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Research Article

Prevalence Of Headache Among Medical Student.

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Abstract

Background: Headache is one of the most common complaints during the medical curriculum and occurs due to numerous psychological and physical stressors, which are more prevalent among medical students than in the general population. This study aimed to evaluate the frequency, characteristics, and types of headaches, as well as their precipitating and associated variables among medical students.

Aim: Headache is among the commonest complaints in medical students it could be due to many physical or psychological stressors The aim of this study is to assess the prevalence of headache among male and female medical students

Methods: This cross-sectional study was conducted at Al-Ameed University Faculty of Medicine and Kerbala University Faculty of Medicine from October 2023 to February 2025. First- to sixth-year medical students who had experienced some form of headache in their lifetime and had headache attacks during the past 6 months were included. All participants completed a structured checklist covering demographic data, associated factors, and headache characteristics. Medical stages were classified into three groups: Group 1 (first and second years), Group 2 (third and fourth years), and Group 3 (fifth and sixth years) to assess significant differences in headache characteristics among them.

Results: A total of 624 students from two medical colleges in Kerbala province, Iraq, were included: 298 males (47.8%) and 326 females (52.2%). Overall, 47.5% of students reported headaches starting after an accident, illness, or infection, suggesting potential external triggers (26% males, 39.5% females). The majority of headaches were subacute (44.2%), lasting 4–8 weeks, while 42.6% were acute (<4 weeks). Chronic headaches (>3 months) were less common (13.2%). The most common precipitating factor was stress and anxiety (55.9%), followed by fatigue (55.1%) and loud noises (47.4%). No significant relationship was found between headache and foods or medications. Headache was most frequently described as tightness (49%) or throbbing (30.9%). Notably, neuroimaging was performed in 37.1% of patients without clear indications. Several headache characteristics were significantly associated with all stages of study, while others were significantly associated with gender.

Conclusion: Headache is very common among medical students, with a prevalence exceeding 50%. Most headaches fall into the subacute category and do not require neuroimaging or extensive investigations. The most striking findings were stress, anxiety, and fatigue as precipitating factors. Furthermore, certain headache characteristics are significantly associated with the level of stress across all study stages. Females were more susceptible to headache, with significant associations between many headache characteristics and gender across different stages of study. We recommend providing mentor educators for all students and establishing a center to address mental, social, and medical issues for all students in medical colleges, given the high burden of stress and long study hours that accompany this burden.

Keywords: Headache, stress, anxiety, medical students, prevalence.

INTRODUCTION

Headache is a subjective sensation of pain or discomfort of the head or face, often triggered by stress, dehydration, sleep deprivation, or underlying medical conditions [1]. Headache disorders are among the most prevalent neurological conditions; 50% of adults experience at least one headache per year, with higher occurrence in women [1]. Primary headaches (migraine, tension-type headache, cluster headache) account for nearly 98% of cases, while secondary headaches may indicate serious pathology [1]. The International Classification of Headache Disorders, 3rd edition (ICHD-3) provides standardized diagnostic criteria [2]. Key red flags for secondary headache are summarized by the mnemonic SNOOPP (Systemic symptoms, Neurologic deficits, Sudden onset, older age, Progressive course, Positional change/

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Precipitators/Papilledema) [3–5]. Management includes trigger avoidance, acute analgesia (paracetamol, NSAIDs), and prophylaxis for frequent attacks (≥2/month) with beta-blockers, amitriptyline, or topiramate [1].

Headache is a common complaint among medical students due to physical and psychological stressors [6]. This study aims to assess the prevalence of headache among male and female medical students.

Aim of the study

Headache is among the commonest complaints in medical students it could be due to many physical or psychological stressors The aim of this study is to assess the prevalence of headache among male and female medical students.

METHODOLOGY

Study design and setting

A cross-sectional study was conducted from October 2023 to February 2025 among undergraduate medical students at two colleges in Kerbala province, Iraq: University of Al-Ameed Faculty of Medicine (minimum 50 students per stage, years 2–6) and University of Kerbala Faculty of Medicine (minimum 20 students per stage, years 1–6), representing diverse socioeconomic backgrounds. The cross-sectional design is appropriate for assessing the prevalence of conditions such as headache in a defined population at a single time point [7,8].

Sampling

A stratified random sampling technique was employed using academic year as the stratum. Stratified random sampling ensures representation from each subgroup (academic year) and improves the precision of prevalence estimates compared to simple random sampling [9,10]. The total sample size was proportionally allocated to each year (first to sixth), followed by simple random sampling using random number generator software. The response rate was 100%.

