



Frequency of Migraine in Patients Presenting with Headache at Neurology Department of a Tertiary Care Hospital in Bahawalpur Pakistan

Muhammad Sohail Ajmal Ghoauri¹, Nauman Ismat Butt ^{2,*}, Barak Waris², Hala Shafique¹

¹ Bahawal Victoria Hospital, Quaid-e-Azam Medical College Bahawalpur, Bahawalpur, Pakistan

² Azra Naheed Medial College, Superior University, Lahore, Pakistan

*Corresponding Author: Department of Medicine and Allied, Azra Naheed Medial College, Superior University, Lahore, Pakistan. Email: nauman_ib@yahoo.com

Received: 20 January, 2025; Revised: 15 February, 2025; Accepted: 1 March, 2025

Abstract

Background: Migraine is a prevalent condition that results in significant morbidity and is associated with various systemic diseases, making it a critical public health concern. Early recognition of migraines can facilitate prompt medical treatment and the implementation of personalized therapy, helping to prevent it from becoming a debilitating condition for individuals.

Objectives: To determine the frequency of migraine in patients presenting with headaches at the neurology department of a tertiary care hospital in Bahawalpur, Pakistan.

Methods: This observational cross-sectional study was conducted at the Department of Neurology, Bahawal Victoria Hospital, Quaid-e-Azam Medical College, Bahawalpur, Pakistan, from September 2024 to December 2024. Migraine was defined according to the International Classification of Headache Disorders (ICHD-3) criteria. Patients with an altered state of consciousness, a history of fits or seizures, and diagnosed psychiatric illnesses were excluded. After obtaining ethical approval and detailed informed consent, 296 patients presenting with headaches were enrolled using a non-probability consecutive sampling technique. Demographic information, including age and gender, was noted, and the patients were assessed for migraine, its triggering factors, and associated features. All data were recorded and entered into SPSS version 23.

Results: The mean age of the patients was 30.3 ± 13.7 years, with the majority (186, 62.8%) being female. Migraine was present in 108 (36.5%) patients. Stratification of data revealed a statistical association of migraine with female gender (P-value = 0.013) but not with age (P-value = 0.614). The most frequently reported triggering factors were stress (106, 98.1%) and sleep disturbances (102, 94.4%). Photophobia (94, 87.0%) and phonophobia (92, 85.2%) were the most commonly reported associated features.

Conclusions: More than one-third of the patients presenting with headaches had migraines. Furthermore, migraine had a significant association with female gender but not with age. Nearly all the patients reported stress and sleep disturbances as triggers for migraine.

Keywords: Migraine, Headache, Neurology, Pakistan

1. Background

Headaches, also known as cephalgia, are a common and debilitating condition that can severely impact an individual's ability to perform everyday activities. There are various types of headaches, including migraine, tension-type headache, cluster headache, and frequent headaches. Globally, headaches affect approximately 40% of the population, with migraines alone accounting for 47% of the total burden (1, 2). As a highly prevalent condition, headaches affect over half of the global

population, making them an important subject of research and management.

Migraine is a genetically influenced, complex primary headache disorder that typically presents with moderate to severe, often unilateral headaches, accompanied by symptoms such as nausea, vomiting, and sensitivity to light (photophobia) and sound (phonophobia). This condition is commonly underdiagnosed and is a major cause of disability and absenteeism from work (3). It affects around 30% of the global population, making it a significant health

concern (4). Research indicates that women are more prone to migraines (20.7%) compared to men (9%). The prevalence of migraine is lower in Asia (10.1%) than in the United States (15.3%). In Iran, 6.9% of the population reported experiencing migraines, while in Pakistan, migraines account for 22.5% of all headaches, making it the second most common after tension headaches. Among the Pakistani population, the prevalence is higher in females (85.7%) than in males (14.3%) (5).

Numerous studies have attempted to identify factors that exacerbate migraines, though no definitive conclusions have been reached (6). Commonly recognized triggers include stress, insufficient sleep, fatigue, and exposure to bright sunlight, with menstruation being an additional trigger for women (7). Other factors, such as poor nutrition, fasting, and dehydration, which are often overlooked by sufferers, may also contribute to the onset of migraines (8). Weather conditions, particularly bright summer sunlight, have also been found to provoke migraines more than softer winter sunlight (9). Migraine patients often manage their symptoms through various remedies, including sleeping, taking hot showers, staying hydrated, consuming fatty foods, or using over-the-counter or prescribed pain medications (10).

Migraine is a prevalent condition that leads to significant morbidity and is linked to various systemic diseases, making it a key public health concern. Early recognition of migraines can facilitate prompt medical treatment and the implementation of personalized therapy, helping to prevent it from becoming a debilitating condition for individuals (11).

