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Prevalence and Risk Factors Associated with Depression in Patients with Primary Headache Disorders

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ABSTRACT

Background: *Primary headache disorders and depression are two of the most common health problems that health professionals encounter. No previous epidemiological studies have investigated the relationship between these conditions in Saudi population.* ***Objective:*** *To evaluate the prevalence and correlates of major depression in patients with Primary headache disorders.* ***Patients and Methods:*** *Cross sectional study of randomly selected sample of patients with primary headache who were seen in neurology clinic in three tertiary care Centers in Aseer region. Data collected from medical records, which include relevant socio-demographic & clinical variables, headaches were classified based on the third edition of International Classification of Headache Disorders (ICDH-3 BETA) while Hamilton Depression Rating Scale (HAM-D) was used to assess depression.* ***Results:*** *1025 subjects were included, with the mean age 29 ± 10 years, males 40.3% & females 59.7%. Those who met the criteria for migraine were 264 (25.8%) most of them were males (59.1%), married and older. 24.2% were diagnosed as probable migraine. Tension type headache was diagnosed in 293 patients (28.6%) while rest 21.4% had other type of headaches. Depression was prevalent in those with migraine 222 (84.1%) but surprisingly no clear association with severity noted and no difference when compared with those who did not meet the criteria for migraine of have other types of headache P=0.87 Odds ratio and 95% Cl=0.97 [0.66:1.4]. However, there were significant association between frequency of headaches and depression (P=0.001).* ***Conclusion:*** *Depression is common in patients with migraines and other types of headache. In our population depression was significantly associated with increase of the frequency of headaches regardless of severity of attacks.*

Keywords: Depression, Migraine, Frequency, Primary headaches, Severity

INTRODUCTION

Headache is a nearly universal disorder and it is estimated that nearly half of world's adult population suffering from active primary headache disorder. Migraine is the second most common primary headache disorder following tension type headache, afflicting one in every eight people. It is characterized by throbbing and relatively unpredictable episodes of head pain that may last up to three days [1]. Various studies have shown that patients with migraine have a higher frequency of depression and anxiety: a finding that will be unsurprising to most people that deal with pain. We could try to explain this as the psychological reaction to the pain and its unpredictability. Nevertheless, the link is deeper than that [2-4]. The depressed patient often presents a wide variety of complaints that can be categorized as

physical, emotional, and psychic. The physical complaints include chronic pain and headaches; sleep disturbances; severe insomnia and early awakening; appetite changes; anorexia and rapid weight loss; and a decrease in sexual activity, ranging at times to impotence in males and amenorrhea or frigidity in females. Emotional complaints include feeling "blue," anxiety, and rumination over the past, present, and future. Finally, psychic complaints may include such statements as "morning is the worst time of day," suicidal thoughts, and death wishes [5-7].

The focus is to estimate the relationship between primary headache and in particular migraine, among Saudis and its effects on the patients psychologically and socially, and if they really should receive social and psychological care [8]. In a study from Neurological Institute, Taipei Veterans General Hospital it was shown that Compared with patients without migraine, Major depressive disorder (MDD) patients with had higher physical and anxiety scores on the three psychometric instruments. Migraine accounted for 5% to 11% of the effect of the total scores on the three psychometric scales. Approximately half (48.5%) of patients reported headache worsening during or after a depressive episode [9]. In another study from Italy, there was an association between migraine and psychiatric symptoms. This association was stronger with MDD and anxiety disorders. The association gets stronger with migraines with aura rather than without. They reported that migraine patient should be carefully screened for depression to improve quality of life and to gain more successful migraine therapies [10].

Researchers did this study after recognizing the lack of such studies in Aseer region. Since Aseer has become more urban, there are a lot of changes in the socioeconomic status and life style among people of Aseer region, which is considered as a stressful condition which is a known risk to develop migraine and depression consequently.