Stress classification

Medical stages were categorized by stress level: mild (years 1–2), moderate (years 3–4), and severe (years 5–6). Previous studies have demonstrated that psychological stress levels vary significantly across different phases of medical education, with earlier and later years often showing higher distress [11, 12].

Statistical analysis

Data were entered into a spreadsheet and analyzed using SPSS version 28.0 (IBM, Chicago, Illinois, USA) [13,14] and Real Statistics Resource Pack for Excel 2016. Descriptive statistics were presented as n (%) for categorical variables and mean ± standard deviation (SD) for continuous variables [15]. Normality was assessed using the Shapiro-Wilk test [16]. Homogeneity of variances was assessed by Levene's test ($p < 0.05$). Fisher's LSD method was used for confidence intervals. A p-value < 0.05 (two-sided) was considered statistically significant.

RESULTS

Demographic and clinical characteristics

This study investigated the characteristics of headaches among medical students. Nearly half (47.5%) of students reported headaches starting after a participating factor (smoking, sleeping prevention, fatigue). Most headaches were described as episodic (72.6%) rather than constant (27.4%). Weekly headaches were the most frequent (45.0%), followed by monthly (31.8%) and daily (23.1%). And the rest of result shown in the table below. The perveance of headache is (53%)

Table 1. Characteristic of headache among medical students(N=624).

Variable	G	Frequency	Percentage
Did the headaches start after participating factors (smoking, sleeping prevention, fatigue)	Yes	296	47.5
	No	328	52.6
The headaches	Are constant	171	27.4
	Come and go	453	72.6
How often do the headaches occur?	Daily	144	23.1
	Weekly	281	45.0
	Monthly	199	31.8
How many hours do the headaches last?	1-6	373	59.8
	6-12	170	27.2
	12-24	65	10.4
	12-48	11	1.8
	48-72	3	.5
	More than 72	2	.3

Do the headaches occur at a certain time of day?	Morning	155	24.8
	Afternoon	294	47.1
	Night	175	28.1
Are the headaches becoming:	Stronger	156	25.0
	Lasting longer	151	24.2
	Occurring more frequently	140	22.4
	None	177	28.4
Do the headaches ever wake the patient up when they are asleep?	Yes	189	30.3
	No	435	69.8
Does rest or sleep relieve the headache?	Yes	397	63.6
	No	227	36.4
Do the headaches stop the patient from doing regular daily activities?	Yes	299	47.9
	No	325	52.1
Has the patient ever missed work/school because of a headache?	Yes	247	39.6
	No	377	60.4

Table (2) demonstrated that the most concerning finding is that anxiety or stress was the overwhelming leader, with over (55.9%) of students followed by fatigue (55.1%) and loud noises (47.4%) the rest of result shown in the table below.

Table 2. Frequency of the most common participating factors of headache among medical students(N=624).

Variable	Frequency	Percentage
Anxiety or stress	349	55.9
Fatigue	344	55.1
Loud Noises	296	47.4
School	278	44.6
Family problems	262	42.0
Hunger (missing meals	253	40.5
Too little sleep (staying up late)	241	38.6
Too much sleep (sleeping in)	224	35.9
Bright lights	209	33.5
Sunshine	206	33.0
Odors (Perfume, cigarettes) No.	201	32.2
Hot weather	200	32.1
Ice cream	186	29.8
Menstrual cycle	183	29.3
Riding in a car	166	26.6
Exercise or playing	157	25.2
Birth control pills	135	21.6
Alcohol	96	15.4

Figure 1. Frequency of the most common participating factors of headache among medical students(N=264).

