



Prevalence of Tension-Type Headache among Medical Students in Tabuk University, Saudi Arabia

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Background: Headaches disorders have a significant burden on the world. Tension Type Headache is the most common type among primary headaches. Since medical students are exposed to a lot of stress, and it is associated with a tension-type headache, the importance of this

study comes. This study aims to measure the prevalence of tension-type headache among medical students at Tabuk University 2020.

Methodology: A cross-sectional study in Tabuk, Saudi Arabia was conducted. The study included medical students at the University of Tabuk in the academic years from 2nd to 6th grades during the calendar year of 2020. An adapted semi-structured self-administered questionnaire was retrieved from other validated questionnaires. The internal validity and reliability of the questionnaire were tested using Cronbach's alpha test and was highly reliable (25 items, $\alpha = .715$). Both medical and research experts assessed the face and content validity. The data were coded, tabulated, and analyzed using the Statistical Package for the Social Sciences (SPSS, version 27).

Results: The total number of the students was 380 (response rate, 78.6%). 55.22% were females, and 44.78% were males their mean age was $21.18 \pm SD 1.78$ years. Out of the 297 students, only 122 met the diagnostic criteria. The 1-year prevalence Tension Type Headache (TTH) included the three types: frequent TTH 67.2%, 18.0% infrequent TTH, and only 14.8% suffered from chronic TTH. The most common aggravating factors included studying stressors (82%), 68% of the participants reported daily activity interference, and 48.4% reported that headache aggravate with routine physical activities (e.g., walking or climbing stairs). The headache quality varied between throbbing/pulsating (54.9%), pressing/tightening (68.9%) and sharp/stabbing (10.7%). The median headache intensity was 5.25 at pain level score (IQR =2). Only 28% of the students sought counseling where the main analgesic used was Acetaminophen (74%). Many non-pharmacological therapies were practiced by the students to relieve headache, including sleep (60.7%), rest (63.1%) and caffeine (41.8%). 23% of the medical students reported that they sought medical counseling to maintain their performance level. There was a statistically significant difference between the average age of medical students suffering from frequent and infrequent TTH, $t(102) = 2.31, p = .023$.

Conclusion: Tension-type headache is a prevalent type of headache among Saudi medical students. Prevalence and aggravating factors in our study were comparable to previously reported literature. Future studies with large sample size may be required among all university students to define burden of the case in Saudi Arabia.

Keywords: Tension; headache; headaches disorders; tension type headache.

1. INTRODUCTION

Headaches disorders have a significant burden on the world. Apart from this, Headaches affect people of all ages, socioeconomic statuses, and races. Moreover, in neurology disorders, headaches considered to be one of the most prevalent complaints [1]. Additionally, headaches are the second most common condition in neurology clinics [2].

According to The International Classification of Headache Disorders 3rd edition International Classification of Headache Disorders (ICHD-3), the tension-type headache (TTH) is classified under primary headaches, which also include migraine, cluster, trigeminal autonomic cephalalgias and others [3]. TTH is the most common type among primary headaches [4]. Despite numerous clinical and neurophysiological studies, the exact cause of tension headache remains elusive. Detailed discussion on these studies is beyond the scope of this article. A distillate of the currently available data does however suggest that percranial

myofascial mechanisms probably are of importance in episodic TTH, whereas sensitization of pain pathways in the central nervous system resulting from prolonged nociceptive stimuli from pericranial myofascial tissues seems to be responsible for the conversion of episodic to chronic TTH [4].

Vast majority of TTH patients do not seek medical attention. Only when ETTH attacks become frequent or the headache changes into chronic type (CTTH), patients seek treatment. Diagnosis of TTH is difficult as headache characteristics are non specific. Diagnosis is essentially clinical and based on negative associations and by exclusion. A typical case or those with abnormal neurological examination must be investigated thoroughly to exclude secondary headaches [3].

