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RESEARCH ARTICLE

Clinical characteristics and disability of subjects with migraine in a tertiary Centre in Mangalore: A Cross-Sectional Study

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ABSTRACT

Background: Migraine is the second most common cause of headaches and the most common headache-related neurological disability in the world. It is commonly linked with a broad range of psychiatric comorbidities. There has been a reported increase in the prevalence of migraine-related disability in patients who develop mood disorders due to migraine. This study is driven by the rising incidence of disability and deteriorating health-related quality of life observed in a significant portion of migraine patients. Approximately one-third to half of these individuals experience inadequate diagnosis and treatment, while two-thirds report mood changes associated with their condition. Addressing these gaps is crucial for improving overall patient outcomes and quality of life.

Methods: This cross-sectional study has been carried out in the duration of one month in which the subjects with migraine were recruited by consecutive sampling amongst those aged 16-64 years from Mangalore, diagnosed with migraine based on the International Classification of Headache Disorders (ICHD), with the major demographic variables of age, gender, education, occupation, and marital status, socio-economic status and assess some of its clinical features, including aspects of consequential disability using a previously validated Migraine disability assessment (MIDAS) questionnaire.

Results: A total of 50 patients were studied. The study shows a female preponderance of 74%. The prevalence of migraine varied with age, rising through early adult life and declining in the late 40s and early 50s. Majority of about 52% belonged to the age group of 14-34 years. The duration and frequency of headaches were found to correlate with the presence of mood disorders in 60% of the patients. Moreover, a higher migraine-related disability was noted in patients with comorbid mood disorders. Majority of the subjects (52%) under the study belonged to moderate levels of functional disability based on Migraine disability assessment (MIDAS).

Conclusion: The present study revealed migraine preponderance amongst younger female population leading to significant mood disorders with rising migraine-related disability. An early diagnosis and optimum treatment of these individuals can prevent these impairments and lead to a better quality of life in these individuals. Patients with migraine must be screened for mood disorders using questionnaires like the Hospital Anxiety and Depression Scale (HADS) to rule out comorbid mood disorders.

Keywords: Migraine, Mood disorder, Disability assesment, Quality of life, MIDAS questionnaire, Neurological disability, Female preponderance.

Introduction

Headache is the most common neurological disorder[15] and is broadly classified into the migraine headache and tension headache. Migraine is a primary headache characterized by a set of specific clinical features. It is the most common headache related neurological disability in the world[1]. In terms of disability-adjusted life years (DALY)[16], Migraine headache ranks second globally and has been considered as one among the ten most debilitating diseases globally[15]. The diagnosis of migraine is based on the criteria given by the second edition of the International Classification of Headache Disorders (ICHD-2)[2]. It affects around 15% of women and 6% of men over 1 year period.[1] Owing to the inadequacy in diagnosis and treatment, there has been a rise in levels of disability leading to a poor quality of life[3]. It affects multiple domains of functioning including social, occupational, academic, personal, and particularly psychological domains. Particularly migraine is commonly linked with a broad range of psychiatric comorbidities[4]. There has been a reported increase in the prevalence of migraine-related disability in patients who develop mood disorders due to migraine[5]. Considering the paucity in literature and limited work that has been done in migraine leading to mood disorders and other psychiatric comorbidities, leading to overall poor quality of life[17].

Hence, the present study was conducted to study the clinical characteristics of migraine, identify and treat patients adequately to prevent the disability and correlate mood disorders[13] in patients with migraine, and assess mood-related disability.

Materials and Methods:

The cross-sectional observation prospective clinical study was begun after getting approval from Institutional Ethics Committee of Father Muller Medical College, Mangalore, Karnataka, India and written informed consent from the study subjects. Subjects with migraine amongst those aged 14-64 years diagnosed with migraine based on ICHD were recruited by consecutive sampling at Neurology outpatient department of Father Muller Medical college and hospital, Mangalore, Karnataka during one month between march and April 2017.

Consecutive/Universal sampling method was adopted for the data collection, all the migraine patients visiting the Neurology outpatient department and satisfying the inclusion criteria during the study period were recruited for the study.