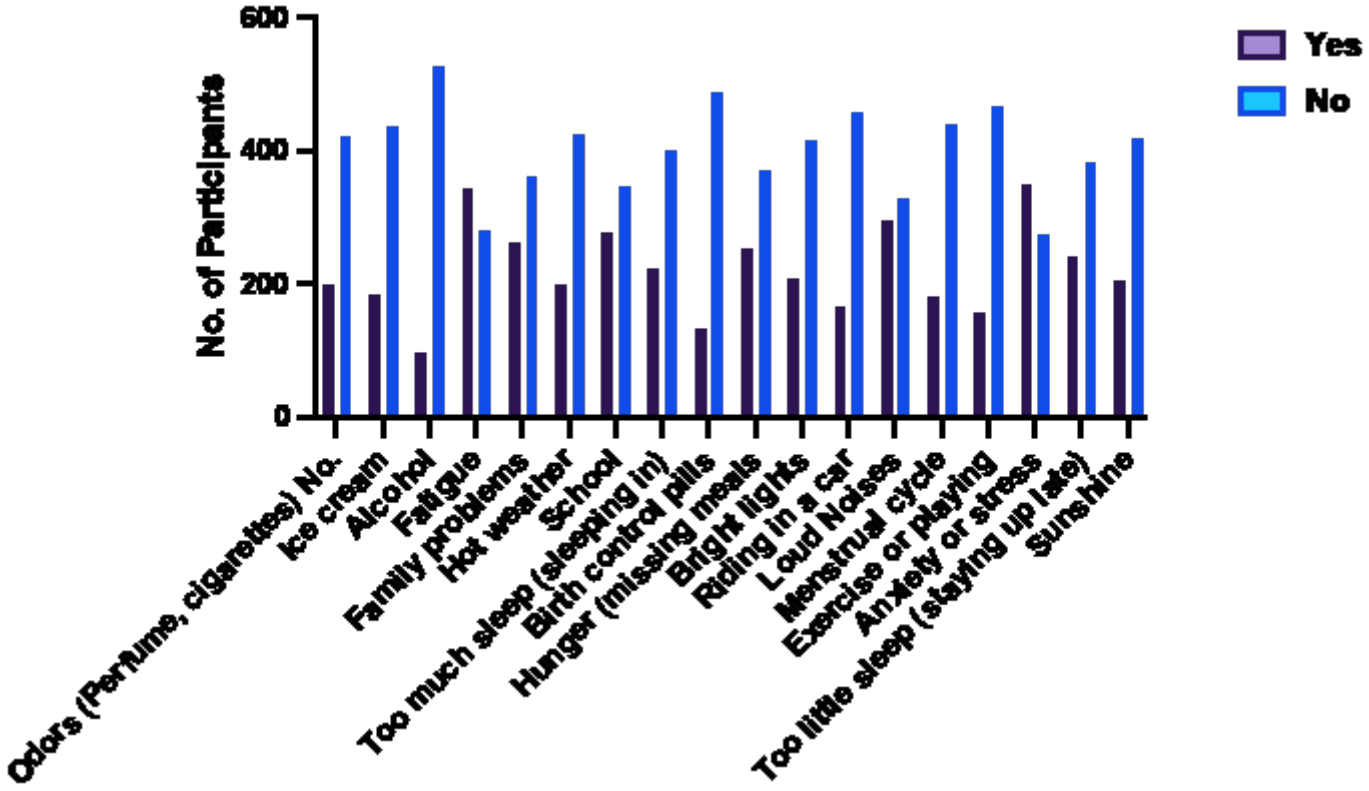

Table (3) shows the frequency of various factors that may contribute to headaches among medical students.

Table 3. Association of medications, foods and headache frequency(N=624).

Variable	Groups	Frequency	Percentage	Pvalue
Medication	Yes	131	21	
	No	493	79.0	
Certain foods	Yes	90	14.4	
	No	534	85.6	

Table (4) illustrated the frequency of various warning signs reported by medical students before experiencing headache, it was reported that Tiredness, sleepiness, or yawning were the most common warning sign (50.5%). (43.4%) of students reported experiencing dizziness before headaches. Eye problems, Over (42.5%) of the students reported eye problems as a warning sign. Other warning signs like paleness, mood swings, increased appetite, and cravings were reported by less than half of the students and the rest of result shown in the table below.

Table 4. Frequency of the warning signs BEFORE the headache begins among medical students(N=624).

Variable	Frequency	Percentage
Tired, sleepy or yawning	315	50.5
Dizziness	271	43.4
Eye problems	265	42.5
Mood swings (either high or low)	247	39.6
Irritability	210	33.7
Rings around the eyes	182	29.2
Craving sweets	147	23.6
Increased appetite	144	23.1
Paleness	140	22.4
Hyperactivity	136	21.8

Figure 2. Frequency of the warning signs BEFORE the headache begins among medical students(N=624).