According to the previous study on primary headache disorder among medical students, it appears that they represent a vulnerable group for TTH [5]. Additionally, previous studies revealed that the lifetime prevalence of TTH

among medical students ranges between (12.2%) to (79%) [6-16]. TTH is characterized by a recurrent episode of mild to moderate headache that is not accompanied by classic debilitating symptoms of migraine like nausea, vomiting, photo, and phonophobia [4]. Furthermore, common triggers for TTH are stress, fatigue, and menstruation [17].

Since medical students are exposed to a lot of stress, and it is associated with a tension-type headache, the importance of this study comes [18]. Farthest we know there is a lack of studies regarding tension-type headache among medical students in Tabuk, Saudi Arabia. This study aims to measure the prevalence of tension-type headache among medical students among Tabuk University 2020.

A study was conducted at King Abdul-Aziz University, Jeddah, Saudi Arabia, to determine the prevalence of tension headache among medical students. The researchers distributed a self-administrated questionnaire to 4th to 6th-grade medical students (n=387). The study results show that the lifetime prevalence of tension headache was (66.4%). However, the one-year prevalence was (28.9%). Females were showing a significantly higher risk of tension headache than males. Moreover, sleeping less than 8 hours/night increases the risk of having a tension headache. Additionally, the most common factor that aggravates tension headache was studying stressors (83.3%) [6].

A study was performed in the Medical School of Zagreb University. The study sample was 314 students; the Participants were aged between 18 and 27. The study illustrated that tension-type headache (TTH) was (60.1%) for first-year students, and (57.7%) for sixth-year students. When they were asked about trigger factors, more than 50% of both first and sixth-year students mentioned that lack of sleep and stress were the main factors for the headache. Only 32 out of 220 suffered from headaches (14.5%) who had consulted a doctor about their headache. Furthermore, self-medication usage had a high percentage of sixth-year students (73.3%), while first-year students (59.8%). The most common medication was acetylsalicylic acid. (68.6%) stated that at the period of the headache, they could not perform well or perform at all [7].

1.1 Study Objective

This study aims to measure the prevalence of tension-type headache among medical students

at Tabuk University 2020, to estimate the difference between gender regarding tension type headache, to assess the prevalence of analgesia use for headache, to assess the prevalence of student that seek medical and non-medical attention, and to assess the association between Family history and tension type headache.

2. METHODOLOGY

2.1 Subjects and Methods

A cross-sectional study in Tabuk, Saudi Arabia was conducted. The study included medical students at the University of Tabuk in the academic years from 2nd to 6th grades during the calendar year of 2020. All the students with chronic headache and who gave consent were approached, and then only those with tension headache were selected, other types of headaches were not included. The selection criteria that we followed was to exclude students who suffered from headache for less than 7 episodes occurring per year; their headache was accompanied by no more than one of the following symptoms: nausea or vomiting; and no more than one of photophobia or phonophobia. The sample size was 297 participants, and data was collected via online questionnaire. The total number of the students was 380 (response rate, 78.6%) An adapted semi-structured self-administered questionnaire was retrieved from other validated questionnaires [6,14,15], which is divided into three sections:

- 1- Demographic profile (age, gender).
- 2- International classification of headache (ICHD-3) that inquired about the headache profile.
3. Factors that aggravate or relieve headache (Analgesics, non-pharmacological method to relieve the headache: Sleep, rest, caffeine).

Tension-type headache was defined as an individual who had experienced ten or more attacks of headache during the past year, and which had lasted for at least 30 minutes to 7 days each. The headache accompanied by at least two of the following four pain characteristics: bilateral location, non-pulsating (pressing or tightening), mild-to-moderate severity, and not aggravated by routine physical activity, in the absence of features that characterize migraine, such as nausea, vomiting, photophobia, and phonophobia. But could include either photophobia or phonophobia, but not both. The questionnaire was conducted in

Arabic and it was handed to them during the period from March 2020 to June 2020.

