

# Migraine: Prevalence and Associated Disability Among Nigerian Undergraduates

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**ABSTRACT: Background:** Studies on migraine in Nigeria are scanty while the disability associated with the disease has not been determined. We aimed at determining the lifetime prevalence of migraine and its associated disability among the students of a Nigerian university. **Method:** Using a multi-stage sampling method, undergraduates of Ambrose Alli University, Nigeria were screened with the International Headache Society (IHS) criteria. Those who satisfied the criteria for migraine were then assessed with the Migraine Disability Assessment questionnaire to ascertain the level of disability resulting from migraine in the three months preceding the study. Information was also obtained on the use of preventive and abortive medications. **Results:** Out of the 1513 respondents screened, 145 satisfied the IHS criteria for the diagnosis of migraine giving an overall lifetime prevalence of 9.6% (females 10.3%, males 8.9%,  $p > 0.05$ ). Migraine associated disability was little or none in 53.1% (males 55.2%, females 51.3%,  $p > 0.05$ ), mild in 10.3% (males 11.9%, females 9.0%,  $p > 0.05$ ), moderate in 20.7% (males 20.9%, females 20.5%,  $p > 0.05$ ) and severe in 15.9% (males 11.9%, females 19.2%,  $p > 0.05$ ). In spite of the fact that 53 (36.6%) of the migraineurs had moderate–severe disability, only 19/53 (35.8%) reported being on preventive treatment while none had ever used a triptan. **Conclusion:** Prevalence of migraine among our respondents falls within the range reported from similar studies among university students outside Africa. In spite of the high disability associated with the disease, use of effective preventive and abortive therapies is very poor.

**RÉSUMÉ: Prévalence de la migraine et de l'invalidité qui y est associée chez des étudiants sous-gradués au Nigeria. Contexte :** Il existe peu d'études sur la migraine au Nigeria et l'invalidité associée à cette maladie n'a pas été déterminée. Notre but était de déterminer la prévalence à vie de la migraine et l'invalidité qui y est associée chez les étudiants d'une université nigérienne. **Méthode :** Les étudiants de l'Université Ambrose Alli au Nigeria ont été dépistés par une méthode à étapes multiples au moyen des critères de la International Headache Society (IHS). Ceux qui satisfaisaient aux critères de la migraine ont ensuite été évalués au moyen du questionnaire Migraine Disability Assessment pour déterminer le niveau d'invalidité résultant de la migraine dans les trois mois précédant l'étude. Nous avons également obtenu des renseignements sur l'utilisation de médicaments destinés à prévenir ou à faire avorter les crises. **Résumé :** Parmi les 1513 répondants, 145 satisfaisaient aux critères de l'IHS pour le diagnostic de la migraine, soit une prévalence à vie de 9,6% (10,3% pour les femmes et 8,9% pour les hommes,  $p < 0,05$ ). L'invalidité associée à la migraine était peu importante ou inexistante chez 53,1% (55,2% pour les hommes et 51,3% pour les femmes,  $p < 0,05$ ), légère chez 10,3% (11,9% pour les hommes et 9,0% pour les femmes,  $p < 0,05$ ), modérée chez 20,7% (20,9% pour les hommes et 20,5% pour les femmes,  $p < 0,05$ ) et sévère chez 15,9% (11,9% pour les hommes et 19,2% pour les femmes,  $p < 0,05$ ). Malgré le fait que 53 (36,6%) des migraineux avaient une invalidité modérée ou sévère, seulement 19 sur 53 (35,8%) ont rapporté qu'ils prenaient un traitement préventif et aucun n'avait utilisé un triptan. **Conclusion :** La prévalence de la migraine chez nos répondants est dans l'écart rapporté dans des études similaires chez les étudiants universitaires ailleurs qu'en Afrique. Malgré une invalidité élevée associée à la maladie, l'utilisation de traitements préventifs et abortifs efficaces est peu répandue.

