


# Migraine and tension-type headache among undergraduate medical, dental and pharmaceutical students of University of Aleppo: a cross-sectional study

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## ABSTRACT

**Introduction** Headache disorders are among the most common 10 causes of disability worldwide according to the global burden of disease survey 2010. Headache is also wildly common among universities students when compared with other populations. The purpose of this study is to assess headache prevalence among Aleppo University medical, dental and pharmaceutical undergraduate students.

**Methods** A questionnaire-based cross-sectional study was conducted among medical, dental and pharmaceutical students at Aleppo University, Syria. We determined the type of headache according to the International Classification of Headache Disorder-III. The total number of participants was 2068. A  $\chi^2$  test was used to evaluate the association between the categorical outcomes.  $P < 0.05$  was considered significant.

**Results** Out of 2068 participants, 1604 (77.6%) were medical students, 205 (9.9%) were dental students and 259 (12.5%) were pharmaceutical students. The effect on daily activities was higher in chronic tension headache (96.7%) and migraine without aura (94.6%) than migraine with aura (91.3) and episodic tension headache (85.1%). Out of 1191 who had a headache, only 188 (15.9%) had a medical consultation.

**Conclusions** There was no a statistically significant difference in prevalence of tension headache and migraine according to faculties. There was a statistically significant difference in patients with migraine according to academic year, living with family and smoking. The effect on daily activities was higher in chronic tension-type headache and migraine without aura. There is a significant lack of medical consultation among students and most of them took over the counter analgesics depending on personal choice.

## INTRODUCTION

Headache is one of the most frequent complaints in neurology outpatient clinics. Primary headache disorders including

migraine and tension-type headache (TTH) are considered important global health problems due to their high prevalence.<sup>1</sup> Headache disorders are among the most common 10 causes of disability worldwide according to the global burden of disease survey 2010.<sup>2,3</sup> Migraine is the seventh highest negative impact disorder in society.<sup>4</sup> Worldwide, the prevalence of headache disorders is 46% for headache generally, 42% for TTH, 11% for migraine and 3% for chronic daily headache.<sup>5</sup> Headache is also a significant common problem among universities students when compared with other populations.<sup>6</sup> 88.2% of students stated that they took over the counter medicine in most countries.<sup>7</sup> A study in Oman on medical students found that migraine and TTH prevalence was 12.2% with a difference between males and females. Only 23.3% of participants had a medical consultation.<sup>8</sup> On the other hand, the prevalence of migraine in Egyptian medical students was 17.9% and 35.4% of the students sought medical assistance.<sup>9</sup> A systematic review study on university students reported that migraine prevalence was 16.1%. 11.3% of the participants were males and 21.7% were females with statistical significance. The African, European students had the lowest migraine prevalence, respectively. Otherwise, Asian and American students had the highest migraine prevalence (21%) and (16%), respectively. In medical students, the prevalence of migraine was 15.7%. Conversely, the prevalence of migraine was 17.4% in non-medical students.<sup>10</sup> Economic, familial, social and even educational problems are associated with headache disorders in children and adolescent.<sup>11</sup> The accurate

pathophysiology for TTH remains uncertain. It has been proposed that muscular origin is the underlying cause for the TTH.<sup>12</sup> It is strongly suggested that psychological factors (personality type) have an important role in the headache by acting as provoking agents.<sup>13</sup> This study is the first in Syria that determine the prevalence of headache among health-field faculties students, and shows whether there is a difference between these faculties. We will also evaluate the impact of several variables that are not mentioned in medical literature on headaches (such as academic degree, countryside vs city, living with family, psychological factors and marital status). We studied these variables because they were affected by the war, bad economic situation and displacement during the crisis in Syria.

