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Clinical Profile of Migraine Headache with Special Reference to Trigger Factors in Medical College Set Up

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Abstract: ***Background and objectives: Migraine is one of the disabling primary headache in the population. It affects the individual and society at large by loss of productivity by the sufferers and enormous economic burden. There are multiple factors which can trigger migraine. If properly controlled, it can reduce the burden of migraine. Health care professionals are exposed to multiple trigger factors like sleep disturbance, stress and untimely food habits which give rise to increase in migraine frequency. We conducted this study of detailed clinical profile and trigger factors among the 2050 subjects (MBBS students: 909, BDS students: 323, Nursing students: 268, Post graduates students and staff: 550) in our medical institute Methods: Subjects were given questionnaires on migraine headache and instructed to give details of clinical features with special reference to trigger factors. The assessment tools used were visual analogue scale (VAS) and migraine disability assessment scale (MIDAS). Results: Out of 2050 subjects 697 suffered from migraine headache. The overall prevalence of migraine headache was 34%. Out of which females had higher prevalence (66.1%) as compared to males (33.8%). Headache experienced by majority of student population was unilateral (31.4%), pulsating type (51.6%) and of moderate intensity (77.1%). Common associated symptoms were nausea associated with other factors (40%) and photophobia & phonophobia (18.6%). Stress (72.1%) & decreased sleep (49.4%) were the most common triggering factors. Practice of self-medication was reported by 80.2% of subjects. Specific anti migraine medication use in migraineurs was found to be low (7.7%) showing inadequate management of migraine headache in our study population. Conclusion: Our study noted high frequency of trigger factors in medical professionals and most common triggering factor was stress and disturbed sleep. There was very low usage of specific anti migraine medications among them. To our knowledge this is the first large study to evaluate migraine among medical professionals.***

Keywords: Headache, Migraine, Trigger factors.

1. Introduction

Headache is a common neurological disorder, which is associated with significant disease burden. Headache affects work, social and leisure activities and has a tremendous impact on a person's life [1], [2]. Headache research has focused on both general populations and specific groups such as adolescents, college undergraduates, people in the workplace and persons with potentially related co morbidities such as epilepsy and psychiatric illnesses [3].Globally, it has been estimated that prevalence among adults of current headache disorder (symptomatic at least once within the last year) is 47%. 11% have migraine, 42% have tension-type headache (TTH), and 3% have chronic daily headache [4]. Half to three quarters of the adults aged 18–65 years in the world have had headache in the last year and among those individuals, more than 10% have reported migraine. Headache on 15 or more days every month affects 1.7–4% of the world's adult population. Despite regional variations, headache disorders are a worldwide problem, affecting people of all ages, races, income levels and geographical areas. In the Global Burden of Disease Study, updated in 2004, migraine on its own was found to account for 1.3% of years lost due to disability. Headache disorders impose a recognizable burden on sufferers including sometimes substantial personal suffering, impaired quality of life and financial cost. Repeated headache attacks, and often the constant fear of the next one, damage family life, social life and employment. The long-term effort of coping with a chronic headache disorder may also predispose the individual to other illnesses. For example, depression is three times more common in people with migraine or severe headaches than in healthy individuals. Economic burden of headache disorders are a public-health concern given the large amount of associated disability and financial costs to society. As headache disorders are most troublesome in the productive years (late teens to 50s), estimates of their financial cost to society – principally from lost working hours and reduced productivity – are massive. In the United Kingdom, for example, some 25 million working- or school-days are lost every year because of migraine alone; this financial cost is matched by TTH and chronic daily headache combined [5].

Migraine is a chronic neurovascular disease. It is characterized by a state of neuronal hyperexcitability, with abnormal modulation involving several receptors and ion channels at several sites including the cerebral cortex, the trigemino vascular system, and brainstem nuclei [6]. Migraine is divided into two major subtypes, migraine with aura and migraine without aura. Migraine without aura is most common type [7]. The International Headache Society (IHS) defines migraine without aura as a recurrent headache disorder with attacks lasting from 4 to 72 hours and is unilateral, pulsatile, and of moderate to severe intensity, and symptoms are associated with nausea, vomiting,

photophobia or phonophobia [8].The prevalence of migraine is 10% worldwide. The World Health Organization ranks migraine 19th on the list of diseases worldwide that cause disability [9]. Migraine is due to neuronal hyper excitability of ophthalmic branch of the trigeminal nerve which innervates cerebral blood vessels, dural vessels and other intracranial structures. It causes spontaneous depolarization which results in release of neuropeptides like substance P, neurokinin A, calcitonin gene related peptide etc. It leads to neuronal inflammation of trigeminal nerve which causes vasodilatation of cranial blood vessels, leakage of plasma proteins from dural vessels, mast cell degranulation, and activation of cellular immune response. According to Reuter et al., migraine with aura is due to cortical spreading depression which stimulates trigeminal nerve spontaneously and results in neurogenic inflammation [10].Trigger factors of migraines, are defined as factors that, in isolation or in combination with other factors, induce a crisis in susceptible individuals [11] and generally precede a crisis by less than 48 hours [12]. Many of these factors have been reported, such as those related to food, hormones, and the environment, with stress being one of the most common [13][14]. Despite this, there is little evidence to conclusively correlate the majority of these factors with the initiation of a crisis [15].