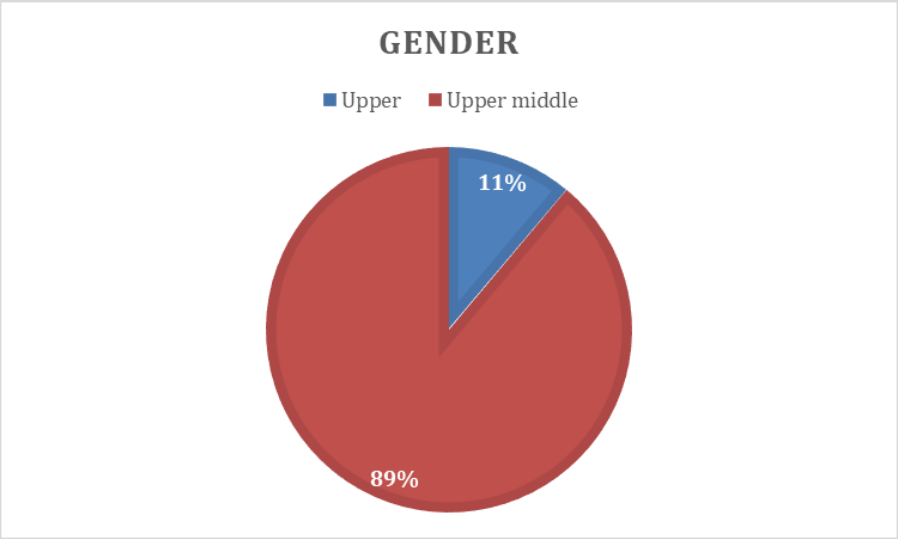
Data was collected based on questionnaire which had 3 sections. Section A includes identification data of the study participants. Section B focuses on collecting comprehensive socio-demographic information. This section includes details on age, gender, education level, current occupation, marital status, type of residence, information about monthly income and respondents are classified according to the modified Kuppuswamy socio-economic status scale 2012[6]. Section C includes questions related to characteristics of headache namely duration, frequency, character, localization, type, severity, associated symptoms, family history, and questions related migraine disability assessment (MIDAS)[7]. The questionnaire was prepared after thorough review of literature of published articles.

Operational definition of migraine encompasses headache attacks lasting for 4-72 hours without treatment or failure of treatment which fulfills at least two of the following characteristics: moderate or severe pain intensity, aggravation by or avoidance of routine physical activity, unilateral headache, feelings of pulsation. During migraine, at least nausea and/or vomiting or photophobia and phonophobia is experienced.

SPSS Version 21.0 was used for entering and analyzing the data. Descriptive statistics like proportion, mean and standard deviation were used to express the results.

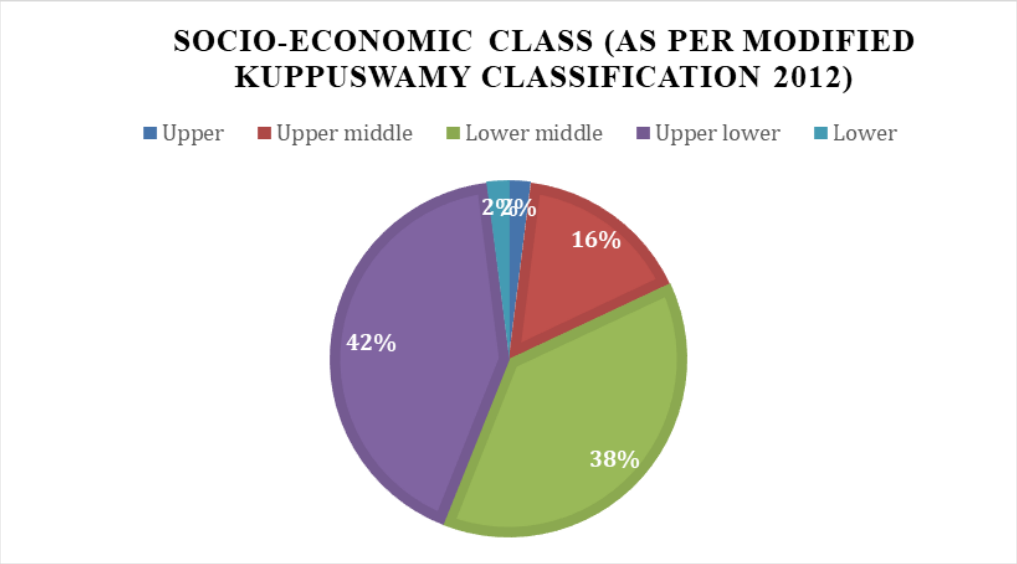
Results

Figure 1: Gender of Study Participants (N=50)[12]



The study included 50 participants with a median age of 34.14 years (±12.22). The majority were female (37) as depicted in Figure 1.