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Migraine is a chronic episodic disorder that is associated with a significant disability in the sufferers. It is rated by the World Health Organization as one of the most disabling chronic disorders, along with quadriplegia, dementia and psychosis<sup>1</sup>. A crude prevalence rate of 5.3% was reported from a community-based study by Osuntokun et al in Nigeria<sup>2</sup> in comparison to the one-year prevalence rate of 11% in the United States and Western Europe (6% in men and 15-18% in women) while a population based survey among Canadian adults showed the prevalence to be 14%<sup>3-6</sup>. The overall prevalence in university students has been found to range from as low as 2.4% in Greece<sup>7</sup>

to as high as 33% in Brazil<sup>8</sup>. The associated disability in migraine is enormous and the Migraine Disability Assessment

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(MIDAS) score is used to define the level of associated disability in the sufferers. This questionnaire makes assessment of severity of the disease easy and also assists the clinician in the choice of abortive and preventive treatments<sup>9</sup>.

Despite the progress in the acute management and prevention of migraine, the condition still remains underdiagnosed and the available therapies are underused<sup>10</sup>. This is even worse in some parts of the world where effective abortive medications like triptans are not available. For instance, in spite of the fact that one of the triptans has been tried in a group of migraineurs in Nigeria and found to be effective<sup>11</sup>, the triptans are still not readily available.

Studies on migraine among Nigerians are few and there is no information on the number of migraineurs who seek or utilize acute therapy while the disability associated with this condition has not been studied before in the country. The objectives of this study were to determine the lifetime prevalence of migraine among the students of a Nigerian university and also determine the associated disability using the MIDAS score. This will throw some light on the prevalence of this condition in Nigeria and provide a rationale for use of abortive and preventive treatments in the sufferers so as to reduce the associated disability and improve their quality of life.

#### METHOD

This was a cross-sectional study carried out at the Ambrose Alli University, Ekpoma in Southern Nigeria with a student population of 6,000 and a total of nine faculties and a college as at the time of the study (January, 2007). The university has students predominantly from the south-south, south-east and south-western regions of the country. The study proforma was approved by the research and ethics committee of Irrua Specialist Teaching Hospital which is the training hospital for the university's medical school. A training of the research assistants for the study (who were fifth year medical students) on administration of the questionnaire was conducted after which a pilot study was undertaken with 30 students. The questionnaire was modified after the pilot study and it was this modified version that was used for the actual study.

To obtain the lifetime prevalence of migraine from this student population, the sample size to be studied was estimated to be 200. This was based on a standard normal deviate of 1.96

and a degree of accuracy of 0.05 while the proportion of university students with migraine was put at 16% based on a previous study in the country<sup>12,13</sup>. However, in order to avoid the possibility of type 2 error in addressing the second objective (to determine migraine associated disability), a fairly large size of migraineurs would be needed; thus the primary sampling unit was increased to 2,000 from a sampling frame of 6,000 undergraduate students. We divided the sampling unit into ten clusters based on a total of nine faculties and a college. Each of the clusters had a total of 200 semi-structured questionnaires administered on the students using convenience sampling method based on their availability in the lecture rooms in their various departments or hostels at the time of the interview after an informed consent to participate in the study was obtained. The authors were on hand to give clarifications where necessary.

In the first phase of the study, relevant socio-demographic information was obtained while screening for migraine was done with the use of International Headache Society (IHS) criteria<sup>14</sup>. The criteria include:

- A. At least five attacks fulfilling criteria B–D
- B. Headache attacks lasting 4–72 hours (untreated or unsuccessfully treated)
- C. Headache has at least two of the following characteristics:
  1. Unilateral location
  2. Pulsating quality
  3. Moderate or severe pain intensity
  4. Aggravation by or causing avoidance of routine physical activity (e.g. walking or climbing stairs)
- D. During headache at least one of the following:
  1. Nausea and/or vomiting
  2. Photophobia and phonophobia
- E. Not attributed to another disorder

Presence of aura was not assessed. Other information obtained include precipitants of acute attack, and drugs used in prevention and treatment. Preventive drugs were taken to be those used by the respondents on a daily basis for most of the time with a view to preventing an acute attack; this could be prescribed by physicians or self-prescribed while drugs used for treatment were taken to be those used by the migraineurs to abort an acute attack.