2. Materials and Methods

This is cross sectional, prospective type of study, which included 2050 subjects. This is conducted in Vydehi Institute of Medical Sciences and Research Centre (VIMS & RC), Bengaluru. Duration of this study was from June 2013 to Dec 2015. Medical students, Dental students, Nursing students, Post graduates and teaching / non-teaching staff of VIMS & RC who have headache have been recruited Approval for the study protocol was obtained from the institutional health research and ethics committee.International headache society criteria.Visual Analogue Scale (VAS) and Migraine Disability Assessment (MIDAS) were used as assessment tools. Subjects in the age range of 18-70 years of either gender and who is suffering from headache were included. Subjects diagnosed of secondary headaches and who were unwilling to give consent were excluded. Analysis was undertaken using SAS system (version 9.2).

3. Results

3.1 Demographic and Clinical Characteristics

The sample consisted 2050 participants of both gender. The studied population were from a medical college setup consisting of MBBS, BDS, Nursing, Post Graduates and Staff.

3.2 Socio-demographic characteristics

Table 1.1: Age

Age	N	Migraine	No Headache	TTH
18-25	1554(75.8%)	552(26.9%)	656(32%)	346(16.8%)
26-35	344(16.7%)	96(4.6%)	167(8.1%)	81(3.9%)
36-45	132(6.4%)	44(2.1%)	54(2.6%)	34(1.6%)
>45	20(0.9%)	5(0.2%)	12(0.5%)	3(0.1%)

The mean age of the samples was 23.56 years (±6.0)

Table 1.2: Gender

Gender	N	Migraine	No Headache	TTH
Female	1274(62.1%)	461(66.1%)	544(61.1%)	269(57.9%)
Male	776(37.8%)	236(33.8%)	345(38.8%)	195(42.0%)

The study group had 1274 females and 776 males of whom 461females and 236 males had migraine headache.

Table 1.3: Course

Course	N	Migraine	No Headache	TTH
MBBS	909(44.3%)	357(51.2%)	364(41%)	188(40.5%)
BDS	323(15.7%)	108(15.4%)	117(13.1%)	98(21.1%)
Nursing	268(13.0%)	74(10.6%)	148(16.6%)	46(9.9%)
PG's and Staff	550(26.8%)	158(22.6%)	260(29.2%)	132(28.4%)

The study group consisted of 2050 participants, 44.3% were MBBS students 15.7% were BDS students, 13% were nursing students and 26.8% belonged to post graduates and staff.

Table 2: Clinical data of migraine characteristics:

Table 2.1: Premonitory symptoms

Migraine	*Frequency and Percentage*
Migraine with aura	156(22.3%)
Migraine without aura	541(77.6%)

In our study out of 2050 participants 697 had migraine type of headache, 22.3% had migraine with aura and 77.6% had migraine without aura.

Table 2.2: Duration of Headache

Duration of Headache	Frequency and Percentage
<1month	55(7.8%)
1-3months	226(32.4%)
3-6months	173(24.8%)
6-12 months	65(9.3%)
>12months	178(25.5%)

In the study group 32.4% of them had headache of 1-3 months duration followed by > 12 months in 25.5%, 3-6 months among 24.8%, 9.3% reported of 6-12 months duration and 7.8% reported < 1month duration of headache.

Table 2.3: Duration of Attack

Duration of each attack	Frequency and Percentage
4-12 hours	603(86.5%)
12-24 hours	71(10.1%)
24-48 hours	13(1.8%)
48-72 hours	10(1.4%)

86% of them reported 4-12 hours duration of each attack, while 10.1% reported 12-24 hours, 1.8% reported 24-48 hours and 1.4% reported 48-72 hours.

Table 2.4: Number of attacks in a month

Number of attacks in a month	Frequency and Percentage
5-10	618(88.6%)
10-15	58(8.3%)
>15	21(3.0%)

In our study 88.6% reported 5-10 attacks in a month , 8.3% of them reported 10-15 attacks and 3% of them reported >15 attacks per month.

Table 2.5: Onset of each attack

Onset of each attack	Frequency and Percentage
Gradual	453(64.9%)
Sudden	244(35.0%)

64.9% of them reported gradual onset of each attack while 35% of them reported sudden onset of each attack.

Table 2.6: Time of Occurrence

Time of Occurrence	Frequency and Percentage
Morning	140(20.0%)
Afternoon	225(32.2%)
Evening	187(26.8%)
Nocturnal	22(3.1%)
Mixed/Varied	123(17.6%)

32.2% of them reported attack of migraine occurred mostly during afternoons while 26.8% reported evening, 20% reported morning, 17.6% reported mixed/varied and only 3.1% of them reported nocturnal.

Table 2.7: Site

Site	Frequency and Percentage
Unilateral	219(31.4%)
Bifrontal	96(13.7%)
Temporal/Temple	121(17.3%)
Occipital	21(3.0%)
More than one type	154(22.0%)
Orbital	3(0.4%)
Holocranial	50(7.1%)
Changing	33(4.7%)

In our study 31.4% of them reported unilateral headache and 22% of them reported more than one type of headache while 17.3% of them reported of temporal, 13.7% of them reported bifrontal, 7.1% reported holocranial, 4.7% reported changing type, 3% reported occipital and 0.4% of them reported orbital.