Figure 2: Socio-economic class (as per modified Kuppuswamy classification 2012[6]) of Study Participants (N=50)



Among 50 subjects with migraine, a larger proportion belonged to lower socio-economic classes, with 42% classified as class IV (6-10) as depicted in Figure 2.

Table 1: Baseline Characteristics of Study Participants (N = 50)

Baseline Characteristics	Number	Percentage (%)
Education		
A - professional or honors	1	2.0
B - graduate/postgraduate	6	12.0
C - intermediate or diploma	7	14.0
D - high school	22	44.0

Baseline Characteristics	Number	Percentage (%)
E - middle school	5	10.0
F - primary school	5	10.0
G - illiterate	4	8.0
Occupation		
A - profession	2	4.0
B - skilled work	5	10.0
C - semiskilled work	6	12.0
D - unskilled work	5	10.0
E - unemployed	23	46.0
F - student	9	18.0
Marital Status		
Single	13	26.0
Married	37	74.0
Residence		
Urban	29	58.0
Rural	21	42.0

Educational backgrounds varied, with the largest group having completed high school (44%), while a small percentage were illiterate (8%). In terms of occupation, a significant portion were unemployed (46%), with students comprising 18%. Most participants lived in urban areas (58%) The demographic profile suggests a sample primarily composed of middle-aged, married, and less-educated individuals, with a notable level of unemployment as depicted in Table 1.

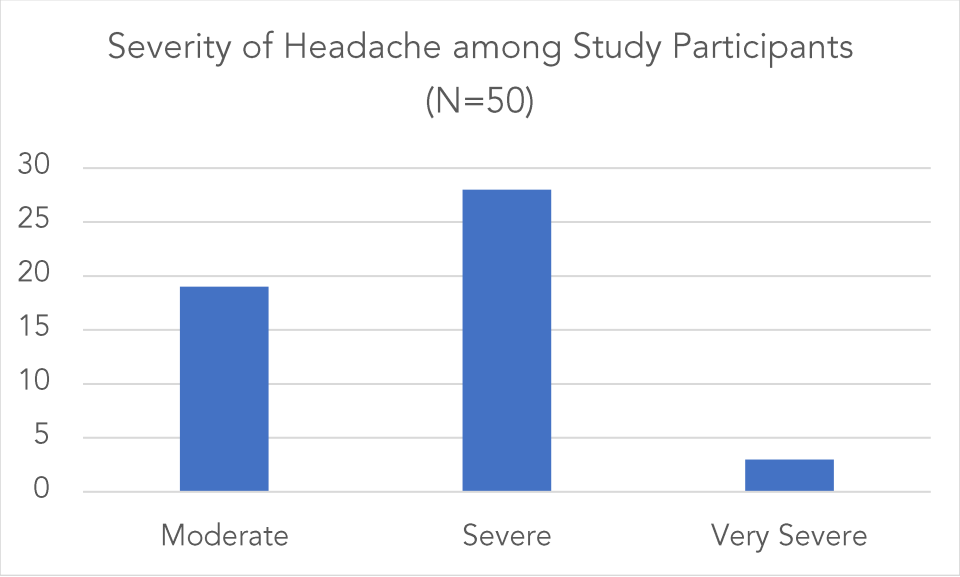
Table 2: Characteristics of headache among study participants (N = 50)

Headache Characteristics	Number	Percentage
Type of Migraine		
A: with aura	8	16.0
B: without aura	42	84.0
Types of Aura		
0 : Nil	42	84.0
A : Visual	6	12.0
B : Sensory	1	2.0

Headache Characteristics	Number	Percentage
C : Motor	1	2.0
Monthly Occurrences of Headache		
A : 0 – 4	6	12.0
B : 5 – 9	16	32.0
C : > 10	28	56.0
Duration of Attacks in hours		
A : < 6 hours	10	20.0
B : 6 – 24 hours	23	46.0
C : 24 – 72 hours	14	28.0
D : > 72 hours	3	6.0
Character of the Headache		
A : Pulsating	25	50.0
B : Sharp	15	30.0
C : Dull	5	10.0
D : Others	5	10.0
Family History		
A : Present	11	22.0
B : Absent	39	78.0