2. Objectives

The rationale of this study was to determine the prevalence of migraines among patients presenting with headaches at the neurology department of a tertiary care center. Additionally, identifying triggers will assist in understanding their relationship with migraine attacks and their frequency within the sample. This research is valuable as there is limited data on migraines in Pakistan, and it will help raise awareness and encourage further studies on the topic.

3. Methods

The present observational cross-sectional study was conducted at the Department of Neurology, Bahawal Victoria Hospital, Quaid-e-Azam Medical College, Bahawalpur, Pakistan, from September 2024 to December 2024, with the aim of determining the frequency of migraine among patients presenting with

headaches. Migraine was defined according to the International Classification of Headache Disorders (ICHD-3) criteria (11). Patients with an altered state of consciousness, a history of fits or seizures, and diagnosed psychiatric illnesses were excluded from the study. Keeping a confidence interval of 95% and a 5% margin of error, a sample size of 235 was calculated using an expected frequency of migraine as 18.84% among patients presenting with headaches (12). However, the final sample size was 296.

After obtaining ethical approval and detailed informed consent, 296 patients presenting with headaches were included in the study using a non-probability consecutive sampling technique. Demographic information, including age and gender, was noted, and the patients were assessed for migraine. Information regarding its triggering factors and associated features was collected on a self-report basis. All data were recorded and entered into SPSS version 23 for analysis. Mean and standard deviation were calculated for numerical data, whereas percentage and frequency were generated for qualitative variables. The chi-square test was applied post-stratification, using a P-value of less than 0.05 as significant.

4. Results

The mean age of the patients was 30.3 ± 13.7 years, with the majority of patients aged 25 years or above, as shown in Table 1. Among the participants, 186 (62.8%) were female. Migraine was present in 108 (36.5%) patients. Stratification of data revealed a statistical association of migraine with female gender (P-value = 0.013) but not with age (P-value = 0.614), as shown in Table 2. The most frequently reported triggering factors were stress (106, 98.1%) and sleep disturbances (102, 94.4%), as demonstrated in Table 3. Photophobia (94, 87.0%) and phonophobia (92, 85.2%) were the most commonly reported associated features of migraine, as depicted in Table 4.

5. Discussion

In the present study, the prevalence of migraine was 36.5%, which is higher compared to previous studies that reported a prevalence of 9.1% in China, 12% in Australia, and 18.84% in Nepal (3, 12, 13). Recent studies from Pakistan have reported migraine prevalence rates of 28% and 39.8%, which align with the results of our study (8, 14). Our findings are consistent with data from the United States and Iran, which report similar prevalence rates of migraine (15, 16). However, studies from India have shown a higher prevalence of migraine in the general population (17). These variations in migraine

Table 1. Clinical and Demographic Variables (n = 296)

Variables	No. (%)
Gender	
Female	186 (62.8)
Male	110 (37.2)
Age (y)	
≤ 24	112 (37.8)
≥ 25	184 (62.2)
Migraine	
Present	108 (36.5)
Absent	188 (63.5)

Table 2. Stratification of Data with Regards to Migraine (n = 296)^a

Variables	Migraine		P-Value
	Present	Absent	
Gender			
Female	82 (44.1)	104 (55.9)	0.013
Male	26 (23.6)	84 (76.4)	
Age (y)			
≤ 24	38 (33.9)	74 (66.1)	0.614
≥ 25	70 (38.0)	114 (62.0)	

^a Values are expressed as No. (%).

Table 3. Triggering Factors of Migraine (n = 108)

Triggering Factor	No. (%)
Stress	106 (98.1)
Sleep disturbances	102 (94.4)
Hunger	96 (88.9)
Lights	82 (75.9)
Seasonal variation	30 (27.8)
Menstruation	24 (22.2)
Strong scents/perfumes	10 (9.3)
Loud noises	6 (5.6)
Smoking	4 (3.7)

prevalence across different regions may be due to factors such as geographic location, altitude, cultural differences, and the use of different assessment methods, which can influence the reported incidence rates globally (7, 18).

The results of this study provide valuable insights into the clinical and demographic characteristics, triggering factors, and associated features of migraines among the patient population. The majority of the patients were female (62.8%), with a significant association found between female gender and the

presence of migraine (P-value = 0.013), confirming the well-established gender disparity in migraine prevalence. However, no significant association was found between age and migraine (P-value = 0.614), indicating that migraine occurrence in this sample was not age-dependent. This finding is consistent with other studies that have reported similar results (11, 15, 16).