METHODOLOGY

A cross-sectional study on sample of 1025 patients who were previously diagnosed with primary headache patients and met the modified International Classification of Headache Disorders (ICHD), (males and females) attending Aseer Central Hospital in Abha, Saudi German hospital in Khamis Mushait, and King Abdullah Hospital in Bisha, kingdom of Saudi Arabia - Aseer region. Patients were selected from neurology clinic in the three hospitals using systematic random sampling technique by selecting each 10^{th} patient from the hospitals. Sample distribution among the hospitals based on probability proportionate to size. Patients were interviewed directly using face to face method.

Data Collection

Direct interview questionnaire that was designed by the researchers after intensive literature review was used for data collection. The questionnaire including demographic data, medical and family history of the patient. The Arabic version of migraine criteria according to ICHD [11] and a validated Arabic version of the Hamilton rating scale for depression [12].

Statistical Analysis

Data were collected, coded, and fed to statistical software IBM SPSS version 20. The given graphs were constructed using Microsoft excel software. All statistical analysis was done using two tailed tests and alpha error of 0.05. P-value less than or equal to 0.05 was considered to be statistically significant. Regarding scoring system, the items discrete scores for depression scale were summed together then the sum of scores for each dimension and total score was calculated by summing the scores given for its responses and categorized based on original scale cutoff points. Descriptive statistics was done by showing frequencies and percentages for categorical variables. Mean score with SD were calculated for each depression domain with also displaying the most frequent response at each domain by calculating score mode. Chi-square or exact tests were used to test for association between depression and sample attributes and with also headache profile.

RESULTS

The included 1025 patient with diagnosis of primary headache syndrome whose ages ranged from 17 years to 85 years with mean age of 35.7 ± 12.8 years. About 85% of the included sample were females and 49.2% were married. The majority of the included patients were Saudi (97.9%) and 70.2% were highly educated. More than half of the sample (54.4%) had no work with family income exceeding 5000 SR in about 67.5%. More than 75% of the included patients were from city and 87.1% were nonsmokers (Table 1).

Table 1 Bio-demographic characteristics of patients with chronic headache in Aseer region, Saudi Arabia in 2017

Bio-Demographic characteristics		No	%
Age in years	<20	131	12.80%
	20-30	455	44.40%
	30-40	263	25.70%
	>40	176	17.20%
Gender	Male	413	40.30%
	Female	612	59.70%
Marital status	Married	504	49.20%
	Single	487	47.50%
	Divorced/widow	34	3.30%
Nationality	Saudi	1003	97.90%
	Non-Saudi	22	2.10%
Education level	Primary school	37	3.60%
	Mid-school	38	3.70%
	High-school	230	22.40%
	University and above	720	70.20%
Occupation	Not working	558	54.40%
	Governmental	349	34.00%
	Private field/others	118	11.50%
Family income (in Saudi riyal)	25,000 or more	105	10.20%
	25000-15000	198	19.30%
	5000-15000	511	49.90%
	less than 5000	211	20.60%
Residence	Village	240	23.40%
	City	785	76.60%
Smoking	Current smoker	92	9.00%
	Ex-smoker	40	3.90%
	Non-smoker	893	87.10%

