

# The characteristics and subtypes of headache in relation to age and gender in a rural community in Eastern Turkey

## *Türkiye'nin doğu ve kırsal kesiminde yaşa ve cinsiyete göre baş ağrısı özellikleri ve alt tipleri*

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### Summary

**Objectives:** Headache is a frequent and widespread symptom constituting a major health problem for all age groups, though vast differences are present according to age and gender, as well as population characteristics. In this hospital-based study, we investigated the characteristics and subtypes of headache in relation to age and gender in a rural community in the eastern part of Turkey.

**Methods:** A total of 11549 subjects were evaluated, and 4951 patients (42.8%) reported headaches. The 1-year headache prevalence was 38.6% in children, 47.0% in adults, and 23.3% in the elderly ( $p<0.001$ ). The female to male ratio was higher in adults ( $p<0.001$ ) and elderly headache patients ( $p<0.001$ ), but not in children ( $p=0.654$ ).

**Results:** The most common diagnosis was frequent episodic tension-type headache in all age groups. Headaches attributed to epileptic seizure and rhinosinusitis were about three times more common in children, while chronic tension-type headache was about three times more common in adults and the elderly. While 60% of patients with migraine were male among the group of children, about 80% of patients were females among the adults.

**Conclusion:** The understanding of the epidemiology of headache and subtypes is important as it constitutes a major health problem due to its high prevalence in all age groups.

Key words: Headache; prevalence; subtypes.

### Özet

**Amaç:** Baş ağrısı tüm yaş gruplarında sık görülen yaygın bir halk sağlığı problemi olmakla birlikte, yaşa, cinsiyete ve toplum özelliklerine göre farklılık göstermektedir. Bu hastane bazlı çalışmada, Türkiye'nin kırsal bir bölümünde baş ağrısının özellikleri ve alt tipleri cinsiyete ve yaşa göre incelendi.

**Gereç ve Yöntem:** Toplam 11549 hasta değerlendirildi ve 4951 hastada (%42.8) baş ağrısı saptandı. Bir yıllık baş ağrısı prevalansı çocuklarda %38.6, erişkinlerde %47.0 ve yaşlı nüfusta ise %23.3 olarak izlendi ( $p<0.001$ ).

**Bulgular:** Erişkinlerde ve ileri yaşlı hastalarda kadın erkek oranı yüksek olarak saptandı ( $p<0.001$ ), çocuklarda ise kadın erkek oranı arasında farklılık izlenmedi ( $p=0.654$ ). Tüm yaş gruplarında en sık tanı sık epizodik gerilimi tipi baş ağrısı olarak izlendi. Epileptik nöbetlere ve rinosinüzite bağlı baş ağrıları çocuk yaş grubunda üç kat daha sık olarak görülürken, kronik gerilim tipi baş ağrısı erişkinlerde ve ileri yaş grubunda üç kat daha sık olarak saptandı. Çocuk yaş grubunda migren hastalarının %60'ı erkek iken, erişkin migren hastalarının %80'i kadın idi.

**Sonuç:** Baş ağrısının ve alt tiplerinin epidemiyolojisinin bilinmesi, tüm yaş gruplarında yüksek bir prevalansa sahip olması ve büyük bir halk sağlığı sorunu oluşturması nedeniyle önemlidir.

Anahtar sözcükler: Baş ağrısı; prevalans; alt tipler.