Migraines are known to occur in about 60% of women during menstruation, primarily due to the drop in estrogen levels before menstrual bleeding, which results in a loss of serotonergic tone in the blood vessels

Table 4. Associated Features of Migraine (n = 108)

Associated Features	No. (%)
Photophobia	94 (87.0)
Phono phobia	92 (85.2)
Nausea	74 (68.5)
Vomiting	46 (42.6)
Lightheadedness	26 (24.1)
Vertigo	18 (16.7)

(18). In our study, hormonal fluctuations were identified as a trigger in 22.2% of the migraine cases, which supports the theory that hormonal changes, particularly those related to the menstrual cycle, can trigger migraine attacks. This underscores the need to consider hormonal factors when managing migraines in female patients.

In terms of triggering factors, stress (98.1%) and sleep disturbances (94.4%) were the most commonly reported triggers in our study, highlighting the role of lifestyle factors in exacerbating migraine attacks. Other common triggers included hunger (88.9%) and bright lights (75.9%), while seasonal variation (27.8%) was also identified as a relevant trigger, particularly in females. Regarding associated features, photophobia (87.0%) and phonophobia (85.2%) were the most prevalent, aligning with the typical sensory disturbances observed in migraine sufferers. These findings underline the complex etiology of migraines, with both environmental and physiological factors playing a role in their onset and severity. This study contributes to the limited body of research on migraines in Pakistan, offering a foundation for future studies and raising awareness about the importance of early identification and management of migraine triggers.

The present study has certain limitations that should be considered. Being based in a single hospital, the findings may not be fully representative of the broader population, limiting the broader impact of the results. Therefore, it is important to conduct further studies with a larger and more diverse sample size to better understand the prevalence, triggers, and morbidity of migraines in the Pakistani population, and to assess the broader implications for migraine management and prevention strategies.

5.1. Conclusions

In conclusion, this study highlights a significant association between female gender and the prevalence of migraines, with more than one-third of the patients reporting migraines and a notable gender difference.

However, age did not show a significant relationship with migraine occurrence. Stress and sleep disturbances were identified as the most common triggers, reported by nearly all participants, while photophobia and phonophobia were the most frequent associated symptoms. These findings suggest that managing stress and improving sleep quality may help in preventing migraines, and the gender-based differences observed could inform more targeted treatment strategies, particularly for female patients.

Footnotes

Authors' Contribution: Study concept and design: N. I. B.; Acquisition of data: M. S. A. G. and H. S.; Analysis and interpretation of data: N. I. B., B. W., and M. S. A. G.; Drafting of the manuscript: N. I. B., M. S. A. G., and B. W.; Critical revision of the manuscript for important intellectual content: N. I. B., B. W., and H. S.; Statistical analysis: N.I.B. and B.W.; Administrative, technical, and material support: M. S. A. G. and H. S.; Study supervision: N. I. B. and M. S. A. G.

Conflict of Interests Statement: The authors declared no conflict of interests.

Data Availability: The dataset presented in the study is available on request from the corresponding author during submission or after publication.

Ethical Approval: The present cross-sectional study was conducted in accordance to the ethical standards laid down in the 1964 Declaration of Helsinki, revised in the year 2000. Permission for data collection and ethical approval was obtained from Head of department, certificate number: N/2024-097.

Funding/Support: The authors declared no funding.

Informed Consent: Detailed informed consent was taken from each participant prior to enrolment in study, with assurance to maintain anonymity.