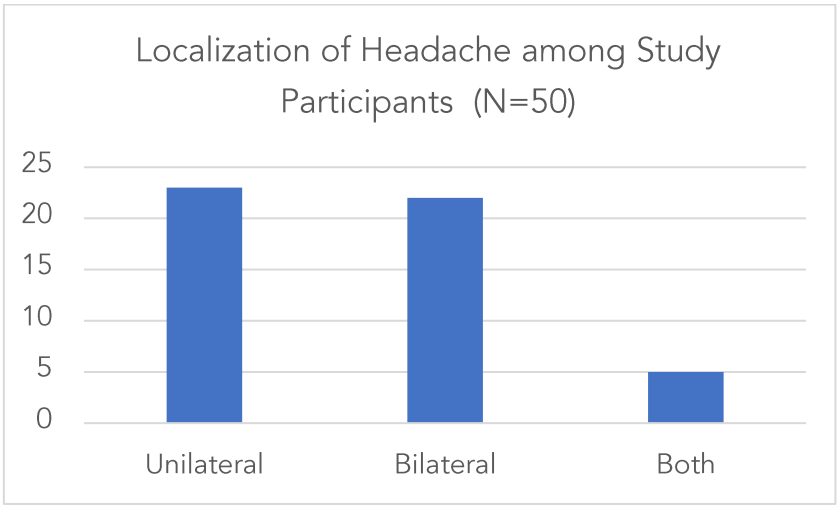
Out of 50 study participants 84% (n=42) of them reported of having migraine without aura, 56% (n=28) of them reported of having headache more than 10 times in a month, 46.0% (n=23) of them had headache episodes that lasted for upto 24 hours. Among 50 subjects with migraine who had headache, 39 subjects (78.0%) gave the family history of headache as depicted in Table 2.

Figure 3: Severity of Headache among Study Participants (N=50)



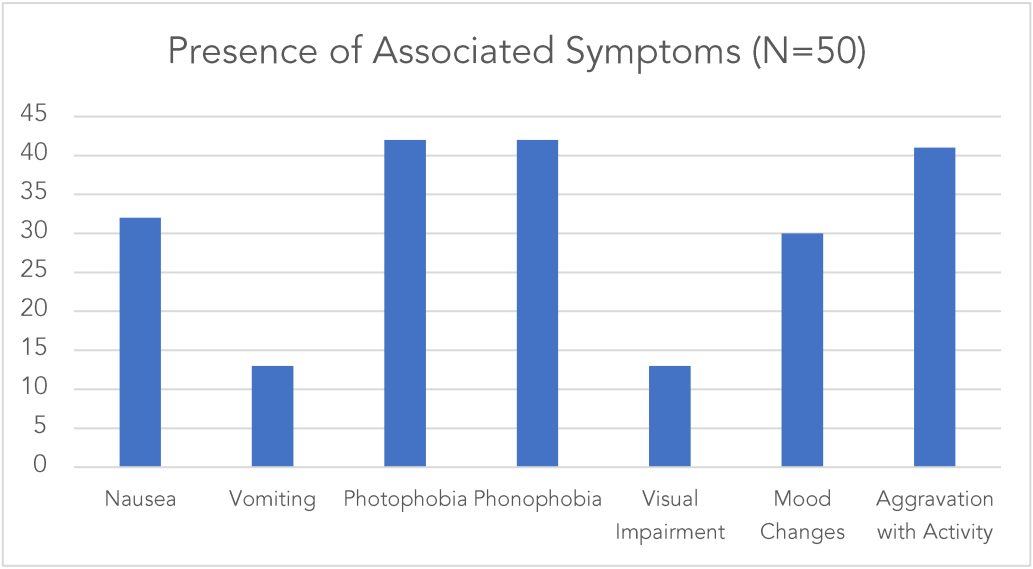
Out of 50 study participants most of them suffered from severe pain (n=28, 56.0%) as depicted in Figure 3.

