related activities.

Conclusion: Academic-related stress activities were major predisposing triggers for the prevalence of both headaches.

Keywords: Abraka, academic-related stress activities, DELSU, migraine, stress, tension-type headache,

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Stress Lié à la Scolarité et Prévalence de la Migraine et des Céphalées de Tension Parmi les Étudiants de Premier Cycle de la Delta State University, Abraka , Nigéria.

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Résumé

Objectif: Cette étude visait à déterminer la prévalence de la migraine et des céphalées de tension chez les étudiants de premier cycle de la Delta State University (DELSU), Abraka , Delta State, Nigeria et sa relation avec le stress scolaire.

Méthodes: Une enquête transversale auprès de 432 étudiants de premier cycle dans les onze facultés de DELSU, Abraka, Nigeria, à l'aide de questionnaires pour déterminer la prévalence des migraines (MH) et des céphalées de tension (TTH). Les données extrapolées ont été analysées avec le logiciel statistique SPSS (version 20)

Résultats: MH s'est avéré avoir une prévalence élevée (198, 45,8%) parmi les étudiants de DELSU. La photophobie accompagnait la plupart des épisodes de MH plus que la phonophobie, les nausées et les vomissements. De même, le TTH était également très répandu 237 (54,9%) parmi les étudiants du DELSU, les filles étant plus vulnérables que les garçons. L'analyse de corrélation de Spearman a révélé que la prévalence de MH et de TTH est fortement associée aux activités académiques des étudiants.

Conclusion: Les activités de stress liées aux études étaient des déclencheurs prédisposants majeurs à la prévalence des deux maux de tête.

Mots-clés: Abraka, activités de stress académique, DELSU, migraine, stress, céphalées de tension

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INTRODUCTION

Headache is a common debilitating chronic vascular disorder of neurologic origin characterized by painful symptomatic manifestations primarily around the head or neck axis (1,2**)**. It contributes immensely to reduced functional efficiency and work output as well as impact the overall quality of life of its sufferers, thus constituting a burden to societal economic development (3-5). Headache disorders have been ranked among the top ten global disabling diseases (5); and according to the International Classification of Headache Disorders (ICHD), it can be primary or secondary (5). Primary headaches characteristically devoid of any underlying disease condition or structural problem accounts for about 47% of all known and reported headaches globally in terms of prevalence (2,6). Most common among primary headaches are migraine headache (MH) and tension-type headache (TTH) (2,7**)**; with worldwide statistical reports on the prevalence ratio for tension-type, migraine and chronic daily headaches revealed as: 38% : 10% : 3%, respectively (2,6). Furthermore, lifetime prevalence indicate that females are more vulnerable to headache attacks (of any kind) than male with their ratio reported as 99% (TTH -88%; MH -25%) : 93% (TTH -69%; MH -8%) (2**).**

Headaches are categorically diagnosed as definitive (detail clinical examination by a headache specialist; represents the gold-standard) or probable (interviews by non-clinicians, self-reported questionnaire, or combining screening questionnaire and interview by a physician) (8). Probable headache diagnostic tools derived from the ICHD recommended criteria are especially employed in robust population-based studies though with less relative validity compared to definitive diagnosis (8-10). According to ICHD-IIIβ, migraine headache (MH) is generally typified by one-sided moderate to severe spiraling pain on the head (3,9,11). Characteristically, MH begins dully but gradually develops into more throbbing or pulsating forms and are often accompanied by nausea, vomiting, photophobia (light-sensitive) and phonophobia (sound-sensitive) (12). On the other hand, tension-type headache (TTH) also known as *stress* headache reflects mild to moderate pain characterized by sustained tight band-like (squeezing) feelings (pressure) around the head (13). Evidence in documented literature have attributed stress as the greatest potential trigger/aggravator of most primary headaches (12,14). Other lesser associated-risk factors include family-related history, BMI, smoking, sleeping problems, eating habits, menstruation (due to hormonal imbalance in women) and temperature (14-16).

