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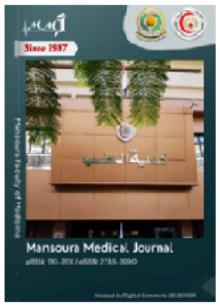

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Migraine among Neurology outpatient attendants in Mansoura University: Sociodemographic and Migraine comorbidities analysis

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ORIGINAL STUDY

Migraine Among Neurology Outpatient Attendants in Mansoura University: Sociodemographic and Migraine Comorbidities Analysis

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Abstract

Background: **Twelve percent of the population is thought to suffer from migraines. 1%−2% of individuals worldwide suffer from chronic migraine (CM). Approximately 2.5% of cases who have episodic migraine (EM) develop CM. A number of risk factors are linked to the development of CM. Independent of medication; there is a sizable short-term variance in migraine frequency. Sleep difficulties, psychological illness, and cardiovascular disease are all linked to migraine. It is the second most incapacitating illness globally.**

Objectives: **To evaluate the sociodemographic characteristics of migraineurs and their different co-morbidities.**

Patients and methods: **A cross-sectional study with analytic component was conducted on 300 patients complaining of migraine who attended neurology outpatient Centre at Mansoura university complaining of Headache. The study was carried out for one year after approval of the Institutional Review Board (IRB).**

Results: **The study demonstrated a statistically significant association between age and pain scale of headache with higher mean scale among cases aged greater than 35−50 followed by cases aged less than 20 years, then cases aged 50 years, and the least for cases aged from 20 to 35 years. Also, we revealed that there is a statistically significant positive correlation between age of onset and migraine disability assessment scale (MIDAS), Headache Impact Test (HIT), and total Hamilton Depression Rating Scale (HAMD) scores ($r = 0.140$, 0.174 & 0.168, respectively). There was a significant positive correlation between disease duration and migraine disability assessment scale, Headache Impact Test, and total Hamilton Depression Rating Scale scores ($r = 0.152$, 0.160 & 0.125, respectively).**

Conclusion: **This work is a reminder that migraineurs might have various diseases which also should be effectively treated, and that the risk of such diseases is increased with increases in headache day frequency and pain intensity. Migraine is found to be more predominant among females compared with males and more predominant in the rural Egyptian population, married and educated population. Also, a more educated person is more worried about his/her headache and are more often consult the physician. The most common comorbid conditions in migraine patients are anxiety and depression. These comorbidities impact the formulation of preventive therapy.**

Keywords: Chronic migraine, Comorbidities analysis, Migraine, Neurology, Sociodemographic

1. Introduction

Migraine is experienced by more than 28 million people worldwide. It is estimated that the worldwide prevalence reaches 10%, and it affects women more than men (Mazaya and Kushartanti, 2019). The Global Burden of Diseases (GBD) study reported that migraine has become the second largest cause of disability in 2016 (Vos et al., 2017). A simplified diagnostic criterion for migraine is quite reproducible which mentions as repeated attacks of headache lasting 4−72 h in patients with a normal physical examination, no other reasonable cause for the headache and at least 2 of the following features as: unilateral pain, throbbing pain, aggravated by movement and moderate or severe

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intensity plus at least one of the features including nausea, emesis, photophobia, and phonophobia (Olesen et al., 2013).

There are many disorders that are frequently comorbid with migraine. These include anxiety, chronic pain, fibromyalgia, bipolar disorder, cardiovascular disease, epilepsy, hypertension, headache (other than migraine), irritable bowel syndrome, sleep disorders, obesity, and Gastroesophageal reflux disorder (Amoozegar, 2017).

Numerous clinical research on migraine triggers have been conducted, utilizing either patient self-report, clinician-administered questionnaires, or patient diaries. Large systematic studies have validated the most frequent migraine triggers, with stress, auditory stimulation, exhaustion, fasting, and menstruation being the most regularly implicated. Menstruation is possibly the most prevalent migraine cause in women. More than half of migraine sufferers reported an increase in migraine frequency during menstruation (Marmura, 2018).

Many clinical studies investigated the correlation between migraine attacks and weather, focusing on variables such as barometric alterations, lightning, temperature, and humidity. It shows that migraineurs significantly sensitive to weather changes, with lower temperature and higher humidity and linked to increased headache intensity (Kaniecki, 2021).

We are planning this study to better understand the distribution and burden of migraine between our outpatient attendants and help to define and identify the groups at greatest risk for developing Migraine. Moreover, the study will evaluate the association between sociodemographic characteristics of migraineurs with their various comorbidities so as to determine the most significant factors affecting their comorbidity profile.

2. Patients and methods

A cross-sectional study with analytic component was carried out on 300 patients complaining of migraine who attending neurology outpatient Centre at Mansoura university complaining of Headache. The study was carried out for one year after approval of the Institutional Review Board (IRB).

Ethical consideration: The study protocol submitted to IRB committee in faculty of medicine, Mansoura University for approval in October 2020. Informed verbal consent obtained from every patient share in the study after confirmation of confidentiality and personal privacy. The data collected from patients will not be used in other purposes rather than the present research.

2.1. Inclusion criteria

Patients complaining of Migraine based on the international headache society (IHS) migraine headache criteria, aged above 16 years old, with total duration of headache six months or more.

The Exclusion criteria: included patients who refuse to participate in the study, patients complaining of headaches other than migraine.

