Original Research Article

DOI: https://dx.doi.org/10.18203/2394-6040.ijcmph20204557

Migraine headache prevalence in Taif city, Saudi Arabia

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Received: 11 October 2020 Revised: 18 October 2020 Accepted: 19 October 2020

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ABSTRACT

Background: Migraine is a public health concern and is the third most common cause of disability for individuals below the age of 50. Despite the multiplicity of studies on the epidemiology and nature of diseases around the world, except from Saudi Arabia. Present study was conducted to see the prevalence of migraine in Taif city, Saudi Arabia. **Methods:** This was a cross sectional analysis of 354 individuals in Taif area. Data were collected via a self directed questionnaire, including demographic variables, clinical variables and therapeutic variables. Data was moved to the device and analyzed using SPSS software.

Results: As a result, of the 354 recruited participants, 54% were female and 46% were male. Migraine existed in 89.9% of the urban population. About 24% of migrants were unemployed, and 16% were non workers. Headache found in 71.6% of males and 86.9% of females (p=0.002). Gender has been substantially associated with migraine prevalence (odds ratio 0.28). Approximately 47% posted a pain score of 4-6. In 32.4% of females and 26.6% of males, medical advice was sought. Nausea occurred in more than one-third of patients before and after a headache. Just 31.4% of participants were conscious of migraine causes.

Conclusions: The past of the family was found in 64% of the participants. In Taif city, migraine is prevalent. It is more prevalent among women and urban areas.

Keywords: Migraine headache, Taif, Prevalence

INTRODUCTION

Migraine is projected to be the third cause of impairment according to the 2015 Global burden disease (GBD) for

individuals under the age of 50. It may be serious enough to compromise the quality of life and day-to-day activities. Trigeminovascular theory is the most accepted pathophysiological explanation for migraine. Trigeminal nerve fibers covering the basal meningeal and cerebral

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vessels are thought to activate and eventually release various inflammatory mediators such as vasoinhibitor peptide (VIP) and calcitonin-related peptide (CGRP). This substance induces local neurogenic inflammation, induces vasodilatation and activates other nerve fibers. Pain signals are centrally distributed to the thalamus and the sensory cortex.^{2,3}

Popular migraine causes include long-term fasting, hypoglycemia, sleep disruption, psychological stress, hormonal changes such as oral contraceptive pills, menstruation, and ovulation, and certain drugs (such as nitroglycerin, reserpine, and estrogen. Migraine can occur with aura (typical migraine) or without aura (classical migraine). Migraine can also progress through several stages, such as prodrome, aura, headache attack, and post prodrome.³ The prodrome usually precedes headache for up to 1 day. During this level, the patient can experience irritability, mood fluctuations, changes in appetite, anorexia or food cravings, sleep disturbances, and salt and water retention. It is commonly seen in patients with traditional migraine (aura migraine). Migraine aura is a focal cerebral disorder that precedes the onset of headache in migraines at 10-20 per cent.⁴ It typically lasts for 5-20 minutes on average.

Migraine aura can be visual (e.g. blurred vision, spectra of fortification, scintillation, micropsy, macropsy, or black spots), sensory, motor, autonomic, cognitive, mental, or dizzy. The stage of headache typically lasts for hours and can persist for many days (migraine status).⁵ It is normally serious and interferes with day-to-day tasks and even sleep. During the post prodrome stage, the migraineur feels tired and lethargic, or less generally energized and energized.³

Migraine is a public health issue that has been widely researched over the last decades. It is prevalent in teenagers and young adults. Despite the multiplicity of studies addressing the prevalence of migraine in different countries, local studies in Saudi Arabia are minimal and studies in Taif city are scarce. As a result, this research was performed.

METHODS

Subjects and nature of the analysis

Current study is a cross-sectional analysis conducted using a pre-designed questionnaire conducted via an online survey in August 2017. The survey was approved by the university ethics board and survey was conducted among patients suffering from headaches in Taif city, Saudi Arabia.^{5,6}

Criteria of the international headache society (IHS)

It is not possible to diagnose migraine based on a clinical review in a significant number of population-based surveys. In such cases, the advantage of the IHS guidelines is that they provide a systematic and organized process for incorporating medical history as a basis for diagnosis. The IHS migraine types are migraine without aura (IHS 1.1) and migraine with aura (IHS 1.2).⁶ For patients to be listed as a migraine respondent, they must have had five or more headaches in their lifetime fulfilling the various criteria mentioned below;

The IHS criteria for migraine

- At least five attacks fulfilling criteria B-D.
- Headache attacks lasting for 4-72 hours (untreated or unsuccessfully treated).
- Headache has at least two of the following four characteristics; unilateral location, pulsating quality, moderate or severe pain intensity and aggravation by or causing avoidance of routine physical activity (e.g., walking or climbing stairs).
- Headache with at least one of the following; nausea and/or vomiting, photophobia and phonophobia.
- Not better accounted for another ICHD-3 diagnosis.