Stress, although largely a defensive physiologic responsive component vital to human survival (17), is also widely thought of as a natural phenomenon occurring in abnormal situations wherein an individual lack the capable physiologic prerequisites to deal with a perceived danger or cope with a form of or set of activities (18,19). According to the American Psychiatric Association (APA), stress generally manifest as either physical (e.g. intense physical labor, over-exertion, dehydration, musculoskeletal misalignment/imbalances) or psychological (e.g. emotional -fears, resentment, bereavement; mental -information overload, pressure to excel, unrealistic deadliness) tensions (20). There are strong assertions that abnormally-sustained stress (physical or psychological) is highly common across all age groups including students and has been directly attributed as a greater predisposing factor (compared to irregular sleep, poor eating habits etc.) for chronic neurological problems including 'headache' (primary headache specifically) among tertiary university students (5,10,21,22).

Studies that include physical stressful events in the context of academic-related stress activities and its impact on primary headaches among students of tertiary institution seem to be under-reported. The expression 'academic-related stress activities' used in this study refers not only to mental tension (concentration during lectures, studying for tests and examination) but also to other physically exhaustive events (e.g. waking up early to attend lectures, long distant walks to lecture venues, long duration of over-lapping lectures [as high as 12 hours long], over-crowded lecture halls, prolonged standing positions during lectures due to inadequate sits, constantly changing lectures venues, dehydrations, noise especially from running generating sets) experienced during days of academic activities. Based on available evidence (4), the risk of developing headache among tertiary institution students may even spike in low-income and developing nations (with limited educational resources and poor infrastructure) including Nigeria as reports indicates (22,23) due to increased stressful demands. To the best our knowledge, no study has reported the prevalence of MH and TTH and the possible impact of academic-related stress among tertiary institution students in Delta State University and

surrounding Southern States in Nigeria.

This study therefore sought to investigate the prevalence of probable migraine and tension-type associated headaches amongst undergraduates of Delta State University, Abraka, Delta State, South-South Nigeria. The study also evaluated in the same population the holistic relationship between the academic-related stress activities and migraine and tension-type headaches.

MATERIALS AND METHODS

The study design was a descriptive cross-sectional survey carried out between April and June 2018 among undergraduate students of Delta State University, (DELSU) Abraka. DELSU currently has eleven faculties distributed across 3 different campuses within Delta State. The institution hosts an average of about 8,000 undergraduate students across the respective faculties per academic session. From this population size, an estimated sample size of 381 was obtained based on the Slovin's formula for sample size calculation (24**)**. Only undergraduate students of Delta State University (DELSU), Abraka, were enrolled in the study between April to June, 2018. Based on faculty stratification, random distribution of 440 questionnaires among undergraduate students of the eleven faculties (40 per faculty) of DELSU was conducted of which 432 were successfully reclaimed and data used for the study. Every faculty returned the completed questionnaires assigned to them except for Faculties of Management Sciences and Basic Medical Sciences that returned 36 and 38 respectively. Ethical approval was gotten from the "Ethics Committee" of the Faculty of Basic Medical Sciences, DELSU, Abraka, and oral informed consent was obtained from the students before data collection.

The survey instrument for data collection was a well-structured 5-part questionnaire as previously described (10) with modifications. Part one contained general information on students' demographics (sex, age, marital status, department, level and faculty of study). Part two evaluated general headaches using a dual-phase rationale screening tool; phase I included questions like experiencing and frequency of headache attack. To minimize the occurrence of overlap of other probable headaches, only students who responded positively to academic related activities proceeded to phase II screening where the severity of the headache (mild, moderate, severe, very severe), time and period of occurrence were addressed. Parts three and four evaluated generally for MH and TTH. Part three employed the ID Migraine™ (Pfizer Inc., New York, NY, USA) assessment tool (10). It comprises of a set of questions that specifically determine probable MH according to the ICHD-IIIβ criteria. Students who responded 70% and above of the desirable answers were considered sufferers of migraine. Part four utilizes the ICHD-IIIβ criteria for evaluating probable TTH (9). Students who gave the desired answer were considered to sufferers of TTH. In the final (5^{th}) part, we modified the method of Mukadder Mollaoglu's Assessment List of Trigger Factors (19,25) to determine the degree of academic-related stress activities common among the study population on the students' quality of life.