All patients included in this study were subjected to: Data collection as age, sex, marital status, residence, education, occupation, and socioeconomic status. Diagnosis Migraine headache on the basis of IHS migraine headache criteria patients must have had at least five headache attacks that lasted 4–72 h (untreated or unsuccessfully treated) and the headache must have had at least two of the following characteristics: unilateral location, pulsating quality, moderate or severe pain intensity, aggravation by or causing avoidance of routine physical activity (e.g., walking, climbing stairs). In addition, during the headache the patient must have had at least one of the following: nausea and/or vomiting, photophobia and phonophobia. As regard migraine with aura (Arnold, 2018) Measuring disability related to migraine in a 3 month period using migraine disability assessment scale (MIDAS) (Stewart et al., 2000)

Scoring: Measuring the impact of headache on daily life in both episodic and chronic migraine sufferers and discriminates well between chronic migraine, episodic migraine using Headache Impact Test (HIT-6). Diagnosis of associated psychiatric comorbidities such as Anxiety and its severity measured using the Hamilton Anxiety Rating Scale (HAM-A) and Depression using Hamilton Depression Rating Scale (HAM-D). Detection of body mass index (BMI) in migraineurs. BMI is the most widely used measure to diagnose obesity

2.2. Statistical analysis

Data were collected, tabulated, and statistically analyzed using an IBM personal computer with Statistical Package of Social Science (SPSS) version 22 (SPSS, Inc, Chicago, Illinois, USA) where the following statistics were applied: Descriptive statistics: in which quantitative data were presented in the form of mean ($\overline{X}$), SD, range, and qualitative data were presented in the form of numbers and percentages. Analytical statistics: used to find out the possible association between studied factors and the targeted disease. The used tests of significance included: The Chi-square test (χ^2): was used to study the association between two qualitative variables. *

Student *t*-test: a test of significance used for comparison between two groups having quantitative variables. *P* value of >0.05 was considered statistically nonsignificant. *P* value of less than 0.05 was considered statistically significant value of less than 0.001 was considered statistically highly significant.

3. Results

A CONSORT flowchart of the study population shown in Fig. 1. Of the 350 patients with Migraine, the study was carried out for one year after approval of the Institutional Review Board at Mansoura University Hospitals. 50 patients were excluded from the study (32 patients declined consent and 18 patients did not meet the inclusion criteria, 300 patients were willing to participate in the study and were divided into two groups male (n = 77) and female (n = 223).

Our study showed that, the mean ± SD age of the studied cases is 34.85 ± 12.10 ranging from 17 to 67 years, mean age of onset is 22.71 ± 8.87 ranging from 9 to 52 years, mean duration of disease is 11.94 ± 6.17 ranging from 3 to 25 years, the median number of children is 3 ranging from 0 to 5. Of the studied cases; 38% overweight and 30% obese, 74.3% are females, 67.7% married, 70.7% are rural residence, 45.0% technical education, 21.7% not educated and university education, 60.7% are housewives, 20% employee, 17% manual workers, and 2.3% no working (Table 1). In addition to, distribution of symptoms assessed by HAMD scale, the most frequent symptom with very sever degree were tension (29.3%), anxiety (22%), depressed mood (20%), Fear (19.3%) insomnia (15.7%) (Table 2).

In this concern, we illustrated statistically significant difference between males and females as regarding; current age of the cases (37.78 versus 33.57) and age of onset (25.65 versus 21.69) for males and females, respectively. Also, education and occupation illustrate statistically significant difference between males and female. Furthermore, there is statistically significant difference between males and female as regard number of days having headache and pain scales with longer duration is detected among males and pain scale higher among females (Table 3).

Also, our study demonstrated a statistically significant association between age and pain scale of headache with higher mean scale among cases aged greater than 35–50 followed by cases aged less than 20 years, then cases aged 50 years, and the least for cases aged from 20 to 35 years. Also, we demonstrated that there is a statistically significant positive correlation between age of onset and MIDAS, HIT, and total HAMD scores (r = 0.140, 0.174 & 0.168, respectively) (Table 4).

Moreover, there was a statistically significant positive correlation between disease duration and MIDAS, HIT, and total HAMD scores (r = 0.152,