## METHODS

### Study design, setting and data collection

A questionnaire-based cross-sectional study was conducted in the period from November to December 2020. The purpose of the study is to determine the prevalence of migraine and TTH among medical, dental and pharmaceutical undergraduate students at Aleppo University, Syria. Inclusion criteria include: (1) students from the second to the final years; (2) students who complete the question 'Did you have a headache two or more times in the last three months?'. Exclusion criteria include: (1) history of head or neck trauma; (2) history of neurological disorders (history of stroke or transient ischemic attack, intracranial haemorrhage, intracranial aneurysm, brain tumour, any cranial operation, multiple sclerosis, epilepsy, encephalitis, meningitis and dementia); (3) having an allergic rhinitis and sinusitis; (4) presence of acute systemic disease; (5) pregnant students. The students were approached after class lectures and clinical rotations. The team explained the goals of the study and the participation process was voluntary and anonymous. The verbal consent was obtained after applying the exclusion criteria and students were handed a paper copy of the questionnaire for completion. The total number of the students in each faculty was as the following: Faculty of Medicine (4505), Faculty of Dentistry (1240), Faculty of Pharmacy (754). The power analysis was done by Epi Info program (a combined sample size of 363 students was sufficient with 95% CI). The total number of participants was 2129 and we excluded 61 questionnaires due to uncompleted data, so the final number of participants became 2068.

### The survey

The questionnaire was based on the reviewing of pertinent literature<sup>14–16</sup> and our feedback. The pilot study was performed on 50 students and no subsequent changes were made. The students in the pilot study were included in data analysis. The questionnaire included five sections. The first section collected demographic and general information including age, gender, department,

academic year, academic degree, marital status, employment status, residence, smoking and alcohol consumption. At the end of this section, the headache was assessed by the question 'Did you have a headache two or more times in the last three months?' which is a closed yes or no question. Students who answered yes were assumed to suffer from headache by further questions and students who answered no did not complete the questionnaire. The second section including questions to determine the type of headache according to the International Classification of Headache Disorder-III (ICHD-III).<sup>17</sup> All students with headache that did not match migraine and TTH criteria were considered to have unclassified headache. The third section assessed the characteristics of headache (type of pain, site of headache, duration of headache, age at which the headache began, family history, pain in the neck, the effect of headache on daily activities and trigger factors). The fourth section assesses experience of the student with the management of headache (requesting medical consultation, taking analgesics and using preventive medications). The last part was about psychological factors associated with headache. First, the questionnaire was written in English; then, we translated it into Arabic because Arabic is the local language and medical education language's in Syria. We reported the English version of the questionnaire in online supplemental additional file 1.

### Statistical analysis

Descriptive statistics were performed to calculate the number of participants and per cent. A  $\chi^2$  test was used to evaluate the association between the categorical outcomes.  $P < 0.05$  was considered statistically significant. Statistical analysis was done using SPSS V.26.

## RESULTS

### Demographic characteristics of the participants

Out of 2068 participants, 1604 (77.6%) were medical students, 205 (9.9%) were dental students and 259 (12.5%) were pharmaceutical students. 997 (47.2%) and 1091 (52.2%) of the participants were males and females, respectively. Most of the participants (50.8%) had an academic degree between 80 and 90. 12.4% and 16.1% of the participants smoked cigarettes and smoked hookah, respectively. [Table 1](#) demonstrates student's demographics.

### Prevalence and distribution of tension headache and migraine

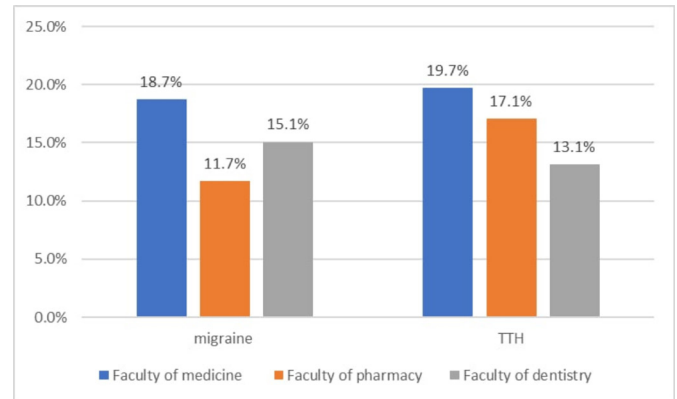
Medical students have high prevalence of TTH (19.7%) and migraine (18.7%) compared with dental and pharmaceutical students but the difference is not statistically significant ([figure 1](#)). Among patients with migraine, there was a statistically significant difference according to academic year, living with family and smoking ( $p < 0.05$ ) ([table 2](#)). On the other hand, patients with TTH have not a significant difference for any subgroups ([table 3](#)).