The SPSS statistical software (Version 20) and Microsoft excel package were used in analyzing data obtained herein. By way of descriptive statistics, results were presented in tables and charts wherein categorical variables were described as frequency and percentage. Also, Spearman correlation method for analyzing statistical data was used as comparative test tool for the relationship between stress and migraine or between stress and tension-type headache. The differences between groups were considered significant when P was less than 0.05 ($p<0.05$).

RESULTS

The demographic characteristics of the respondents according to age, sex and marital status revealed that majority of the students were within the age range of 21-25 years (Table1). A number of the students reported that they had experienced headache in the last 3months of which 53.7% stated that the pain from their headache was moderate, and only a few (3.2%) reported that theirs was very severe. About two-third of the respondents (63.0%) also claimed to have suffered from headache attacks during the afternoon than any other time while 46.1% reported mid-semester as their most vulnerable semester period (Table 2).

According to the study respondents, a total of 198 (45.8%) students said they experienced hemicranial headaches located on one side of the head (indicative of probable migraine) as compared to 234 (54.2%) who had generalized headaches. Gender differences showed that MH is more prevalent in female (25.7%) than in male (20.1%). Moreover, the total percentage of respondents that reported nausea, vomiting, phonophobia (sound-sensitivity) and photophobia (light-sensitivity) as

headache accompanying symptoms were 57.0%, 32.5%, 70.9% and 72.7% respectively (Table 3). The prevalence of TTH (tension-type headache) is depicted in Table 4. The mean value of respondents who suffered headaches on both sides of the head (220, 51.0%) and experience a tight band-like feeling around their heads (253, 58.6%) was 237 (54.9%) suggesting probable TTH. Females also reported a higher prevalence (32.2%) of TTH than male (22.7%). The total percentage respondents who reported stress as trigger factor of the headache (of any severity) they experienced were higher (85.3%) than those that reported sleep deprivation (68.1%), irregular meals (59.5%) and alcohol intake (26.2%). The graphical illustrations shown in Figures 1 and 2 on the prevalence of primary headache among students of the DELSU across the eleven Faculties revealed that students in the Faculties of Science, Law, Arts and Management Sciences are more predisposed to MH than the other faculties, whereas; those in Faculties of Pharmacy, Agriculture and Basic Medical Sciences suffer more from TTH.

Anxiety toward academic-related activities was employed as a tool to predict the presence of stress following systematic computation of score that evaluated academic-related activities. As shown in Table 5, 42.4% of respondents had increased anxiety during days of intense academic activities (DIAA) compared to the (13.7%) on DMAA and (7.6%) on DNAA. In total, 63.7% of claimed that they are especially anxious or stressed during days academic-related activities compared to 36.3% who claimed they never felt any anxiety (Table 5).

The results of correlated impact of academic-related stress activities on migraine or tension-type headaches among students of Delta State University is presented in Table 6. As shown by Spearman's rank correlation analysis, there was significant ($p<0.05$) relationship between academic-related stress level experienced (SLE) and migraine (headache on one side of head, OSH), as well as between academic-related SLE and tension-type headache (headache on both sides of head, BSH).

DISCUSSION

Global consensus affirms headache, which a chronic brain-originating neurovascular disorder as are current painful and debilitating condition affecting generally people of all ages indiscriminately (1,22). This consensus on headache (especially the primary forms) has been reported to be alarmingly very common among undergraduate students of tertiary institutions globally (22). A study conducted among undergraduate students of three tertiary institutions in Kwara State, in North-Central Nigeria, positively confirmed the prevalence of primary headache (mainly migraine and tension-type) as a common unpleasant condition (4). The findings from our broad-based cross-sectional study revealed the prevalence of primary headaches (MH and TTH) among undergraduate students and a significant correlation between academic-related stress activities and primary headaches.