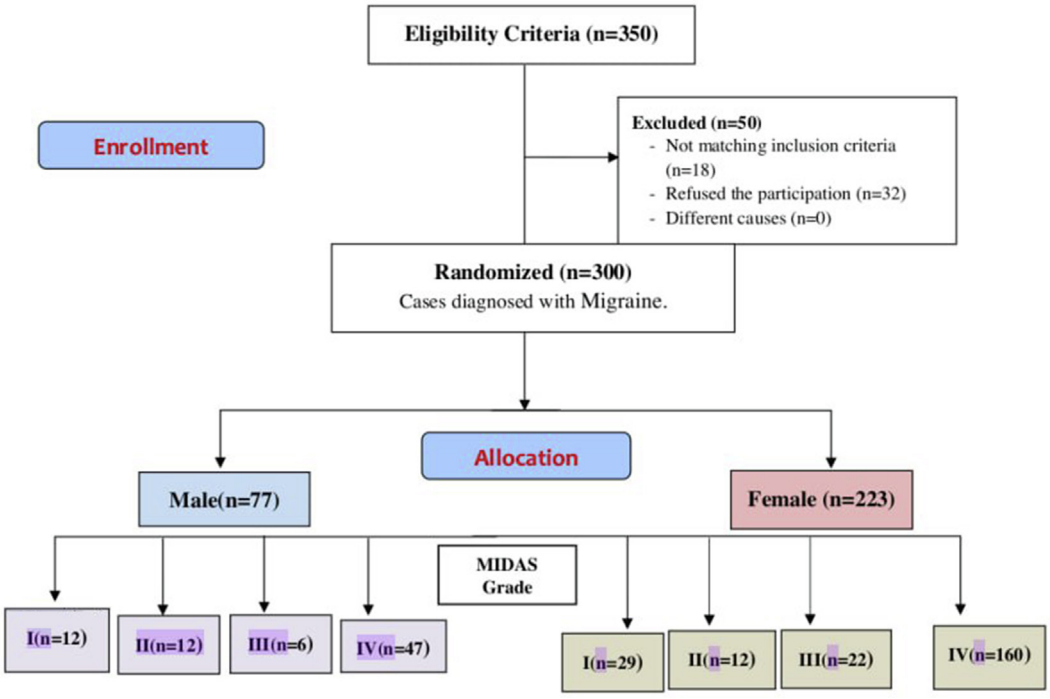

Fig. 1. CONSORT Flow chart of patients with migraines.

Table 1. Socio-demographic data of the studied patients.

Variable	Studied patients ($N = 300$)
Age/year	
Mean ± SD	34.85 ± 12.10
Range	(17–67)
Age of onset/years	
Mean ± SD	22.71 ± 8.87
Range	(9–52)
Disease duration/years	
Mean ± SD	11.94 ± 6.17
Range	(3–25)
BMI (kg/m^2)	
Mean ± SD	31.62 ± 16.88
Range	(16–70)
BMI categories	Number of patients (Percentage %)
normal	96 (32%)
overweight	114 (38%)
Obesity	90 (30%)
Sex	
Male	77 (25.7)
Female	223 (74.3)
Marital state	
Single	85 (28.3%)
Married	203 (67.7%)
Widow	6 (2.0%)
Divorced	6 (2.0%)
Number of kids	
Median	3
Range	(0–5)
Residence	
Rural	212 (70.7%)
Urban	88 (29.3%)
Education	
Not educated	65 (21.7%)
Preparatory	29 (9.6%)
Secondary	6 (2.0%)
Technical education	135 (45.0%)
University	65 (21.7%)
Occupation	
Housewife	182 (60.7%)
Employee	60 (20.0%
Manual worker	51 (17.0%)
Not working	7 (2.3%)

0.160 & 0.125, respectively) (Table 5). In addition to, there was a statistically significant association between MIDAS score and the following factors as age, age of onset, disease duration, sex, marital status, residence, education, and occupation of the studied cases (Table 6).

Also, there was a significant association between HAMD score and the following factors as age, age of onset, disease duration, marital status, residence, education, and occupation of the studied cases (Table 7). Furthermore, there was a statistically significant association between HIT score and the following factors as age, age of onset, disease duration, sex, marital status, residence, education, and occupation of the studied cases (Table 8).

4. Discussion

Migraine is a common disabling condition. According to the 2016 Global Burden of Disease data, migraine was the second most disabling disease all over the world, second only low back pain. Migraine may be subdivided into episodic migraine (EM) or chronic migraine (CM) based mainly on the number of monthly headache days (Steiner et al., 2020). Comorbid conditions are significant contributors to the overall migraine burden (Buse et al., 2020). There are several comorbidities linked to migraine. They include cardiovascular diseases (e.g. stroke, MI), psychiatric illnesses (depression, anxiety, bipolar disorder, personality disorders, suicide attempts), neurological disorders (e.g. epilepsy), sleep disorders (e.g. insomnia, restless leg syndrome and sleep apnea), inflammatory disorders (e.g. allergic rhinitis, asthma) and chronic pain conditions (e.g. fibromyalgia), among many others (de Boer et al., 2019). Understanding comorbid conditions in migraine patients are significant. Their determination helps

Table 2. Hamilton anxiety scale among the studied patients ($N = 300$).

Symptoms	Not present N (%)	Mild N (%)	Moderate N (%)	Severe N (%)	Very severe N (%)
Anxiety	66 (22.0)	68 (22.7)	58 (19.3)	42 (14.0)	66 (22.0)
Tension	40 (13.3)	55 (18.3)	76 (25.3)	41 (13.7)	88 (29.3)
Fear	80 (26.7)	74 (24.7)	70 (23.3)	18 (6.0)	58 (19.3)
Insomnia	114 (38.0)	39 (13.0)	52 (17.3)	48 (16.0)	47 (15.7)
Intellectual symptoms	73 (24.3)	61 (20.3)	30 (10.0)	71 (23.7)	65 (21.7)
Depressed mood	85 (28.3)	50 (16.7)	57 (19.0)	48 (16.0)	60 (20.0)
Muscular symptoms	93 (31.0)	65 (21.7)	59 (19.7)	59 (19.7)	24 (8.0)
Sensory symptoms	86 (28.7)	86 (28.7)	81 (27.0)	41 (13.7)	6 (2.0)
Cardiovascular symptoms	109 (36.3)	72 (24)	42 (14)	77 (25.7)	0
Respiratory symptoms	152 (50.7)	77 (25.7)	24 (8.0)	47 (15.7)	0
Gastrointestinal symptoms	197 (65.7)	51 (17)	40 (13.3)	6 (2.0)	6 (2.0)
Genitourinary symptoms	217 (72.3)	23 (7.7)	18 (6.00	36 (12.0)	6 (2.0)
Autonomic symptoms	229 (76.3)	24 (8.0)	17 (5.7)	24 (8.0)	6 (2.0)
Behavior at Interview	181 (60.3)	60 (20.0)	53 (17.7)	6 (2.0)	0
Hamilton anxiety scale	70 (23.3%)	100 (37.5%)	65 (21.7%)	11 (3.7%)	54 (18%)

Table 3. Sociodemographic characteristics, the number of days having headache distribution and pain scales of headache according to the Sex of the studied cases.

