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# MIGRAINE KNOWLEDGE, PREVALENCE, TRIGGERS, AND INFLUENCE AMONG INTER UNIVERSITY STUDENTS IN LAHORE, PAKISTAN: A CROSS-SECTIONAL STUDY

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## Abstract

Migraine is a chronic neurological disorder marked by recurrent, unilateral, pulsing headaches that severely hinder the everyday activities and academic performance of university students. This community-based cross-sectional study, carried out during the 2025–2026 academic year among 690 students in Lahore, Pakistan, employed International Headache Society (IHS) criteria and the Migraine Disability Assessment (MIDAS) score for evaluation. The study identified a migraine prevalence of 25.2%, accompanied by a significant headache burden. The predominant symptoms seen during attacks were pulsating headache and unilateral headache. Recognized triggers were weariness and sleep loss, whereas the primary treatment strategies involved sleeping and wrapping the head with cloth. Notwithstanding the significant prevalence, 74.8% of students were oblivious to their migraine experiences. Additionally, 56.8% of individuals with migraines experienced moderate to severe disability (MIDAS Grade III/IV), and 23.4% (162/690) necessitated hospitalization. The study reveals that migraine is common but significantly under diagnosed among university students, adversely impacting their productivity and quality of life. It is advisable to implement campus-based screening measures and awareness activities to promote early diagnosis and management.

**Keywords:** Migraine, Pakistan, Prevalence, University Students, Headache

## INTRODUCTION

Migraine is a chronic neurological disease characterized by recurring, usually unilateral, pulsating headaches (1) and is also associated with nausea, photophobia and phonophobia. The fifth cause of health problem that decreases life expectancy because of disability (2). It is among the leading causes of years lived with disability (YLDs) and contributes considerably to the global burden of headache disorders across all age groups (3). Migraines are a major public health problem affecting not only the physical health but also the daily functioning, academic achievement, and quality of life in general, especially in young adults (4). University students represent a subgroup of young people facing their own academic, social and environmental challenges (5). These stresses include abnormal sleep patterns, pressure to perform well in school, and lifestyle changes, all of which have been associated with the frequency and severity of migraine attacks (6). It is important to assess migraine knowledge, prevalence and repercussions in university settings to establish targeted educational interventions and health policies to improve student well-being and academic performance (7). Migraines are widespread among university students, more prevalent in females, and have been associated with detrimental consequences on daily activities and academic performance (8), (9).

Migraine directly and indirectly affects the college students' life substantially. Migraine attacks may cause absenteeism from work, reduced concentration, lower academic performance and impaired social interaction (10). Those who experience frequent migraines are also more likely to have co-occurring mental health disorders, such as sadness and anxiety, which exacerbate emotional and intellectual challenges (11). Previous investigations have shown an association of migraine with some medical and psychological comorbidities as sadness, anxiety and difficulties sleeping (12). Although various studies have investigated migraine in the broader community, few have addressed the prevalence of migraine among college students



(13). In addition, university students with migraines have been linked to psychological issues, extended reading or exam preparation period, physical or mental stress and sleep deprivation (14), (15).

Migraines have also been associated with stress, depression, sleep issues during school, poor academic performance, fewer daily activities and lost school days (16), (17). Furthermore, there is a complex and bidirectional relationship between migraine and sleep problems (18). Sleep can trigger or relieve migraines (18), (19). Stress is one of the commonest causes of migraine (20). Hence, the primary objective of the present cross-sectional study was to evaluate the prevalence and characteristics of migraine, and associated health and self-management factors among a sample of Pakistani university students from four public and private universities.

## METHODOLOGY

This community based cross sectional survey was undertaken in the universities of Lahore involving four private and public sector universities during academic year 2025-2026.

### SAMPLE SIZE

The sample size was determined using the formula of sample size calculation for cross-sectional study design  $n_0 = \frac{(Z^2 * p * q)}{e^2}$  to be a minimum of 694 students. Parameters for the sample size estimate: 95% confidence interval and marginal error not exceeding 5%. 800 participants were addressed to adjust for missing data and nonresponse.