Specifically, the study revealed that MH is prevalent amongst undergraduate students of DELSU. Of the 432 active participants, 198 (45.8%) reported to have migraine according to the ID-Migraine™ evaluation tool. The reliable validity of the ID-Migraine™ tool in diagnosing probable migraine base on the ICHD-IIIβ criteria have been previously reported with 95% CI - sensitivity / specificity (10,21). Alarmingly, this figure surpasses global statistical estimate of 11% has been reported **(2)**. Also, the prevalence of MH was found to be significantly higher in females than in males, thus supporting previous findings (2). This could be attributed partly to the frequent hormonal imbalances (e.g. higher estrogen levels) that females especially in their prime experience. Besides, the increase in number of female respondents enrolled in the study as compared to male may have also contributed to this increased prevalence in female. Most student migraineurs in this study were between the age bracket of 20-25, were singles and in either 100 Levels or their final year. This is quite noteworthy, since pressure to settle down and compete for the demands for excellence immediately after gaining admission or to satisfy the institution graduating requirements is especially very high in these two spectrums of class level of study. Moreover, most migraineurs rated their headache as moderate intensity (53.7%); only a few (3.2%) said theirs was very severe. Across the various faculties, Science and Law reported the highest prevalence. Comparative-wise using Faculty of Medical Sciences as a reference point, migraine prevalence of undergraduate medical students (16, 42.1%) reported in our study was notably higher than that reported for undergraduate medical students of University of Gonder in North-Western Ethiopia (13.1%) (5) and National Hospital, Nairobi, Kenya (33.8%) (26) in Africa as well as Soochow University (7.9%) (10) in China. Similarly, In Nigeria, our study

also carries a higher prevalence of MH compared to that reported previously in Kwara, Ilorin for three tertiary institutions, which showed a combined prevalence of 3.9% (4). According to meta-analytical investigations, the variations in these reports may in part be related to factors such as geographical diversification, population and race (**2**).

Our result further reported an alarming prevalence of probable tension-type headache (TTH) amongst the study population. According to the ICHD-IIIβ criteria for TTH (8-10), average summation (using headache on both sides of the head and tight-band feelings) indicate that 54.9% of students' respondents are sufferers of TTH with female (139; 32.2%) being more vulnerable than male (98; 22.7%). Students of the faculties of Pharmacy (27; 67.5%), Agriculture (25; 62.5%) and Basic Medical Sciences (24; 60.0%), respectively, reported the highest prevalence for TTH. Overall, our study showed that undergraduate students of DELSU are more susceptible to TTH than MH. The prevalence of TTH (54.8%) in our study bear similarity to the respective findings of (14) and (27), although higher than that reported for students of Isfahan University, Iran (44.6%) (23). Additionally, we observed in this study that stress (85.4%) was the main trigger for the prevalent episodes of TTH among student respondents followed by sleep deprivation (68.1%) irregular meal (60.6%) and alcohol, thus corroborating previous findings (5,10,21).

Based on the modified Mukadder Mollaoglu's Assessment Trigger tool (10,25), qualitative assessment of the association between academic-related stress activities and probable primary headache prevalence in the study population, revealed that majority of the students (42.4%) felt increasing and helplessly anxious (stress predictor) during days of intense academic activities (DIAA) compared to DMAA (13.7%), DNAA (7.6%) and NEVER (33.6%). Most even claim to have skipped lectures and sometimes tests due to increased anhedonia (loss of interest in food or other pleasure-seeking activities) toward their academic and social routine. In addition to mental stress, the increased anxiety found among the study population could in part be attributed to sustained physical factors like musculoskeletal strain due to prolonged sitting / standing during lectures, over-crowded/noisy (generators) lecture rooms, fatigue, dehydration, long duration of lectures etc. This agrees strongly with posits from previous studies which suggests that physical and environmental stressors along with life-style negatively impact the quality of life of university students (22,27,28).

Spearman's Rank correlation coefficient analysis showed that academic-related stress activities had significant association on the prevalence of probable migraine (MH) or tension-type headache (TTH) among DELSU undergraduate students. The tail end of the correlation coefficient in this study showed an associative significance ($p<0.016$) for MH and ($p<0.017$) for TTH, respectively, in relation to academic-related stress activities; thus, supporting findings from previous reports (29,30). Some studies have however reported negative significant correlation between academic-related stress and primary headache have been documented (22). These discrepancies on the associative correlation between academic-related stress and prevalence of primary headache (MH and TTH) among students of tertiary institutions in the present study and those of other institutions previously reported could in part be attributed to differences in study population, methodology, educational system/curriculum and technological availability as well as period of the semester in which the study was conducted.

