

Research Article

## Prevalence of Headache Disorders, their Impact on the Daily Lifestyle of the Patients, and the Correlation of their Demographic and Clinical Features with Headache Impact Test 6

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### Abstract

**Introduction:** Headache disorders are common among people of all ethnic groups. Primary headache disorders  
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include migraine, tension-type headache, cluster headache, and chronic daily headache syndrome. Secondary headaches include medication overuse

headache. The aim of this study is to evaluate the prevalence of various types of headaches disorders, their impact on the daily lifestyle of the patients, and the correlation of their demographic and clinical features with Headache Impact Test 6 (HIT-6).

**Materials and methods:** This prospective study was conducted at a tertiary care hospital in Karachi for a period of six months. 198 patients who came in the outpatient (OPD) department and had a diagnosis of headache were included in this study irrespective of their age and gender. The demographic features, clinical features, and the final diagnoses made by the attending physician using the International Classification of Headache Disorders II (ICHD-II) were recorded. The impact of headaches on the daily lifestyle of the patients was determined by using a six-item HIT-6 questionnaire. For continuous variables, the means and standard deviations were calculated. Whereas for categorical data, frequencies and percentages were calculated. Effect modifiers like demographic and clinical features were controlled through stratification, Fischer's exact test was used and a p-value of  $\leq 0.05$  was taken as significant.

**Results:** The mean age of the patients was  $34.39 \pm 15.58$  years. Age distribution showed 90 (45.45%) patients of eight to 30 years, 84 (42.42%) patients of 31-50 years, and 24 (12.12%) patients of 51-75 years of age. There were 69 (34.8%) male and 129 (65.2%) female patients. The unmarried patients were 81 (40.9%) and married patients were 117 (59.1%). The lower-class patients were 94 (47%), the working-class patients were 87 (43.9%), the middle-class patients were 15 (7.6%), and the upper-class patients were three (1.5%). Primary headache was diagnosed in 150 (75.8%), and the secondary headache was diagnosed in 48 (24.2%) patients. 45 (22.7%) patients had throbbing, 87 (43.9%)

had stabbing, and 66 (33.3%) had pressing headache quality. Unilateral headache was in 108 (54.5%), and the bilateral headache was in 90 (45.5%) patients. Pulsatile headache was in 102 (51.5%), and the non-pulsatile headache was in 96 (48.5%) patients. 51 (25.8%) patients had approximately one hour, 42 (21.2%) patients had more than four hours, and 105 (53%) patients had a continuous headache. The frequency was two to three times per week in 51 (25.8%), daily in 81 (40.9%), and variable in 66 (33.3%) patients. The headache occurred in the morning in 39 (19.7%), in the afternoon in 12 (6.1%), in the evening in 24 (12.1%), in the night in 30 (15.2%), and variably in 93 (47%) patients. Headache was mild in 36 (18.2%), moderate in 93 (47%), and severe in 69 (34.8%) patients. Aura, nausea, vomiting, photophobia, phonophobia, runny nose, and lacrimation were also present in many patients. 78 (39.4%) patients had a tension-type headache, and 60 (30.3%) had a migraine while others had several different conditions. The average HIT-6 score was  $65.86 \pm 7.506$ . The severe impact was found in 168 (84.8%) patients, substantial impact in nine (4.5%), some impact in 12 (6.1%), and no impact in nine (4.5%) patients. Stratification showed a significant relationship with age, marital status, socioeconomic status, quality of headache, site of headache, pulsatile/non-pulsatile feature, frequency of headache, the severity of headache, and nausea.

**Conclusions:** Tension-type and migraine headaches are the most common headaches that mostly affect young to middle-aged married females of low socioeconomic status. Age, marital status, socioeconomic status, quality of headache, site of headache, pulsatile/non-pulsatile feature, frequency of headache, the severity of headache, and nausea are some of the determinants of the impact of headaches on daily life. Further studies are needed to validate these conclusions.