Sex			
Variable	Male $n = 77$	Female $n = 223$	Test of significance
Age/year			$t = 2.67$
Mean ± SD	37.78 ± 15.87	33.57 ± 10.24	$P = 0.008$[a]
Age of onset/years			$t = 3.43$
Mean ± SD	25.65 ± 12.26	21.69 ± 7.11	$P = 0.001$[a]
Disease duration/years			$t = 0.313$
Mean ± SD	12.13 ± 5.86	11.87 ± 6.28	$P = 0.755$
Number of kids			$z = 0.280$
Median (Range)	3 (0–5)	3 (1–5)	$P = 0.780$
BMI (kg/m^2)			$t = 0.325$
Mean ± SD	28.40 ± 7.22	28.73 ± 7.70	$P = 0.746$
BMI categories			
normal	23 (24)	73 (76.0)	$\chi^2 = 1.05$
overweight	33 (28.9)	81 (71.1)	$P = 0.593$
Obesity	21 (23.3)	69 (76.70	
Marital state			
Single	29 (34.1)	56 (65.9)	MC = 7.76
Married	48 (23.6)	155 (76.4)	$P = 0.051$
Widow	0	6 (100)	
Divorced	0	6 (100)	
Residence			
Rural	59 (76.6)	153 (68.6)	$\chi^2 = 1.77$
Urban	18 (23.4)	70 (31.4)	$P = 0.183$
Education			
Not educated	24 (36.9)	41 (63.1)	MC = 23.76
Preparatory	11 (37.9)	18 (62.1)	$P < 0.001$[a]
Secondary	0	6 (100)	
Technical education	18 (13.3)	117 (86.7)	
University	24 (36.9)	41 (63.1)	
Occupation			
Housewife	18 (9.9)	164 (90.1)	MC = 65.49
Employee	25 (41.7)	35 (58.3)	$P < 0.001$[a]
Worker	29 (56.9)	22 (43.1)	
Not working	5 (71.4)	2 (28.6)	
Number of days having a headache			$t = 2.236$
Mean ± SD	23.58 ± 36.44	17.02 ± 19.69	$P = 0.027$[a]
Pain scales of headache			$t = 2.256$
Mean ± SD	7.58 ± 1.88	9.85 ± 12.62	$P = 0.014$[a]

Used tests: Student t test, Mann Whitney, Monte Carlo test, Chi–Square test χ^2

[a] Significant.

identify common or shared underlying genetic and biological mechanisms of disease. This facilitates the development of novel therapies targeted (Lipton et al., 2019).

Therefore, the current study aimed to evaluate the sociodemographic of people with migraine and their various comorbidities. The current study included 300 patients complaining of Migraine on the basis of IHS migraine headache criteria. The current study showed that mean ± SD age of the studied cases was 34.85 ± 12.10 years, mean age of onset was 22.71 ± 8.87 years, mean duration of disease was 11.94 ± 6.17, median number of children was 3. Of the studied cases, 38% were overweight and 30% obese, 74.3% females, 67.7% married, 70.7% were rural residence, 45% technical education, 21.7% not educated and 21.7% university education, 60.7% were housewives, 20% employee, 17% manual workers and 2.3% no working.

On other hand, Banday and colleagues (Banday et al., 2020) enrolled 323 migraine cases among which men were 30 (9.3%) and women were 293 (90.7%). The mean age of men is 38.80 ± 17.53 years while of women 35.38 ± 13.29 years, with a $P = 0.307$. Regarding the occupation, the majority of patients (56%) were housewives, followed by students (25.2%), government employees (8.9%), laborers (4%), businessmen (4.5%), and farmers (1.3%). Regarding the educational state, it was reported more in the illiterate class 196 (60.68%) compare with in literates 127 (39.31%). Regarding the socio-economic state, migraine was observed more in the lower middle class of the society (57%).

In an American migraine study Survey and in other studies with different methodologies, migraine was 3 folds more common among women compared with men Lipton and colleagues (Lipton et al., 2001). In contrast, in the current work, it was observed 10 folds more in women compared with men.

Hossain and colleagues (Hossain et al., 2017) observed that the majority of people with migraine were women (72.7%) and housewives (57.6%). Our work also confirmed that housewives the main group of patients (56%). The sex difference may be related to hormonal fluctuations among women. The current study demonstrated that among migraine cases without aura; 70.6% were unilateral location, 78.6% pulsating quality, 82% moderate or severe intensity and 79% aggravated by walking stairs and their symptoms included 65% Phono phobia and photophobia and 31.7% vomiting. Among Migraine with aura cases, 2% of the studied cases had one aura symptom developed gradually over greater than 5 min and 2% of the studied cases had symptoms occurring in succession and 2% of the studied cases had headache following aura with free interval of at least 60 min Aura features included 12% Homonymous visual disturbance, 10% Unilateral weakness, 9.7% Aphasia or unclassifiable speech difficulty and 8% Unilateral paresthesia and/or numbness.