The internal validity and reliability of the questionnaire were tested using Cronbach's alpha test and was highly reliable (25 items, $\alpha = .715$). Both medical and research experts assessed the face and content validity.

2.2 Statistical Analysis

The data were coded, tabulated, and analysed using the Statistical Package for the Social Sciences (SPSS, version 27). Qualitative data were expressed as numbers and percentages, and the chi-square (χ^2) test was used to test the association between variables. Quantitative data were expressed as mean and standard deviation (mean \pm SD). A p-value of < 0.05 was considered as statistically significant. Descriptive statistics were conducted in terms of frequency (n) and proportions (%). Bivariate analyses (Pearson chi-square) performed to study the association between the 1-year prevalence TTH (Y/N) and gender, medical grade and smoking covariates.

3. RESULTS

A total of 297 medical students were approached 55.22% were females, and 44.78% were males their mean age was $21.18 \pm SD 1.78$ years. Out of the 297 students, only 122 met the diagnostic criteria (41.1%) (Table 1).

The 1-year prevalence TTH included the three types: frequent TTH 67.2%, 18.0% infrequent TTH, and only 14.8% suffered from chronic TTH (Table 2). Smoking was significantly associated with suffering from TTH headache ($\chi^2=14.77$, $p=.001$, $\phi = 0.348$). The most common aggravating factors included studying stressors (82%), 68% of the participants reported daily activity interference, and 48.4% reported that headache aggravate with routine physical activities (e.g., walking or climbing stairs). The headache quality varied between throbbing/pulsating (54.9%), pressing/tightening (68.9%) and sharp/stabbing (10.7%). The median headache intensity was 5.25 at pain level score (IQR =2).

Headache usually was accompanied or preceded by nausea (15.6%), phonophobia (35.2), or photophobia (27.9%), and visual error (46.7%). The percentages of those who reported TTH headache with Aura symptoms as displayed in

Table 3 are as follows: Visual (13.1%), Speech disturbances (0.8%), sensation disturbance (8.2%) and motor weakness (3.3%). Out of 122 participants, 54.9% reported having family history of headaches.

Table 4 shows types of therapies and types of counseling among students who suffered from TTH, students stated that headache limited their daily activity as walking and climbing stairs (59%) and 89.3% reported that their headache was of moderate to severe intensity. Only 28% of the students sought counseling where the main analgesic used was Acetaminophen (74%) as explained in Table 4.

Analgesics were taken according to an advice from a family member (23%), and only 7% of them took analgesic according to an advice from a physician or a pharmacist (Fig. 2).

Most medical students (66.4%) reported taking different types of analgesics as a self-medication mainly Panadol (60.7%). Many non-pharmacological therapies were practiced by the students to relieve headache, including sleep (60.7%), rest (63.1%) and caffeine (41.8%).

23% of the medical students reported that they sought medical counseling to maintain their performance level. The survey revealed that (61.5%) of the medical students' headaches got worse since they joined medical college.

There was a statistically significant difference between the average age of medical students suffering from frequent and infrequent TTH, $t(102) = 2.31$, $p = .023$. Infrequent ($M = 21.88$ years, $SD = 1.83$) and frequent ($M = 20.93$ years, $SD = 1.65$) and the effect size was medium ($d = 0.53$) according to Cohen's (1988) guidelines. The confidence interval for the difference between the means was 0.13 to 1.74.

A one-way Anova was conducted to compare the number of episodes per year between the three types of headaches (infrequent, frequent, and chronic) A statistically significant difference was found among the three levels of TTH on number of episodes per year. $F(2,119) = 52.97$, $p < .001$. Post hoc Tukey HSD tests indicate that the chronic group ($M = 714.67$ episodes, $SD = 680.68$) differed significantly from infrequent ($M = 6.68$ episodes, $SD = 4.36$) and frequent group ($M = 43.13$ episodes, $SD = 35.22$) in their number of episodes per year with a mean difference of 707.98, $p < .001$, 95% CI (512.68, 903.29) with a very large effect size $d = 1.47$ and 671.53, $p <$

.001, 95% CI (511.58,831.48) with a very large effect size $d = 1.39$ respectively.

