

# Primary headache characters and coping strategies among medical students of Umm Al-Qura University in the Western Region of Saudi Arabia

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## ABSTRACT

**الأهداف:** استقصاء خصائص الصداع الأولي بين الطلبة في كلية الطب بجامعة أم القرى، مكة المكرمة.

**الطريقة:** أُجري البحث في شكل دراسة مسحية، حيث تم جمع البيانات عن طريق الاستبيانات الإلكترونية. تم استخدام الدليل التشخيصي (ICHD-3) لتصنيف الصداع إلى 10 أنواع.

**النتائج:** تم جمع 623 (82.2%) من أصل 758 استبيان تم إرساله. بلغ عدد الطلبة الذين تعرضوا لنوبات الصداع خلال السنة السابقة 558 (89.6%) طالبًا وطالبة. أكثر أنواع الصداع التي تم تشخيصها: الصداع التوترى المتكرر (n=173, 31.0%)، الصداع المحتمل التوترى غير المتكرر (n=114, 20.4%)، الصداع المحتمل التوترى المتكرر (n=63, 11.3%). أكثر فئمة من الطلبة أفصحت عن تأثر مستواها الدراسي بسبب الصداع هي مجموعة الطلبة المشخصين بالصداع التوترى المزمن (n=2, 40.0%). وُجد أن صداع الشقيقة بدون الإرهاس متفشيًا بين الطالبات (n=29, 10.5%) أكثر من الطلاب (n=10, 3.5%). قام أغلب الطلبة بعلاج الصداع بأنفسهم ومن دون الحصول على استشارة طبية (62.5%-100.0%). أكثر الوسائل التي تم استعمالها للسيطرة على نوبات الصداع هي المسكنات (67.4%-80.0%)، الخلود إلى النوم (54.3%-80.0%)، تعاطي الكافيين (28.3%-60.0%).

**الخلاصة:** تشير النتائج إلى إصابة طلبة الطب بالصداع أكثر من غيرهم. قد يؤثر الصداع سلبيًا على الإنتاجية، وهذا بدوره يقتضي التركيز على هذه المشكلة ومعالجتها. توصي الورقة البحثية بعمل الدراسات على التدخلات التي من شأنها تقليل وتخفيف نوبات الصداع، والحد من الآثار السلبية له على هذه الفئة من المجتمع.

**Objectives:** To assess the headache patterns among medical students of Umm Al-Qura College of Medicine, Makkah, Kingdom of Saudi Arabia. Medical students represent a vulnerable group for primary headache disorders, as they are exposed to various physical and psychological stressors.

**Methods:** We carried an observational, cross-sectional study, and collected data during

February, 2017 using electronic questionnaires. The international classification of headache disorders, third edition (ICHD-3) beta edition was used to classify headache into 10 types.

**Results:** A total of 623 responses (82.2%) were received out of 758 participants. The one-year headache prevalence was 558 (89.6%). The most common diagnosis among both genders was frequent tension-type headache (TTH) (n=173, 31.0%), followed by probable infrequent TTH (n=114, 20.4%) and probable frequent TTH (n=63, 11.3%). The greatest proportions of students who reported an impact of their academic level were found among the chronic TTH, migraine without and with aura (n=2, 40.0%; n=14, 34.4%; n=11, 33.3%). Migraine without aura was more prevalent among females (n=29, 10.5%) than males (n=10, 3.5%). Self-medication was common (62.5%-100.0%). Simple analgesics (67.4%-80.0%), sleeping (54.3%-80.0%) and caffeine intake (28.3%-60.0%) were the top 3 therapies that were practiced.

**Conclusion:** The prevalence of headache among Umm Al-Qura university (UQU), Makkah, Kingdom of Saudi Arabia's medical students appears higher than the prevalence among the general population. This may have a significant impact on academic performance and necessitates special attention. We recommend further studies on interventions to reduce the prevalence and impact of this prevalent problem.