**Table 1** Demographic characteristics of the participants

	n	n/N %
<b>Total</b>	<b>2068</b>	<b>100</b>
<b>Sex</b>		
Male	977	47.2
Female	1091	52.8
<b>Faculty</b>		
Medicine	1604	77.6
Dentistry	205	9.9
Pharmacy	259	12.5
<b>Academic year</b>		
Second	407	19.7
Third	484	23.4
Fourth	398	19.2
Fifth	444	21.5
Sixth	335	16.2
<b>Academic degree</b>		
60–69	114	5.5
70–79	719	34.8
80–89	1050	50.8
90–100	185	8.9
<b>Marital Status</b>		
Single	1921	92.9
Engaged	91	4.4
Married	55	2.7
Widow	1	0.0
<b>Job</b>		
No	1750	84.6
Yes	318	15.4
<b>Residence</b>		
Countryside	212	10.3
City	1856	89.7
<b>Living with family</b>		
No	451	21.8
Yes	1617	78.2
<b>Smoking</b>		
No	1812	87.6
Yes	256	12.4
<b>Hookah</b>		
No	1736	83.9
Yes	332	16.1
<b>Alcohol</b>		
No	1988	96.1
Yes	80	3.9

### Characteristics of headache

The mean age when the headache began is 16.9y±2.9 and 17.2y±2.7 for patients with migraine and TTH, respectively. The effect on daily activities was higher in chronic TTH (96.7%) and migraine without aura (94.6%) than



**Figure 1** Prevalence of headache in the three colleges. TTH, tension-type headache.

migraine with aura (91.3%) and episodic tension headache (85.1%). Headache lasted less than 4 hours in 69% of participants and less than 8 hours on 91% of them. 48.2% of patients with migraine had family history in comparison with 33% for patients with TTH (table 4).

### Trigger factors of headache

As it is mentioned in table 5, lack of sleep (70%), exam time (67%), stress (61%), noise (60%) and fasting (57%) are considered the most common potential trigger factors for headache in our study.

### Psychological factors associated with headache

Most of the students who had a headache have associated psychological factors (94.6%). The most common factors include: depressed mood (60.5%), anxiety (57.9%), dissatisfaction with educational performance (52.7%) and stress (49.5%) (table 5).

### Medical care and use of analgesic drugs

Out of 1191 students who had a headache, only 188 (15.9%) had a medical consultation. On the other hand, most of the students (66.4%) took over the counter analgesics. Personal choice was the main reason to take over the counter analgesics (58.3%). 81.6% of the students take analgesics between 1 and 7 days every month. Paracetamol was the most common medication (91.1%) followed by ibuprofen (22.7%) (table 6).

### DISCUSSION

The prevalence of migraine in our study was 17.6% (12.5% with aura and 5% without aura), in comparison with the prevalence of migraine worldwide which was 10%.<sup>5</sup> We found that migraine prevalence among medical students was high. Several studies from Ethiopia,<sup>14</sup> Saudi Arabia,<sup>16</sup> Kuwait<sup>18</sup> and Russia<sup>15</sup> support our conclusion, but the difference in prevalence among the studies is due to the difference in the methodology, because we used a self-reported questioner and we did not confirm the diagnosis by clinical examination. Moreover, we did not include all types of headache. Sampling criteria and the diagnostic parameters should be considered.<sup>19</sup> Emotional

**Table 2** Prevalence and distribution of migraine

	Without aura		With aura		Total		P value
	n	n/N %	n	n/N %	n	n/N %	
Total	259	12.5	104	5.0	363	17.6	
Sex							0.066
Male	89	9.1	40	4.1	129	13.2	
Female	170	15.6	64	5.9	234	21.4	
Faculty							0.547
Medicine	220	13.7	80	5.0	300	18.7	
Dentistry	14	6.8	10	4.9	24	11.7	
Pharmacy	25	9.7	14	5.4	39	15.1	
Academic year							0.001
Second	42	10.3	21	5.2	63	15.5	
Third	71	14.7	41	8.5	112	23.1	
Fourth	54	13.6	21	5.3	75	18.8	
Fifth	57	12.8	15	3.4	72	16.2	
Sixth	35	10.4	6	1.8	41	12.2	
Academic degree							0.754
60–69	7	6.1	3	2.6	10	8.8	
70–79	84	11.7	45	6.3	129	17.9	
80–89	140	13.3	47	4.5	187	17.8	
90–100	28	15.1	9	4.9	37	20.0	
Marital status							0.622
Single	241	12.5	100	5.2	341	17.8	
Engaged	10	11.0	2	2.2	12	13.2	
Married	8	14.5	2	3.6	10	18.2	
Widow	0	0.0	0	0.0	–	0.0	
Job							0.795
No	227	13.0	92	5.3	319	18.2	
Yes	32	10.1	12	3.8	44	13.8	
Residence							0.136
Countryside	28	13.2	12	5.7	40	18.9	
City	231	12.4	92	5.0	323	17.4	
Living with family							0.010
No	71	15.7	33	7.3	104	23.1	
Yes	188	11.6	71	4.4	259	16.0	
Smoking							0.022
No	230	12.7	91	5.0	321	17.7	
Yes	29	11.3	31	12.1	60	23.4	
Hookah							0.357
No	211	12.2	84	4.8	295	17.0	
Yes	48	14.5	20	6.0	68	20.5	
Alcohol							0.218
No	248	12.5	99	5.0	347	17.5	
Yes	11	13.8	5	6.3	16	20.0	