Figure 4: Localization of Headache among Study Participants (N=50)



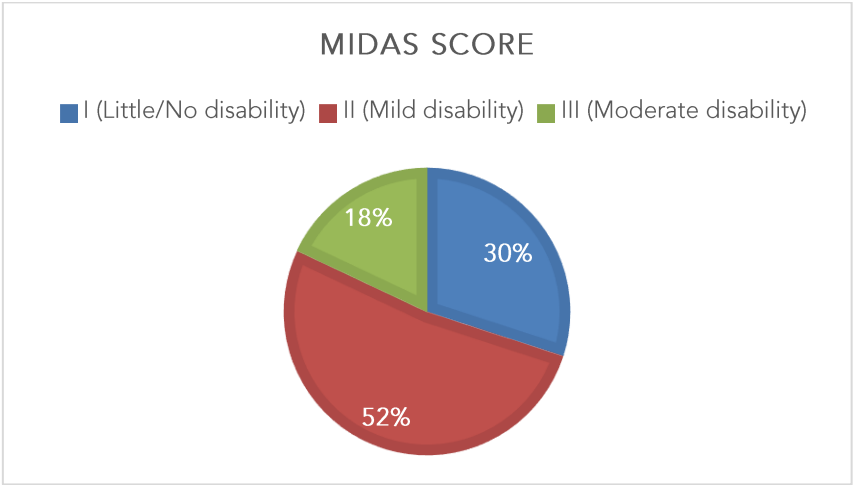
Among 50 subjects with migraine who had headache, 23 subjects (46%) had unilateral headache, 22 subjects (44%) reported of bilateral headache as depicted in Figure 4.

Figure 5: Presence of Associated Symptoms (N=50)



Among 50 subjects with migraine the most common associated symptoms of migraine is reported as Mood Changes (n=30, 60.0%), Nausea (n=32, 64.0), Aggravation with activity (n=41, 82.0%), Photophobia (n=42, 84.0%) and Phonophobia (n=42, 84.0%) as depicted in Figure 5.

Figure 6: Disability associated with headache as per MIDAS score



On analyzing the disability associated with headache as per MIDAS score, It was found that 52.0% (n=26) had MIDAS Grade II disability (mild disability) followed by MIDAS Grade I disability (little/no disability) in 30.0% (n=15) and 18.0% (n=9) had MIDAS Grade III disability (Moderate disability) among the study participants as depicted in Figure 6.

Statistical Correlation: Cross-Tabulation

Table 3: Cross-tabulation of Age at onset of Headache and Family History of Headache

Age at onset (in years) * family history				
		Family history		Total
		Present n (%)	Absent n (%)	
Age at Onset (in years)	14 – 34	9 (26%)	25 (74%)	34
	34 – 49	1 (7%)	13 (93%)	14
	50 – 64	1 (50%)	1 (50%)	2
Total		11 (22%)	39 (78%)	50

There is no association between age at onset of headache and family history of headache (Chi Square Value: 1.1, p - value: 0.2943) as depicted in Table 3.

Table 4: Cross-tabulation of Gender of subject with migraine and Family History of Headache

Gender * family history				
		Family history		Total
		Present n(%)	Absent n(%)	
Gender	Male	0	13 (100%)	13
	Female	11 (30%)	26 (70%)	37
Total		11 (22%)	39 (78%)	50

There is an association between gender of subjects with migraine and family history of headache ($p<0.05$, Chi Square Value: 4.955, p - value: 0.026) as depicted in Table 4.

Table 5: Cross-tabulation of Gender of subject with migraine and Age at onset of Headache

		Age at onset (in years)			Total
		14-34 n (%)	35-49 n (%)	50-64 n (%)	
Gender	Male	7 (54%)	4 (31%)	2 (15%)	13
	Female	27 (73%)	10 (27%)	0	37
Total		34 (68%)	14 (28%)	2 (4%)	50

There is an association between gender of subjects with migraine and age at onset of headache ($p<0.05$, Chi Square Value: 6.258, p - value: 0.044) as depicted in Table 5.

Table 6: Cross tabulation of Duration of attack in hours and localization of Headache

		Localization			Total
		U/L n(%)	B/L n(%)	Both n(%)	
Duration of headache (in hours)	< 6	5 (50%)	4 (40%)	1 (10%)	10
	6 - 24	9 (39%)	12 (52%)	2 (9%)	23
	24 – 72	7 (50%)	6 (43%)	1 (7%)	14
	>72	2 (66%)	0	1 (33%)	3
Total		23 (46%)	22 (44%)	5 (10%)	50

There is no association between Duration of attack in hours and localization of Headache ($p>0.05$, Chi Square Value: 4.095, p - value : 0.664) as depicted in Table 6.