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Headache disorders are among the most frequent complaints in neurology clinics.<sup>1-3</sup> They constitute 13% of total neurology outpatient complaints and represent 1/1000 of hospital consultations according to a Saudi study.<sup>4</sup> Headache disorders are underestimated, under-recognized and under-treated, and represent the third highest leading cause of disability worldwide.<sup>3,5</sup> Headache disorders constitute a major socioeconomic burden on both the individual and society.<sup>3</sup> In a population study of 2,421 people in the Kingdom of Saudi Arabia, 4% of all working days are lost due to absenteeism from headache disorders.<sup>6</sup> Moreover, psychiatric morbidities were significantly higher among migraineurs than in healthy population, which reflects a more inferior quality of life in this population.<sup>7</sup>

Headache disorders are classified according to their cause into primary headache disorders, which are not related to an underlying disease, and secondary headache disorders, wherein existent morbidity is a culprit (namely, head trauma and meningitis).<sup>8</sup> Primary headache disorders, by far, are the most common type of headache disorders worldwide. In Kingdom of Saudi Arabia, a country-wide cross-sectional survey in one-year duration revealed a high prevalence of migraine (32%), followed by tension-type headache (27%), and medication overuse headache (2.7%).<sup>6</sup>

Medical students represent a vulnerable group for primary headache disorders, as they are exposed to various physical and psychological stressors. Previous studies on primary headache disorders among medical students suggest an association with low academic performance, which calls for action.<sup>9</sup> This study aims to determine the prevalence of primary headache disorders among medical students of Umm Al-Qura College of Medicine, Makkah, Kingdom of Saudi Arabia and the coping strategies they use to mitigate the effects of headaches on their academic performance.

**Methods.** The study target population was the fourth, fifth and sixth-year medical students affiliated with UQU, College of Medicine, Makkah, Kingdom of Saudi Arabia. Junior students were not included as many of them are not aware of some medical terminology which were used in the instrumental tool. It was an observational, cross-sectional study using electronic questionnaires. All students of the study were invited to participate.

We contacted and invited the students individually by text messages. In the invitation messages, we

encouraged the students to participate, and we provided a summary of the study aims. We also sent reminder messages 2 weeks after the invitation messages to remind those who did not yet complete the survey. Online forms were used to collect the data from participants. We started the data collection in February 2017. For each academic-year students, we picked an exam-free time to gather the data. The data collection process was completed in the same semester we commenced pooling it.

The instrument tool was an online uploaded Google form that has 2 parts (**Supplement 1**). The first part was concerned with demographics. The second part is comprised of 23 questions related to the characters of a primary headache and the strategies used to cope with it. The diagnosing questions were formulated according to the ICHD-3 beta, issued by the Headache classification committee of the international headache society (HIS).<sup>10</sup> The instrument tool classifies headaches into 10 primary types collectively: infrequent TTH, frequent TTH, chronic TTH, migraine with and without aura, as well as the probable diagnoses of each of the previous 5 types. Students who did not meet any of the criteria were considered unclassified. Students who did not complete the questionnaire were excluded, so were those who mentioned a secondary cause of their headache. To ensure the reliability of the instrument tool, we pretested it on 30 students from our population before launching the study. We verified the diagnoses in these 30 students with a face to face interview. This pretesting yielded a 100% sensitivity and specificity. The subjects in the pretest group had all the diagnoses we sought for in the study, except the chronic TTH, probable chronic TTH and probable migraine with aura.

The questionnaire form did not include any identifying information that could disclose the identity of the participating students. The students were informed that their participation is part of a study and that it is voluntary. Ethical approval was obtained from the faculty of Medicine, UQU, Makkah, Kingdom of Saudi Arabia.

Nominal data was described through frequency tables. Parametric data was expressed in means and standard deviations, while non-parametric data was expressed as medians and interquartile ranges. Bivariate analysis using Chi-square was carried out to compare and define possible relationships among types of headache, and to compare the prevalence of different diagnoses between males and females. A  $p$ -value < 0.05 was considered significant.

**Results.** Among the 758 students (376 females; 382 males) who were invited to the survey, 623 responses (82.2%) were valid for analysis after the

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exclusion of incomplete forms. Table 1 demonstrates the demographics of the sample. There were more male responses (n=327, 52.3%) than females' (n=297, 47.7%). The mean age of all participating students was 22.9±1.1 years old. The prevalence of headache episodes during the year preceding the study was 558 out of 623 (89.6%). The median number of days during which students suffered a headache was 15 (IQR=23). The median duration of each headache episode was 2.5 hours (IQR=3.1). Frontal and temporal sites of a headache were the most common (45% and 36%).