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## Introduction

Headache is a very common universal symptom with heterogeneous causes.<sup>[1]</sup> There are numerous number of studies of population-based epidemiological studies about headache carried out in many countries. Several studies have reported a high incidence, prevalence, and individual and societal cost of headache disorders in children and adolescents, as well.<sup>[2]</sup> The episodic and chronic daily headaches in children result in missed school days and interfering with other daily activities.<sup>[2,3]</sup> It is well-known that childhood headache has specific characteristics other than adulthood headache. Nevertheless, epidemiological studies have demonstrated the reliability of the International Headache Society (IHS) criteria for the diagnosis of headache in children.<sup>[4,5]</sup> The incidence of most primary headache disorders show a decline, especially after 55-60 years of age.<sup>[4,6]</sup> In studies investigating adult patients over 18 years, headache patients over 65 years were reported to account for about 6.4% of the population and only few numbers of clinical and epidemiological studies have been performed in patients aged over 65 years.<sup>[7,8]</sup>

Headache is a frequent and widespread symptom constituting a major health problem at all age groups, though there are vast differences according to age and gender, as well as population characteristics. The primary headache subtypes in Turkish population has been little studied, there is only few studies evaluating the headache, and mostly in schoolchildren.<sup>[9-13]</sup> Therefore, little is still known about the characteristics and subtypes of headache, especially in rural areas of Turkey.

In this context, we aimed to investigate the characteristics and subtypes of headache in relation to age and gender in a rural community in east Turkey.

## Methods

This study was conducted in city of Iğdir situated on the eastern border of Turkey. Iğdir has international borders to three countries: Armenia, Republic of Azerbaijan, and Iran. It is an underdeveloped small city with a population of 181866. About 41% of the population is between 0-14 years of age, 54% of the population is aged between 15-64, and 5% con-

stitutes people aged 65 and more. The male gender constitutes 50.9% of the population, while 49.1% of Iğdir population is female. This area is unique in that it includes three ethnical groups, Turkish, Kurdish and Azerian. More than 95% of the population was Muslim.

Iğdir State Hospital is the only hospital in Iğdir. During one-year period of 2009, all patients admitted to Neurology outpatient clinics were involved in the study and evaluated by the same neurologist (G.B.). In Iğdir, there is no family practitioner, and the State Hospital gives both primary- and secondary-level service. The final diagnosis was made according to IHS-Second Edition of International Classification of Headache Disorders (ICHD-II) criteria<sup>[14]</sup> on the basis of clinical assessment of the patients, and parents of children. In this study, all patients (with a participation rate of 100%) were asked retrospectively about having had headache during the last year, and if so, they were evaluated in detail for headache. This cross-sectional, observational study has a sample size of 11549 people admitting to hospital and 4951 patients with headache in a city with a population of 181866. The study was approved by local ethical committee.

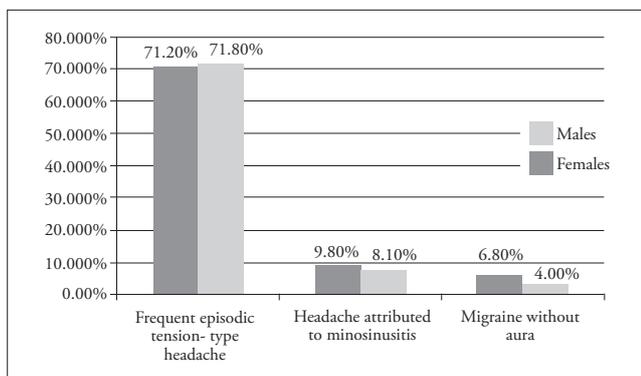
The data was analyzed using the SPSS 12.0 software (SPSS Inc., Chicago, IL, USA). The 1-year prevalence rates were calculated overall and by demographics. Age was divided into 3 categories as follows: children and adolescents aged between 0 to 14, adults aged between 15-64, and elderly aged 65 and more. In the statistical analysis, the chi-square test was used to compare the distribution of categorical variables between subgroups and the Student t test was used to compare continuous variables. The threshold of significance was determined at a p value equal to or less than 0.05.

## Results

Among 11549 subjects admitted to neurology clinics and questioned for headache by the same neurologist, a total of 4951 patients (42.8%) were diagnosed to have headache. Of 4951 subjects, 3178 patients (64.1% of patients with headache, and 27.5% of all study population) had headache as the primary symptom to consult a neurologist.