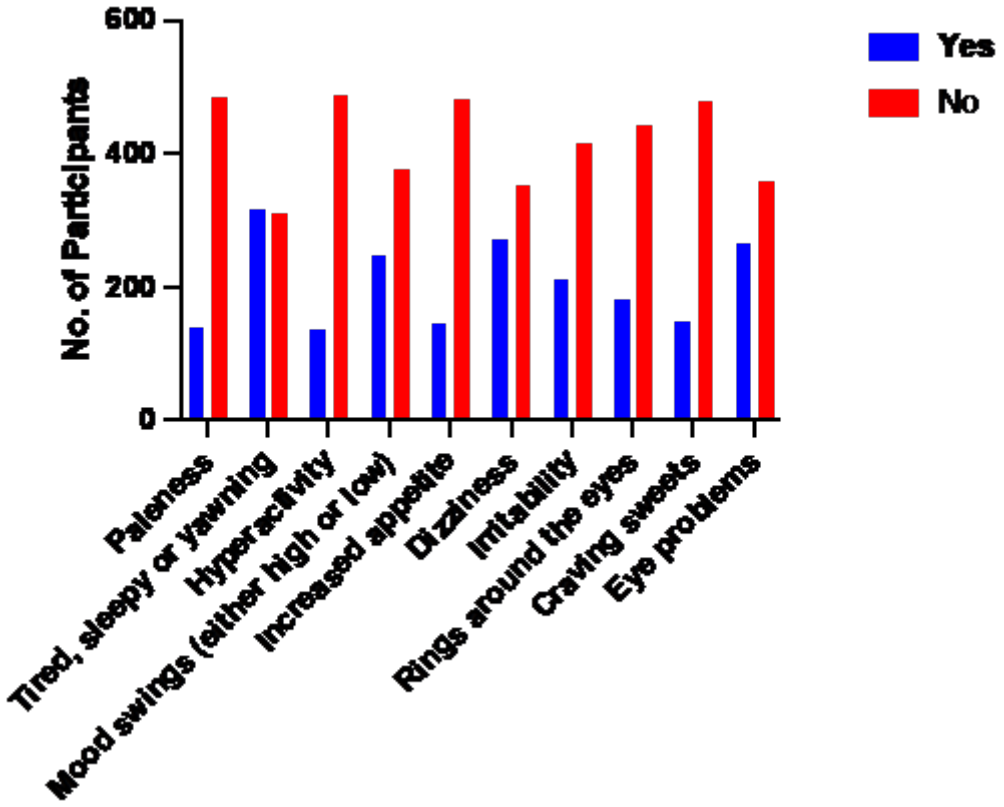

Table (5) below shows the frequency of headaches in various locations among medical students. Forehead headaches are the most common (43.9%) followed by all around the head (38%) and left-sided headaches (28.5%) . Neck, right-sided, top of head, temple, and back of head headaches are all less frequent and the rest of result shown in the table below.

Table 5. Frequency of the headache locations among medical students(N=264).

Variable	Frequency	Percentage
Forehead	274	43.9
All around the head	237	38.0
Left side	178	28.5
Back of the head	170	27.2
Neck	160	25.6
Right side	143	22.9
Top of the head	143	22.9
Temples	141	22.6

Figure 3. Frequency of the headache locations among medical students(N=264).

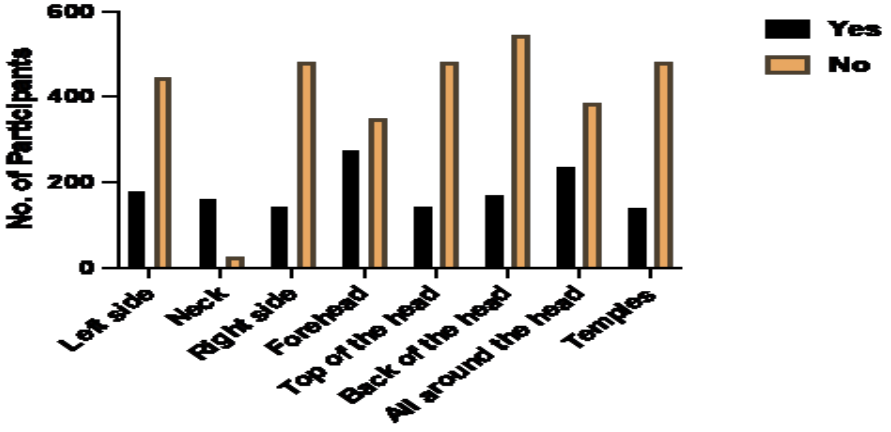

Table (6) shows the frequency of different types of feelings reported by medical students. Results demonstrated that various sensations experience, including pressure, sharpness, tightness, throbbing/pounding, aching, and dullness. Tightness (like a rubber band wrapped around the head) was the most common feeling (49%). Throbbing pain, a hallmark of migraine headaches, were also common (30.93%). aching pain and dull pain were all less frequent. The rest of result shown in the table below.