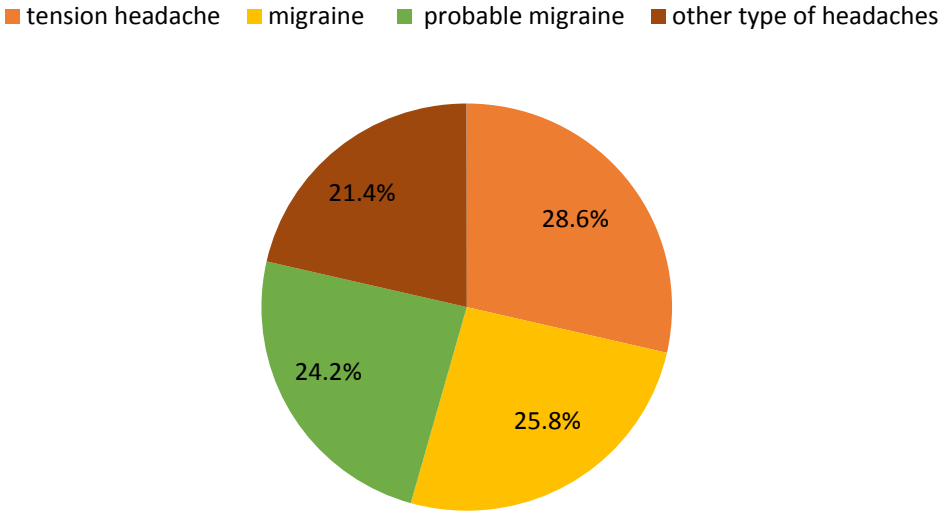

Figure 1 Sub-types of primary headache disorders in Aseer region, Saudi Arabia in 2017

Tension type headache was the most common diagnosis seen in 293 patients (28.6%) followed by migraine in 264 patients (25.8%) and 24.2% of patients were diagnosed as probable migraine, while the rest 21.4% had other type of headaches (Figure 1). As for chronic health problems (Figure 2), hypertension was the most frequently recorded one (28.2%) followed by diabetes mellitus (18.8%), thyroid disorders (16.1%), asthma was also recorded among 12.1% while stroke was the least frequently recorded problem (2%).

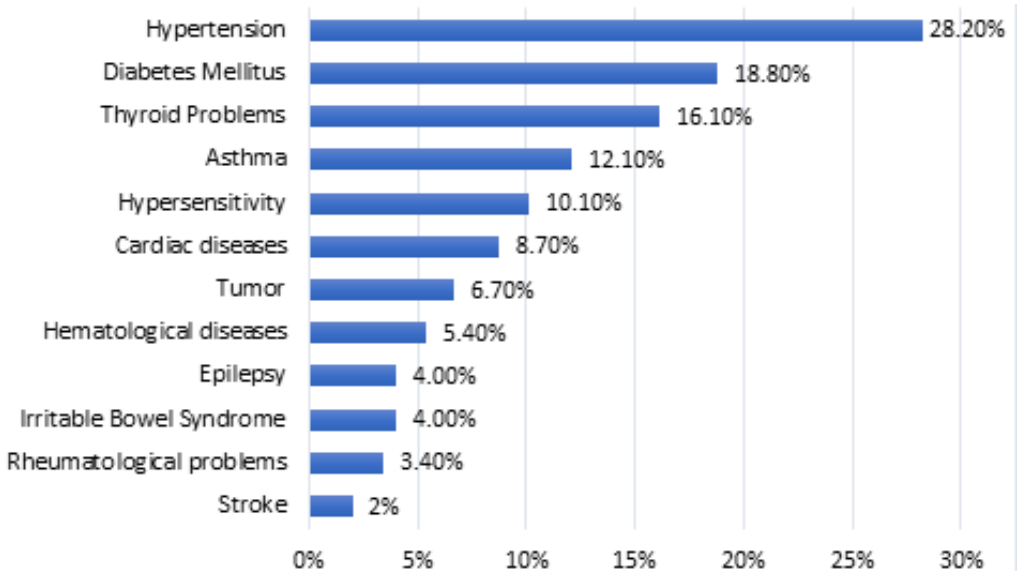

Figure 2 Chronic health problems recorded among patients with primary headache in Aseer region, Saudi Arabia in 2017

As for headache attacks, Table 2 illustrates that 76% of the sampled patients suffered from episodic recurrent headache attacks and 87.8% had migraine. Throbbing (84.3%) and higher intensity with movement (81.6%) were the most recorded features of headache attacks. High sounds, light exposure and nausea were the most associated symptoms (81.4%, 72.6% and 50.2%, respectively). Visual aura was the most recorded aura with headache attacks while exhaustion (74.4%) and sleep disturbances were the most triggering factors for having the attack. About 44% of the patient had the attack for 1 to 4 hours and 53.6% of them had the attack 1 to 2 times per month. Only 14.1% of the patient received headache prophylactic medications and 63.4% used analgesics.