Özdemir and colleagues (Özdemir et al., 2014) found that phonophobia was found as one of the common symptoms that accompany migraine headache (91.5%). While problems with bright light (15.9%) and moderate (19.5%) and intense (17.1%) levels of nausea were observed, nausea was absent

Table 4. Relation between (duration, pain scales of headache and age) and (age of onset and MIDAS, HIT-6™, HAM-D total scores) among the studied patients (N = 300).

Variable	Age/year				Kruskal Wallis test	*P* value
	<20 (*N* = 23)	20–35 (*N* = 137)	>35–50 (*N* = 98)	>50 (*N* = 42)		
Number of days having headache						
Mean ± SD	13.91 ± 19.30	18.93 ± 23.49	17.41 ± 22.78	37.92 ± 7.74	1.059	0.368
Range	(0–45)	(0–90)	(0–90)	(0–90)		
Pain scales of headache						
Mean ± SD	8.74 ± 0.45	6.89 ± 2.11	12.10 ± 17.01	8.25 ± 0.44	3.568	0.015[a]
Range	(8–9)	(4–10)	(6–80)	(8–9)		
Age of onset						
Variable	<20 *N* = 129 (%)	20–30 *N* = 118 (%)	>30–40 *N* = 35 (%)	>40 *N* = 18 (%)	χ^2	*P* value
MIDAS grade:						
I (Little or no disability).	29 (70.7)	12 (29.3)	0	0		
II (Mild disability.)	1 (4.2)	16 (66.7)	5 (20.8)	2 (8.3)	40.93	<0.001[a]
III (Moderate disability)	12 (42.9)	16 (57.1)	0	0		
IV (Severe disability)	87 (42.0)	74 (35.7)	30 (14.5)	16 (7.7)		
$r = 0.140$, $P = 0.015$[a]						
HIT-6TM						
Little impact	8 (34.8)	9 (39.1)	4 (17.4)	2 (8.7)		
Some impact	21 (53.8)	18 (46.2)	0	0	18.36	0.031[a]
Substantial impact	49 (41.5)	38 (32.2)	21 (17.8)	10 (8.5)		
Severe impact	51 (42.5)	53 (44.2)	10 (8.3)	6 (5.0)		
$r = 0.174$, $P = 0.002$[a]						
Total HAMD score						
Not present	43 (61.4)	21 (30)	6 (8.6)	0		
Mild	39 (39.0)	37 (37)	13 (13.0)	11 (11.0)		<0.001[a]
Moderate	34 (52.3)	22 (33.8)	3 (4.6)	6 (9.2)	48.89	
Severe	2 (18.2)	9 (81.8)	0	0		
Very severe	11 (20.4)	29 (53.7)	13 (24.1)	1 (1.9)		
$r = 0.168$ $P = 0.003$[a]						

χ^2, Chi-square test; **F**, ANOVA test; **HAM-D**, Hamilton depression; **HIT-6™**, The six-item headache impact text; **MIDAS**, Migraine disability assessment; **r**, Spearman correlation co-efficient.

[a] Significant.

Table 5. Relation between disease duration and MIDAS, HIT-6™, HAM-D total scores (N = 300).

Variable	Duration of disease (years)				χ^2	*P* value
	≤5 *n* = 57 (%)	>5–10 *n* = 112 (%)	>10–15 *n* = 49 (%)	>15 *n* = 82 (%)		
MIDAS grade:						
I (Little or no disability).	9 (22.0)	23 (56.1)	7 (17.1)	2 (4.9)		
II (Mild disability.)	0	5 (20.8)	4 (16.7)	15 (62.5)	33.97	**<0.001**[a]
III (Moderate disability)	8 (28.6)	13 (46.4)	3 (10.7)	4 (14.3)		
IV (Severe disability)	40 (19.3)	71 (34.3)	35 (16.9)	61 (29.5)		
$r = 0.152$ $P = 0.008$[a]						
HIT-6TM						
Little impact	0	9 (39.1)	7 (30.4)	7 (30.4)		
Some impact	7 (17.9)	25 (64.1)	3 (7.7)	4 (10.3)	23.34	**0.004**[a]
Substantial impact	28 (23.7)	38 (32.2)	19 (16.1)	33 (28.0)		
Severe impact	22 (18.3)	40 (33.3)	20 (16.7)	38 (31.7)		
$r = 0.160$ $P = 0.006$[a]						
Total HAMD score						
Not present	20 (28.6)	37 (52.9)	4 (5.7)	9 (12.9)		
Mild	17 (17)	30 (30.0)	19 (19.0)	34 (34.0)	34.89	<0.001[a]
Moderate	10 (15.4)	19 (29.2)	4 (36.4)	26 (40.0)		
Severe	0	4 (36.4)	12 (22.2)	3 (27.3)		
Very severe	10 (18.5)	22 (40.7)	49 (16.3)	10 (18.5)		
$r = 0.125$ $P = 0.01$[a]						

χ^2, Chi-square test; **HAM-D**, Hamilton depression; **HIT-6™**, The six-item headache impact text; **MIDAS**, Migraine disability assessment; **r**, Spearman correlation co-efficient.

[a] Significant.

Table 6. Relation between sociodemographic characteristics and MIDAS score.