Table 6. characteristic of headache among medical students(N=624).

Variable	Frequency	Percentage
Ice back pain	160	25.6%
Throbbing/pounding (like a hammer)	193	30.9%
Tightness (like a rubber band wrapped around the head)	306	49%
Dull	148	23.7%

Figure 4. characteristic of headache among medical students (N=624).

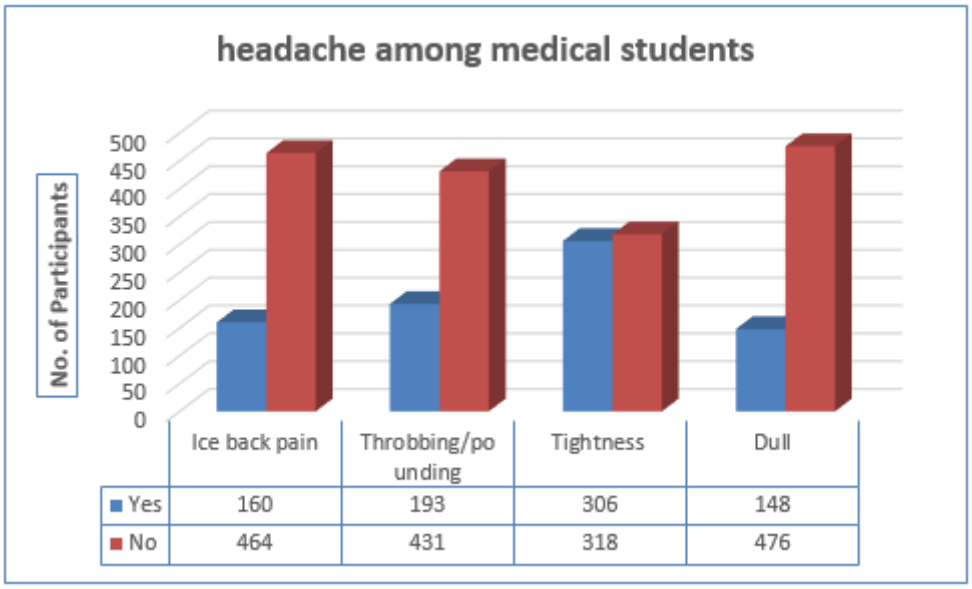

Table (7) Presented the frequency of various symptoms experienced by medical students during headaches. Nausea is the most common symptom (39.7%), followed by confusion (33%). Vomiting was less frequent than others (26.1%). The rest of result shown in the table below.

Table 7. Frequency of the symptoms when the patient has a headache among medical students(N=624).

Variable	Frequency	Percentage
Nausea	248	39.7
Dizziness and light headedness	206	33.0
Fatigue in the arms or legs	164	26.3
Vomiting	163	26.1
Stomach pains	142	22.8
Numbness to the arms and face	118	18.9

Figure 5. Frequency of the symptoms when the patient has a headache among medical students(N=624).