To investigate whether study stressors is associated with the student grade in medical school chi-square statistic was conducted. Assumptions were checked and were met. The Pearson chi-square results and indicates that the student stressors is significantly associated with the student grade ($\chi^2 = 23.75$, $df = 4$, $N = 122$, $p < .001$). Females are more likely than males expected under the null hypothesis to be affected by study stressors. Phi which indicates the strength of the association between the two variables, is .441.

Simultaneous multiple regression was conducted to investigate the best predictors of number of episodes per year. The combination of variables to predict TTH episodes per year from age, smoking, student year of study, family history, and gender was statistically significant. $F(5,116) = 2.825$, $p = .019$. The beta coefficients are: 360.31, -25.50, 173.54, 85.39, -135.28, -18.76 respectively. Note that the year of study and family history significantly predict number of episodes of TTH when all variables are included. The adjusted R^2 value was .07. This indicates that 7% of the variance in number of episodes per year was explained by the model.

Table 1. Demographics characteristics of participants

Category	N (%)	χ^2	df	p-value
Gender	297			
Male	133 (44.78)			
Female	164 (55.22)			
Unilateral	275 (92.5)	99.18	1	< .001
Last year prevalence of headache (out of 297)	122 (41.1)			
Age Mean \pm SD	21.18 \pm 1.78 years			
Gender	122	0.00	1	1.000
Male	61 (50)			
Female	61 (50)			
Smoke	19 (15.6)	57.84	1	< .001
Educational Level		14.72	4	.005
2 nd year	33 (27)			
3 rd year	35 (28.7)			
4 th year	23 (18.9)			
5 th year	13 (10.7)			
6 th year	18 (14.8)			
Days had headache in last year, median (IQR)	21.00 \pm 35 days			
Episodes in the last year, median (IQR)	30 \pm 63.75 episodes			
Duration of each episode, median (IQR)	2 \pm 3 hours			
Character of headache				
Pressing/tightening	84 (68.9)	37.12	1	<.001
Throbbing/pulsating	67 (54.9)	1.18	1	.277
Stabbing	13 (10.7)	75.54	1	<.001
Associated symptoms				
Vomiting	12(4)			
Nausea	19(15.6)	57.84	1	<.001
Photophobia	34(27.9)	23.90	1	<.001
Phonophobia	43(35.2)	10.23	1	<.001
Visual error	57(46.7)	.53	1	.469
Episodes in the last year, median (IQR)			30 \pm 63.75 episodes	
Average intensity (out of 10) Median (IQR)			5.25 \pm 2	
Family history of headache	67 (54.9)	1.18	1	.277

4. DISCUSSION

Tension-type headache (TTH) is the most common primary headache disorder, with a worldwide lifetime prevalence of 46% to 78%. TTH causes greater disability and accounts for more missed work days than migraine. The etiology of TTH is thought to be multifactorial, involving genetic and environmental factors [3].

In our study, the 1-year prevalence TTH included the three types: frequent TTH 67.2%, 18.0% infrequent TTH, and only 14.8% suffered from chronic. Lower results were reported in KSA as history of headache was reported in (92%) of students; the tension headache was seen in (58%) [12]. A study was conducted in Umm Al-Qura college of medicine, Makkah, Saudi Arabia, reported one-year headache prevalence was

(89.6%), the most common diagnosis among both genders was frequent tension-type headache (31%) [15]. Another study in Riyadh, among medical students showed that (53.78%) of participants had a headache, and (41.66%) had TTH [8]. A study in Taif University, show that (29.5%) of female students experienced TTH [14]. Another reported lower results as (46%) of students suffered from recurrent headaches. Overall tension-type headache prevalence was (18.1%) men (17.3%) and women (19.2%) [19]. In Brazil, among medical a found that (98.8%) is the lifetime prevalence of headaches. Tension-type among medical students was (59%) [10]. In Oman, reported prevalence of headache among medical students as (95.3%). Tension headache and migraine prevalence rates were similar (12.2%). However, there was a difference in distribution among gender [13].