Table 2.8: Nature of pain

Quality/Nature of Pain	Frequency and Percentage
Pulsating	360(51.6%)
Throbbing	129(18.5%)
Bursting	24(3.4%)
Band like	21(3.0%)
Shooting	10(1.4%)
More than one type	153(21.9%)

The most characteristic headache was pulsating which was seen in 51.6% of the participants followed by more than one type in 21.9% , throbbing in 18.5%, bursting type was reported in 3.4%, 3% reported band like and 1.4% reported shooting type.

Table 2.9: Intensity of pain

Visual Analogue Scale for Pain	Frequency and Percentage
Mild(0-4)	95(13.6%)
Moderate(5-7)	538(77.1%)
Sever(8-10)	64(9.1%)

77.1% of them reported of moderate intensity of pain on visual analogue scale, 13.6% of them reported mild and 9.1% of them reported of sever intensity.

Table 2.10: Family history

Family history	Frequency and Percentage
Present	166(23.8%)
Absent	531(76.1%)

In our sample 76.1% of them reported of having no family history of migraine while 23.8% of them had family history of migraine.

Table 2.11: Relieving factors

Relieving factors	Frequency and Percentage
Rest	407(58.3%)
Sleep	496(71.1%)
Massage	188(26.9%)
Vomiting	44(6.3%)
Entertainment	66(9.4%)
Change of Posture	18(2.5%)

71.1% of them reported sleep as relieving factor while 58.3% of them reported of rest as relieving factor, 26.9% reported massage, 9.4% of them reported entertainment, 6.3% reported vomiting and 2.5% of them reported of change of posture as relieving factor.

Table 2.12: Medications

Medications	Frequency and Percentage
NSAID'S	471(67.5%)
Opioids	17(2.4%)
Prophylactic	54(7.7%)
Triptans	14(2.0%)
Homeopathy	3(0.4%)

In our study 67.5% of them used NSAID's, 2,4% used opioids , 2% used triptans,0.4% used homeopathy and only 7.7% of them used prophylactic medications.

Table 2.13: MIDAS

MIDAS degree	
I	477(68.4%)
II	99(14.2%)
III	86(12.3%)
IV	34(4.8%)

Participants in our study reported of headache related disability, that is 68.4% had MIDAS score of grade I, 14.2% had grade II, 12.3% had grade III, and 4.8 % had grade IV.