Migraine with aura

- At least two attacks fulfilling criteria B and C.
- One or more of the following fully reversible aura symptoms; visual, sensory, speech and/or language, motor, brainstem and retinal.
- At least two of the following four characteristics; at least one aura symptom spreads gradually over >5 minutes, and/or two or more symptoms occur in succession, each individual aura symptom lasts 5-60 minutes, at least one aura symptom is unilateral and aura is accompanied, or followed within 60 min, by headache.
- Not better accounted for another ICHD-3 diagnosis, and transient ischemic attack has been excluded.

Inclusion and exclusion criteria

Current study is a cross-sectional survey analysis using a pre-specified questionnaire, which was distributed as hard copies by research collaborators. Questionnaire was organized by a series of questions about headaches and related symptoms to eventually assess if the respondent met the above-mentioned HIS requirements (A-E) as listed above. The questionnaire was translated into Arabic and, if possible, the questions were rephrased in the everyday language. The HIS criteria sub classify people with non-migraine headaches into tension-type and cluster headaches; however, this distinction was not needed in our survey and would significantly add futile effort and time. People reporting non-migraine headaches were then listed as headaches. The third class of respondents were those who reported no headaches in the past year (no headaches). There was no pilot study done for current research, the surveys were performed by local teams in each hospital. The survey kit included a cover letter and a questionnaire with Arabic and English

versions. Each patient was asked to read the survey and determine whether or not to participate.⁷

Sample size was calculated using the following formula:

$$\frac{z2 \times p(1-p) \div e2}{1 + (z2 \times p(1-p) \div e2N)}$$

Statistical analysis

All data obtained were moved to a spreadsheet for further review. Standard descriptive measures were determined on an individual basis for each question/item. SPSS 24 for Windows (SSPS Inc., Chicago, IL, USA) was used for data processing. Prevalence is expressed as a proportion and 95% confidence intervals (CIs) were determined for all patients, excluding those with any related diseases from the study. Migraineur status was modelled as a binary dependent variable (yes/no) using multiple logistic regression to analyze associations with age covariates, gender, habitat, marital status, employment status, educational level and smoking tobacco.⁸

RESULTS

Three hundred and fifty four individuals were included in current research. Females accounted for 54.3 per cent and males accounted for 45.7 per cent of the study. Among the 354 individuals surveyed, the gender-specific prevalence of headache was almost equal (64.4%) among the sexes. However, the aura existed in 16.3% of females and just 6.7% of males. The gender specific distribution of headache is depicted in (Table 1 and Figure 1).

Table 1: Prevalence of migraine in different study groups sorted by gender.

Diagnosis	Females N (%)	Males N (%)
Migraineurs with aura	26 (16.3)	13 (6.7)
Migraineurs without aura	10 (6.3)	1 (0.5)
Headachers	103 (64.4)	125 (64.4)
Non-headachers	21 (13.1)	55 (28.4)
Total	160 (100)	194 (100)

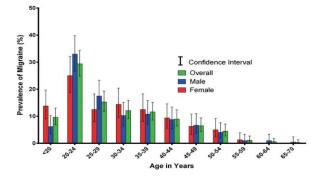


Figure 1: Sex specific prevalence of migraine with associated CI sorted by age.

Demographic variables between genders

Variations in the outcomes of different demographic variables which have been studied are shown in (Table 2); some of these have shown statistically significant differences. The vast majority of the individuals studied were urban rather than rural, with figures of 89.8% and 10.2% respectively. Females living in cities (94.4%) were substantially higher than males (89.8%) (p=0.010). There was no statistically significant difference between the marital states or the educational level of the subjects studied. 40% of the participants were unemployed and 28% were non-workers. Among females, 29.4% were unemployed and 30% were non-worker students, while 16% and 23.7% were unemployed and non-worker students, respectively (p<0.001). More than three fourth (78.5%) of participants were non-smokers, with smokers comprising 36.1% of males and 3.1% of females (p< $0.00\bar{1}$).^{8,9}