Table 2 Headache profile as recorded among patients with primary headache in Aseer region, Saudi Arabia I 2017

Headache profile		No	%
Suffer from recurrent headache attacks	Yes	779	76.00%
	No	246	24.00%
Have migraine attacks	Yes	900	87.80%
	No	125	12.20%
Diagnosed before by a doctor with migraine	Yes	264	25.80%
	No	761	74.20%
Headache features	throbbing	864	84.30%
	One-sided (unilateral)?	812	79.20%
	increases with moving around	836	81.60%
Associated symptoms	nausea	515	50.20%
	vomiting	206	20.10%
	Increases with light exposure (photophobia)	744	72.60%
	Increases with sounds	834	81.40%
	Increases with certain scents or smells	459	44.80%
Headache aura	Visual aura (light flashes)	450	43.90%
	Sensory aura?	120	11.70%
	Language disturbances	203	19.80%
Headache triggers	Fasting	145	14.20%
	Sleep disturbance	478	46.60%
	Exhaustion	762	74.40%
	Some foods	73	7.10%
	Weather changes	240	23.40%
	Menstruation	14	1.40%

Duration of headache	< 1 hour	147	14.30%
	1-4 hours	450	43.90%
	5-24 hours	253	24.70%
	> 24 hours	175	17.10%
Headache attacks per month	1-2/month	549	53.60%
	2-4/month	240	23.40%
	> 4/month	236	23.00%
Usage of headache prophylaxis	Yes	145	14.10%
	No	880	85.90%
Usage of analgesics for headache	Yes	650	63.40%
	No	375	36.60%

On measuring depression rate (Table 3), depressed mood, insight were the worst recorded items (mean score of about 1.4 out of 4) followed with anxiety, insomnia, somatic symptoms, and backaches (mean score 1.1 out of 4). Generally, 84.4% of the sampled patients with chronic headache attacks were depressed (Figure 3) as mild depression was recorded among 25.1%, moderate depression among 24% while 20.7% were severely depressed (Figure 4).

Table 3 Descriptive of depression scale items among patients with primary headache in Aseer region, Saudi Arabia in 2017

HAM scale Items	Mean	SD	Mode
Depressed Mood (Gloomy attitude, pessimism about the future, feeling of sadness, tendency to weep)	1.5	1.3	2
Feelings of Guilt	1.1	1.3	0
Suicide	0.4	0.8	0
Work and Interests	0.9	1.1	0
Retardation (Slowness of thought, speech, and activity; apathy; stupor)	1.2	1.3	0
Anxiety - Psychic	1.7	1.5	0
Anxiety - Somatic Gastrointestinal, indigestion Cardiovascular, palpitation, Headaches Respiratory, Genito- urinary, etc.	1.5	1.1	1
Hypochondriasis	0.8	1.4	0
Insomnia - Initial (Difficulty in falling asleep)	1	0.7	1
Insomnia - Middle (Complains of being restless and disturbed during the night. Waking during the night.)	0.9	0.7	1
Insomnia - Delayed (Waking in early hours of the morning and unable to fall asleep again)	0.8	0.7	1
AGITATION (Restlessness associated with anxiety)	0.4	0.6	0
Somatic Symptoms - Gastrointestinal (Loss of appetite, heavy feeling in abdomen; constipation)	0.8	0.7	1
Somatic Symptoms - General (Heaviness in limbs, back or head; diffuse backache; loss of energy and fatigability)	0.9	0.7	1
Genital Symptoms (Loss of libido, menstrual disturbances)	0.5	0.7	0
Insight (Insight must be interpreted in terms of patient's understanding and background)	1.3	0.7	2
Weight loss	0.3	0.6	0