In the study population, 5002 subjects were male (43.3%), and 6547 were female (56.7%); while of 4951 patients with headache, 1442 patients (29.1%) were male, and 3509 patients (70.9%) were female ( $p < 0.001$ ). The mean age of the study population was  $40.2 \pm 18.2$  years; and the mean age of the patients with headache was  $38.5 \pm 17.5$  years (ranging between 5 and 94 years) ( $p = 0.856$ ). The study population was divided into three groups on the basis of age distribution. Of 11549 subjects, 728 patients were equal to or younger than 14 years of age (children and adolescents), and 281 of them had headache (38.6%). 9067 subjects were between 15 and 64 years of age (adults), and 4262 of them had headache (47.0%). Finally, 1754 subjects were equal to or older than 65 years of age (elderly), and 408 of them had headache (23.3%). The 1-year prevalence of headache was significantly lowest in elderly ( $p < 0.001$ ), and highest in adults ( $p = 0.030$ ). The 1-year prevalence rates for subtypes of headache in different age group are given in Table 1.

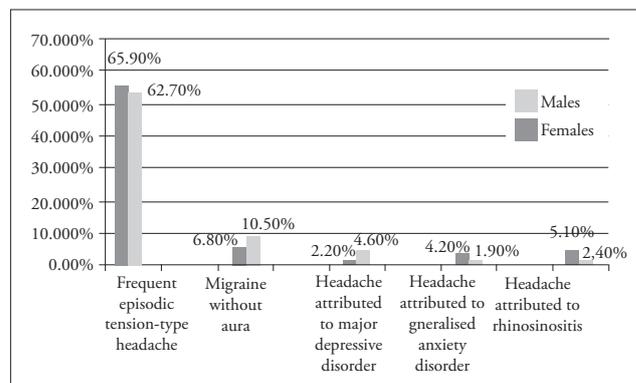
In children and adolescents with headache, the mean age was  $12.0 \pm 1.7$  years. Among them, 132 patients (47.0%) were male, and 149 (53.0%) were female. The headache subtypes are given in Table 1. The most common diagnosis was frequent episodic tension-type headache (71.5%), followed by headache attributed to rhinosinusitis (8.9%), and migraine without aura (5.3%). Of 15 patients with migraine, 60% were male and 40% were female. The type of headache did not show any relation with gender ( $p = 0.542$ ) nor ages of the patients ( $p = 0.948$ ) in this group (Figure 1). There was no difference between headache prevalences or subtypes with three ethnic groups, either.



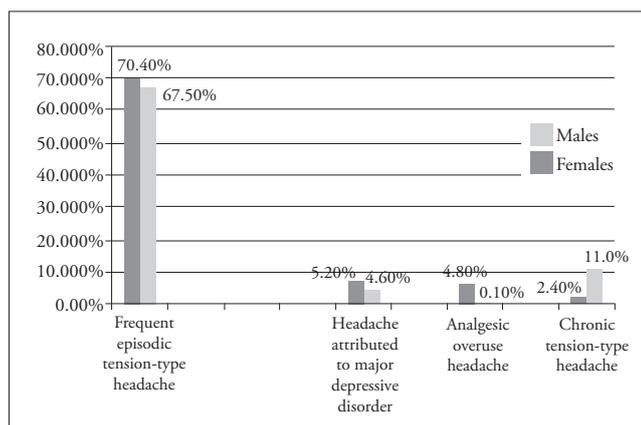
**Figure 1.** Common headache subtypes according to gender diagnosed in children and adolescents.