**Keywords:** Headache Disorders; Prevalence; Headache Impact Test; Impact on Lifestyle; Correlation; Demographic Features; Clinical Features; Humans

## **1. Introduction**

Headache disorders are a common occurrence among people of all races, backgrounds, and ethnicities. It is believed that more than half of the adult human population has suffered from headaches accompanying these headache disorders at least once in their lifetimes [1]. Primary headache disorders include migraine, tension-type headache, cluster headache, and chronic daily headache syndrome [1, 2]. Medication overuse headache is a secondary headache disorder having a substantial medical impact [1]. Migraine is a one-sided headache usually starting at puberty and occurring in episodes once or twice a month [1, 3]. A migraine headache may or may not be accompanied by an aura. It is the second most common type of headache reported worldwide with over 10% of people affected [1, 3, 4]. The prevalence is three times higher in females [1, 5]. Tension-type headache is a stress-related headache having a musculoskeletal origin. It is described as a vice-like or band like ache around the neck and/or the forehead to the occiput [1]. Episodic tension-type headache is the most common type of headache reported worldwide, sometimes by 71% of the population of a region [1, 2]. Cluster headache is a primary headache disorder characterized by severe unilateral retro-orbital or periorbital pain. It involves tearing of the eyes and stuffy nose. It is not very common, affecting less than one in 1000 people [2].

Chronic daily headache syndrome is a descriptive term applied to a range of headache types occurring about 15 days a month. The headache may be tension-type, migraine, or even cluster headache. Medication overuse headache, as its name suggests, is a headache caused due to chronic excessive use of analgesics and non-

steroidal anti-inflammatory drugs (NSAIDs) as well as other drugs [1]. This iatrogenic disorder is thought to affect more than 1% of the world's population, up to 5% in some areas [2]. Headache disorders are ever-present, widespread, and disabling, and yet their recognition, diagnosis, and treatment are unsatisfactory worldwide [1]. The detrimental effects of headaches are not very well documented. A headache interferes with an individual's physical performance, work efficiency, leisure activities, the standard of living, and psychosomatic well-being. Research has also shown that the level of disability differs according to the frequency of headache occurrences. The purpose of our study is to calculate the prevalence of the different types of headache disorders in people belonging to all social and economic backgrounds, their impact on the daily lifestyle of the patients, and correlation of their demographic and clinical features with Headache Impact Test 6 (HIT-6).

## **2. Materials and Methods**

### **2.1 Study design and sampling**

This prospective study took place at Dow University Hospital Karachi, from 10/01/2019 to 04/01/2020 (for six months). Inclusion criteria included any age, either gender, and diagnosis of headache. All other patients were excluded from the study.

### **2.2 Data collection**

A total of 198 patients came in the outpatient (OPD) department who met the inclusion/exclusion criteria and were included in this study. All patients were informed about the study and both verbal and written informed consents were obtained. The demographic features (age, gender, marital status, socioeconomic status), and the clinical features (quality, site, pulsatile/non-pulsatile feature, duration, frequency, timing, severity, aura, nausea, vomiting, photophobia, phonophobia, runny nose, and lacrimation) were noted on a preformed

proforma. The final diagnoses made by the attending physician in accordance with the International Classification of Headache Disorders II (ICHD-II) were also noted. A six-item HIT-6 questionnaire was used to determine the impact of headaches on the daily lifestyle of the patients.

### 2.3 Data analysis

Data were entered and analyzed on Statistical Package for the Social Sciences, version 19 (SPSS Statistics, Chicago, IL). Continuous data were presented as mean and standard deviation values. Whereas categorical data were presented in numbers and percentages. Stratification was done to see the effects of demographic and clinical features on the HIT-6 score, Fischer's exact test was applied and a p-value of  $\leq 0.05$  was considered as significant.

### 3. Results

Mean age of the patients was 34.39 years with a standard deviation of 15.58 years. The youngest patient was eight years old while the oldest was 75 years old, as shown in Table 1. The distribution of age showed that 90 (45.45%) patients were from eight to 30 years, 84 (42.42%) patients were from 31-50 years, and 24 (12.12%) patients were from 51-75 years of age, as shown in Figure 1. 69 (34.8%) patients were male while 129 (65.2%) were female. 81 (40.9%) patients were unmarried while 117 (59.1%) were married. 94 (47%) patients belonged to the lower-class, 87 (43.9%) belonged to the working-class, 15 (7.6%) belonged to the middle-class while three (1.5%) belonged to the upper-class families. 150 (75.8%) patients presented with primary headaches while 48 (24.2%) with secondary headaches. The headache was described by 45 (22.7%) patients as throbbing, 87 (43.9%) as stabbing while 66 (33.3%) as pressing. 108 (54.5%) patients experienced unilateral while 90 (45.5%) experienced bilateral pain. 102 (51.5%) patients

experienced pulsatile while 96 (48.5%) experienced non-pulsatile pain.