**Table 1: Overall and sex prevalence of migraine among respondents**

Migraine	Overall, n(%) [95% CI]	Male, n(%) [95% CI]	Female, n(%) [95% CI]
Absent	1368 (90.4) [88.9-91.9]	688 (91.1) [89.0-93.2]	680 (89.7) [87.5-91.9]
Present	145 (9.6) [8.1-11.1]	67 (8.9) [6.9-10.9]	78 (10.3) [8.1-12.5]
<b>Total</b>	<b>1513 (100.0)</b>	<b>755 (100.0)</b>	<b>758 (100.0)</b>

CI=confidence interval

**Table 2: Demographic and clinical characteristics of the migraineurs**

Variable	Overall (n=145)	Male (A) (n=67)	Female (B) (n=78)	p value A vs B
Age, years	22.0 ± 3.3	22.0 ± 3.3	22.4 ± 3.3	0.47
Age at onset, years	17.3 ± 4.2	17.3 ± 4.3	17.5 ± 3.5	0.76
Duration, years	5.1 ± 3.7	5.0 ± 3.7	5.1 ± 3.7	0.87
Family history	47 (32.4)	21 (31.3)	26 (33.3)	0.80
Number of attacks in the previous 3 months	5.0 ± 7.7	5.3 ± 8.6	4.8 ± 6.9	0.70
Mean pain intensity	4.7 ± 4.1	4.2 ± 4.0	5.2 ± 4.0	0.14
Use of preventive treatment	37 (25.5)	18 (26.9)	19 (24.4)	0.73

Values are mean ± SD and frequency (percentage)

In the second phase, associated disability in the three months preceding the study was assessed in those who satisfied the IHS criteria for migraine with the aid of MIDAS questionnaire<sup>15</sup>. A score of 0-5 was graded as little or no disability (grade I), 6-10 as mild disability (grade II), 11-20 as moderate disability (grade III) while >20 was defined as severe disability (grade IV). Questions were answered on the number of days of headache in the three months before the study while intensity of headache was assessed on a scale of 0-10 in which 0 represented no pain at all and 10 represented pain as bad as it could be.

#### Statistics

Statistical analysis was done with the Statistical Package for the Social Sciences version 11.0 (SPSS Inc). Frequency tables

with appropriate 95% confidence limits for the variables of interest were generated while means and standard deviations were calculated. For comparison of the difference between categorical variables, Chi-square test was used while means were compared using analysis of variance (ANOVA). A p value <0.05 was taken as a measure of statistical significance.

#### RESULTS

##### *Characteristics of the respondents and prevalence of migraine*

Out of the 2,000 questionnaires distributed, only 1,513 were returned with complete information giving a response rate of 75.7%. There was no statistically significant gender difference in the non-responders (230 males and 257 females, p=0.12). The responders comprised of 755 males and 758 females with a mean

**Table 3: Migraine disability by gender and in relation to use of preventive treatment**

MIDAS score	Overall (n=145)	Males (A) (n=67)	Females (B) (n=78)	Use of Preventive Treatment (n=37)	p value A vs B
Grade I	77 (53.1) [44.8-61.3]	37 (55.2) [43.1-67.4]	40 (51.3) [40.0-62.6]	15 (40.5) [24.4-56.6]	0.64
Grade II	15 (10.3) [5.3-15.3]	8 (11.9) [4.0-19.8]	7 (9.0) [2.5-15.5]	3 (8.1) [-0.9-17.1]	0.56
Grade III	30 (20.7) [14.0-27.4]	14 (20.9) [11.0-30.8]	16 (20.5) [11.4-29.6]	11 (29.7) [14.7-44.7]	0.95
Grade IV	23 (15.9) [9.8-22.0]	8 (11.9) [4.0-19.8]	15 (19.2) [10.3-28.1]	8 (21.6) [8.1-35.1]	0.23

Values are frequency (percentage) [95% Confidence interval]

**Table 4: Treatment and preventive options of all migraineurs**

<i>Treatment option</i>	<i>Frequency</i>	<i>% [95% CI]</i>
<b>Preventive treatment</b>		
Paracetamol	25	67.6 [52.2-83.0]
NSAID	6	16.2 [4.1-28.3]
Unspecified	6	16.2 [4.1-28.3]
<b>Treatment of acute attack</b>		
Paracetamol	86	59.3 [57.9-60.7]
NSAID	8	5.5 [1.7-9.3]
Rest alone	9	6.2 [2.2-10.2]
Cafergot (ergotamine preparation)	4	2.8 [0.1-5.5]
Antimalarial	4	2.8 [0.1-5.5]
NSAID + sedative	2	1.4 [-0.6-3.4]
Opiate	1	0.7 [-0.7-2.1]
Triptan	0	0.0 [0.0-0.0]
Unspecified	31	21.4 [14.6-28.2]