Table 2 shows types of aura among migraineurs with aura. Moreover, headache classification among both genders is summarized in Table 3.

Overall there was a notable impact on the academic level of students diagnosed with headache. The highest proportions of students who reported an impact of their academic level were found among the chronic TTH,

migraine without and with aura (n=2, 40.0%; n=14, 34.4%; n=11, 33.3%). Table 4 details the proportions for each diagnosis.

Most students were self-medicating (Table 5). Among the therapies used to mitigate a headache, simple analgesics (67.4%-80.0%), sleeping (54.3%-80.0%) and caffeine intake (28.3%-60.0%) were the top 3 therapies practiced in all definitive types of headache. Headache episodes tended to stop after using the reported therapies in all types of headache (78.3%-100.0%). Table 5 delineates how the students were coping with headache.

**Discussion.** This study described the headache characterization among medical students of the Kingdom of Saudi Arabia. It shows a one-year headache prevalence among medical students in almost 90% of participants. The variability in prevalence rates from different studies in the literature can be attributed to the strictness to the classification model adopted. In our study, we used the latest criteria provided by the HIS (ICHD-3 beta) at the time we started the data collection.

The one-year prevalence of headache in our study exceeds the global prevalence of 46.0%.<sup>11</sup> Previously, there were some studies which investigated headache prevalence in Saudi Arabia. The prevalences in these studies were: 12.1%, 63.0%, 59.8%, 84.1%, 8.0%, 8.0%.<sup>2,12-17</sup> In one study, the last one-year Saudi prevalence of primary headache disorders among the Saudi community adults described a national crude prevalence of 63%.<sup>13</sup> Aside from medical students, there was one study which was conducted on medical and paramedical health workers in hospitals of Taif city.<sup>18</sup> The overall prevalence of headache among the study participants in a 3-months duration was 88.3%. Other international studies of headache prevalence among medical students varied (58.7%, 88.3%, 46.0%, 90.0%, 96.8%, 33.0%).<sup>19-24</sup>

The high prevalence of headache among medical students and health care workers can be attributed to many associated factors. The psychosocial factors on medical students are major culprits.<sup>25</sup> Furthermore, the required physical efforts that are exerted play a

**Table 1** - Demographics and primary headache characters among UQU medical students.

Category	n (%)
Age Mean±SD	22.9±1.1 years
<b>Gender</b>	
Male	327 (52.3)
Female	297 (47.7)
Last year prevalence of headache (out of 623)	558 (89.6)
Days had headache in last year, median (IQR)	15±23 days
Episodes in the last year, median (IQR)	18±33 episodes
Duration of each episode, median (IQR)	2.5±3.1 hours
<b>Site of headache*</b>	
Frontal	251 (45)
Occipital	84 (15.1)
Vertical	60 (10.8)
Temporal	201 (36)
Generalized**	144 (25.8)
Orbital	154 (27.6)
<b>Bilateral or unilateral*</b>	
Bilateral	424 (76)
Unilateral	134 (24)
<b>Character of headache*</b>	
Pressing/tightening	393 (70.4)
Throbbing/pulsating	258 (46.2)
Stabbing	48 (8.6)
<b>Associated symptoms*</b>	
Vomiting	10 (1.8)
Nausea	84 (15.1)
Photophobia	178 (31.9)
Phonophobia	146 (26.2)
Average intensity (out of 10) Mean±SD	5.1±1.7
Family history of headache	250 (44.8)

\*Students could select more than one option, \*\*Encompasses frontal, occipital, vertical and temporal sites concurrently, UQU - Umm Al-Qura University, SD - standard deviation, IQR - interquartile range

**Table 2** - Types of aura among migraineurs with aura N=32\*.

Type of aura	n (%)
Motor	2 (6.3)
Sensory	11 (34.4)
Speech	2 (6.3)
Visual	25 (78.1)

\*Students could select more than one type of aura.