Table 2. Headache classifications among male and female students

Diagnosis	Male N (%)	Female N (%)
Infrequent TTH	15 (24.6)	7 (11.5)
Frequent TTH	39 (63.9)	43(70.5)
Chronic TTH	7 (11.5)	11(18)
TTH with aura	52(85.2)	44 (72.1)

Table 3. Types of aura among medical students with aura

Type of aura	N (%)	χ ²	df	p-value
Visual	16(13.1)	66.40	1	<.001
Speech disturbances	1(0.8)	118.03	1	<.001
Sensation disturbances	10(8.2)	85.28	1	<.001
Motor	4(3.3)	106.53	1	<.001

Table 4. Therapies used by medical students

Analgesics	N %	Male N(%)	Female N(%)	χ ²	df	p-value
Analgesics names				243.62	4	<.001
Acetaminophen	74(60.7)	37(60.7)	37(60.7)			
Diclofenac	3(2.5)	1(1.6)	2(3.3)			
Salicylic acid	3(2.5)	0	3(4.9)			
Ibuprofen	3(2.5)	1(1.6)	2(2.5)			
Solpadeine	1(0.8)	0	1(1.6)			
Non-pharmacological method						
Sleep	74(60.7)	37(60.7)	37(60.7)	67	2	<.001
Rest	77(63.1)	43(70.5)	34(55.7)	71.43	2	<.001
Caffeine	51(4.8)	21(34.4)	30(49.2)	62.48	2	<.001
Counselling			35.71	1		<.001
Family members	23(18.9)	1(1.6)	22(36.1)			
Physician	6(4.9)	1(1.6)	5(8.2)			
Pharmacist	1(0.8)	1(1.6)	0			