Characteristics of migraine and use of medicines

78.5% of subjects examined had a migraine headache. Characteristics of migraine headache, medications used and outcome of treatment among males and females is shown in (Table 3). Migraine headache was substantially more prevalent in females (86.9%) than males (71.6%) (p=0.002). More than half of the recruited individuals reported having had more than five prior headache attacks, with scores of 62.6% and 55.8% among females and males, respectively (p<0.001). As for the length of headache, males tended to have shorter headaches than females. 58% of males reported that their headache lasted longer than 4 hours, while only 34.5% reported such brief headaches. The migraine status (headache lasting more than 72 hours) was higher among females with a figure of 5.6% compared to only 1.4% among males. The variations, however, were not statistically important. 10

The vast majority of the individuals studied reported pain scores ranging from 4 to 6. Among females, 37.4%, 32.4% and 15.8% reported pain scores of 4-6, 6-9 and >9, respectively, while 54.7%, 22.3% and 5% reported pain scores of 4-6, 6-9 and > 9, respectively (p=0.002). The type of headache was also statistically different among the groups studied. Throbbing headaches were reported by 49.6% and 56.8%, respectively, of females and males. Next came pressure headaches of 46.6% and 42.4% for females and males, respectively (p=0.001).11,12 As far as medical advice was concerned, less than one-third of the recruited subjects had seen doctors. Just 32.4% of females and 26.6% of males reported seeing a doctor. Most of them did not have a headache investigation, with a ranking of 77.7% for females and 87.8% for males. CT brain tended to be the most common research performed between 7% of females and 4.3% of males, followed by blood tests and EEG (p=0.001). Males received more drugs than females; the findings of the study revealed that 56.1% of females and 59% of males received headache medicine. Among males, 37.8% reported that it had always improved, while only 35.9% of females reported it (p=0.003).¹³

Table 2: Different demographic characteristics among study participants.

Variables	Fema	Female			Tota	1	P value
Variables	N	%	N	%	N	%	
Habitat							
City	151	94.4	167	86.1	318	89.8	0.010*
Town/village	9	5.6	27	13.9	36	10.2	0.010
Marital status							
Divorced	6	3.8	1	0.5	7	2.0	
Married	74	46.3	88	45.4	162	45.8	0.056
Single	78	48.8	105	54.1	183	51.7	0.030
Widow	2	1.3	0	0.0	2	0.6	
Employment status							
Employed	47	29.4	95	49.0	142	40.1	
Retired	2	1.3	15	7.7	17	4.8	
Student "not working"	53	33.1	46	23.7	99	28.0	< 0.001†
Student "working"	10	6.3	7	3.6	17	4.8	
Unemployed	48	30.0	31	16.0	79	22.3	
Education level							
Bachelor's	101	63.1	104	53.6	205	57.9	
Diploma	6	3.8	11	5.7	17	4.8	
High school/or less	43	26.9	69	35.6	112	31.6	0.232
Master	7	4.4	9	4.6	16	4.5	
PhD	3	1.9	1	0.5	4	1.1	
Smoking tobacco							
No	155	96.9	123	63.4	278	78.5	< 0.001+
Yes	5	3.1	71	36.6	76	21.5	< 0.001†

^{*}The Chi-square statistic is significant (p<0.05), †The Chi-square statistic is significant (p<0.001).

Table 3: Characteristics migraine and associated diagnostics/medications among study participants.

Variables	Female		Male		Total		D 1
variables	N	%	N	%	N	%	P value
Headache							0.002*
No	21	13.1	55	28.4	76	21.5	0.002*
Yes	139	86.9	139	71.6	278	78.5	
Headache frequency							
2-4	29	20.9	36	25.9	65	23.4	< 0.001†
Five times and more	87	62.6	68	48.9	155	55.8	
Less than 2 times	23	16.5	35	25.2	58	20.9	
Headache duration							
1-3 days	25	18.0	9	6.5	34	12.2	
13-24 hours	13	9.4	7	5.0	20	7.2	0.108
6-4 hours	34	24.5	31	22.3	65	23.4	0.108
7-12 hours	11	7.9	9	6.5	20	7.2	
Less than 4 hours	48	34.5	81	58.3	129	46.4	
More than 3 days	8	5.8	2	1.4	10	3.6	
Pain score							
1-3	20	14.4	25	18.0	45	16.2	0.002*
4-6	52	37.4	76	54.7	128	46.0	0.002*
6-9	45	32.4	31	22.3	76	27.3	
>9	22	15.8	7	5.0	29	10.4	
Pain type							
Burning pain	6	4.3	1	0.7	7	2.5	0.001*
Pressure pain	64	46.0	59	42.4	123	44.2	
Throbbing pain	69	49.6	79	56.8	148	53.2	

Continued.