**Table 3** Prevalence and distribution of tension-type headache

	Episodic		Chronic		Total		P value
	n	n/N %	n	n/N %	n	n/N %	
Total	355	17.2	30	1.5	385	18.6	
Sex							0.075
Male	153	15.7	13	1.3	166	17.0	
Female	202	18.5	17	1.6	219	20.1	
Faculty							0.355
Medicine	291	18.1	25	1.6	316	19.7	
Dentistry	33	16.1	2	1.0	35	17.1	
Pharmacy	31	12.0	3	1.2	34	13.1	
Academic year							0.092
Second	52	12.8	4	1.0	56	13.8	
Third	106	21.9	9	1.9	115	23.8	
Fourth	69	17.3	8	2.0	77	19.3	
Fifth	71	16.0	5	1.1	76	17.1	
Sixth	57	17.0	4	1.2	61	18.2	
Academic degree							0.951
60–69	10	8.8	0	0.0	10	8.8	
70–79	131	18.2	10	1.4	141	19.6	
80–89	178	17.0	18	1.7	196	18.7	
90–100	36	19.5	2	1.1	38	20.5	
Marital status							0.492
Single	334	17.4	29	1.5	363	18.9	
Engaged	14	15.4	1	1.1	15	16.5	
Married	6	10.9	0	0.0	6	10.9	
Widow	0	0.0	0	0.0	-	0.0	
Job							0.737
No	313	17.9	25	1.4	338	19.3	
Yes	42	13.2	5	1.6	47	14.8	
Residence							0.487
Countryside	27	12.7	2	0.9	29	13.7	
City	327	17.6	28	1.5	355	19.1	
Living with family							0.580
No	83	18.4	5	1.1	88	19.5	
Yes	272	16.8	25	1.5	297	18.4	
Smoking							0.146
No	332	18.3	26	1.4	358	19.8	
Yes	23	9.0	4	1.6	27	10.5	
Hookah							0.387
No	298	17.2	26	1.5	324	18.7	
Yes	57	17.2	4	1.2	61	18.4	
Alcohol							0.763
No	342	17.2	29	1.5	371	18.7	
Yes	13	16.3	1	1.3	14	17.5	