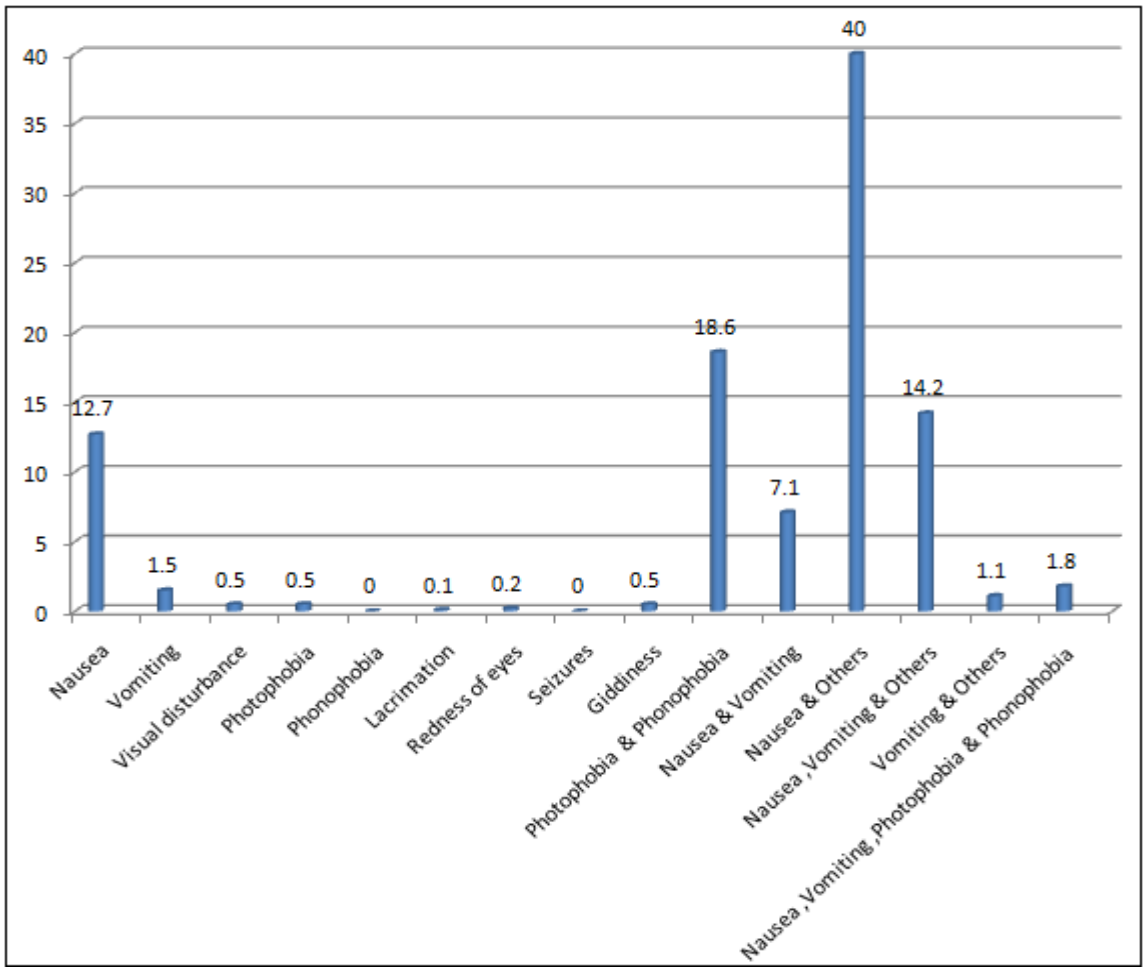

Figure 1: Associated factors of migraine

Among the associated symptoms, nausea with other factors (40%) was the commonest associated symptom, followed by photophobia with phonophobia (18.6%) and other factors like nausea (12.7%), vomiting (1.5%) ,visual disturbance (0.5%), Lacrimation (0.1%), Giddiness (0.5%), Redness of eyes (0.2%) and 1.8% had nausea, vomiting, photophobia and phonophobia.

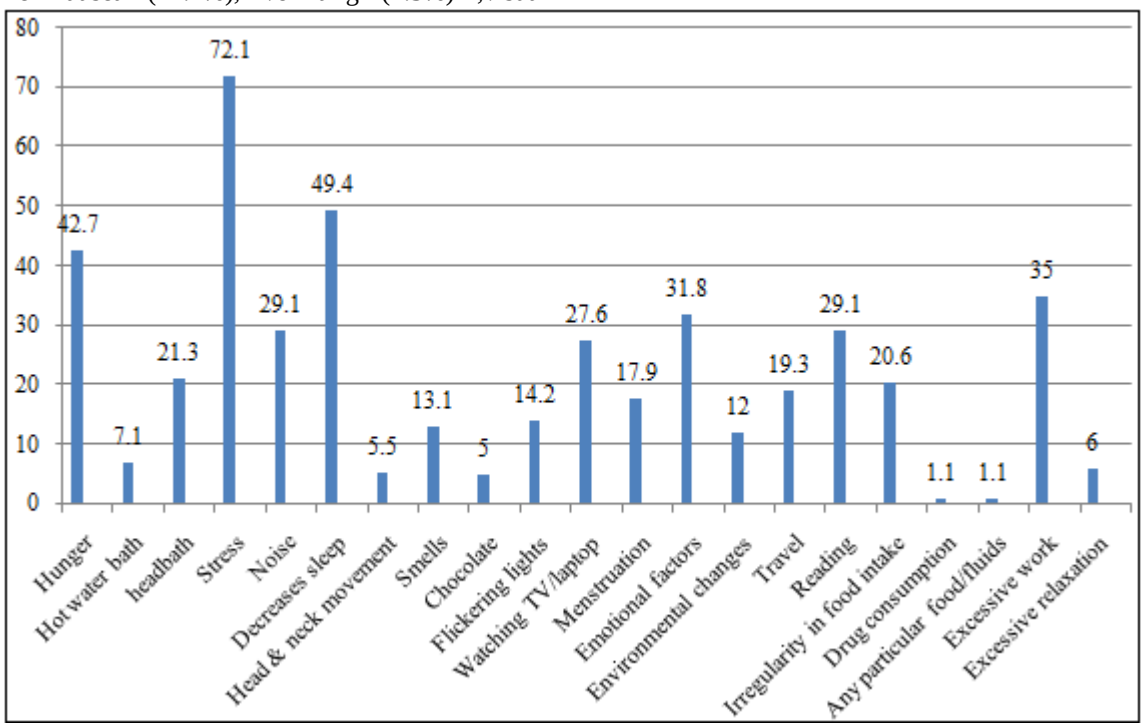

Figure 2: Attacks Triggered by exposure to various factors

Among the triggering factors, hunger, hot water bath, head bath, stress, noise, decreased sleep, odour, chocolate consumption, flickering lights, watching TV/laptops, menstruation, emotional factors, weather changes, travel, reading, irregularity in food intake, excessive work were statistically significant. (P= <0.0001Figure:1).