Variables	Female		Male		Total		P value
	N	%	N	%	N	%	r value
Examined by a doctor		•					
No	94	67.6	102	73.4	196	70.5	< 0.001†
Yes	45	32.4	37	26.6	82	29.5	
Investigations done							
Blood tests	10	7.2	3	2.2	13	4.7	
CT	10	7.2	6	4.3	16	5.8	
EEG	4	2.9	6	4.3	10	3.6	
MRI	1	0.7	1	0.7	2	0.7	0.001*
MRT	5	3.6	0	0.0	5	1.8	
None	108	77.7	122	87.8	230	82.7	
X-ray	1	0.7	1	0.7	2	0.7	
Headache medications							
No	61	43.9	57	41.0	118	42.4	0.009*
Yes	78	56.1	82	59.0	160	57.6	
Improvement by medications							
Always	28	35.9	31	37.8	59	36.9	
Never	1	1.3	1	1.2	2	1.3	0.003*
Sometimes	49	62.8	50	61.0	99	61.9	-

^{*}The Chi-square statistic is significant (p<0.05), \dagger Chi-square statistic is significant (p<0.001).

Table 4: History and nature of the attacks among study participants.

Variables	Fen	nale	Ma	Male		1	P value
	N	%	N	%	N	%	P value
Symptoms before attack							
Muscle weakness	3	1.9	7	3.6	10	2.8	
Nausea	33	20.6	21	10.8	54	15.3	
None	58	36.3	63	32.5	121	34.2	
Numbness in the skin	2	1.3	4	2.1	6	1.7	0.002*
Sensitivity to light	16	10.0	6	3.1	22	6.2	
Sensitivity to noise	7	4.4	9	4.6	16	4.5	
Sight disorders	15	9.4	26	13.4	41	11.6	
Speech defects	2	1.3	3	1.5	5	1.4	
Vomiting	2	1.3	0	0.0	2	0.6	
Symptoms during attack							
Nausea	58	36.3	21	10.8	79	22.3	
None	31	19.4	71	36.6	102	28.8	< 0.001†
Sensitivity to light	25	15.6	29	14.9	54	15.3	
Sensitivity to noise	19	11.9	17	8.8	36	10.2	
Vomiting	5	3.1	1	0.5	6	1.7	
Symptoms after attack							
Muscle weakness	8	5.0	6	3.1	14	4.0	
Nausea	9	5.6	10	5.2	19	5.4	
None	94	58.8	99	51.0	193	54.5	
Numbness in the skin	2	1.3	2	1.0	4	1.1	0.108*
Sensitivity to light	9	5.6	4	2.1	13	3.7	
Sensitivity to noise	6	3.8	6	3.1	12	3.4	
Sight disorders	5	3.1	8	4.1	13	3.7	
Speech defects	3	1.9	3	1.5	6	1.7	
Vomiting	2	1.3	1	0.5	3	0.8	
Knowing the trigger							0.002*
No	80	50.0	87	44.8	167	47.2	0.002*
Yes	59	36.9	52	26.8	111	31.4	

Continued.

Variables	Fen	Female		Male		l	P value
	N	%	N	%	N	%	r value
Waking up by pain							
Always	16	10.0	7	3.6	23	6.5	0.001
Never	63	39.4	79	40.7	142	40.1	
Sometimes	59	36.9	52	26.8	111	31.4	
Family history of headache							< 0.0014
No	42	30.2	58	41.7	100	36.0	< 0.001†
Yes	97	69.8	81	58.3	178	64.0	

^{*}The Chi-square statistic is significant (p<0.05), †Chi-square statistic is significant (p<0.001).

Table 5: Logistic regression between different co-variables and migraine prevalence.

Predictors	В	SE	Adjusted OR (95% CI)†	P value
Age	-0.03	0.02	0.97 (0.93 - 1.02)	0.219
Gender	-1.28	0.42	0.28 (0.12 - 0.63)	0.002*
Habitat	-0.77	0.77	0.46 (0.1 - 2.11)	0.320
Marital status	-0.46	0.37	0.63 (0.3 - 1.3)	0.211
Employment status	-0.22	0.12	0.8 (0.64 - 1.01)	0.060
Education level	0.06	0.15	1.06 (0.79 - 1.42)	0.694
Smoking tobacco	0.01	0.51	1.01 (0.37 - 2.76)	0.978

The form of migraine attack

The essence and characteristics of migraine attacks is revealed in (Table 4). The vast majority of patients reported no related symptoms before, during, or following migraine attacks. However, several others reported nausea, vomiting, fatigue, light sensitivity, noise, visual disruption, or speech issues. Nausea was found to be the most influential event encountered by patients before, during and after a migraine attack. Before the attack, 20.6% of females and 10.8% of males reported a feeling of nausea. Nausea also recorded 36.3% of females and 10.2% of males during the attack and 5.6% of males and 5.2% of males following the attack. Sensitivity to light was as common as nausea following migraine attacks, reported by 5.6% and 2.1% of both females and males. 14,15