**Table 4** Characteristics of headache

	Migraine			TTH			Total n (%)
	Without aura n (%)	With aura n (%)	Total n (%)	Episodic n (%)	Chronic n (%)	Total n (%)	
Total	259 (100)	104 (100)	363 (100)	355 (100)	30 (100)	385 (100)	1191 (100)
The effect on daily activities							
No	14 (5.4)	9 (8.7)	23 (6.3)	53 (14.9)	1 (3.3)	54 (14.0)	172 (14.4)
Yes	245 (94.6)	95 (91.3)	340 (93.7)	302 (85.1)	29 (96.7)	331 (86.0)	1019 (85.6)
Family history of headache							
No	128 (49.4)	60 (57.7)	188 (51.8)	235 (66.2)	23 (76.7)	258 (67.0)	715 (60.0)
Yes	131 (50.6)	44 (42.3)	175 (48.2)	120 (33.8)	7 (23.3)	127 (33.0)	476 (40.0)
Onset age (mean±SD)							
	16.9±2.9	16.7±2.9	16.9±2.9	17.2±2.7	16.8±2.4	17.2±2.7	17.2±2.8
Pain type							
Throbbing	169 (65.3)	65 (62.5)	234 (64.5)	101 (28.5)	7 (23.3)	108 (28.1)	512 (43.0)
Tightening	46 (17.8)	16 (15.4)	62 (17.1)	144 (40.6)	12 (40.0)	156 (40.5)	343 (28.8)
Sharp	7 (2.7)	3 (2.9)	10 (2.8)	8 (2.3)	1 (3.3)	9 (2.3)	30 (2.5)
Heaviness feeling	37 (14.3)	20 (19.2)	57 (15.7)	102 (28.7)	10 (33.3)	112 (29.1)	306 (25.7)
Pain site							
Generalised	60 (23.2)	21 (20.2)	81 (22.3)	129 (36.3)	13 (43.3)	142 (36.9)	391 (32.8)
Vertex	43 (16.6)	21 (20.2)	64 (17.6)	65 (18.3)	5 (16.7)	70 (18.2)	227 (19.1)
Unilateral	51 (19.7)	20 (19.2)	71 (19.6)	17 (4.8)	3 (10.0)	20 (5.2)	114 (9.6)
Temporal	66 (25.5)	27 (26.0)	93 (25.6)	80 (22.5)	3 (10.0)	83 (21.6)	265 (22.3)
Occipital	20 (7.7)	7 (6.7)	27 (7.4)	36 (10.1)	3 (10.0)	39 (10.1)	93 (7.8)
Others	19 (7.3)	8 (7.7)	27 (7.4)	28 (7.9)	3 (10.0)	31 (8.1)	101 (8.5)
Pain duration							
Less than 4 hours	127 (49.0)	58 (55.8)	185 (51.0)	252 (71.0)	16 (53.3)	268 (69.6)	827 (69.4)
4–8 hours	95 (36.7)	25 (24.0)	120 (33.1)	81 (22.8)	9 (30.3)	90 (23.4)	260 (21.8)
9–24 hours	27 (10.4)	13 (12.5)	40 (11.0)	12 (3.4)	0 (0.0)	12 (3.1)	66 (5.5)
More than 24 hours	10 (3.9)	8 (7.7)	18 (5.0)	10 (2.8)	5 (16.7)	15 (3.9)	38 (3.2)
Neck pain							
No	174 (67.2)	66 (63.5)	240 (66.1)	262 (73.8)	23 (76.7)	285 (74.0)	861 (72.3)
Yes	85 (32.8)	38 (36.5)	123 (33.9)	93 (26.2)	7 (23.3)	100 (26.0)	330 (27.7)
Triggering factors							
No	31 (12.0)	8 (7.7)	39 (10.7)	72 (20.3)	7 (23.3)	79 (20.5)	205 (17.2)
Yes	228 (88.0)	96 (92.3)	324 (89.3)	283 (79.7)	23 (76.7)	306 (79.5)	986 (82.8)

TTH, tension-type headache.

stress, poor sleeping and eating habits are all influencing medical students more than other people.<sup>18</sup> Females have higher rate for migraine prevalence (21.4%) in comparison with males (13.2%), which is similar to the worldwide migraine prevalence and female medical students' prevalence.<sup>5 16</sup> TTH prevalence was 18.6% (17.2% episodic TTH and 1.5% chronic TTH), which is lower than TTH prevalence worldwide 38%<sup>15</sup>; we suspect that methodological differences could explain the difference result. Our results are close to the results of a Turkish study 20.35% (18.84% episodic TTH and 1.88% chronic

TTH)<sup>20</sup>; probably because of geographical and cultural similarities between Turkey and Syria. Moreover, the methodology in the Turkish study was similar to our study.

Medical students have higher rate of headache 61% in comparison with pharmaceutical students 45.4% and dental students 46.3%; this could be due to stressful life of medical students and lack of free time. The medical system in Syria sorts students into clinical specialties according to their desires (based on their academic grades). Because of this system, there is high competition among students to get seats in clinical specialties, which