Variable	MIDAS Grade				Test of significance
	I	II	III	IV	
Age/years					
<20	12 (52.2)	0	0	11 (47.8)	MC = 59.12
20-35	18 (13.1)	6 (4.4)	23 (16.8)	90 (65.7)	$P < 0.001$[a]
>35–50	11 (11.2)	12 (12.2)	5 (5.1)	70 (71.4)	
>50	0	6 (14.3)	0	36 (85.7)	
Age onset/years					
<20	29 (22.5)	1 (0.8)	12 (9.3)	87 (67.4)	MC = 40.92
20-30	12 (10.2)	16 (13.6)	16 (13.6)	74 (62.7)	$P < 0.001$[a]
>30–40	0	5 (14.3)	0	30 (85.7)	
>40	0	2 (11.1)	0	16 (88.9)	
Duration of disease					
≤5	9 (15.8)	0	8 (14.0)	40 (70.2)	MC = 33.97
>5–10	23 (20.5)	5 (4.5)	13 (11.6)	71 (63.4)	$P < 0.001$[a]
>10–15	7 (14.3)	4 (8.2)	3 (6.1)	35 (71.4)	
>15	2 (2.4)	15 (18.3)	4 (4.9)	61 (74.4)	
BMI categories					
normal	12 (12.5)	6 (6.2)	9 (9.4)	69 (71.9)	MC = 11.3
overweight	11 (9.6)	15 (13.2)	12 (10.5)	76 (66.7)	$P = 0.08$
Obesity	18 (20.0)	3 (3.3)	7 (7.8)	62 (68.9)	
Sex					
Male	12 (15.6)	12 (15.6)	6 (7.8)	47 (61)	MC = 8.94
Female	29 (13.0)	12 (5.4)	22 (9.9)	160 (71.7)	$P = 0.03$[a]
Marital state					
Single	18 (21.2)	0	12 (14.1)	55 (64.7)	MC = 22.99
Married	23 (11.3)	24 (11.8)	16 (7.9)	140 (69)	$P = 0.006$[a]
Widow	0	0	0	6 (100)	
Divorced	0	0	0	6 (100)	
Residence					
Rural	23 (10.8)	24 (11.3)	22 (10.4)	143 (67.5)	MC = 15.26
Urban	18 (20.5)	0	6 (6.8)	64 (72.7)	$P = 0.002$[a]
Education					
Not educated	0	6 (9.2)	5 (7.7)	54 (83.1)	MC = 73.96
Preparatory	0	6 (20.7)	0	23 (79.3)	$P = 0.001$[a]
Secondary	0	0	0	6 (100)	
Technical education	17 (12.6)	12 (8.9)	23 (17)	83 (61.5)	
University	24 (36.9)	0	0	41 (63.1)	
Occupation					
Housewife	17 (9.3)	18 (9.9)	16 (8.8)	131 (72)	MC = 42.34
Employee	18 (30)	0	0	42 (56.9)	$P < 0.001$[a]
Worker	4 (7.8)	6 (11.8)	12 (23.5)	29 (56.9)	
Not working	2 (28.6)	0	0	5 (71.4)	

MC, Monte Carlo test.
[a] Statistically significant.

in 47.6% of cases. Photophobia was seen in 76.8% of cases, sensitivity to odor was determined in 52.4%, and emesis was reported in 29.3%. It was found that physical activity during migraine attack made the headache worse for 67.1% and did not have any effect for 32.9% of migraine cases. The headache was found to be pulsating in 216 cases (87.8%) and had other characteristics in 18 cases (12.2%).

In agreement with our results, Shaik and colleagues (Shaik et al., 2015) reported that regarding utilization of the MIDAS questionnaire among migraine cases, a total of 27%–73% of cases were classified into group A (grade 1 or 2) and group B (grade 3 or 4), respectively.

In disagreement with our results, Shin and colleagues (Shin et al., 2008) showed that the averaged HIT-6 score was 53.4 ± 8.7 points, Impact grade of the HIT-6 evaluated as following; Little or none 41 (32%), Moderate 30 (23%), Substantial 28 (22%), Severe 31 (23%).

The current study evaluated the distribution of symptoms assessed by HAMD scale. The most frequent symptoms with 'very severe' degree in HAMD scale were; tension (29.3%), anxiety (22%), depressed mood (20%), Fear (19.3%) insomnia (15.7%).

Similarly, Banday and colleagues (Banday et al., 2020) studied the frequency of common psychiatric and physical comorbid conditions among migraine

Table 7. Relation between sociodemographic characteristics and HAMD score.