Table 7: Cross tabulation of Duration of attack in hours and association symptoms

Duration of Attack (in hours)								
Asssociated symptoms		<6 n(%)	6-24 n(%)	24-72 n(%)	>72 n(%)	Total	Pearson chi-square value	P-value
Nausea	Yes	5 (27.7%)	8 (44.4%)	4 (22.2%)	1 (5.5%)	18	2.553	0.466
	No	5 (16%)	16 (50%)	8(25%)	3 (9%)	32		
Vomiting	Yes	8 (22.2%)	16 (44.4%)	9 (25%)	3(8.3%)	36	0.658	0.883
	No	2 (14.28%)	8 (57.14%)	3 (21.4%)	1 (7.1%)	14		
Photophobia	Yes	1 (11.1%)	5 (55.5%)	2 (22.2%)	1 (11.1)	9	1.434	0.698
	No	9 (22%)	19 (46.3%)	10 (24.3%)	3 (7.3)	41		
Phonophobia	Yes	2 (25%)	3 (37.5%)	2 (25%)	1 (12.5%)	8	0.970	0.809
	No	8 (19%)	21 (50%)	10 (23.8%)	3 (7.2%)	42		
Visual impairment	Yes	8 (20.5%)	18 (46.1%)	9 (23%)	3 (7.7%)	39	1.928	0.588
	No	2 (18.1%)	6 (54.5%)	3 (27.2%)	0	11		
Mood changes	Yes	8 (38%)	7 (33.3%)	3 (14.2%)	3 (14.2%)	21	10.173	0.017
	No	2 (6.8%)	17 (58.6%)	9 (31%)	1 (3.4%)	29		
Aggravation on activity	Yes	2 (25%)	4 (50%)	2 (25%)	0	8	0.803	0.849
	No	8 (19%)	20 (47.6%)	10 (23.8%)	4 (9.5%)	42		

There is no association between attack duration (in hours) and various symptoms including nausea, vomiting, photophobia, phonophobia, visual impairment, and aggravation on activity. However, mood changes exhibit an association with attack duration ($p = 0.017$), suggesting that mood alterations may vary significantly depending on the duration of the attack as depicted in Table 7.

Table 8: Cross tabulation of Migraine Disability Assessment Score (MIDAS) and other variables

MIDAS						
Associated symptoms		I (Little/No disability) n (%)	II (Mild disability) n (%)	III (Moderate disability) n (%)	Pearson chi-square value	P-value
Duration Of Attack (in hours)	<6	4 (25%)	6 (24%)	0	12.603	0.05
	6-24	9 (56%)	11 (44%)	4 (44%)		
	24-72	0	8 (32%)	4 (44%)		
	>72	3 (19%)	0	1 (12%)		
Total		16	25	9		
Severity	Mild	0	0	0	7.791	0.100
	Moderate	8 (50%)	6 (24%)	6 (67%)		
	Severe	7 (44%)	18 (72%)	2 (22%)		
	Very Severe	1 (6%)	1 (4%)	1 (11%)		
Total		16	25	9		

MIDAS						
Associated symptoms		I (Little/No disability) n (%)	II (Mild disability) n (%)	III (Moderate disability) n (%)	Pearson chi-square value	P-value
Character	Pulsating/throbbing	11 (69%)	9 (36%)	5 (56%)	10.487	0,106
	Sharp	3 (19%)	10 (40%)	2 (22%)		
	Dull	2 (12%)	2 (8%)	2 (22%)		
	Others	0	4 (16%)	0		
Total		16	25	9		
Monthly Frequency (in days)	0-4	5 (31%)	1 (4%)	0	1.335	0.855
	5-9	3 (19%)	13 (52%)			
	>10	8 (50%)	11 (44%)	9 (100%)		
Total		16	25	9		
Education	Professiona or Honors	0	0	1 (11%)	6.381	0.896
	Graduate or Post graduate	3 (19%)	3 (12%)	0		
	Intermediate or post high school diploma	2 (12.5%)	4 (16%)	1 (11%)		
	High school	6 (37.5%)	10 (40%)	6 (67%)		
	Middle school	1 (6%)	3 (12%)	1 (11%)		
	Primary school	2 (12.5%)	3 (12%)	0		
	Illiterate	2 (12.5%)	2 (8%)	0		
Total		16	25	9		
Gender	Male	4(25%)	8 (32%)	1 (11%)	0.601	0.740
	Female	12 (75%)	17 (68%)	8 (99%)		
Total		16	25	9		

The cross tabulation of MIDAS scores in relation to associated symptoms reveals an association between attack duration and disability level (p = 0.05), indicating that longer attacks correlate with increased disability. However, other factors such as severity, character of pain, monthly frequency, education level, and gender show no association with disability levels. There is a female preponderance across all disability levels as depicted in Table 8.