### STUDY DESIGN

Study participants were selected using a nonprobability quota sampling method stratified by gender. A nonprobability quota sampling method stratified by gender was utilized. Quotas were established based on the gender distribution of the student body to guarantee proportional participation. A total of 800 students were solicited, with 690 agreeing to participate, resulting in a response rate of 86.2%.

### QUESTIONNAIRE

Questionnaire was acquired from referred article (5). They were asked to read a consent form saying that they agreed to participate. The questionnaire was made up of 20 questions about demographic data, pain features, associated symptoms, triggers and understanding of migraine. Standardized to International Headache Society (IHS) criteria and Migraine Disability Assessment Score (MIDAS).

### INCLUSION AND EXCLUSION CRITERIA

The study population included university students of all majors from the second to the fifth year. The pupils were heterogeneous with reference to age (17–25 years) and sex. They ruled out anyone who had had headaches due to illness, a cold or an injury to the head in the past 12 months.

### ETHICAL APPROVAL

Full ethical approval was obtained from the Ethical Review Committee (ERC), Office of Research Innovation and Commercialization (ORIC), University of Central Punjab (UCP) Lahore in December 2025 (ORIC/ERC/IRB/2025/29).

## RESULTS

A total of 690 participants were included in the study from across four universities in Lahore including; 360 students from private universities and 330 from public universities. The number of females was slightly higher than that of males (53.6% vs. 46.4%). Most of the participants were aged 17-22 years (65.9%) and (33.9%) were 23-27 years old. Concerning the year of study, the majority of students were in their second year of study followed by those in their third year, fourth year and fifth year. The majority of participants belonged to non-medical fields (72.0%), while 27.9% were medical students.

In terms of headache characteristics, nearly half of the participants reported 2–4 headache attacks in the last three months (49.1%), while 39.9% experienced five or more attacks, indicating a high headache burden. Headache duration was most commonly 4–6 hours (34.9%) or 7–12 hours (33.6%), whereas shorter (<4 hours) and prolonged (13–24 hours) durations were less frequent.

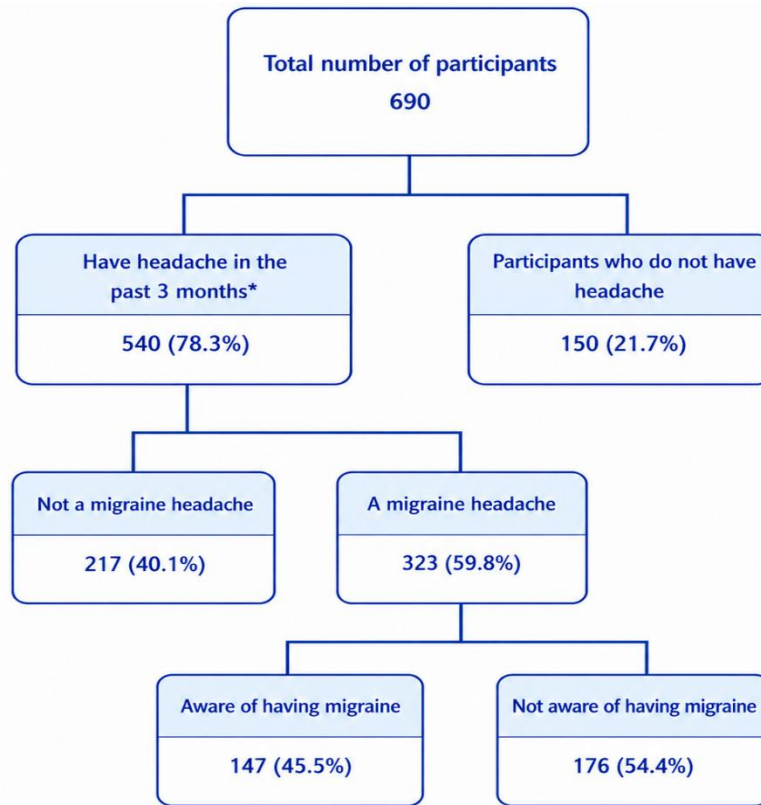
Regarding pain intensity, moderate to severe pain was reported by the majority, with 39.7% describing worse pain and 23.8% reporting severe pain. Only 14.6% experienced mild pain. A family history of headache or migraine was reported by 18.1% of participants. The findings suggest that frequent and moderate to severe headache is quite prevalent among young individuals with low knowledge and limited health care utilization. Demographics of the study participants and migraine features are shown in Table I.