In adult headache patients, there was 4262 patients with a mean age of  $36.9 \pm 13.6$  years. Of these, 1185 patients (27.8%) were male, and 3077 patients (72.2%) were female. There was a much wide range of headache subtypes in adults (Table 1). The most common diagnosis was frequent episodic tension-type headache (63.6%), followed by migraine without aura (9.5%), and chronic tension-type headache (6.5%). The type of headache showed a significant difference between males and females in this group ( $p < 0.001$ ). Although the most common two headache subtypes were frequent episodic tension-type headache and migraine without aura in both genders, the significant difference was due to rare causes of headache. The migraine without aura alone or in association with infrequent episodic tension-type headache, and headache attributed to major depressive disorder were two times; chronic migraine and headache attributed to somatisation disorder were three times; and typical aura with migraine headache and headache attributed to arterial hypertension were four times more commonly diagnosed in females. Whereas headache attributed to rhinosinusitis and to generalized anxiety disorder were two times more commonly encountered in males (Figure 2). The relationship between age and headache subtypes was also found to be significant ( $p < 0.001$ ). The headache subtypes did not show any difference in different ethnic groups ( $p = 0.694$ ).

In elderly with headache, the mean age of 408 patients was  $73.7 \pm 6.1$  years. There was 125 males (30.6%) and 283 females (69.4%). The most common headache subtype observed in this age group was similarly frequent episodic tension-type headache (68.4%) (Table 1). The relationship between headache subtypes and gender was significant



**Figure 2.** Common headache subtypes according to gender diagnosed in adults.



**Figure 3.** Common headache subtypes according to gender diagnosed in elderly.

( $p=0.025$ , OR 1.2). Although frequent episodic tension-type headache was the most common headache type in both genders, headache attributed to major depressive disorder and infrequent episodic tension-type headache were two times, and analgesic-overuse headache was about four times more common in males; whereas chronic tension-type headache was four times more common in females (Figure 3). The subtypes of headache showed no difference with age ( $p=0.599$ ) or ethnicity ( $p=0.847$ ) within this group of patients.

Finally, we observed that the female to male ratio was significantly higher in adults ( $p<0.001$ ) and in elderly ( $p<0.001$ ) but not in children and adolescents ( $p=0.654$ ). The difference in headache subtypes among three age groups were also significantly different ( $p<0.001$ ). The widest spectrum of subtypes was presented by adult age group. The headache attributed to epileptic seizure and to rhinosinusitis were about three times more commonly diagnosed in children and adolescents, while chronic tension-type headache was about three times more common in adults and elderly.

## Discussion

In the current study, the 1-year prevalence rates for headache and subtypes were investigated in different age groups in relation to gender, in a setting of Neurology clinics of a rural community in eastern Turkey. The 1-year prevalence in children and adolescent age group was found as 38.6%. The most common diagnosis was frequent episodic tension-type headache (71.5% of all headaches with a 1-year prevalence of 27.6%), followed by headache

attributed to rhinosinusitis (8.9% of all headaches with a 1-year prevalence of 3.43%), and migraine without aura (5.3% of all headaches with a 1-year prevalence of 2.06%). Alp et al.<sup>[13]</sup> recently reported the one-year prevalence of headache subtypes as 14.3% for migraine, 8.6% for pure tension-type headache, and 4.6% for migraine plus tension-type headache. Bugdayci et al.<sup>[9]</sup> found the prevalence of recurrent headache as 49.2% in children attending to school aged between 8-16 years; and the most common diagnosis was tension-type headache with a ratio of 24.7% followed by migraine (unclassified) with a ratio of 10.4%. A study investigating the epidemiologic profile of migraine and chronic daily headaches in students aged between 12 and 16 years in three public schools in Taiwan. Fuh et al.,<sup>[15]</sup> reported that 484 students (12.2%) had migraine with or without aura, and 1092 students (27.6%) had tension-type headaches. Heinrich et al.<sup>[16]</sup> estimated the prevalence rates of primary headaches in children between 9-14 years in southern Germany as 17.6% for tension-type headache, 13.1% for migraine, while 35.5% of all children were reported that could not be classified. Medical Conditions Section of the National Health and Nutrition Examination Surveys reported the frequent or severe headache prevalence in children between 4-18 years of age as 17.1%.<sup>[17]</sup> In spite of some differences, the most common diagnosis is tension-type headache in almost all studies, followed by migraine. In our study, we also observed that headache attributed to rhinosinusitis is a common problem in this age group.