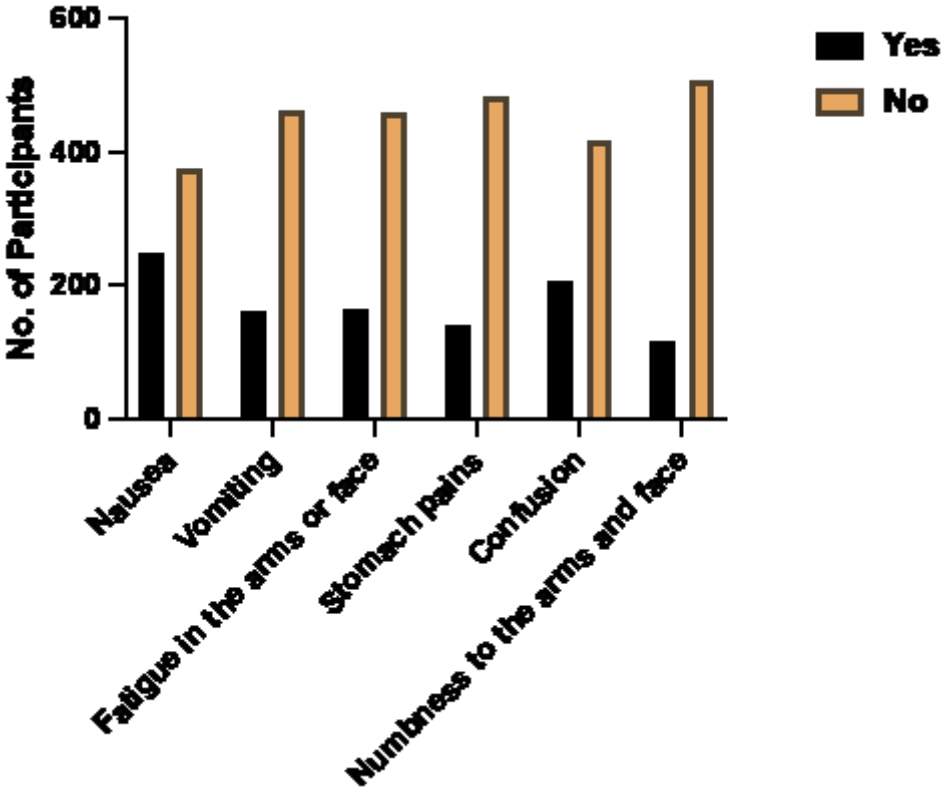

Table (8) shown the frequency of various tests performed during headache treatment among medical students. Blood tests (44.23%) were the most commonly performed test, followed by eye exams (35.89%), followed by dental exam (20.8%) the rest was less common and as it shown in the table below.

Table 8. Frequency of the test performed during that headache treatment period among medical students(N=624).

Variable	Frequency	Percentage
Blood tests	276	44.2
Eye exam	225	36.1
Dental exam	130	20.8
Sinus X-rays	130	20.8
Allergy tests	121	19.4
CT Scan	117	18.8
MRI	114	18.3

Figure 6. Frequency of the test performed during that headache treatment period among medical students(N=624).

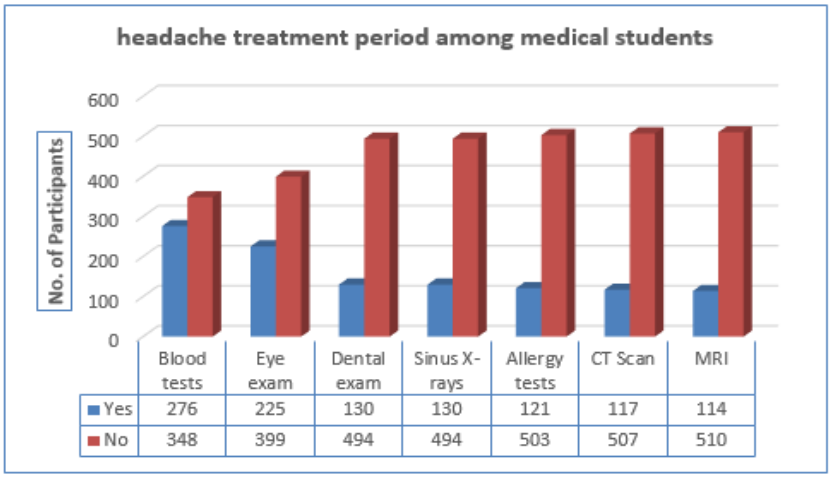

Table (9) shown the Association between characteristic of headache and medical stage and show that the frequency of headache was common weekly in moderate stress stages (18%) followed by severe stress stages (17.7%) and mild stress stages were less common. The duration most common between 1-6 hours in severe stress stages (26.6%) followed by moderate stages (21.96%) and less common in mild stress stages. The rest of the result shown in the table below.

Table 9. Association between characteristic of headache and medical stage (N=624).

Variables Groups		Stress stages			P value
		Mild	Moderate	Severe	
University	University of Al-Ameed	100	200	150	0.001[S]
		21	53	100	
The headaches	constant	44	75	50	0.003[S]
	episodic	77	178	200	
Frequency of the headache	Daily	44	52	48	0.001[S]
	Weekly	51	116	114	
	Monthly	26	85	88	
How many hours do the headaches attack last?	1-6	61	141	171	<0.001[S]
	6-12	37	82	51	
	12-24	22	21	22	
	12-48	1	7	3	
	48-72	0	1	2	
	More than 72	0	1	1	
	Stronger	48	52	56	
The headache pattern	Lasting longer	44	62	45	0.04[S]
	Occurring more frequently	14	59	67	
	None	15	80	82	
headaches ever wake the patient up when asleep?	Yes	50	86	53	0.001[S]
	No	71	167	197	
Does rest or sleep relieve the headache	Yes	69	139	189	0.003[S]
	No	52	114	61	
Headaches stop the patient from doing regular daily activities	Yes	61	112	126	0.002[S]
	No	60	141	124	
Patient ever missed work because of a headache	Yes	59	102	86	0.021[S]
	No	62	151	164	
	Starts out small & builds up	67	154	161	
Chi-Square Results are presented as N(%), p<0.05 considered significantly different, [S]= Significant, [NS]= Non-significant					

Table (10) shown Association between characteristic of headache and Sex. It shows that the headache was most common in male who experienced headaches without participating factors (28.19%) and more frequent in females that triggered by participating factors (27.7%).The headaches tend to be more subacute (24.29%) than acute (22.1%) in females while it was acute (19.3%) than subacute (18.69%) in males. The rest of the result shown in the table below.