Vomiting, on the other hand, was the least symptom encountered before, during, or after the migraine attack. 1.3% of females were recorded before the attack, 3.1% of females and 1% of males were recorded during the attack and 1.3% of females and 0.5% of males were reported after the attack. Less than one-third (31.4%) of participants reported that migraine triggers could be identified; males could recognize triggers more than females (p=0.0027). 41% of men reported that their headaches had never woken them out of sleep, and 39.4% of women reported that. The family history of migraine was reported among 69.8% of female participants and 58.3% of male participants.¹⁶

Correlation between demographic and migraine variables

Logistic regression was conducted to investigate the association between various co-variables and migraine prevalence. Age, gender, habitat, marital status, employment status, educational level and smoking have all been examined. Gender was found to be the only demographic variable significantly associated with migraine prevalence (p=0.002). The odds ratio was 0.28 indicating that males were only 0.28 times more likely to develop migraine than females (Table 5).

DISCUSSION

Migraine headache is a common neurological condition that affects the Saudi population. The prevalence of headache in Taif city was found to be higher than the prevalence reported in various studies. For example, 53.2% of subjects studied in Brazil in 2005.⁷ 33.8% in Nairobi and 27.9% in Kuwait reported a headache. Females appeared to be significantly more affected than males (p=0.002), with an odds ratio of 0.28 for the gender difference. This finding is consistent with previous literature studies that have shown that migraine headache is more prevalent among females.⁷⁻¹¹

High prevalence of migraine among females can be due not only to hormonal changes but also to central cortical excitability. ^{12,13} Migraine headache was also found to be more prevalent among city dwellers than in rural habitats. The stressful life of the city and the lack of meditation and soothing nature of the country can be the reasons behind the high prevalence of migraine among the

inhabitants of the city. Migraine was significantly associated with high unemployment rates (p<0.001). Up to one-half of males and two-thirds of females were either unemployed or unemployed.

On the contrary of the existing knowledge, this study shows that males seemed more eager to seek medical advice (p<0,001) and to receive medication (p=0,009). Females' less interest in drugs may be due to their lower reaction, higher pain tolerance, socio-economic problems, or other factors. More than three-fourths of the sample recruited did not undergo a headache investigation.²⁰

About half of the female and male participants experienced throbbing in the clinical presentation of headache, which is consistent with the essence of classical migraine headache.3 Up to 40% of the participants never wake up from sleep. More than onethird of recruited subjects reported no symptoms associated with migraine. Nausea, fatigue, numbness, visual and speech symptoms have been identified and there has been a major gender difference. This is consistent that substantial gender disparities in migraineassociated symptomology, aura, and headache related impairment. Nausea was the most frequently encountered symptoms in our research before, during or after headache. In disagreement with us, phonophobia and photophobia were more common than nausea in both males and females. 16,17

About one-third of our studied participants had prior knowledge of migraine causes, and females appeared to be more ignorant of them than males (p=0.002). This figure is close to the results that migraines could identify less than half of the migraine triggers. The family history of migraine was high among the population surveyed in more than two-thirds of subjects. Females have had a more favourable family history of migraines than men. ¹⁸ This is consistent with previous literature studies that suggested a high prevalence of positive family history among migraine patients. ¹¹⁻¹⁹

About the limitations of the study, there was not enough time to widen the research and expand the sample size, and some patients was not co-operative with the researchers, for private reasons, to fulfil this research.²⁰

CONCLUSION

Migraine is prevalent in the city of Taif, Saudi Arabia. It is more prevalent among women and urban areas. Migraine causes negative consequences and is associated with high unemployment rates. Most Saudi migraines have throbbing, mildly intense headaches that do not awaken them from sleep. Females experience more frequent headaches, while men seek more medical advice and take medicines. Nausea is the most common migraine-related symptom. Only one-third of Saudi migrants have background knowledge of migraine

triggers. The family history of migraine is very common among Saudi migrants.

Funding: No funding sources Conflict of interest: None declared

Ethical approval: The study was approved by the

Institutional Ethics Review Committee.

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Cite this article as: Hassan KM, Addas OK, Alharthy FT, Banan AA, Alhazmi AA, Dabi MM, et al. Migraine headache prevalence in Taif city, Saudi Arabia. Int J Community Med Public Health 2020;7:4242-9.