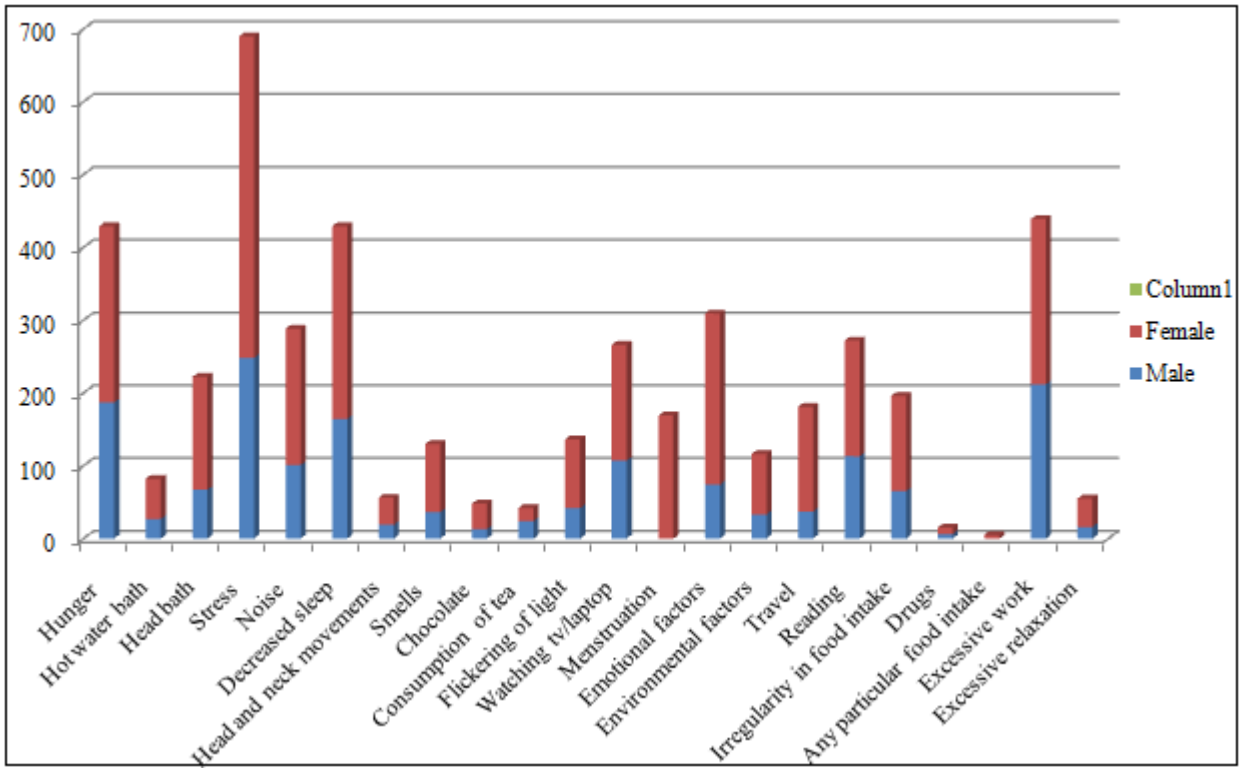

Figure 3: Gender and trigger factors

Our study found predominance of females with migraine. Also stress, decreased sleep and hunger were the commonly reported triggering factors in females.

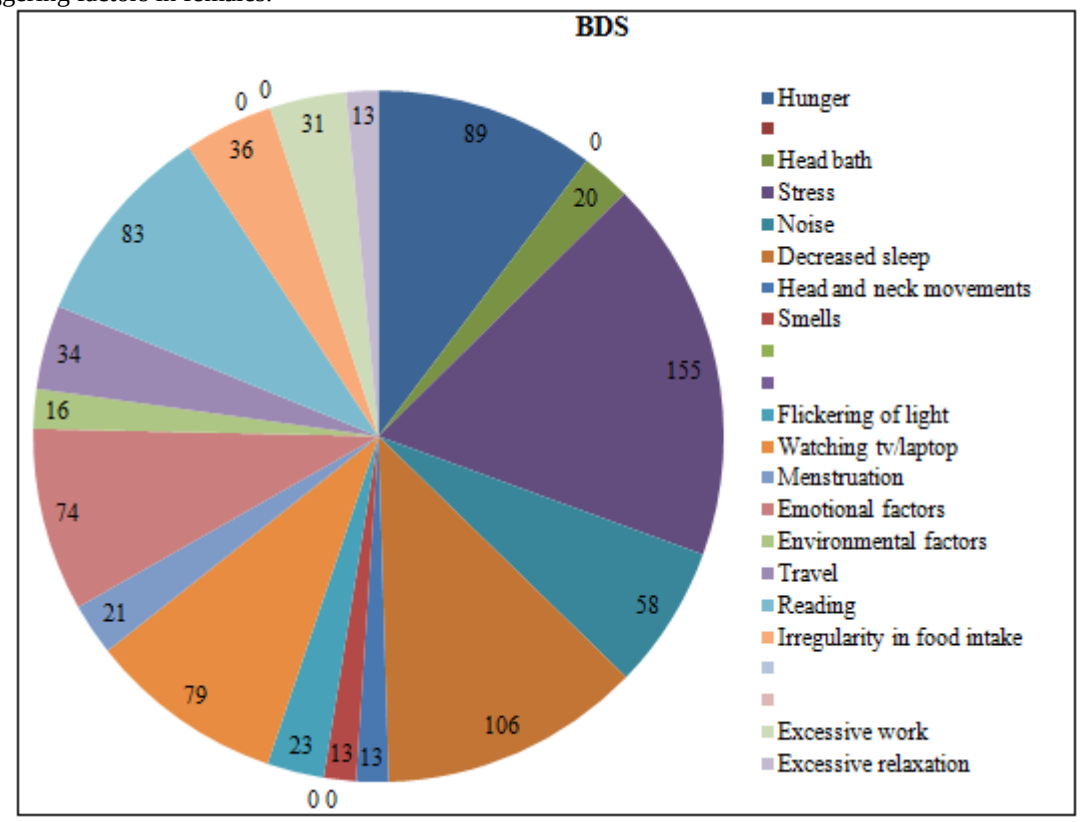

Figure 4.1: Frequency of triggering factors among different courses

Among dental students, stress, decreased sleep and hunger were the commonest triggering factors reported with migraine.