NSAID=Non-steroidal anti-inflammatory drug, CI=confidence interval

age of  $23.3 \pm 2.5$  years; of this number, 488 (32.3%) with a mean age of  $22.3 \pm 3.2$  years had recurrent headaches. The mean age of those without recurrent headache was  $22.4 \pm 3.4$  years ( $p=0.58$ ). Out of those with recurrent headache, 145 (29.9%) satisfied the IHS criteria for the diagnosis of migraine giving an overall frequency of 145/1513 i.e. 9.6% (95% CI = 8.1%-11.1%). The overall and sex prevalence of migraine is given in Table 1 which shows that females have a higher prevalence of 10.3% (95% CI= 8.1%-12.5%) compared to 8.9% (95% CI= 6.9%-10.9%) in male respondents though this was not statistically significant ( $p=0.35$ ).

### *Characteristics of the migraineurs*

As shown in Table 2, the mean age of all migraineurs was  $22.0 \pm 3.3$  years and there was no significant gender difference in the characteristics. There was a positive family history of migraine in a first degree relation in 32.4% while the overall mean pain intensity in the three months before the study was 4.7 with females having a higher score of 5.2 compared to 4.2 in males ( $p>0.05$ ).

### *Migraine associated disability*

Table 3 shows that migraine disability was grade I (little or no disability) in 53.1% (95% CI= 44.8%-61.3%) while 15.9% (95% CI= 9.8%-22.0%) were in group IV (severe disability). In all, 36.6% (95% CI= 28.6%-44.6%) had moderate-severe disability but in spite of this, only 35.8% (95% CI= 22.6%-49.0%) of the

53 respondents with this degree of disability reported being on preventive treatments.

### *Use of preventive and abortive therapies*

In Table 4, a further analysis of the type of preventive and abortive treatments used by all migraineurs was assessed and this shows that for prevention, 67.6% of them use paracetamol while 16.2% use non-steroidal anti-inflammatory drugs (NSAIDs) and a further 16.2% did not specify the type of medications they use for prevention. In the treatment of acute attack, majority of the sufferers (64.8%) use only simple analgesics (paracetamol and NSAID), 2.8% use ergot containing preparations while none reported having ever used triptans.

### **DISCUSSION**

This cross-sectional study has shown that the lifetime prevalence of migraine among Nigerian University students is 9.6% with a slightly higher prevalence in females compared to males (10.3% vs 8.9%) though this is not statistically significant. The age at onset is in the latter second decade in both sexes while about 37% of the sufferers have moderate to severe disability on the MIDAS score.

The prevalence obtained in this study falls within the range of 2.4% to 33% that has been reported from similar studies among university students<sup>7,8</sup>. The observed sex prevalence and the confidence intervals are also similar to the sex prevalence of 7.8% and 8% reported for males and females respectively among Qatari adults in a population-based study<sup>16</sup>. While the overall prevalence is lower than the 12.2% reported by Deleu et al<sup>17</sup> in a similar descriptive epidemiological study on medical students in Oman and the 12.4% reported by Demirkirkan et al<sup>18</sup>, the male prevalence rate is the same as the 8.9% reported in the latter study. These two studies<sup>17,18</sup> also reported higher prevalence rates of 14% and 15.5% respectively in females, while a range of 15-18% has been reported in women in Western Europe and United States<sup>3-5</sup>. Similarly, the prevalence among males in this study is comparable to the 7.8% reported among Canadian males in a population-based study while the prevalence among females is about half of the 24.9% that was reported from that study<sup>19</sup>, though the overall prevalence is lower than that reported by Pryse-Phillips et al<sup>6</sup>. The observed low prevalence among our female respondents could possibly be because of poor recall of the symptoms of the disease or that those with migraine do not get admission to the university because of the disease compared to their male counterparts.