In adults, the 1-year prevalence of headache was 47.0% in our study. The most common diagnosis was also frequent episodic tension-type headache (63.6% of all headaches with a 1-year prevalence of 29.9%), followed by migraine without aura (9.5% of all headaches with a 1-year prevalence of 4.44%), and chronic tension-type headache (6.5% of all headaches with a 1-year prevalence of 3.07%). In a study by Rueda-Sánchez et al.<sup>[18]</sup> in Colombia, a survey was conducted in 1841 households aged between 18-65 years, which reported that 58% of participants had a headache episode at least once during their lifetime, with 13.7% describing the clinical characteristics of migraine, and 8.4% describing chronic daily headache. In a study by Al-

**Table 1.** The 1-year prevalence rates for headache subtypes classified according to IHS-ICHD-II criteria in three age groups

Headache subtypes	Children and adolescents			Adults			Elderly		
	Among all subtypes		1-year prevalence	Among all subtypes		1-year prevalence	Among all subtypes		1-year prevalence
	n	%	n	%	n	%	n	%	
1.1. Migraine without aura	15	5.3	403	9.5	2	4.44%	0.5	0.11%	
1.2.1. Typical aura with migraine headache	-	-	17	0.4	-	0.19%	-	-	
1.2.2. Typical aura with non-migraine headache	-	-	2	0.05	-	0.02%	-	-	
1.2.5. Sporadic hemiplegic migraine	-	-	1	0.02	-	0.01%	-	-	
1.4. Retinal migraine	-	-	2	0.05	-	0.02%	-	-	
1.5.1. Chronic migraine	-	-	23	0.5	-	0.25%	-	-	
1.5.2. Status migrainosus	-	-	4	0.1	-	0.04%	-	-	
1.5.5. Migraine-triggered seizure	-	-	1	0.02	-	0.01%	-	-	
1.6.1. Probable migraine without aura	-	-	9	0.2	-	0.10%	-	-	
1.1. Migraine without aura, and	-	-	39	0.9	1	0.43%	0.2	0.06%	
2.1. Infrequent episodic tension-type headache	6	2.1	94	2.2	14	1.04%	3.4	0.80%	
2.2. Frequent episodic tension-type headache	201	71.5	2711	63.6	279	29.90%	68.4	15.91%	
2.3. Chronic tension-type headache	6	2.1	278	6.5	34	3.07%	8.3	1.94%	
2.4. Probable tension-type headache	-	-	7	0.2	-	0.08%	-	-	
3.1.1. Episodic cluster headache	-	-	4	0.1	-	0.04%	-	-	
3.1.2. Chronic cluster headache	-	-	1	0.02	-	0.01%	-	-	
3.4.2. Probable paroxysmal hemicrania	-	-	4	0.1	-	0.04%	-	-	
4.1. Primary stabbing headache	-	-	9	.2	2	0.10%	0.5	0.11%	
4.2. Primary cough headache	1	0.4	2	0.05	-	0.02%	-	-	
4.3. Primary exertional headache	1	0.4	2	0.05	-	0.02%	-	-	
4.4. Primary headache associated with sexual activity	-	-	1	0.02	-	0.01%	-	-	
4.5. Hypnic headache	-	-	5	0.1	2	0.06%	0.5	0.11%	
4.6. Primary thunderclap headache	-	-	1	0.02	-	0.01%	-	-	
5.1.1. Acute post-traumatic headache attributed moderate or severe head injury	1	0.4	3	0.07	-	0.03%	-	-	
5.5. Headache attributed to traumatic intracranial haematoma	-	-	1	0.02	-	0.01%	-	-	
6.1. Headache attributed to ischaemic stroke or transient ischaemic attack	-	-	7	0.2	10	0.08%	2.5	0.57%	
6.2. Headache attributed to non-traumatic intracranial hemorrhage	-	-	1	0.02	1	0.01%	0.2	0.06%	
6.4. Headache attributed to arteritis	-	-	1	0.02	-	0.01%	-	-	
6.6. Headache attributed to cerebral venous thrombosis	-	-	2	0.05	-	0.02%	-	-	
6.7.4. Headache attributed to pituitary apoplexy	-	-	1	0.02	-	0.01%	-	-	

Table 1 continued.