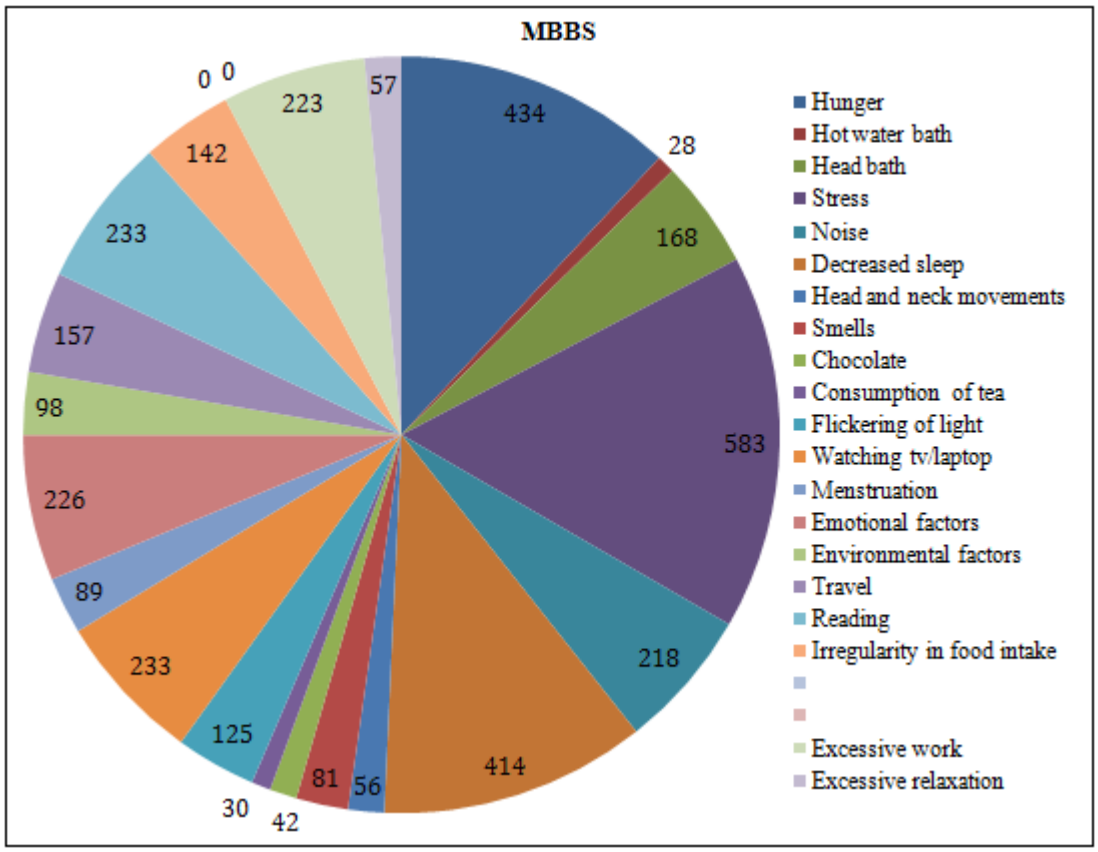

Figure 4.2: MBBS

Among medical students too stress, hunger and decreased sleep were the commonly reported triggering factors.