When compared to a similar cross-sectional study among university students in Nigeria more than two decades ago, the prevalence is lower as that study reported a prevalence of 16% for migraine<sup>13</sup>. That study could however have possibly over-estimated the prevalence because the Ad Hoc Committee report on headache classification published in 1964<sup>20</sup> was utilized in making an assessment of migraine after validation by a clinical diagnosis whereas the current edition of the IHS criteria was used in our study. Our prevalence is also higher than the 5.3% crude prevalence reported by Osuntokun et al<sup>2</sup> in a community-based study but this is not unexpected as migraine incidence is high in the third decade of life and the mean age of our respondents is 23.3 years. The latter study was also not strictly

based on IHS criteria but rather utilized a questionnaire validated by neurological examination and this could have possibly been more sensitive in detecting those without migraine than our own screening which was purely questionnaire-based.

Although the MIDAS questionnaire is useful in recommending treatment and preventive therapies for migraineurs<sup>9</sup> and also facilitates communication between physicians in addition to making studies comparable, we are not aware of any study that has utilized it in the evaluation of migraine in a standardized manner in Nigeria. Among our respondents, we found that the migraine associated disability was grade I in 53.1%, grade II in 10.3% and grade III in 20.7%, while 15.9% had grade IV disability. The migraineurs with moderate-severe disability in this study is low (36.6%) when compared to the range of 47% to 56% reported for those with grade III or IV disability in the international Migraine and Zolmitriptan Evaluation study<sup>21</sup> and the 77.8% reported for those with moderate-severe disability in the study of Jelinski et al in which the clinical features and pharmacologic management of migraineurs referred to headache specialists in Canada was reviewed<sup>22</sup>. However, the high disability in the latter study could have been over-represented because it is very likely that it was the patients with worse headaches that were referred to the neurologists for expert management. The degree of disability is also low when compared to the findings from a similar study in Turkey in which it is reported that 67.9% of their respondents had moderate-severe disability<sup>18</sup>. The reasons for this low disability could possibly be because the mean number of attacks per month in the latter study is five compared to a mean of five attacks in the previous three months in our study. It is also possible that our respondents were not able to recall the disturbances from all the attacks they had in the three months prior to the study or that they were still able to function in spite of the headache. If the latter situation applies, then they are likely to have under-reported the disability associated with the disease. It is also important to note that the social perception of the person with recurrent headaches could have influenced the reported disability in this study because in many cultures in Nigeria, recurrent inability to work or do household chores as a result of headaches is socially perceived as a form of malingering.

Out of the 53 (36.6%) migraineurs with disability in the moderate to severe range (grade III-IV), only 19 (35.8%) reported using preventive medications. A further analysis however showed that the preventive medications they mentioned were just simple analgesics like paracetamol and non-steroidal anti-inflammatory drugs like diclofenac and ibuprofen. None of the sufferers used any of the well-documented preventive drugs like amitriptylline. Also, none of the sufferers reported having ever used triptans and only 2.8% use oral ergot containing preparations to abort an attack. Our finding on the latter drug is in consonance with the report of Lipton and Silberstein that only 5% and 10% of migraineurs use ergot and triptans respectively to abort their attacks<sup>10</sup>. However, since triptans were not readily available and only oral ergotamine preparations are seen in most pharmacies in the country, it is probable that their poor use is as a result of unavailability rather than under-utilization. Nonetheless, we suggest that there should be more public health education on migraine and that the effective preventive and

abortive therapies should be made available so that the sufferers can access them and have improved quality of life.

The main strength of this study is the fact that in addition to determining the prevalence of migraine among university students in Nigeria, it has also studied the associated disability in the sufferers. To the best of our knowledge, this is the first time the MIDAS questionnaire was used in the systematic evaluation of disability among migraineurs in Nigeria although we appreciate that the study was limited by a number of factors. Firstly, since a great majority of students in Nigerian universities are from average income homes, the observed prevalence in them might not be a true reflection of the situation in the country because of association of migraine with low socioeconomic status<sup>3</sup>. In addition, the study could have been influenced by recall bias because it is possible that some of the students did not readily recall if they had any of the symptoms screened for while some of them might not know the actual names of the drugs they use either for prevention or treatment of acute attacks. We however believe that the objectives were largely achieved, though a community-based study will be needed to validate our findings.

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