7.1. Headache attributed to high cerebrospinal fluid pressure	1	0.4	0.13%	10	0.2	0.11%	2	0.5	0.11%
7.3.3. Headache attributed to other non-infectious inflammatory disease	-	-	-	3	0.07	0.03%	-	-	-
7.4. Headache attributed to intracranial neoplasm	-	-	-	5	0.1	0.06%	-	-	-
7.6. Headache attributed to epileptic seizure	7	2.5	0.96%	5	0.1	0.06%	-	-	-
7.7. Headache attributed to Chiari malformation type I	-	-	-	1	0.02	0.01%	-	-	-
7.9. Headache attributed to other non-vascular intracranial disorder	-	-	-	2	0.05	0.02%	1	0.2	0.06%
8.1.4.1. Immediate alcohol-induced headache	-	-	-	1	0.02	0.01%	-	-	-
8.2.1. Ergotamine-overuse headache	-	-	-	8	0.2	0.09%	3	0.7	0.17%
8.2.2. Triptan-overuse headache	-	-	-	13	0.3	0.14%	-	-	-
8.2.3. Analgesic-overuse headache	4	1.4	0.54%	54	1.3	0.60%	10	2.5	0.57%
8.2.5. Combination analgesic-overuse headache	-	-	-	7	0.2	0.08%	-	-	-
9.1. Headache attributed to intracranial infection	-	-	-	2	0.05	0.02%	-	-	-
9.2. Headache attributed to systemic infection	4	1.4	0.54%	2	0.05	0.02%	-	-	-
10.1.1. High-altitude headache	-	-	-	1	0.02	0.01%	-	-	-
10.1.3. Sleep apnoea headache	-	-	-	27	0.6	0.30%	7	1.7	0.40%
10.3. Headache attributed to arterial hypertension	-	-	-	21	0.5	0.23%	6	1.5	0.34%
10.3.4. Headache attributed to pre-eclampsia	-	-	-	2	0.05	0.02%	-	-	-
10.5. Headache attributed to fasting	-	-	-	1	0.02	0.01%	-	-	-
11.2. Headache attributed to disorder of neck	-	-	-	20	0.5	0.22%	1	0.2	0.06%
11.3. Headache attributed to disorder of eyes	1	0.4	0.13%	1	0.02	0.01%	-	-	-
11.4. Headache attributed to disorder of ears	-	-	-	1	0.02	0.01%	-	-	-
11.5. Headache attributed to rhinosinusitis	25	8.9	3.43%	134	3.1	1.48%	2	0.5	0.11%
11.6. Headache attributed to disorder of neck, eyes, ears, nose, sinuses, teeth, mouth, or other facial or cervical structures	-	-	-	3	0.07	0.03%	-	-	-
11.8. Headache attributed to other disorder of cranium.	-	-	-	1	0.02	0.01%	-	-	-
12.1. Headache attributed to somatisation disorder	2	0.7	0.27%	10	0.2	0.11%	-	-	-
12.3. Headache attributed to major depressive disorder	3	1.1	0.41%	163	3.8	1.80%	14	3.4	0.80%
12.5. Headache attributed to generalised anxiety disorder	3	1.1	0.41%	107	2.5	1.18%	6	1.5	0.34%
13.1. Trigeminal neuralgia	-	-	-	6	0.1	0.07%	3	0.7	0.17%
13.2. Glossopharyngeal neuralgia	-	-	-	2	0.05	0.02%	2	0.5	0.11%
13.8. Occipital neuralgia	-	-	-	-	-	-	1	0.2	0.06%
13.15.2. Post-herpetic neuralgia	-	-	-	2	0.05	0.02%	1	0.2	0.06%
13.18.3. Facial pain attributed to multiple sclerosis	-	-	-	1	0.02	0.01%	-	-	-
13.18.4. Persistent idiopathic facial pain	-	-	-	10	0.2	0.11%	4	1.0	0.23%
Total	281	100%	728	4262	100%	9067	408	100%	1754
	patients		subjects			subjects	patients		subjects