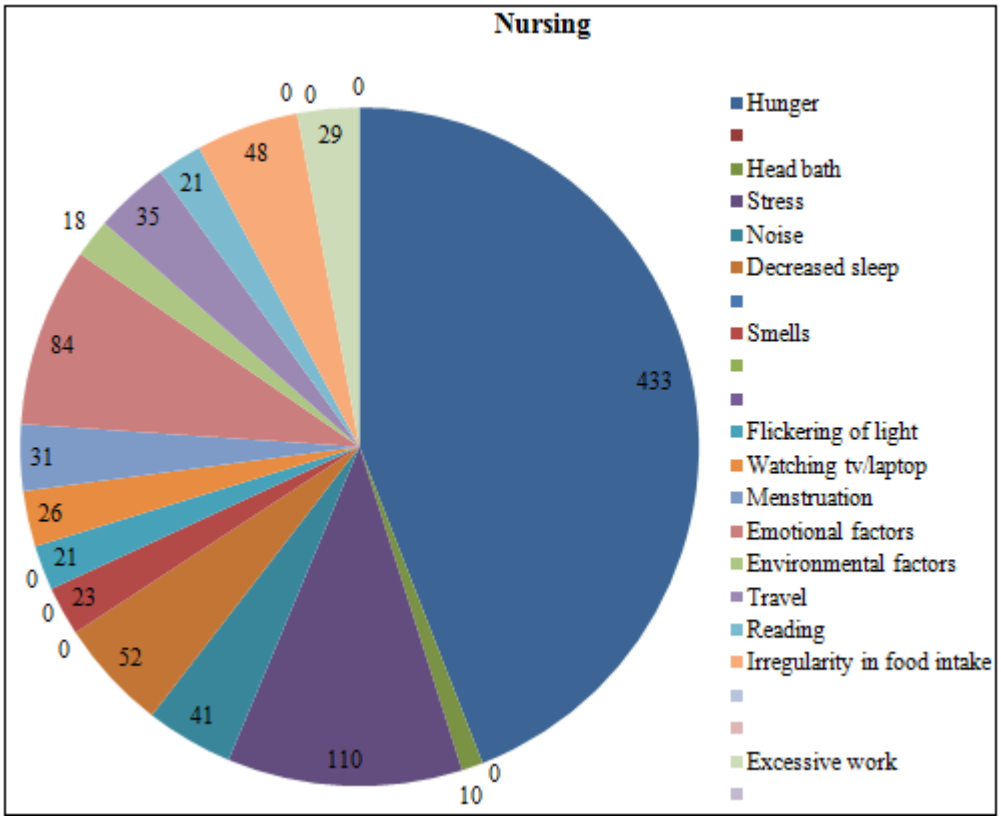

Figure 4.3: Nursing

However nursing students reported hunger as the commonest triggering factor followed by stress and emotional factors.

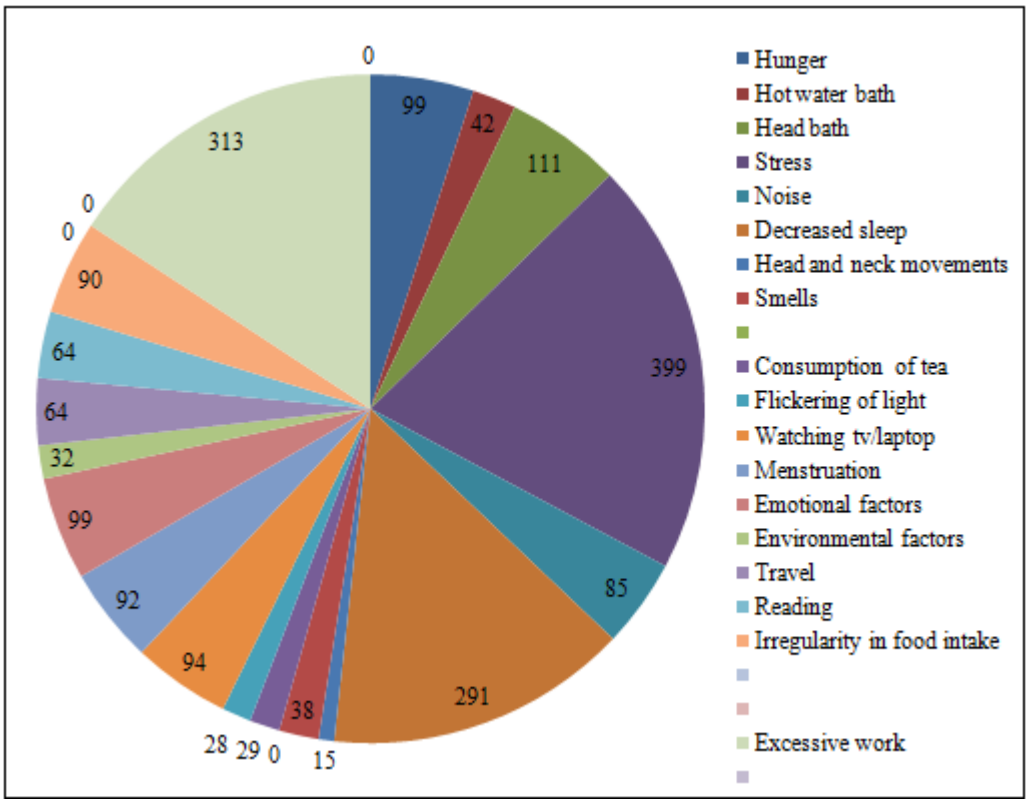

Figure 4.4: Postgraduate(PG) & Staff

Post graduates and staff also reported stress as the commonest triggering factor followed by environmental changes and decreased sleep.

4. Discussion

Migraine is a highly prevalent and disabling subtype of primary headache and a benign neurological disorder. The present study was aimed at identifying the triggering factors and their frequency, emphasising the importance of awareness and avoidance of trigger factors. The study consisted of 2050 participants, cross-sectional assessment was done both by structured and unstructured clinical interview using a specially designed proforma to collect socio-demographic details, Visual Analogue Scale(VAS) for pain and Migraine Disability Assessment Questionnaire (MIDAS). Out of 2050 participants 697 of them had migraine type headache.