The duration of the headache of 51 (25.8%) patients was approximately one hour while 42 (21.2%) patients had more than four hours of duration and 105 (53%) patients had a continuous headache. 51 (25.8%) patients experienced headaches two to three times a week, 81 (40.9%) patients daily, and 66 (33.3%) patients experienced headache variably. 39 (19.7%) patients experienced a headache in the morning, 12 (6.1%) in the afternoon, 24 (12.1%) in the evening, 30 (15.2%) in the night while 93 (47%) patients experienced headache variably. 36 (18.2%) patients had mild, 93 (47%) had moderate while 69 (34.8%) had a very severe headache. Many of these patients were presented with different symptoms like aura, nausea, vomiting, photophobia, phonophobia, runny nose, and lacrimation. The frequencies and percentages of all the above stated demographic and clinical features are shown in Table 2. 78 (39.4%) patients were diagnosed by the attending physician with tension-type headache, 60 (30.3%) were diagnosed with migraine, and others were diagnosed with several different conditions, as shown in Table 3. The average HIT-6 score was 65.86 with a standard deviation of 7.506, as shown in Table 4. We assessed from our HIT-6 questionnaire that 168 (84.8%) patients were impacted to a severe degree, nine (4.5%) had a substantial impact, 12 (6.1%) were impacted to some extent, and nine (4.5%) patients were not impacted at all in their lives, as shown in Figure 2.

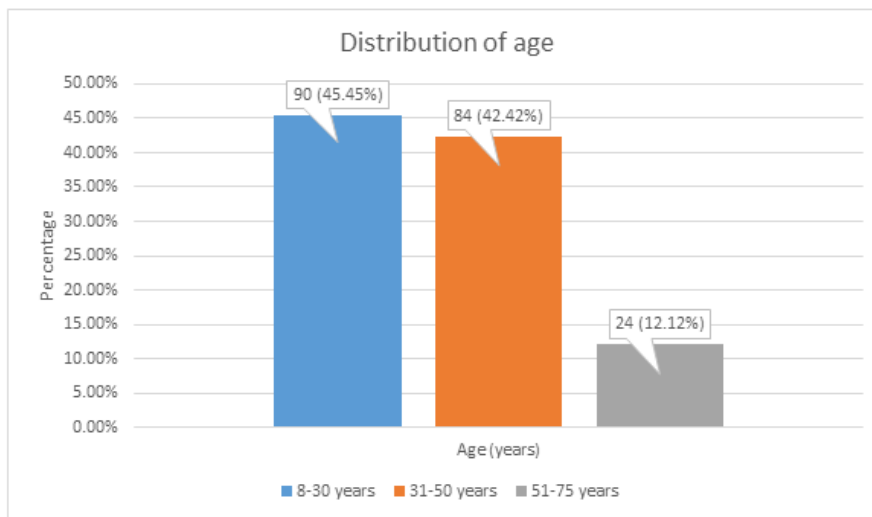
Stratification of HIT-6 score with the demographic and clinical features showed a statistically significant relationship with age (p-value= 0.001), marital status (p-value= 0.001), socioeconomic status (p-value= 0.001), quality of headache (p-value= 0.001), site of headache (p-value= 0.009), pulsatile/non-pulsatile feature (p-value= 0.002), frequency of headache (p-value= 0.02),

the severity of headache (p-value= 0.001), and nausea (p-value= 0.049). Younger patients who were married, belonged to working or lower socioeconomic class, and had daily, moderate to severe intensity, stabbing,

unilateral or pulsatile headaches in the absence of nausea had their daily lives more affected, as shown in Table 5.

Age (years)	N	Minimum	Maximum	Mean	Standard deviation
	198	8	75	34.39	15.578

**Table 1:** Analysis of age.



**Figure 1:** Distribution of age.

Variable	Category	N (%)
Gender	Male	69 (34.8%)
	Female	129 (65.2%)
Marital Status	Unmarried	81 (40.9%)
	Married	117 (59.1%)
Socioeconomic status	Lower class	94 (47%)
	Working class	87 (43.9%)
	Middle class	15 (7.6%)
	Upper class	3 (1.5%)
Type of headache	Primary headache	150 (75.8%)
	Secondary headache	48 (24.2%)
Quality of headache	Throbbing	45 (22.7%)
	Stabbing	87 (43.9%)