zoubi et al.<sup>[19]</sup> investigating the adult and elderly age group, the majority of patients with headache could not be subtyped (38.4%), though the most common diagnosis was tension-type headache (36.1%). Another recent study by Vukovic et al.<sup>[20]</sup> showed that the 1-year crude prevalence of migraine with and without aura was 7.5%, of probable migraine was 11.3%, and of tension-type headache was 21.2% in a study group aged 18 years and older. Stovner and Andree<sup>[21]</sup> reported a mean prevalence of current migraine among more than 170,000 adults as 14.7%, and the mean prevalence of tension-type headache among more than 66,000 adults as 62.6% in their recent review, similar to our results.

Almost all studies investigating the headache prevalences have examined a population aged 18 and over, but did not classify as adults and elderly. In our study, the 1-year prevalence of headache was found as 23.3% in elderly, and the most common headache subtype was similarly frequent episodic tension-type headache (68.4% of all headaches with a 1-year prevalence of 15.91%). Few studies in elderly population have reported around 43% to 66% for the one-year prevalence of headache.<sup>[22-24]</sup> These authors also reported that the prevalence of headache was higher in women with a ratio of 52.0% versus 31.1% in men. Similarly, our findings showed that females had a higher prevalence rates for headache in adult and elderly groups, though this was not valid in children age group.

Unlike common headache types, studies investigating the prevalence rates for such rare headache subtypes are rare. Our study also supplies the 1-year prevalence rates for other rare subtypes of headache in different age groups (Table 1). Katsarava et al.<sup>[25]</sup> reported the prevalence of cluster headache as 87/100000, which was found as 44/100000 for episodic and 11/100000 for chronic cluster headache in our study. Koopman et al.<sup>[26]</sup> estimated the incidence rate for trigeminal neuralgia as 12.6%. The 1-year prevalence for trigeminal neuralgia was found as 0.07% in adults and 0.17% in elderly in our study.

In addition, we also observed the developmental pattern in gender difference for migraine. While 60% of patients with migraine were male in young

age group, about 80% of the patients with the diagnosis of migraine were females in adults. A similar observation was recently reported by Slater et al.,<sup>[27]</sup> who suggested that biological or sociological factors increase the risk of migraine in boys in the preadolescent period, which shifts as children enter adolescence. On the other hand, the subtypes of headache showed no significant difference in relation with gender in children and adolescents. Among three age groups, the headache attributed to rhinosinusitis and to epileptic seizure were about three times more commonly diagnosed in children and adolescents, while chronic tension-type headache was about three times more common in adults and elderly. Unlike children and adolescents, the female to male ratio was significantly higher in adults and elderly. In adults, the migraine without aura alone or in association with infrequent episodic tension-type headache, and headache attributed to major depressive disorder were two times; chronic migraine and headache attributed to somatisation disorder were three times; and typical aura with migraine headache and headache attributed to arterial hypertension were four times more commonly diagnosed in females. On the other hand, headaches attributed to rhinosinusitis and to generalized anxiety disorder were two times more commonly encountered in males. In elderly, headache attributed to major depressive disorder, infrequent episodic tension-type headache, and analgesic-overuse headache were two times more common in males, whereas chronic tension-type headache was four times more common in females.

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