The study subjects were recruited on a purposive basis and their socio demographic background showed that majority were females (461) out of 697 migraineurs. The mean age of the subjects recruited here has been 23.5±6.0 (Table 1.1). At present, studies on the negative impact of migraine among adults are limited primarily to population-based samples of adults aged 30-65 [24],[16]. In our sample, 552 (79.7%) of the study subjects belonged to 18-25 years of age constituting the majority. Our study showed high prevalence of migraine in females 461(62.1%) compared to that of males 236(33.8%), as already demonstrated in previous studies conducted by Bindu Menon et al[17], Galinovic et al [18] and Sanvico et al [19]. However this finding should be interpreted with caution as our sample had more female participants. The higher frequency of migraine was found in MBBS students 357(51.4%) followed by Postgraduates and Staff 158(22.6%), 108(15.4%) in BDS and 74(10.6%) in Nursing students respectively.

In our study, prevalence of migraine was found to be 697(34%), out of which 541(77.6%) were not associated with aura and 156(22.3%) were associated with aura, similar to studies conducted by Marianges Zandrozny et al [20] and a study conducted by IHS .However studies have shown variation in migraine prevalence because of number of methodological challenges as previously reported by Leonardi et al [1].

The most characteristic headache was pulsating 360(51.6%), followed by more than one type 153(21.9%) and throbbing type 129(18.5%) respectively. These findings are similar to a previous study conducted by Lipton et al [23]. 88.6% had 5-10 attacks per month, followed by 8.3% had 10-15 attacks and 3% had more than 15 attacks per month. 86.5% of them had duration of each attack of 4-12 hours.64.9% had gradual onset and 35% had sudden onset of migraine headache, 83.2% had intermittent headache whereas 16.7% had continuous headache. In our study 31.4% had unilateral headache and 22% had more than one site of headache, this

was similar to previous studies done. Family history of migraine was seen in 23.8%, this finding is similar to other studies which show high positive family history, Smitherman et al [26], Bindu et al [17], Ojini et al [21], Panda et al[22]. Most subjects with migraine in our study self-medicated with non-prescription over the counter drugs(80.2%)[17],[30],[35],[41],[42],59], 67.5% used NSAID's followed by prophylactic medication (7.7%), 2% used opioids ,triptans and 0.4% used homeopathy. Surprisingly only few used prophylactic medication and triptans. Subjects also reported several non-drug strategies to relieve of migraine headache like sleep (71.1%), followed by rest (58.3%), massage (26.9%), entertainment (9.4%), vomiting (6.3%) , change of posture (2.5%) and head massage (2.1%), which was also reported by Bindu et al[17] and by Marianges Zandrozny et al [20] . Also some of them reported relief after masturbation (0.1%), intake of food (0.1) and consumption of coffee (0.2%).77.1% had moderate intensity of pain on visual analogue scale, 13.6% reported mild intensity of pain and 9.1% had sever intensity of pain, similar to Bindu et al [17] Ojini et al[21].

Participants in our study reported headache related disability that is 68.4% reported MIDAS score of grade I, 14.2% had grade II, 12.3% had grade III,and 4.8 % had grade IV Linde et al[2], Smitherman et al [26]Bi, ndu et al [17], Aoao Eliezer Serri-de-barros et al [24]. Absenteeism from work/college was seen in 21% of the participants with days ranging from 1-2 days, while 32% had decreased productivity at work/college, 50% had to miss household work, social and leisure activities in the last three months for about 1-2 days.

Our study showed nausea with other factors (40%) was the commonest associated symptom, followed by photophobia with phonophobia (18.6%) and other factors like nausea (12.7%), vomiting (1.5%) ,visual disturbance (0.5%) lacrimation (0.1%), giddiness (0.5%), redness of eyes (0.2%) and 1.8% had nausea vomiting photophobia and phonophobia. These findings are consistent with other studies, Bindu et al [17], Dokhari et al [25].

The results showed that most patients exhibited multiple triggering factors. Stress was the commonest triggering factor (72.1%) which is consistent with other studies [17][26][27][28][29][30][31][32]. Others included mainly decreased sleep (49.4%), hunger (42.7%), excessive work (35%), emotional factors (31.8%), noise (29.1%) and reading (29.1%). Most participants also reported susceptibility to environmental and hormonal triggers like, head bath (21.3%), irregularity in food intake (20.6%), hot water bath (7.1%), watching TV/laptop (27.6%), flickering lights (14.2%), weather changes (12%), travel (19.3%), odour (13.1%) excessive relaxation (6%), head and neck movement (5.5%) and menstruation (17.9%). Earlier studies have also reported similar findings [17],[26],[28],[33],[34],[35],[36] ,[37],[38].

Only few participants reported susceptibility to dietary factors like chocolate (5%), Chinese food (0.1%), spicy food (0.1%), sweets (0.1%), consumption tea/alcohol/coffee (1.1%) and fruits like grapes and pineapple (0.1%), these finding are consistent with other studies [26][30],[39],[40][41].

Stress, in turn was the most prevalent trigger in the present study among either gender or different courses.

5. Conclusion

This study concluded that subjects in a medical college setup with migraine exhibited multiple triggering factors. Stress was the commonest triggering factor and also showed headache related disability like absenteeism and decreased productivity of work. Also self-medication and non-pharmacological strategies were commonly practised.

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