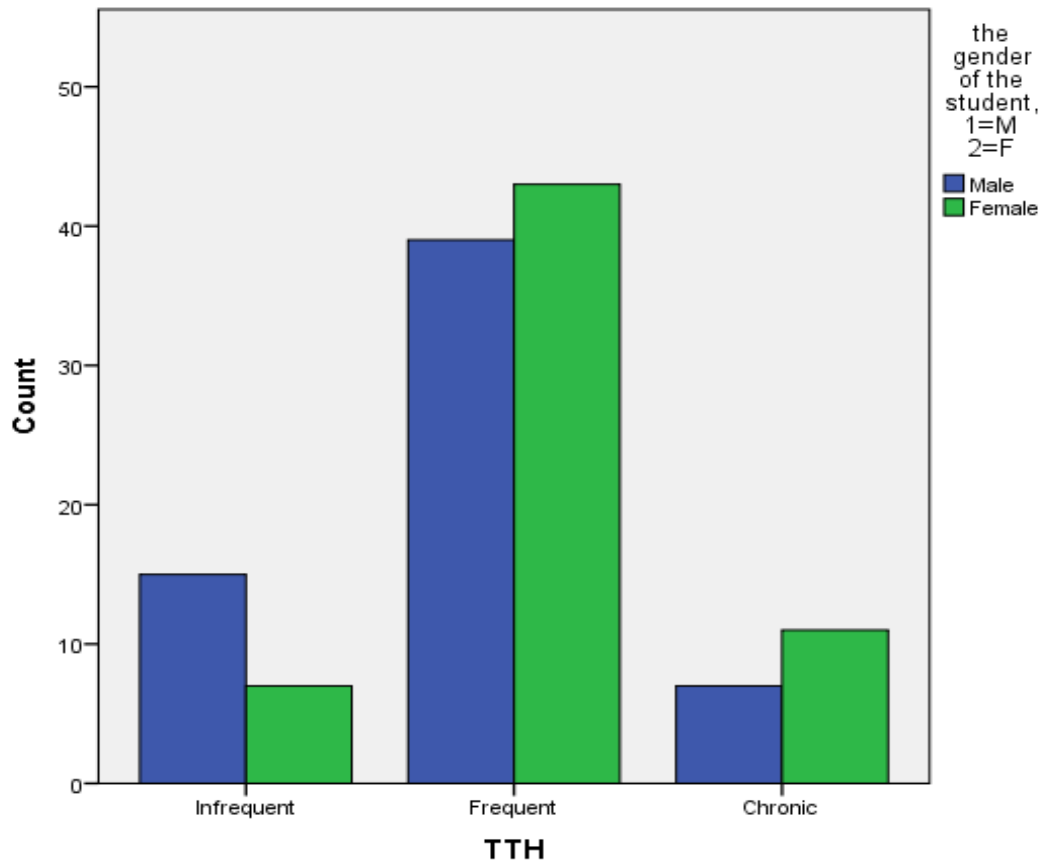


Fig. 1. Tension-type headache among medical students according to Gender

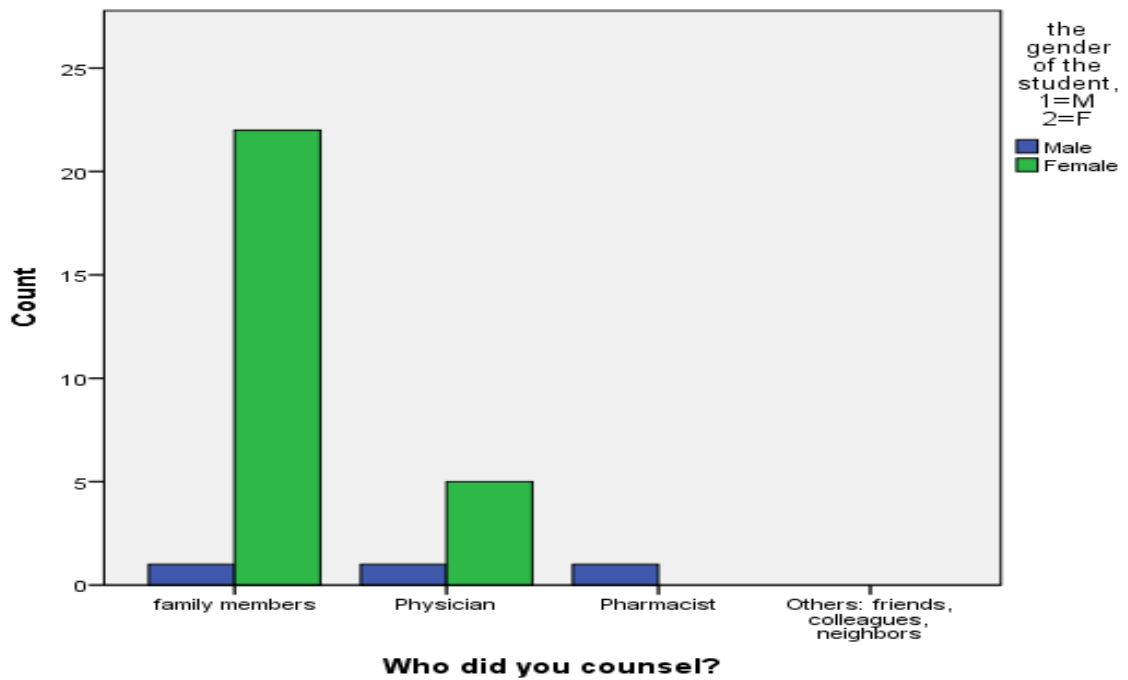


Fig. 2. Counselling type among medical students

The careful monitoring of the trigger factors of headache could be an important step in treatment, because their avoidance may lessen the frequency and severity of attacks. Furthermore, they may provide a clue to the etiology of headache [14]. In our study, the most common aggravating factors included studying stressors (82%), 68% of the participants reported daily activity interference, and 48.4% reported that headache aggravate with routine physical activities (e.g., walking or climbing stairs). A study in KSA reported the main trigger for migraine attacks was stress or anxiety, and 18.3% of migraineurs reported the presence of more than one trigger. Most of the migraineurs (43.6%) reported that the frequency of migraine attacks per month was fewer than daily to weekly, and 86.6% reported a family history of migraine [14]. This result is going with those revealed from other national and international studies [20-22] Stress at study or work were reported in another study as (93.6%) was the most reported trigger factor, followed by lack of sleep (92.3%) and change in time of sleep (87.2%). Almost three quarters of the migraineurs reported environmental triggers, including sudden change in temperature (79.5%) and noise (76.9%) [23,24]. Another study reported an association between type of headache, disturbed sleep pattern, and social stress [11]. This was comparable to a study reported stress (24.9%), irregular sleep (20.8%), and substantial reading (18.5%) were the most common triggers for headache followed by exams (11.1%), smoking (5.8%) and fasting (25%). Lack of sleep, followed by excessively long hours of work were reported in another Saudi study [13].

In our sample, participants who reported TTH headache with Aura symptoms as displayed as follows: Visual (13.1%), Speech disturbances (0.8%), sensation disturbance (8.2%) and motor weakness (3.3%). Out of 122 participants, 54.9% reported having family history of headaches.

Another study on medical students reported that 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%) [25].

In our study, out of 122 participants, 54.9% reported having family history of headaches. This was higher than reported in previous literature as positive family history of headache was found in 6.1% of students with TTH, and there was statistically significant association between