**Table 3** - Headache classifications among male and female students.

Diagnosis	Male n=327	Female n=297	Both genders N=558 n (%)	P-value
Chronic TTH	1 (0.4)	4 (1.4)	5 (0.9)	0.17
Frequent TTH	98 (34.8)	75 (27.2)	173 (31.0)	0.05
Infrequent TTH	27 (9.6)	19 (6.9)	46 (8.2)	0.25
Migraine with aura	17 (6.0)	15 (5.4)	32 (5.7)	0.76
Migraine without aura	10 (3.5)	29 (10.5)	40 (7.5)	<0.01
Probable chronic TTH	0 (0.0)	1 (0.4)	1 (0.2)	0.29
Probable frequent TTH	35 (12.4)	28 (10.1)	63 (11.3)	0.59
Probable infrequent TTH	59 (20.9)	55 (19.9)	114 (20.4)	0.89
Probable migraine with aura	1 (0.4)	2 (0.70)	3 (0.5)	0.51
Probable migraine without aura	11 (3.9)	32 (11.6)	40 (7.2)	<0.01
Unclassified*	23 (8.2)	16 (5.8)	39 (7.0)	0.48

TTH - Tension-type headache, \*Responses which did not fit into any of the diagnoses.

**Table 4** - Academic level impaction for each headache diagnosis.

Headache diagnosis	Students reported academic level impaction n (%)
Chronic TTH	2 (40)
Frequent TTH	27 (15.56)
Infrequent TTH	1 (2.2)
Migraine with aura	11 (33.3)
Migraine without aura	14 (34.4)
Probable chronic TTH	0 (0.0)
Probable frequent TTH	8 (12.7)
Probable infrequent TTH	6 (5.3)
Probable migraine with aura	1 (33.3)
Probable migraine without aura	10 (25.0)

TTH - Tension-type headache

major role, as physical activities are known triggers for headache episodes.<sup>26</sup> An additional factor that is present in specific geographic areas, including Kingdom of Saudi Arabia, is the high ambient temperature.<sup>27</sup>

Our results show that only a minority of our students sought medical attention in all types of headache (0.0%-28.1%). Notably, no one among those with chronic TTH sought medical attention. The higher rates of academic level impaction in some types of headache in our study (chronic TTH and migraine) necessitates the care for such students so that they can maintain their productivity. A Saudi study on migraineurs from medical students and interns in King Abdulaziz University, Jeddah, Kingdom of Saudi Arabia, revealed a high rate of negative impact on educational performance (83.9%) and the ability to attend educational classes (78.2%).<sup>28</sup>

**Limitations.** To exclude secondary causes of headache, a complete history, physical examination, and appropriate

investigations are needed in some cases, none of which was carried out in this study. The negative academic impaction was self-reported, which might not be optimal for the reliability of such information. The study did not seek the triggers of headache among the students.

In conclusion, the prevalence of headache among UQU medical students, Makkah, Kingdom of Saudi Arabia, appears higher than the prevalence among the general population. Headache episodes tended to negatively impact the academic level, especially in chronic TTH and migraine. The high prevalence and reported academic level impact necessitates the care towards the medical students. Detailed studies on other medical fields staff are needed.

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**Table 5** - Coping of the students with headache.

Category*	Chronic TTH n=5	Frequent TTH n=173	Infrequent TTH n=46	Migraine with aura n=32	Migraine without aura n=40
	n (%)				
Sought medical attention (e.g., visited a physician)	0 (0.0)	18 (10.4)	3 (6.5)	9 (28.1)	10 (23.8)
Self-medicate	5 (100.0)	135 (78.0)	38 (82.6)	20 (62.5)	32 (76.2)
Simple analgesics as paracetamol	4 (80.0)	128 (74.0)	31 (67.4)	26 (81.2)	30 (71.4)
aspirin	0 (0.0)	4 (2.3)	2 (4.3)	1 (3.1)	3 (7.1)
Triptan (e.g., sumatriptan)	1 (20.0)	0 (0.0)	0 (0.0)	1 (3.1)	0 (0.0)
Ergot medication	0 (0.0)	0 (0.0)	0 (0.0)	1 (3.1)	1 (2.4)
Herbs and alternative & traditional medicine	0 (0.0)	6 (3.5)	1 (2.2)	1 (3.1)	2 (4.8)
Caffeine	3 (60.0)	53 (30.6)	13 (28.3)	12 (37.5)	19 (45.2)
Sleeping	4 (80.0)	111 (64.2)	25 (54.3)	23 (71.9)	35 (83.3)
Does headache stop with the selected therapies?	5 (100.0)	145 (83.8)	36 (78.3)	27 (84.4)	36 (85.7)
No therapy	0 (0.0)	22 (12.7)	6 (13.0)	3 (9.4)	0 (0.0)