Table 10. Association between characteristic of headache and Sex(N=624).

Variables Groups		Sex		P value
		Male	Female	
University	University of Al-Ameed	224	226	0.432 [NS]
	University of Kerbala	74	100	
Did the headaches start after participating factors (smoking, sleeping prevention, fatigue)	Yes	117	178	0.002 [S]
	No	181	148	
How long has the patient had these headaches	Acute	124	142	0.004 [S]
	Sub-Acute	120	156	
	Chronic	54	28	

The headaches	constant	55	114	0.021 [S]
	Come & go	243	212	
How often do the headaches occur	Daily	53	91	0.001 [S]
	Weekly	139	142	
	Monthly	106	93	
How many hours do the headaches last?	1-6	197	176	<0.001 [S]
	6-12	60	110	
	12-24	35	30	
	12-48	2	9	
	48-72	2	1	
	More than 72	2	0	
Do the headaches occur at a certain time of day	day	62	93	<0.001 [S]
	Morning	134	160	
	Afternoon	80	62	
	Night	22	11	
Are the headaches becoming	Stronger	67	89	<0.001 [S]
	Lasting longer	55	96	
	Occurring more frequently	83	57	
	None	93	84	
Do the headaches ever wake the patient up when they are asleep?	Yes	75	114	0.003 [S]
	No	223	212	
Does rest or sleep relieve the headache	Yes	200	197	0.543 [NS]
	No	98	129	
Do the headaches stop the patient from doing regular daily activities	Yes	147	152	0.054 [NS]
	No	151	174	
Has the patient ever missed work/school because of a headache	Yes	116	131	0.322 [NS]
	No	182	195	
Is the headache pain	Intense when it starts	112	124	0.521 [NS]
	Starts out small and builds up	186	202	
Chi-Square Results are presented as N(%), p<0.05 considered significantly different, [S]= Significant, [NS]= Non significant				

Table (11) shown Association between characteristic of headache between medical stage and sex it shows that the duration of headache mostly acute in moderate stress stages in males (18.79%) and was mostly subacute in moderate stress stages in female (22.08%) and the rest of result shown in the table below.

Table 11. Association between characteristic of headache between medical stage and sex (N=624)

Variable	Groups	Male N=298			P value	Female N=326			P value
		Mild stress	Moderate stress	Severe stress		Mild stress	Moderate stress	Severe stress	
How long has the patient had these headaches	Acute	14	56	54	0.001 [S]				0.002 [S]
	29	55	58	0.002					
	Sub Acute	25	40	55		29	72	55	
	Chronic	18	20	16		6	10	12	

How many hours do the headaches last?	1-6	29	88	80	0.067 [NS]				0.05 [S]
	41	55	80	0.05					
	6-12	20	18	22		20	45	45	
	12-24	5	21	9		6	13	11	
	12-48	0	2	0		0	9		
	48-72	0	0	2		0	1	0	
	More than 72	0	1	1		0	0	0	
Dose the headache awakes the patient from sleep	Yes	23	22	30	0.001 [S]	32	34	48	0.002 [S]
	No	38	89	96		28	108	76	
Does rest or sleep relieve the headache	Yes	32	76	92	0.001 [S]	32	90	75	0.003 [S]
	No	20	38	40		37	49	43	

DISCUSSION

The present study demonstrates that headache is a highly prevalent condition among medical students, with an overall prevalence of 53%. This finding is consistent with previous studies reporting prevalence rates ranging from approximately 50% to over 70% among medical students, reflecting the significant burden of headache disorders in this population [17,18]. For instance, a study conducted among medical students reported a headache prevalence of 68%, highlighting the widespread nature of this condition [19].