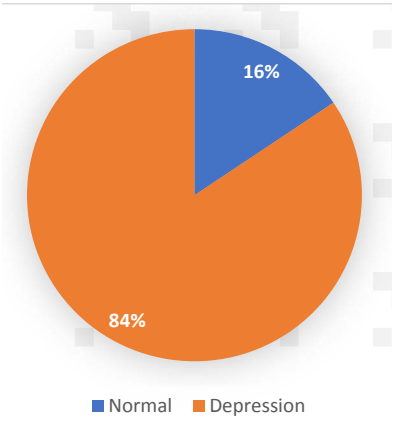

Figure 3 Prevalence of depression among patients with primary headache in Aseer region, Saudi Arabia in 2017

On relating depression status with sample characteristics (Table 4) it was found that depression rate was significantly higher among patients at young age (12.5% at below 20 years and 46.2 at those who aged 20-30 years). Also, 61.7% of the females were depressed compared to 38.3% of the males with statistical significance (P<0.05). Divorced, widow and single patients were significantly more depressed than normal. Also, depression rate was significantly higher among patients with no work (55.8%) compared to working group. About 22.4% of the patients with history of head injury were depressed compared to normal with head injury 10.6% of those who did not (P<0.05). Depression was recorded among 15.7% of patients with chronic health problem compared to 8.1% of healthy group with significance recorded.

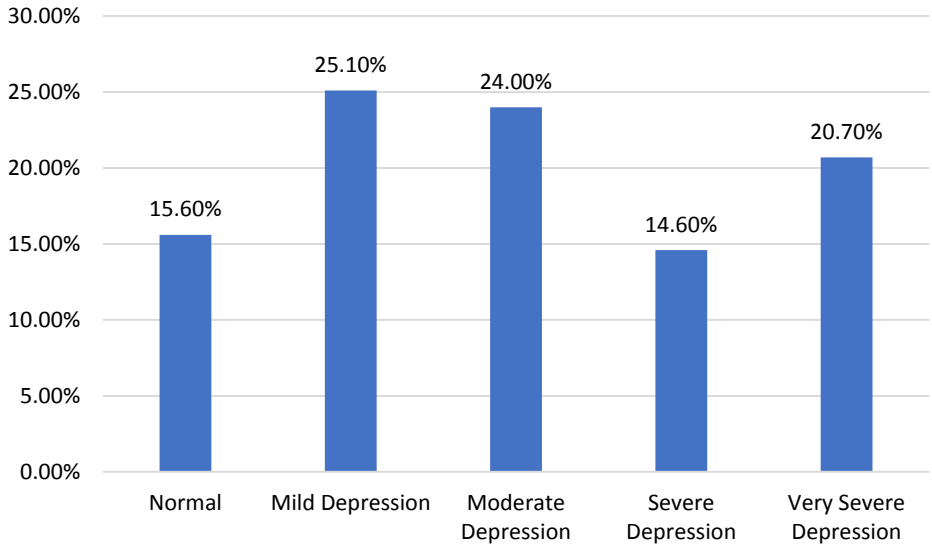

Figure 4 Degree of depression among patients with primary headache in Aseer region, Saudi Arabia 2017

Table 4 Bio-demographic characteristics as predictors of depression among patients with primary headache in Aseer region, Saudi Arabia in 2017