TTH - Tension type headache, \*Students could select more than one therapy.

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**Supplement 1 - Questionnaire questions.**

1-Age (in years): Write a number: -----

2-Gender: -Male -Female

3-Have you ever had at least one episode of headache during the last 365 days (last one year)? -Yes -No

4-Approximately, how many DAYS have you had headache during the past year? Write an approximate number (e.g., 21 days). Write a number: -----

5-In relation to the previous question, how many EPISODES per day do you have headache? Write a number: -----

6-Each episode of your headache lasts in average for how much? (Answer must be expressed in minutes, hours, or days). (e.g., 12 hours) Write a number: -----

7-The usual site of your headache is at: (Look at the picture if you did not understand the choices, you can select more than one answer)

-1. Frontal -2. Occipital -3. Vertical -4. Temporal

-Generalized (involves all the previous locations of the head) -Orbital (at the orbit of the eye, not shown in the picture)



8-Your headache is usually: -Bilateral -Unilateral

9-Your headache quality is usually (you can choose more than one feature):  
-Sharp/Stabbing -Pressing/Tightening -Throbbing/Pulsating

10-Does your headache aggravate with routine physical activities (e.g., walking or climbing stairs)? -Yes -No

11-Does your headache cause you to avoid routine physical activities (e.g., walking or climbing stairs)? -Yes -No

12-What is the average intensity of your headache? (0 denotes no pain at all, 10 denotes the worst pain ever) -Select a number from 0 (no pain at all) to 10 (worst possible pain)

13-Is your headache usually accompanied or preceded by vomiting? -Yes -No

14-If you answered yes to the previous question, describe the intensity of your vomiting (select 0 if you answered no vomiting). -Select a number from 0 (no vomiting) to 10 (very severe vomiting)

15-Is your headache usually accompanied or preceded by nausea? -Yes -No

16-If you answered yes to the previous question, describe the intensity of your nausea (select 0 if you answered no nausea). -Select a number from 0 (no nausea) to 10 (very severe nausea)

17-Is your headache usually associated with photophobia (sensitivity from light)? -Yes -No

18-Is your headache usually associated with phonophobia (a fear from loud sounds)? -Yes -No

19-Do you have a family history of headache? -Yes -No

20-Do you have any of these fully reversible aura symptoms that is accompanied or followed by your headache episodes? (you can check more than one if applicable).

-Visual aura (wavy lines or blind spots, etc) -Sensation disturbances (pins, needles, numbness) -Speech disturbances (e.g., aphasia)

-Motor weakness -I have none of the above aura symptoms

21-Which of these is usually consistent with your aura symptoms? (you can check more than one if applicable).

-My aura symptoms comes and spreads gradually over 5 minutes or more -My aura symptoms lasts 5-60 minutes

-On of my aura symptoms is unilateral -I have no aura symptoms

22-Have you ever sought medical attention for your headache? (e.g., you have visited a physician). -Yes -No

23-which medications/therapies do you use for your headache? (you can select more than one medication)

-Simple analgesics as Paracetamol (e.g., Panadol) -Aspirin -Triptan (e.g., Sumatriptan) -Sedatives -Ergot medications -Herbs and alternative and traditional medications

-Caffeine -Physical therapy -Sleeping -I take no medications for my headache

24-Does your headache stop with what you selected in the previous question? -Yes -No -I take no medications for my headache

25-Did your headache impact your academic level? -Yes -No