Notwithstanding, the present study is not devoid of limitations. Amongst such are: lack of specified expert diagnosis by qualified neurologist. This likely increases the chances of wrong diagnosis of either MH or TTH within the study population. Another limitation was the narrowed primary headache variables (MH and TTH) assessed herein. Chronic headache, cluster headache and non-specific headache which are less forms of primary headaches were not evaluated alongside MH and TTH in the study population. Also, since assessment was based on self-reporting and memory retrieval of past experiences of respondents in our study, subjective reasonings may have influenced some responses leading to bias.

CONCLUSION

Probable Migraine (MH) and tension-type headache (TTH), are the two most prevalent sub-types of primary headache affecting general population including students of tertiary institutions. This study provides valuable preliminary data on the prevalence of migraine and tension-type headaches and possible association of academic-related stress as attributable factors among students of Delta State University (DELSU), Abraka, South-South Nigeria. Compared to undergraduate students of

other institutions as previous reports indicated, DELSU undergraduate students recorded higher prevalence of MH and TTH, with female being more sufferers than their male. This study has also shown for the first time that significant positive association exist between academic-related stress activities and prevalence of MH as well as TTH among DELSU undergraduate students, thus constituting potential predisposing triggers for headaches disorders. Although more confirmatory studies that include headache expert evaluation and diagnosis are needed to support the findings from the present study, better academic-friendly conditions (e.g. standard lecture/tests/examination time-table schedule, short lecture sessions, appropriate class population, well-ventilated, and noise-free classroom with sitting capacity) that encourages less stress and fatigue while improving functional efficiency and hedonic (food- or pleasure-seeking and sociability) habits are strongly recommended.

Conflicts of interest: None.

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Table 1: Demographic characteristics of respondents

Variable	Frequency (n=432)	Percentage (%)	Cumulative Percentage (%)
Age			
15-20	134	31.0	31.0
21-25	227	52.5	83.6
26-30	7	1.6	85.2
31-35	63	14.6	99.8
36-40	1	0.2	100.0
Gender			
Male	167	38.7	38.7
Female	265	61.3	100.0
Marital Status			
Single	423	97.9	97.9
Married	9	2.1	100.0

Table 2: Prevalence of headache among undergraduates of Delta State University, Abraka