	HAMD					test of significance
	Absence	Mild	Moderate	Severe	Very severe	
Age/years						
<20	17 (73.9)	6 (26.1)	0	0	0	MC = 73.84
20–35	41 (29.9)	30 (21.9)	30 (21.9)	6 (4.4)	30 (21.9)	$P < 0.001$*
>35–50	6 (6.1)	40 (40.8)	29 (29.6)	5 (5.1)	18 (18.4)	
>50	6 (14.3)	24 (57.1)	6 (14.3)	0	6 (14.3)	
Age onset/years						
<20	43 (33.3)	39 (30.2)	34 (26.4)	2 (1.6)	11 (8.5)	MC = 48.89
20–30	21 (17.8)	37 (31.4)	22 (18.6)	9 (7.6)	29 (24.6)	$P < 0.001$*
>30–40	6 (17.1)	13 (37.1)	3 (8.6)	0	13 (37.1)	
>40	0	11 (61.1)	6 (33.3)	0	1 (5.6)	
Duration of disease						
≤5	20 (35.1)	17 (29.8)	10 (17.5)	0	10 (17.5)	MC = 34.89
>5–10	37 (33.0)	30 (26.8)	19 (17.0)	4 (3.6)	22 (19.6)	$P < 0.001$*
>10–15	4 (8.2)	19 (38.8)	10 (20.4)	4 (8.2)	12 (24.5)	
>15	9 (11.0)	34 (41.5)	26 (31.7)	3 (3.7)	10 (12.2)	
BMI categories						
normal	24 (25)	32 (33.3)	18 (18.8)	2 (2.1)	20 (20.8)	MC = 6.09
overweight	23 (20.2)	44 (38.6)	26 (22.8)	5 (4.4)	16 (14.0)	$P = 0.637$
Obesity	23 (25.6)	24 (26.7)	21 (23.3)	4 (4.4)	18 (20)	
Sex						
Male	23 (29.9)	24 (31.2)	12 (15.6)	6 (7.8)	12 (15.6)	MC = 8.96
Female	47 (21.1)	76 (34.1)	53 (23.8)	5 (2.2)	42 (18.8)	$P = 0.062$
Marital state						
Single	35 (41.2)	24 (28.2)	12 (14.1)	5 (5.9)	9 (10.6)	MC = 75.72
Married	29 (14.3)	76 (37.4)	53 (26.1)	6 (3.0)	39 (19.2)	$P < 0.001$*
Widow	0	0	0	0	6 (100)	
Divorced	6 (100)	0	0	0	0	
Residence						
Rural	46 (21.7)	82 (38.7)	36 (17)	6 (2.8)	42 (19.8)	MC = 17.04
Urban	24 (27.3)	18 (20.5)	29 (33)	5 (5.7)	12 (13.6)	$P = 0.002$*
Education						
Not educated	17 (26.2)	24 (36.9)	6 (9.2)	0	18 (27.7)	MC = 142.09
Preparatory	5 (17.2)	0	6 (20.7)	6 (20.7)	12 (41.4)	$P < 0.001$*
Secondary	0	6 (100)	0	0	0	
Technical education	12 (8.9)	52 (38.5)	47 (34.8)	0	24 (17.8)	
University	36 (55.4)	18 (27.7)	6 (9.2)	5 (7.7)	0	
Occupation						
Housewife	35 (19.2)	82 (45.1)	29 (15.9)	6 (3.3)	30 (16.5)	MC = 113.29
Employee	30 (50)	12 (20)	1 (1.7)	5 (8.3)	12 (200	$P < 0.001$*
Worker	5 (9.8)	6 (11.8)	28 (54.9)	0	12 (23.5)	
Not working	0	0	7 (100)	0	0	

cases. Cases showed a significantly greater risk of anxiety, depression, neuropathic pain. In a study from Taiwan, migraine was linked to a significantly greater risk of anxiety and depression than controls (Chen et al., 2012). The American Migraine Prevalence and Prevention study demonstrated that migraineurs were more likely to have anxiety (OR = 1.8), depression (OR = 2.0), and bipolar disorder (Buse et al., 2010).

Breslau and colleagues (Breslau et al., 2003) demonstrated that the prevalence of major depression was 3 folds greater in persons with migraine in comparison to controls. The current study assessed the sociodemographic characteristics distribution according to sex of the studied cases. There was statistically significant difference between males and females as regarding; current age of the cases (37.78 versus 33.57) and age of onset (25.65 versus 21.69) for males and females, respectively. Also, education and occupation illustrated statistically significant difference between males and female. Additionally, our study showed that there was a significant difference between males and female as regard number of days having headache and pain scales with longer duration detected among males and pain scale higher among females.

In contrast to our results, the majority of studies agreed that there are no sex-related differences in attack frequency: 1–4 monthly headache days on average for both sexes (48.8% in females and 45.3%

Table 8. Relation between sociodemographic characteristics and HIT score.

	HIT				test of significance
	Little impact	Some impact	Substantial	severe impact	
Age/years					
<20	0	0	11 (47.8)	12 (52.2)	MC = 45.41
20–35	6 (4.4)	34 (24.8)	49 (35.8)	48 (35)	$P < 0.001$[a]
>35–50	11 (11.2)	5 (5.1)	34 (34.7)	48 (49)	
>50	6 (14.3)	0	24 (57.1)	12 (28.6)	
Age onset/years					
<20	8 (6.2)	21 (16.3)	49 (38)	51 (39.5)	MC = 18.36
20–30	9 (7.6)	18 (15.3)	38 (32.2)	53 (44.9)	$P = 0.03$[a]
>30–40	4 (11.4)	0	21 (60)	10 (28.6)	
>40	2 (11.1)	0	10 (55.6)	6 (33.3)	
Duration of disease					
≤5	0	7 (12.3)	28 (49.1)	22 (38.6)	MC = 24.34
>5–10	9 (8.0)	25 (22.3)	38 (33.9)	40 (35.7)	$P = 0.004$[a]
>10–15	7 (14.3)	3 (6.1)	19 (38.8)	20 (40.8)	
>15	7 (8.5)	4 (4.9)	33 (40.2)	38 (46.3)	
BMI categories					
normal	7 (7.3)	13 (13.5)	39 (40.6)	37 (38.5)	MC = 1.97
overweight	11 (9.6)	16 (14.0)	43 (37.7)	44 (38.6)	$P = 0.922$
Obesity	5 (5.6)	10 (11.1)	36 (40)	39 (43.3)	
Sex					
Male	6 (7.8)	18 (23.4)	23 (29.9)	30 (39)	MC = 10.99
Female	17 (7.6)	21 (9.4)	95 (42.6)	90 (40.4)	$P = 0.012$[a]
Marital state					
Single	6 (7.1)	18 (21.2)	26 (30.6)	35 (41.2)	MC = 26.12
Married	17 (8.4)	21 (10.3)	86 (42.4)	79 (38.9)	$P = 0.002$[a]
Widow	0	0	6 (100)	0	
Divorced	0	0	0	6 (100)	
Residence					
Rural	17 (8.0)	33 (15.6)	88 (41.5)	74 (34.9)	MC = 9.34
Urban	6 (6.8)	6 (6.8)	30 (34.1)	46 (52.30	$P = 0.025$[a]
Education					
Not educated	6 (9.2)	5 (7.7)	30 (46.2)	24 (36.9)	MC = 50.93
Preparatory	0	0	17 (58.6)	12 (41.4)	$P < 0.001$[a]
Secondary	0	0	6 (100)	0	
Technical education	11 (8.1)	16 (11.9)	59 (43.7)	49 (36.3)	
University	6 (9.2)	18 (27.7)	6 (9.2)	35 (53.8)	
Occupation					
Housewife	23 (12.6)	15 (8.2)	77 (42.3)	67 (36.8)	MC = 41.68
Employee	0	18 (30)	13 (21.7)	29 (48.3)	$P < 0.001$[a]
Worker	0	6 (11.8)	23 (45.1)	22 (43.1)	
Not working	0	0	5 (71.4)	2 (28.6)	