**Table 5** Triggering factors and psychological factors associated with headache

	Migraine (n=324)		TTH (n=306)		Total (n=986)	
	n	n/N %	n	n/N %	n	n/N %
<b>Triggering factors</b>						
Lack of sleep	232	71.60	210	68.60	692	70
Exam	223	68.80	210	68.60	657	67
Stress	215	66.40	185	60.50	605	61
Noise	237	73.10	139	45.40	587	60
Fasting	202	62.30	168	54.90	558	57
Mobile use	166	51.20	143	46.70	472	48
Expose to the sun	187	57.70	129	42.20	458	46
Sleeping too much	96	29.60	86	28.10	282	29
Deprivation from coffee drinking	104	32.10	88	28.80	286	29
Emotional distress	103	31.80	86	28.10	275	28
Menstruation	86	26.50	61	19.90	214	22
Weather changes	91	28.10	48	15.70	195	20
Using the computer	60	18.50	55	18.00	177	18
Reading	49	15.10	49	16.00	164	17
Watching TV	56	17.30	39	12.70	144	15
Strong odours	71	21.90	26	8.50	134	14
Smoking	33	10.20	27	8.80	88	9
Bath	16	4.90	11	3.60	40	4
Eat a specific meal	17	5.20	6	2.00	26	3
<b>Psychological factors</b>						
Absent	17	4.7	19	4.9	64	5.4
Present	346	95.3	366	95.1	1127	94.6
Depressed mood	232	63.90	243	63.10	721	60.50
Anxiety	231	63.60	216	56.10	690	57.90
Dissatisfaction with educational performance	207	57.00	206	53.50	628	52.70
Stress	191	52.60	199	51.70	590	49.50
Insomnia	158	43.50	146	37.90	456	38.30
Overwork	115	31.70	117	30.40	357	30.00
Dissatisfaction with personal achievement	112	30.90	91	23.60	299	25.10
Tendency towards conflicts	94	25.90	87	22.60	273	22.90
Dissatisfaction with life	93	25.60	85	22.10	261	21.90
Poor financial condition	55	15.20	58	15.10	177	14.90
Irritability	52	14.30	38	9.90	133	11.20
Not to be married	29	8.00	25	6.50	80	6.70

make medical students in a permanent stress situation to study more and get higher marks. This competition does not exist in the faculties of pharmacy and dentistry.

The prevalence of headache according to students' academic year is not compatible with the results of other studies<sup>16 18</sup>; this result is may be due to the differences among educational systems at other universities.

Employed students have lower rate of headache 44% in comparison with unemployed students 60.1%. This may be due to difficult economic situation in Syria. Employed

students have better financial state and the poor economic state increase both migraine and TTH.<sup>15</sup>

Rural areas were associated with a lower prevalence of TTH (13.7%) in comparison with urban areas (19.1%), which reflects the effect of stressful life in the cities.

Smoker students are less likely to have TTH (10.5%) in comparison with non-smoker students (19.8%); smokers assume that smoking relieves stress.<sup>21</sup>

In migraine, 48.2% of the participants report a family history of headache and 33% of participants with

**Table 6** Using analgesics and medical consultation

	Migraine (n=363)		TTH (=385)		Total (n=1191)	
	n	n/N %	n	n/N %	n	n/N %
Medical consultation						
No	275	75.8	332	86.2	998	84.1
Yes	87	24.0	53	13.8	188	15.9
Using analgesics						
No	84	23.1	146	37.9	399	33.6
Yes	279	76.9	239	62.1	789	66.4
Who advise you to take analgesics?						
Physician	74	20.4	27	11.3	136	17.3
Pharmacist	23	6.3	16	6.7	56	7.1
Your family	46	12.7	32	13.4	117	14.9
Personal choice	127	35.0	160	67.2	458	58.3
Other	9	2.5	3	1.3	19	2.4
Analgesics frequency						
1–7 days	211	76.7	195	84.8	626	81.6
8–14 days	37	13.5	22	9.6	76	9.9
15–28 days	19	6.9	10	4.3	52	6.8
Daily	8	2.9	3	1.3	13	1.7
Did you have to increase the dose?						
No	174	62.4	187	78.2	578	73.3
Yes	105	37.6	52	21.8	211	26.7
What is the analgesic which you used?						
Paracetamol	247	88.5	224	93.7	719	91.1
Ibuprofen	71	25.4	43	18.0	179	22.7
Aspirin	12	4.3	5	2.1	20	2.5
Codeine	23	8.2	13	5.4	46	5.8
Diclofenac	24	8.6	17	7.1	57	7.2
Triptans	7	2.5	–	0.0	11	1.4
Others	19	6.8	4	1.7	30	3.8
Do you use preventive medicine?						
No	262	93.9	237	99.2	764	96.8
Yes	17	6.1	2	0.8	25	3.2
Preventive medicine						
Beta blockers	7	41.2	–	0.0	9	36.0
Calcium blockers	–	0.0	–	0.0	1	4.0
Antidepressants	5	29.4	–	0.0	7	28.0
Others	6	35.3	2	100.0	10	40.0