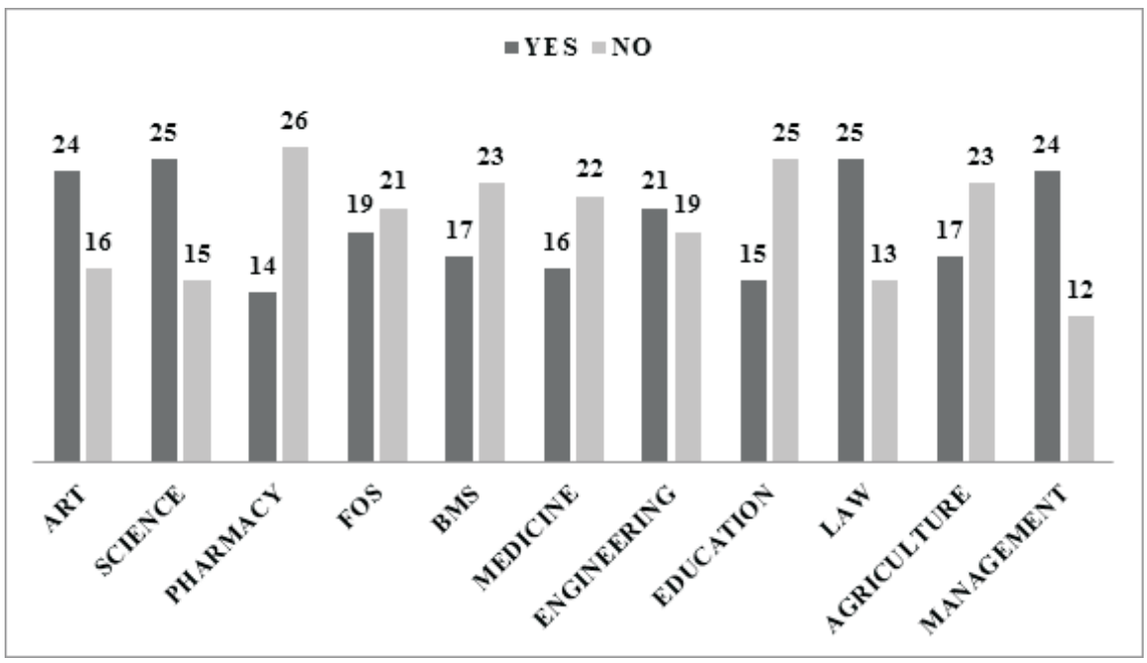
Determinants	Frequency (n=432)	Percentage (%)
Severity of headache in the last three months		
Mild	107	24.8
Moderate	232	53.7
Severe	79	18.3
Very Severe	14	3.2
Time of day headache was felt		
Morning	29	6.7
Afternoon	272	63.0
Evening	109	25.2
Night	22	5.1
Period of the semester headache was felt		
Beginning (Majorly lectures)	50	11.6
Middle (Lectures and Tests)	199	46.1
End (examination period)	183	42.4

Table 3: Determinant of migraine prevalence among undergraduates of Delta State University, Abraka using the symptomatic characteristics of migraineurs based on ID- Migraine^{TM} evaluation tool

ID-Migraine rating for symptomatic migraineurs (more than 2 occurrences within the past 3 months)	Frequency n=432	Percentage (%)
Headache felt on one side of the head		
Yes	198	45.8
No	234	54.2
Gender differences for 'YES' respondents)		
Male	87	20.1
Female	111	25.7
Accompanying symptoms:		
Severity of headache accompanied by nausea		
No headache	192	44.4
Some headache	161	37.3
Most headache	55	12.7
All headache	24	7.0
Severity of headache accompanied by vomiting		
No headache	292	67.5
Some headache	95	22.0
Most headache	36	8.4
All headache	9	2.1
Severity of headache accompanied by phonophobia	126	29.1
No headache	181	41.9
Some headache	82	19.0
Most headache	43	10.0
All headache		
Severity of headache accompanied by photophobia	118	27.3
No headache	224	51.9
Some headache	67	15.5
Most headache	23	5.3
All headache		

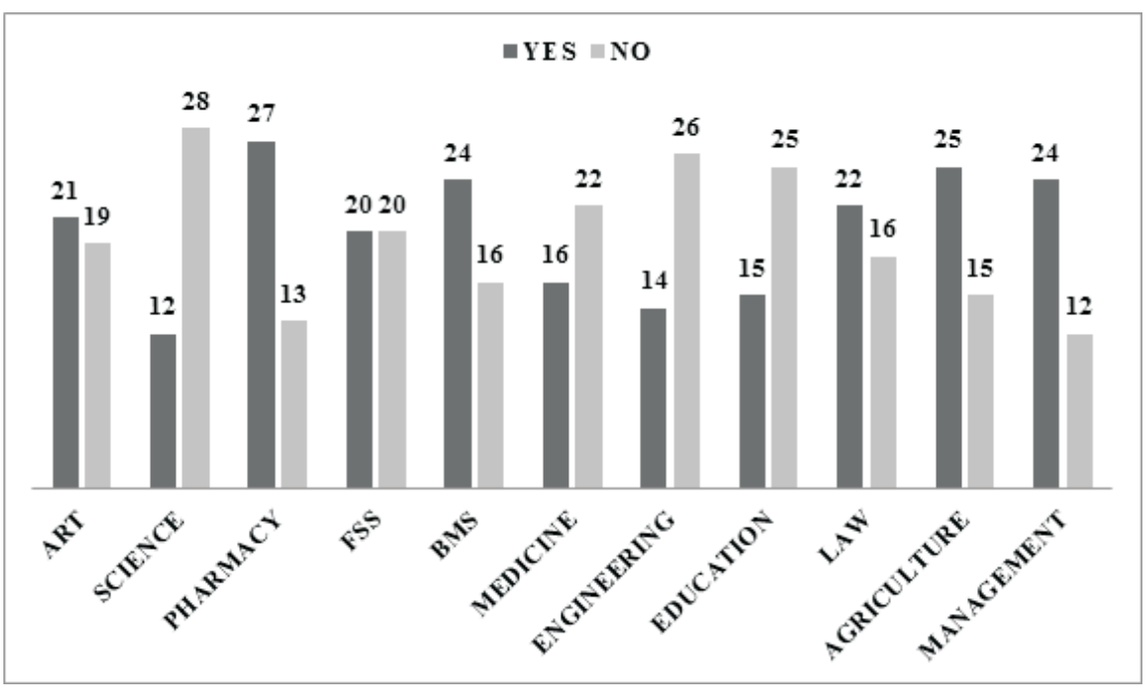
Table 4: Determinant of tension-type headache (TTH) among undergraduates of Delta State University, Abraka using the ICHD-IIIβ r**ating characteristics of episodic tension-type headache**