Predictors		Depression (865)		Normal (160)		P
		No	%	No	%	
Age in years	<20	108	12.5	23	14.3	0.037*
	20-30	400	46.2	55	34.5	
	30-40	217	25.1	46	28.7	
	>40	140	16.2	36	22.5	
Gender	Female	534	61.7	78	48.8	0.002* OR 1.6 (1.2-2.3)
	Male	331	38.3	82	51.2	
Marital status	Married	409	47.3	95	59.4	0.016*
	Single	425	49.1	62	38.8	
	Divorced/widow	31	3.6	3	1.8	
Nationality	Saudi	844	97.6	159	99.4	0.148
	Non-Saudi	21	2.4	1	0.6	
Education level	Primary school	32	3.7	5	3.1	0.518
	Mid-school	34	3.9	4	2.5	
	High-school	199	23	31	19.4	
	University and above	600	69.4	120	75	
Occupation	Not working	483	55.8	75	46.9	0.047*
	Governmental	281	32.5	68	42.5	
	Private field/others	101	11.7	17	10.6	
Family income (in S.R)	25,000 or more	88	10.2	17	10.6	0.428
	25000-15000	162	18.7	36	22.5	
	5000-15000	430	49.7	81	50.6	
	less than 5000	185	21.4	26	16.3	

Residence	Village	212	24.5	28	17.5	0.054
	City	653	75.5	132	82.5	
Smoking	Current smoker	80	9.2	12	7.5	0.694
	Ex-smoker	35	3.5	5	3.1	
	Non-smoker	750	87.3	143	89.4	
Pervious head injury:	Yes	193	22.4	17	10.6	0.001*OR 2.4 (1.42-4.1)
	No	672	77.6	143	89.4	
chronic diseases	Yes	136	15.7	13	8.1	0.012*OR 2.11 (1.16-3.8)
	No	729	84.3	147	91.9	
P<0.05 (significant)						

As for relation between headache attacks and being depressed, Table 5 demonstrates that 77.9% of the patients who suffered from recurrent headache attacks were depressed compared to 65.6% of those who did not (P<0.05). Migraine attacks were of no importance of being depressed as depression was recorded among 88.3% of those who had migraine compared to 85% of those who did not (P>0.05). Headache duration, frequency, using medications or not were not significant predictors for having depression but family history of depression was as 24.4% of patients with family history of depression were depressed compared to 9.4% of those with negative history (P<0.05).

Table 5 Relation between headache profile and depression among patients with primary headache in Aseer region, Saudi Arabia, in 2017

Headache data		Depression (865)		Normal (160)		P
		No	%	No	%	
Suffer from recurrent headache attacks	Yes	674	77.9	105	65.6	0.001* OR 1.82 (1.26-2.6)
	No	191	22.1	55	34.4	
Have migraine attacks	Yes	764	88.3	136	85	0.238 OR 1.33 (0.82-2.15)
	No	101	11.7	24	15	
Diagnosed before by a doctor with migraine	Yes	222	25.7	42	26.3	0.876
	No	643	74.3	118	73.7	
Duration of headache	< 1 hour	127	14.7	20	12.5	0.395
	1-4 hours	371	42.9	79	49.4	
	4-24 hours	214	24.7	39	24.4	
	> 24 hours	153	17.7	22	13.7	
Headache attacks per month	1-2/month	450	52	99	66.9	0.072
	2-4/month	209	24.2	31	19.4	
	> 4/month	206	23.8	30	18.7	
Usage of headache prophylaxis	Yes	124	14.3	21	13.1	0.687
	No	741	85.7	139	86.9	
Usage of analgesics for headache	Yes	550	63.6	100	62.5	0.794
	No	315	36.4	60	37.5	
Family history of migraine or chronic headache	Yes	528	61	90	56.3	0.255
	No	337	39	70	43.7	
Family history of depression	Yes	211	24.4	15	9.4	0.001* OR 3.1 (1.8-5.4)
	No	654	75.6	145	90.6	
* P<0.05 (significant)						

DISCUSSION

This study was done to evaluate the prevalence and correlates of major depression in patients with primary headache in Saudi Population by using cross sectional study of randomly selected sample of patients with primary headache disorder who were seen in neurology clinic in three tertiary care Centers in Aseer region. Data collected from medical records, which include relevant socio-demographic & clinical variables, headaches were classified based on the third edition of International Classification of Headache Disorders (ICDH-3 BETA) while Hamilton Depression Rating Scale (HAM-D) was used to assess depression.