TTH have a family history. Several studies have close results.<sup>8 14 16 20</sup>

93.7% and 86% of participants with migraine and TTH, respectively, report that headache interfered with their daily life activities. In a Saudi study, migraine affected on 85.1% of the participants, but TTH affected only 4.5% of participants.<sup>16</sup> However, a Turkish study revealed that TTH affected on the educational performance of 12.4% of participants.<sup>20</sup>

89.3% of participants with migraine report about trigger factors and 79.5% of participants with TTH report about them. The most common trigger factors for migraine were noise, lack of sleep and exams. While for TTH: stress, lack of sleep and exams were the most common triggers. Stress, lack of sleep and emotional upset were the most common triggers in other studies.<sup>14 16 18 21</sup> However, exams period often associates with stress. In general, lack of sleep, which associated with long time studying, and



exams were the most common trigger factors for headache; these two factors are more common in medical students.

94.6% of the participants have accompanying psychological symptoms. The main psychological symptoms associated with both migraine and TTH are: depressed mood, anxiety, dissatisfaction with educational performance and stress. Kurt elucidates the relationship between headache and depression.<sup>21</sup>

15.9% of the participants seek for medical consultation (24% of participants with migraine and 13.8% of participants with TTH). We found a similarly low rate of medical consultations in other studies: 3.1% in Pakistan<sup>22</sup> (11.9% in patients with migraine and 12.4% in patients with TTH) in Saudi Arabia<sup>16</sup> and 23.3% in Oman<sup>8</sup>; therefore, a large number of students are unaware of their condition. This result may be due to the students' confidence in their medical information, which prompted them to try treat themselves without seeking medical consultation, in addition to easy access to over-the-counter medicines.

66.4% of the participants took over the counter analgesics for their headache, personal choice was the main reason (58.3%) to take them. Only 19.3% of participants took a medication after they seek for physician's advice. About 80.3%, 47.6% and 41% of participants took a medication for the headache in Oman,<sup>8</sup> Turkey<sup>20</sup> and Pakistan,<sup>22</sup> respectively. Anyway, more studies should be conducted to confirm the success of the treatment. Financial state might be the reason for avoiding medical consultation due to the high poverty rate because of crisis in Syria. Also, the health system in Syria has been affected by crisis which makes it difficult to access medical services.

81.6% of participants took the analgesic less than 7 days a month and only 26.7% of the participants raised the dose to control the headache which explains the low rate of medical consultations. Desouky *et al* found that the frequency of using analgesics was less than daily to weekly in 93.8% of patients with migraine compared with 38.9% in patients with TTH.<sup>16</sup>

Paracetamol was the most used analgesic (91.1%); other studies found similar result.<sup>14 16 18</sup> A very low number of participants (3.2%) use a preventive medication. This was due to low rate of medical consultations. Most of our results are not statically significant, but that might be due to the difference in participants numbers in the three faculties.

### Limitations and strengths

We relied on diagnostic criteria of ICHD-III to ensure the diagnosis of all patients with headache in the most optimal way. Furthermore, our study is considered the first Syrian study assessed headache among medical, dental and pharmaceutical undergraduate students. On the other hand, using self-reported questionnaire may lead to recall bias. We recommend to perform more longitudinal studies because our study is a cross sectional which means that there is no cause–effect relation among variables. Also, we depended on participants' self-reports

to determine psychological disorders such as: depression and anxiety without using strict criteria. There was no clinical examination to confirm the diagnosis of the headache. Another limitation was the heterogeneity of the participants among faculties, where the number of students was the largest in faculty of medicine, so we recommend to perform more studies with higher number of students from the other faculties.

### CONCLUSIONS

There was no a statistically significant difference in prevalence of tension headache and migraine according to faculties. There is a statistically significant difference in patients with migraine according to academic year, living with family and smoking. The effect on daily activities was higher in chronic TTH and migraine without aura. Lack of sleep, exam time, stress, noise and fasting are considered the most common potential trigger factors. There is a significant lack of medical consultation among students and most of them took over the counter analgesics depending on personal choice. The most common psychological factors associated with headache include: depressed mood, anxiety, dissatisfaction with educational performance and stress.