References

- Noor T, Sajjad A, Asma A. Frequency, character and predisposing factor of headache among students of medical college of Karachi. *J Pak Med Assoc.* 2016;**66**(2):159-64. [PubMed ID: 26819160].
- Herekar AA, Ahmad A, Uqaili UL, Ahmed B, Effendi J, Alvi SZ, et al. Primary headache disorders in the adult general population of Pakistan - a cross sectional nationwide prevalence survey. *J Headache Pain.* 2017;**18**(1):28. [PubMed ID: 28229320]. [PubMed Central ID: PMC5321642]. <https://doi.org/10.1186/s10194-017-0734-1>.
- Dhungel A, Pandey A, Parajuli S, Khanal P, Maskey N, Luitel A. Migraine among Patients Presenting With Headaches to the Department of Internal Medicine in a Tertiary Care Centre. *JNMA J Nepal Med Assoc.* 2023;**61**(265):710-3. [PubMed ID: 38289792]. [PubMed Central ID: PMC10579747]. <https://doi.org/10.31729/jnma.8271>.
- Stovner L, Hagen K, Jensen R, Katsarava Z, Lipton R, Scher A, et al. The global burden of headache: a documentation of headache prevalence and disability worldwide. *Cephalalgia.* 2007;**27**(3):193-210. [PubMed ID: 17381554]. <https://doi.org/10.1111/j.1468-2982.2007.01288.x>.
- Shah DR, Dilwali S, Friedman DI. Correction to: Migraine Aura Without Headache. *Curr Pain Headache Rep.* 2018;**22**(12):85. [PubMed ID: 30343336]. <https://doi.org/10.1007/s11916-018-0738-9>.
- Marmura MJ. Triggers, Protectors, and Predictors in Episodic Migraine. *Curr Pain Headache Rep.* 2018;**22**(12):81. [PubMed ID: 30291562]. <https://doi.org/10.1007/s11916-018-0734-0>.
- Buse DC, Greisman JD, Baigi K, Lipton RB. Migraine Progression: A Systematic Review. *Headache.* 2019;**59**(3):306-38. [PubMed ID: 30589090]. <https://doi.org/10.1111/head.13459>.
- Liaquat A, Sheikh WA, Yousaf I, Mumtaz H, Zafar M, Khan Sherwani AH. Frequency of migraine and its associated triggers and relievers among medical students of Lahore: a cross-sectional study. *Ann Med Surg (Lond).* 2024;**86**(1):103-8. [PubMed ID: 38222774]. [PubMed Central ID: PMC10783279]. <https://doi.org/10.1097/MS9.0000000000001377>.
- Tekatas A, Mungen B. Migraine headache triggered specifically by sunlight: report of 16 cases. *Eur Neurol.* 2013;**70**(5-6):263-6. [PubMed ID: 24051692]. <https://doi.org/10.1159/000354165>.
- Gu X, Xie Y. Migraine attacks among medical students in Soochow University, Southeast China: a cross-sectional study. *J Pain Res.* 2018;**11**:771-81. [PubMed ID: 29695929]. [PubMed Central ID: PMC5905467]. <https://doi.org/10.2147/JPR.S156227>.
- Gobel CH, Karstedt SC, Munte TF, Gobel H, Wolfrum S, Lebedeva ER, et al. ICHD-3 is significantly more specific than ICHD-3 beta for diagnosis of migraine with aura and with typical aura. *J Headache Pain.* 2020;**21**(1):2. [PubMed ID: 31910800]. [PubMed Central ID: PMC6947981]. <https://doi.org/10.1186/s10194-019-1072-2>.
- Yeh WZ, Blizzard L, Taylor BV. What is the actual prevalence of migraine? *Brain Behav.* 2018;**8**(6). e00950. [PubMed ID: 30106228]. [PubMed Central ID: PMC5991594]. <https://doi.org/10.1002/brb3.950>.
- Lin QF, Xia QQ, Zeng YL, Wu XY, Ye LF, Yao LT, et al. Prevalence of migraine in Han Chinese of Fujian province: An epidemiological study. *Medicine (Baltimore).* 2018;**97**(52). e13500. [PubMed ID: 30593125]. [PubMed Central ID: PMC6314704]. <https://doi.org/10.1097/MD.00000000000013500>.
- Athar F, Zahid A, Farooq M, Ayyan M, Ashraf M, Farooq M, et al. Frequency of migraine according to the ICHD-3 criteria and its association with sociodemographic and triggering factors in Pakistan: A cross-sectional study. *Annals of Medicine & Surgery.* 2022;**82**. <https://doi.org/10.1016/j.amsu.2022.104589>.
- Burch R, Rizzoli P, Loder E. The Prevalence and Impact of Migraine and Severe Headache in the United States: Figures and Trends From Government Health Studies. *Headache.* 2018;**58**(4):496-505. [PubMed ID: 29527677]. <https://doi.org/10.1111/head.13281>.
- Rabiee B, Zeinoddini A, Kordi R, Yunesian M, Mohammadinejad P, Mansournia MA. The Epidemiology of Migraine Headache in General Population of Tehran, Iran. *Neuroepidemiology.* 2016;**46**(1):9-13. [PubMed ID: 26580919]. <https://doi.org/10.1159/000441146>.
- Kulkarni GB, Rao GN, Gururaj G, Stovner LJ, Steiner TJ. Headache disorders and public ill-health in India: prevalence estimates in Karnataka State. *J Headache Pain.* 2015;**16**:67. [PubMed ID: 26197976]. [PubMed Central ID: PMC4510104]. <https://doi.org/10.1186/s10194-015-0549-x>.
- Shrestha O, Karki S, Thapa N, Lal Shrestha K, Shah A, Dhakal P, et al. Prevalence of migraine and tension-type headache among undergraduate medical students of Kathmandu Valley: A cross-sectional study. *Health Sci Rep.* 2022;**5**(5). e747. [PubMed ID: 35949688]. [PubMed Central ID: PMC9358540]. <https://doi.org/10.1002/hsr2.747>.