A considerable proportion of participants (47.5%) reported that their headaches were triggered by identifiable factors such as smoking, sleep deprivation, and fatigue. These findings are in agreement with previous research indicating that lifestyle-related factors, particularly poor sleep hygiene and stress, play a major role in headache occurrence [20,21]. Moreover, the predominance of episodic headaches (72.6%) suggests that most cases are likely primary headaches, particularly tension-type headaches (TTH) and migraines, which are the most common subtypes reported in similar populations [22,23].

Regarding headache frequency, weekly episodes (45%) were the most commonly reported pattern. Comparable findings have been reported in earlier studies, where recurrent headaches were attributed to ongoing academic stress and irregular daily routines among medical students [24, 25]. The majority of headaches in this study lasted 1–6 hours (59.8%), which is consistent with the typical duration of primary headaches, particularly migraines and TTH, as defined by international classification criteria [26].

The temporal distribution showed that headaches occurred most frequently in the afternoon (47.1%), likely reflecting cumulative fatigue and prolonged cognitive effort throughout the day. This observation is supported by evidence linking prolonged mental activity and inadequate rest to increased headache risk [27,28]. Furthermore, the fact that 63.6% of participants reported relief with rest or sleep reinforces the role of fatigue and sleep disturbances in headache pathogenesis [29].

The functional burden of headaches was considerable, with 47.9% of students reporting interference with daily activities and 39.6% missing academic activities. These findings are consistent with previous studies demonstrating that headaches significantly impair academic performance and quality of life, with many students reporting reduced productivity and absenteeism [30,31].

Among the triggering factors, stress and anxiety (55.9%) were the most prominent, followed by fatigue and environmental stimuli such as loud noise. This aligns with a large body of literature identifying stress as a key precipitating factor for both migraine and tension-type headaches in student populations [32,33]. Academic-related stressors, particularly examinations, have been shown to significantly increase headache frequency and severity [34].

Prodromal symptoms were commonly reported, with tiredness, sleepiness, or yawning (50.5%) being the most frequent. Such symptoms are well-documented in migraine patients and are considered early indicators of impending headache attacks [35,36]. Additional symptoms such as dizziness and visual disturbances further support the presence of migraine features among a substantial proportion of participants.

In terms of headache characteristics, the forehead (43.9%) was the most common location, while tightness (49%) was the most frequently described sensation, consistent with tension-type headaches. However, the presence of throbbing pain (30.9%) and associated symptoms such as nausea (39.7%) suggests a significant overlap with migraine-type headaches. Previous studies have similarly reported coexistence of tension-type and migraine headaches among medical students [37,38].

Regarding diagnostic evaluation, blood tests (44.2%) and eye examinations (36.1%) were the most commonly performed investigations, while advanced imaging modalities such as

CT and MRI were less frequently utilized. This is consistent with clinical practice, where imaging is generally reserved for cases with suspected secondary causes rather than routine evaluation of primary headaches [39,40].

Statistically significant associations were observed between headache characteristics and stress levels, with increased stress correlating with higher frequency and longer duration of headaches. This finding is supported by previous studies demonstrating a strong relationship between psychological stress and headache severity in students [41,42]. Additionally, gender differences were observed, with females more likely to experience headaches triggered by external factors and of longer duration. This is consistent with prior research showing a higher prevalence of migraine among females, potentially due to hormonal and psychosocial influences [43,44].

In conclusion, the findings of this study indicate that headaches among medical students are highly prevalent and multifactorial, with significant contributions from stress, lifestyle factors, and environmental triggers. The substantial impact on academic performance and daily functioning highlights the need for targeted interventions, including stress management programs, improved sleep hygiene, and increased awareness of headache triggers. Future studies should focus on longitudinal designs and intervention-based strategies to reduce the burden of headaches in this vulnerable population [45,46].

CONCLUSION

Headache is highly prevalent among medical students, affecting over half of the study population. Most headaches were episodic, commonly occurring on a weekly basis, and typically lasted 1–6 hours. Stress, fatigue, and sleep disturbances were the main contributing factors, with stress being the most significant trigger.

The clinical profile suggests a predominance of tension-type headaches, although migraine features were also observed. Headaches had a notable impact on daily activities and academic performance. Significant associations with stress levels and gender differences highlight the multifactorial nature of headache in this population.

Recommendations

Implementation of stress management programs and promotion of healthy sleep habits are strongly recommended. Universities should encourage lifestyle modifications, including regular physical activity and balanced nutrition, while improving access to medical care for early diagnosis and management.

Additionally, optimizing academic workload and increasing awareness about headache triggers and self-management strategies may help reduce the burden. Further longitudinal and interventional studies are recommended to better understand and address this issue.

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none

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Author contribution

Equily contributed

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