Discussion

Migraine is a wide spectrum of disease characterized by a variable number of episodes, associated with variable intensities of pain, causing implications in the migraine treatment.

The current study focused on the clinical characteristics of migraine, assessed the disability associated with migraine, and correlated clinical profile with the socio-demographic factors. The current study has a special focus on migraine-related disability associated with mood disorders affecting the health-related quality of life[8], considering the inadequacy of diagnosis and treatment amongst migraine patients.

The findings of the current study which involved 50 subjects with migraine are in accordance with similar research specific to the disability and demographic parameters of patients with migraine. The current study shows a female preponderance of 74.0 %. The Majority of about 52.0% belonged to the age group of 14-34. 42.0% belonged to the middle IVth socio-economic class, and 40% had attained atleast high school education. Demographic variables are in accordance with studies done by Renjith V[10], Steiner TJ[11], both studies emphasize on the significant burden of migraine as a disabling condition, however they focus on different populations. Study conducted by Renjith V[10] in Karnataka, India, surveyed 60 patients, revealing a female preponderance (70%) and a mean age of 35.22 years. It documented high rates of associated symptoms such as throbbing pain (90%) and moderate to severe functional disability in 73.3% of participants. Conversely, study conducted by Steinar TJ[11] estimated the one-year prevalence of migraine in England through a larger sample (n = 4007), finding that 7.6% of males and 18.3% of females reported migraines, with a significant decline in prevalence after the age of 40. The study emphasized substantial productivity loss, averaging 5.7 working days lost per year for migraineurs, particularly among the most disabled individuals. Together, these studies underscore the pervasive impact of migraine across different demographics, emphasizing the need for targeted healthcare strategies to address this significant public health issue.

A family history of migraine was present in 78% of subjects. The family history of migraine is associated with a lower age-at-onset. The various symptoms experienced by patients include throbbing pain (50.0%), mood changes (60.0%), nausea (65.0%), photophobia (84.0%), and phonophobia (84.0%).

The duration and frequency of headaches were found to correlate with the presence of mood disorders in 60.0% of the patients. Moreover, a higher migraine-related disability was noted in patients with comorbid mood disorders.

Numerous studies have highlighted that individuals with migraines who also experience mood disorders tend to face a lower quality of life. This includes increased activity limitations, more frequent job absences, greater use of healthcare services, and a higher likelihood of needing assistance with personal or instrumental daily activities. These findings are consistent with the worse disability scores observed in our study.

Most of the subjects (52.0%) under the study belonged to mild levels of functional disability based on MIDAS. MIDAS questionnaire can be used as an effective clinical measure to identify the severity of illness and can be an inevitable tool in planning treatment for migraine.

We would like to acknowledge the limitations of our study. Firstly, the small and specific sample size restricts the generalizability of our findings to a broader population. Secondly, being a cross-sectional study, it does not account for the effects of medication on disability levels over time. Additionally, the relatively short duration of the study limits our ability to assess long-term outcomes and changes in disability. However, one of the primary strengths of our study is its prospective design, which allows for the observation and analysis of outcomes over time, reducing biases associated with retrospective studies. Additionally, the assessment was conducted using standard international criteria and standardized tools, ensuring that the measurements and evaluations were both reliable and valid. Another, strength of our study is that we have carefully excluded other causes of headache especially tension type and medication overuse headaches which could potentially change the clinical and psychological picture of the individuals or any subjects with acute illnesses.

Hence, we contend that this study provides a pure and undistorted picture of Clinical characteristics and disability of subjects with migraine along with a correlation amongst associated symptoms like mood changes with duration and frequency of headaches.

Conclusion

Migraine headache is a common neurological disorder[14] affecting the younger female population leading to significant mood disorders with rising migraine-related disability. An early diagnosis and optimum treatment of these individuals can prevent these impairments and lead to a better quality of life in these individuals. Moreover, patients with migraine must be screened for mood disorders using questionnaires like the Hospital Anxiety and Depression Scale (HADS)[9] to rule out comorbid mood disorders. A prospective longitudinal study, larger sample size, and effectiveness of treatment and quality of life with adequate treatment could be targets for future epidemiological and clinical studies on migraine.

Conflict of Interest:

There are no conflicts of interest.

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