positive family history and the type of headache ($P < 0.001$) [16]. Consistently with this report, 10% of students with headache had a positive family history being less than that reported by Ojini et al. (22%) [26]. This is less than those reported previously [27-29]. The reason for a relatively lower frequency of positive family history of headache in our study is elusive, though, the high prevalence of TTH, which is actually associated with certain individual, psychosocial, and environmental conditions, might be regarded as an explanation [16]. In another study, 86.6% of migraineur students and 61.1% of students with TTH reported having a family history [14], A finding consistently found in previous studies and may highlight the role of genetics in this concern [30-32].

Most medical students in our study (66.4%) reported taking different types of analgesics as a self-medication mainly Panadol (60.7%). Many non-pharmacological therapies were practiced by the students to relieve headache, including sleep (60.7%), rest (63.1%) and caffeine (41.8%). Another study reported that majority of TTH students reported no increase in headache frequency after analgesic use or increase in the analgesic dose used over time. The main analgesic used was paracetamol (46.5%), followed by ibuprofen, acetaminophen, aspirin, and diclofenac sodium (33.8%, 13.9%, 3%, and 2.8%, respectively) [14]. The popularity of paracetamol and acetaminophen was explained in the previous studies by their low price, safety, and less GIT side effects, in addition to their availability as an over-the-counter medication [27]. Another Saudi study reported that headache relief by taking medication was reported in over one-third of respondents. Also, sleep was effective (28.2%) of the respondents. The rest was effective in (19.7%) of the respondents [13].

5. CONCLUSION

Tension-type headache is a prevalent type of headache among Saudi medical students. Prevalence and aggravating factors in our study were comparable to previously reported literature. Awareness of seeking medical advice and relieving stress for management of this case is required among medical students in Saudi Arabia. Future studies with large sample size may be required among all university students to define burden of the case in Saudi Arabia.

CONSENT AND ETHICAL APPROVAL

A letter of approval was obtained from the Institutional Review Board of the Faculty of

Medicine, Tabuk University; the participants gave a verbal consent and then responded to the questionnaire. Participants' privacy and confidentiality will be assured, no identities will be collected.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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