MC, Monte Carlo test.
[a] Statistically significant.

in males) Delaruelle and colleagues (Delaruelle et al., 2018). Moreover, the majority of studies reported longer attack duration among females than in males (28.4 h in men and 36.7 h in women; $P = 0.01$) and a higher recurrence rate Allais and colleagues (Allais et al., 2020).

Bolay and colleagues (Bolay et al., 2020) found that high frequency migraine (>10 monthly headache days) was more common in males compared with females (16.7% and 14.9%, respectively). Interestingly, the current study evaluated many relations between sociodemographic characteristics and clinical parameters. As regard relation between duration, pain scales of headache and age among the studied patients, the current study demonstrated statistically significant association between age and pain scale of headache with higher mean scale among cases aged greater than 35–50 followed by cases aged less than 20 years, then cases aged greater than 50 years and the least for cases aged from 20 to 35 years.

In harmony with our results, El-Metwally and colleagues (El-Metwally et al., 2020) noted that migraine was at its worst between 30 and 40 years of age; such results are comparable to the age-related prevalence in Asian populations Breslau and

Rasmussen (2001). Its greatest level is observed between 25 and 55 years, whereas 90% of migraineurs endure the first attack before the age of 40 Jamal and colleagues (Jamal et al., 2004). As regard relation between age of onset and MIDAS, HIT-6TM, HAM-D total scores, the current study demonstrated statistically significant positive correlation between age of onset and MIDAS, HIT and total HAMD scores (r = 0.140, 0.174 & 0.168, respectively). As regard relation between disease duration and MIDAS, HIT-6TM, HAM-D total scores, the current study illustrated a significant positive association between disease duration and MIDAS, HIT and total HAMD scores (r = 0.152, 0.160 & 0.125, respectively).

Furthermore, Saif and colleagues (Saif et al., 2017) confirmed that age, routine physical activities, and family history of migraine were significant predictors of migraine. As regard relation between sociodemographic characteristics and MIDAS score, the current study demonstrated statistically significant association between MIDAS score and the following factors; age, age of onset, disease duration, sex, marital status, residence, education and occupation of the studied cases.

Similarly, Mourad and colleagues (Mourad et al., 2019) suggested that having longer migraine duration, more associated symptoms, and a low socioeconomic state increased the MIDAS score and therefore the disability level. As regard the relation between sociodemographic characteristics and HAMD score, the current study illustrated a statistically significant association between HAMD score and the following factors; age, age of onset, disease duration, marital status, residence, education and occupation of the studied cases. As regard relation between sociodemographic characteristics and HIT score, the current study demonstrated a statistically significant association between HIT score and the following factors; age, age of onset, disease duration, sex, marital status, residence, education and occupation of the studied cases.

Shin and colleagues (Shin et al., 2008) showed that the summed disability score from diaries was related to HIT-6 score. Headache frequency was the only feature that contributed significantly to HIT-6 score. Such findings are a reminder that migraineurs might have a wide range of other diseases which also should be effectively treated, and that the risk of such diseases is increased with increased headache frequency and pain severity. The discrepancies in results of the above studies could be explained by many factors such differences in genetic contribution of migraine, different populations, selection of patients and sample size.

4.1. Limitation of the study

Our study has some limitations. It included a small representative group of the whole population. Therefore, generalization is limited. As it is a cross-sectional study, the effect of medications on the level of disability was not measured.

4.2. Conclusion

This work is a reminder that migraineurs might have various diseases which also should be effectively treated, and that the risk of such diseases is increased with increases in headache day frequency and pain intensity. Migraine is found to be more predominant among females compared with males and more predominant in the rural Egyptian population, married and educated population. Also, a more educated person is more worried about his/her headache and are more often consult the physician. The most common comorbid conditions in migraine patients are anxiety and depression. These comorbidities impact the formulation of preventive therapy.

Conflicts of interest

There is no conflict of interest.

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