Table 1 described the sociodemographic data of the sample and smoking habit. Table 2 showed the headache profile among the sample, the recurrent attacks were reported in 76% of cases and this is coping with Ibrahim [13], at Saudi Arabia who reported that, more than one-half (54.9%) of the participants had ≥ 2 headache attacks during the three

months. The prevalence of migraine attacks was 25.8% and this almost the same with previous study who stated that migraine prevalence among those suffered with headache was 26.3%.

The associated symptoms and triggers were similar to literatures data similar to what was reported by Teixido M, Carey J. Migraine [14].

In Table 4, the relation between depression and chronic headache patients regarding sociodemographic data, smoking and history of chronic illness.

The age of depression patients with migraine was significantly lower than older age and this is similar to Arita JH, Lin [15] who reported significant differences between the depression migraines group and Control migraines patients who were older.

The female gender showed statistical significant higher than male in depression incidence among chronic headache patient and this may be due to higher incidence of depression among females and this is congruous with Schulman [16] who reported that women are more likely to have migraine and major depressive disorders.

The single, divorced or widow depressed were higher than non-depressed with statistically significant difference P=0.016 and this is congruous with Bulloch [17] who reported high prevalence of major depression in separated or divorced individuals is due to both an increased risk of marital disruption in those with major depression, and also to the higher risk of this disorder in those with divorced or separated marital status.

Higher rates were noted among non-employee may be due to financial stress and burden of instability and this is matched with Rodrigues [18] who reported that, there was a positive correlation between the depression incidence rate and the unemployment.

Higher rate among village residents 24.5% than non-depressed 17.5 this is consistent with Mihai [19] who reported, that depression rate was higher in females, marital status (divorced), living in the rural area, with a low level of education and poverty.

The rate of depression in those who had previous head injuries 22.4% was much higher than those without previous head injuries 10.6% among chronic headache patients with P=0.001* OR 2.4 (1.42-4.1) and this is consistent with Defrin [20] who explained Post-traumatic stress disorder may also affect Chronic Post-Traumatic Headache via increased levels of depression, as has recently been found in individuals with Traumatic Brain Injury.

There was significant association between depression and chronic diseases among chronic headache patients P=0.012* OR 2.11 (1.16-3.8) this may be explained by the adverse health risk behaviors and psychobiological changes associated with depression increase the risk for chronic medical disorders, and biological changes and complications associated with chronic medical disorders may precipitate depressive episodes and this is accorded well with Keton [21] study.

Table 5 showed the relation between depression and headache characters. There was highly significant association between depression and recurrent headache attacks P=0.001* or 1.82 (1.26-2.6), this is accorded well with Nicholson [22] who said that, headache is a chronic disease that occurs with varying frequency and results in varying levels of disability and (depression, anxiety, and anger) have on the development of headache attacks.

The association with migraine showed increased risk, but non-significant this is congruous with Breslau [1] who said that, major depression increased the risk for migraine, and migraine increased the risk for major depression.

The depression increased with more headache attacks per month compared to non-depressive subjects and is in agreement with Song [23] finding.

Uses of headache prophylaxis and analgesics were non-significant. The family history of depression showed highly significant association between the occurrence of depression and chronic headache attacks this is congruous with Minen [24] who found that familial aggregation of both migraine and depression is established.

CONCLUSIONS AND RECOMMENDATIONS

The current study revealed that 4 out of each 5 persons with headache were depressed with extremes in degree of depression as majority either mildly or severely depressed. Depression was significantly related to all studied patients' attributes specially divorced young females. Also, depression rate was higher among patients with history of headache

or migraine attacks. It is crucial to diagnose and treat depression in patient with primary headaches and to more psychological support to prevent or at least early discovering cases at risk for depression or even depressed from being at late and difficult to treat stage.

DECLARATIONS

Conflict of Interest

All authors have no conflicts of interest, financial or otherwise to declare

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