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## REFERENCES

- 1 Vos T, Barber RM, Bell B, *et al*. Global, regional, and national incidence, prevalence, and years lived with disability for 301 acute and chronic diseases and injuries in 188 countries, 1990–2013: a systematic analysis for the global burden of disease study 2013. *The Lancet* 2015;386:743–800.
- 2 Vos T, Flaxman AD, Naghavi M, *et al*. Years lived with disability (YLDs) for 1160 sequelae of 289 diseases and injuries 1990–2010: a systematic analysis for the global burden of disease study 2010. *The Lancet* 2012;380:2163–96.
- 3 Steiner TJ, Birbeck GL, Jensen RH, *et al*. Headache disorders are third cause of disability worldwide. *J Headache Pain* 2015;16:58.
- 4 Murray CJL, Vos T, Lozano R, *et al*. Disability-adjusted life years (DALYs) for 291 diseases and injuries in 21 regions, 1990–2010: a systematic analysis for the global burden of disease study 2010. *The Lancet* 2012;380:2197–223.
- 5 Stovner L, Hagen K, Jensen R, *et al*. The global burden of headache: a documentation of headache prevalence and disability worldwide. *Cephalalgia* 2007;27:193–210.
- 6 Falavigna A, Teles AR, Velho MC, *et al*. Prevalence and impact of headache in undergraduate students in southern Brazil. *Arq Neuropsiquiatr* 2010;68:873–7.
- 7 Akyol A, Kiylioglu N, Aydin I, *et al*. Epidemiology and clinical characteristics of migraine among school children in the menderes region. *Cephalalgia* 2007;27:781–7.
- 8 Deleu D, Khan MA, Humaidan H, *et al*. Prevalence and clinical characteristics of headache in medical students in Oman. *Headache* 2001;41:798–804.
- 9 Oraby MI, Soliman RH, Mahmoud MA, *et al*. Migraine prevalence, clinical characteristics, and health care-seeking practice in a sample of medical students in Egypt. *Egypt J Neurol Psychiatr Neurosurg* 2021;57:1–9.
- 10 Wang X, Zhou HB, Sun JM, *et al*. The prevalence of migraine in university students: a systematic review and meta-analysis. *Eur J Neurol* 2016;23:464–75.
- 11 Nandha R, Chhabra M. Prevalence and clinical characteristics of headache in dental students of a tertiary care teaching dental hospital in northern India. *Int J Basic Clin Pharmacol* 2013;2:51–5.
- 12 Walling AD. Tension-type headache a challenge for family physicians. *Am Fam Physician* 2002;66:728.
- 13 Passchier J, Andrasik F. *Migraine: psychological factors. The headaches*. New York: Raven, 1993: 233–40.
- 14 Birru EM, Abay Z, Abdelwuhab M, *et al*. Management of headache and associated factors among undergraduate medicine and health science students of University of Gondar, North West Ethiopia. *J Headache Pain* 2016;17:1–9.
- 15 Lebedeva ER, Kobzeva NR, Gilev DV, *et al*. Psychosocial factors associated with migraine and tension-type headache in medical students. *Cephalalgia* 2017;37:1264–71.
- 16 Desouky DE, Zaid HA, Taha AA. Migraine, tension-type headache, and depression among Saudi female students in Taif university. *J Egypt Public Health Assoc* 2019;94:1–9.
- 17 Ettlinda, Headache Classification Committee of the International Headache Society (IHS). The international classification of headache disorders, 3rd edition (beta version). *Cephalalgia* 2013;33:629–808.
- 18 Al-Hashel JY, Ahmed SF, Alroughani R, *et al*. Migraine among medical students in Kuwait university. *J Headache Pain* 2014;15:1–6.
- 19 Steiner TJ, Stovner LJ, Al Jumah M. Improving quality in population surveys of headache prevalence, burden and cost: key methodological considerations. *J Headache Pain* 2013;14:1–10.
- 20 Kaynak Key FN, Donmez S, Tuzun U. Epidemiological and clinical characteristics with psychosocial aspects of tension-type headache in Turkish college students. *Cephalalgia* 2004;24:669–74.
- 21 Kurt S, Kaplan Y. Epidemiological and clinical characteristics of headache in university students. *Clin Neurol Neurosurg* 2008;110:46–50.
- 22 Noor T, Sajjad A, Asma A. Frequency, character and predisposing factor of headache among students of medical college of Karachi. *J Pak Med Assoc* 2016;66:159–64.