TTH rating by experiential characteristics (within the past three months)	Frequency (n= 432)	Percentage (%)
1. Headache felt on both sides of the head		
Yes	220	51.0
No	212	49.1
2. Headache felt as tight bands around the head		
Yes	253	58.6
No	179	41.4
Gender differences 'YES' respondents (mean of 1 &2)	98	22.7
Male	139	32.2
Female		
Trigger factors for TTH:		
Severity of headache due to stress level experienced	63	14.6
No headache	182	42.1
Some headache	138	31.9
Most headache	49	11.3
All headache		
Severity of headache due to irregular meal	175	40.5
No headache	167	38.7
Some headache	62	14.4
Most headache	28	6.4
All headache		
Severity of headache due to sleep deprivation	138	31.9
No headache	148	34.3
Some headache	114	26.4
Most headache	32	7.4
All headache		
Severity of headache due to alcohol intake	319	73.8
No headache	58	13.4
Some headache	40	9.3
Most headache	15	3.5
All headache		



FOS – Social Sciences; BMS – Basic Medical Sciences

Figure 1: Prevalence of migraine headache among undergraduates of the different Faculties of Delta State University, Abraka. (n= 40) except for Medicine (n=38); Law (n=38); Management (n=36).



FSS – Social Sciences; BMS – Basic Medical Sciences

Figure 2: Prevalence of tension-type headache among undergraduates of the different Faculties of Delta State University, Abraka. (n=40) except for Medicine (n=38); Law (n=38); Management (n=36).

Table 5: Academic-related anxiety among undergraduates of Delta State University, Abraka

Anxiety (stress) ratings	Frequency (n)	Percent (%)	Cumulative Percent (%)
NA	157	36.3	36.3
DIAA	183	42.4	78.7
DMAA	59	13.7	92.4
DNAA	33	7.6	100.0
Total	432	100.0	

NEVER: No anxiety; DIAA: Days of intense academic activity; DMAA: Days of moderate academic activity and DNAA: Days of no academic activity.

Table 6. Correlations between academic-related stress and primary headaches

Correlations of migraine headache			**OSH**	**SLE**
Spearman's rho	OSH	Correlation Coefficient	1.000	-.**119***
		Sig. (2-tailed)		**0.016**
		N	432	432
	SLE	Correlation Coefficient	-.**119***	1.000
		Sig. (2-tailed)	**0.016**	
		N	432	432
Correlations of tension-type headache			**BSH**	**SLE**
Spearman's rho	BSH	Correlation Coefficient	1.000	-.**114***
		Sig. (2-tailed)		**0.017**
		N	432	432
	SLE	Correlation Coefficient	-.**114***	1.000
		Sig. (2-tailed)	**0.017**	
		N	432	432

***Correlation is significant at P value < 0.05 level (2-tailed).*