	Pressing	66 (33.3%)
Site of headache	Unilateral	108 (54.5%)
	Bilateral	90 (45.5%)
Pulsatile/Non-pulsatile	Pulsatile	102 (51.5%)
	Non-pulsatile	96 (48.5%)
Duration of headache	~1 Hour	51 (25.8%)
	>4 hours	42 (21.2%)
	Continuous	105 (53%)
Frequency of headache	2-3 times/week	51 (25.8%)
	Daily	81 (40.9%)
	Variable	66 (33.3%)
Timing of headache	Morning	39 (19.7%)
	Afternoon	12 (6.1%)
	Evening	24 (12.1%)
	Night	30 (15.2%)
	Variable	93 (47%)
Severity of headache	Mild	36 (18.2%)
	Moderate	93 (47%)
	Severe	69 (34.8%)
Aura	Yes	69 (34.8%)
	No	129 (65.1%)
Nausea	Yes	36 (18.2%)
	No	162 (81.8%)
Vomiting	Yes	42 (21.2%)
	No	156 (78.8%)
Photophobia/phonophobia	Yes	42 (21.2%)
	No	156 (78.8%)
Runny nose	Yes	9 (4.5%)
	No	189 (95.5%)
Lacrimation	Yes	18 (9.1%)
	No	180 (90.9%)

**Table 2:** Analysis of demographic and clinical features of headaches.

Diagnosis	N (%)
Brain damage	3 (1.5%)
Cervical spondylosis	3 (1.5%)
Depression	3 (1.5%)

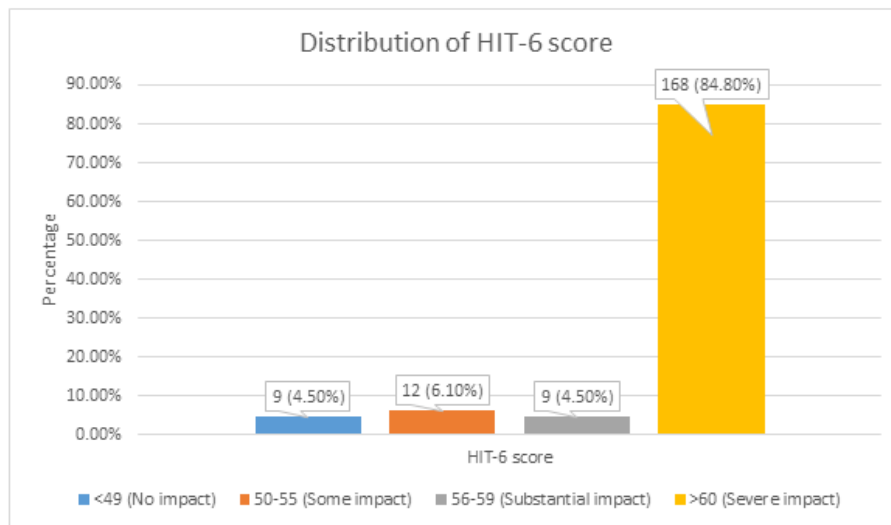
Epilepsy	15 (7.5%)
Increased intracranial pressure	3 (1.5%)
Mental impairment	3 (1.5%)
Mental retardation	3 (1.5%)
Migraine	60 (30.3%)
Parkinson's disease	3 (1.5%)
Chorea	3 (1.5%)
Stress related	3 (1.5%)
Stroke	12 (6%)
Thyroid insufficiency	3 (1.5%)
Tension-type headache	78 (39.4%)
Vertigo	3 (1.5%)

**Table 3:** Attending physician's diagnosis.

HIT-6 score	N	Minimum	Maximum	Mean	Standard deviation
	198	43	78	65.86	7.506

HIT- Headache Impact Test

**Table 4:** Analysis of HIT-6 score.



HIT- Headache Impact Test

**Figure 2:** Distribution of HIT-6 score.

Variables		HIT-6 score				p-value
		<49	50-55	56-59	>60	
Age (years)	8-30	9	6	9	66	0.001
	31-50	0	6	0	78	
	51-75	0	0	0	24	
Gender	Male	3	3	6	57	0.204
	Female	6	9	3	111	
Marital Status	Unmarried	6	9	9	57	0.001
	Married	3	3	0	111	
Socioeconomic status	Lower class	3	3	3	84	0.001
	Working class	3	6	6	72	
	Middle class	3	0	0	12	
	Upper class	0	3	0	0	
Type of headache	Primary headache	6	9	6	129	0.823
	Secondary headache	3	3	3	39	
Quality of headache	Throbbing	0	0	3	42	0.001
	Stabbing	9	3	3	72	
	Pressing	0	9	3	54	
Site of headache	Unilateral	6	9	9	84	0.009
	Bilateral	3	3	0	84	
Pulsatile/Non-pulsatile	Pulsatile	6	0	6	90	0.002
	Non-pulsatile	3	12	3	78	
Duration of headache	~1 Hour	3	6	0	42	0.077
	>4 hours	6	6	6	87	
	Continuous	0	0	3	39	
Frequency of headache	2-3 times/week	0	3	6	42	0.020
	Daily	3	6	3	69	
	Variable	6	3	0	57	
Timing of headache	Morning	0	3	0	36	0.098
	Afternoon	0	0	0	12	
	Evening	3	0	0	21	
	Night	3	3	3	21	
	Variable	3	6	6	78	
Severity of headache	Mild	6	6	0	24	0.001
	Moderate	0	6	6	81	
	Severe	3	0	3	63	
Aura	Yes	3	3	3	60	0.900
	No	6	9	6	108	



Nausea	Yes	0	0	0	36	0.049
	No	9	12	9	132	
Vomiting	Yes	0	0	3	39	0.077
	No	9	12	6	129	
Photophobia/phonophobia	Yes	3	0	0	39	0.077
	No	6	12	9	129	
Runny nose	Yes	0	0	0	9	0.641
	No	9	12	9	159	
Lacrimation	Yes	0	0	0	18	0.316
	No	9	12	9	150	

HIT- Headache Impact Test

**Table 5:** Association of demographic and clinical features of headaches with HIT-6 score.

#### 4. Discussion

This study is a glimpse of the characteristics of headache disorders classified and diagnosed according to ICHD-II. Our study also depicts the impact of headaches on daily life using a standardized HIT-6 questionnaire. The majority of the patients were female. Previous studies have also shown more prevalence of headache disorders in females. Jensen et al. reported male to female ratios of 1:3 and 4:5 in migraine and tension-type headache respectively [6]. Other studies from our region also reported that most types of headaches are more common among females [7, 8]. Migraine and tension-type headaches are the two most frequent headaches reported in our study. Tension-type headache was the most frequently diagnosed headache type in our study. Statistical evidence also suggests that tension-type headache is the most common cause of primary headaches [3, 9]. However, epidemiological data on the prevalence of tension-type headache has been heterogeneous [10, 11]. The wide variations of estimated prevalence might be due to the differences in the age profiles, racial backgrounds, environment, and data collection methodology. Other explanations for this disparity include under-recognition of tension-type headache as a 'real disease' by patients and health

practitioners, lower individual morbidity of tension-type headache, and lack of medical referral system in our country. More epidemiological data are needed to test these explanations. The majority of the patients reporting headaches belonged to lower socioeconomic groups. This is consistent with the findings of Holstein et al. who thoroughly studied the association between socioeconomic status and the frequency of headaches among adolescents. The prevalence of frequent headaches among adolescence increased with decreasing socioeconomic status [12]. However, the association between socioeconomic status and headaches is still an understudied issue. More studies are needed to establish a statistical interaction between the frequency of headaches and socioeconomic factors.

Assessments from the HIT-6 score showed that most of the patients were affected to a severe degree [13, 14]. The literature review also suggests that the amount of disability associated with tension-type headache is much higher than with migraine especially when measured as absence from work [15]. Similarly, Edmeads et al. in their population survey, reported that at least three-quarters of both migraine and tension-type headache sufferers had impaired relationships with their families

and partners. About 50 % of the subjects in this study believed that headaches influenced their families, and 35 % of the sufferers indicated that headaches influenced their social plans [16]. Increasing awareness and improving the capability of primary care physicians to manage tension-type headache and migraine is likely to help decrease the associated burden. Stratification of HIT-6 score with various clinical and demographic features like age, marital status, socioeconomic status, quality of headache, site of headache, pulsatile/non-pulsatile feature, the frequency of headache, the severity of headache, and nausea showed a statistically significant relationship. Similar results were reported by Jelinski et al. They conducted a study across five headache centers throughout Canada with a sample size of 865 patients. They concluded that the average age of the patients was 40 years with the majority of them being females. Most of the patients had headaches every day and the majority of the patients were diagnosed with either migraine or tension-type headache [13].

## 5. Conclusions

Patients seeking medical advice for headaches are mostly young to middle-aged married females of low socioeconomic status. Tension-type and migraine headaches are the most common clinical presentations of headaches. The impact of headaches on daily activities is associated the patient's age, marital status, socioeconomic status, quality of headache, site of headache, pulsatile/non-pulsatile feature, frequency of headache, the severity of headache, and nausea. Follow-up studies to describe the epidemiology and burden of headaches and to find out the actual relationship of the aforementioned factors with HIT-6 score is still needed.

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