**Table I.** Demographics of the study participants and migraine features

Variable	n (%)
Male	320 (46.4%)
Female	370 (53.6%)
<b>Age (years)</b>	
17-22	456 (65.9%)
23-27	234 (33.9%)
<b>Year of study</b>	
Second	226 (32.8%)
Third	215 (31.2%)
Fourth	186 (27.0%)
Fifth	63 (9.1%)
<b>Major field</b>	
Medical	193 (27.9%)
Non- medical	497 (72.0%)
<b>No. of headache attacks in last 3 months</b>	
<2 attacks	76 (11.0%)
2-4 attacks	339 (49.1%)
5 attacks or more	275 (39.9%)
<b>Duration of headache</b>	
<4 hours	116 (16.8%)
4-6 hours	241 (34.9%)
7-12 hours	232 (33.6%)
13-24 hours	100 (14.5%)
<b>Pain Level</b>	
Mild	101 (14.6%)
Moderate	150 (21.7%)
Worse	274 (39.7%)
Severe pain	164 (23.8%)
<b>Awareness</b>	
Yes	174 (25.2%)
No	516 (74.8%)
<b>Family history of headache/migraine</b>	
Yes	125 (18.1%)
No	565 (81.9%)
<b>Hospital admission for headache/migraine</b>	
Yes	162 (23.4%)
No	528 (76.5%)
<b>Medication</b>	
Yes	185 (26.8%)
No	505 (73.2%)
<b>Relief of migraine from medication</b>	
Yes	169 (24.49%)
No	505 (73.2%)

The mean age of the participants was 19 years old (Standard deviation  $\pm$  1.5 years) 540 participants (78.3%) had headache attacks in the past 3 months that were not due to virus, cold or head injury. The prevalence of migraine headache was 25.2% (174/690) in the whole study population and one third of migraine sufferers, 27.1% (47/174), underwent five or more assaults in preceding 3 months (Table I). Nearly half 45% (80/174) of the migraineurs in the study, experienced substantial pain intensity, with pain scores ranging from 6 to 10 on a 0–10 pain scale. Also, 48.8% (85/174) of students with migraine consulted a doctor and 23.4% (162/174) of migraine sufferers were admitted to hospital (Table I).

In the study of 690 participants, 540 (78.3%) had headache attacks in last 3 months of whom 59.8% (323/540) had migraine with 54.4% (176/323) unaware that they experienced migraines, identified according to the IHS criteria illustrated in Fig. 1. Fig. 2 illustrates the most often reported symptoms occurring during a migraine headache attack. Unilateral headache (59.5%), pulsating headache (65.10%), aggravated headache by physical work (58.1%) and phonophobia (20%) were the most prevalent symptoms. In general, migraine attacks are most typically characterized by symptoms of unilateral, throbbing headache coupled with hypersensitivity to light (photophobia) and sound (phonophobia), nausea and vomiting (21). The most prevalent triggers shown in Fig. 3 were fatigue (83.6%), sleep deprivation (75.9%), long usage of phone (35%) and weather changes (31.5%).



\*Not related to flu, cold, or head injury

Fig. 1. Flow chart of research participants

The most commonly used elements in alleviating a migraine episode were sleeping (94%), tying the head with cloth (41.60%), head massage (32.50%) and using heat pack (28.1%) as shown in Fig. 4. The MIDAS questionnaire was concerned with the influence of migraine on the student’s quality of life, which demonstrated that persons suffering with migraine also reduced the productivity. Out of 323 migraine sufferers, 40.24% (130/323) reported moderate to severe impairment due to migraine headache bouts. Bivariate analysis showed substantial association between migraine and age, academic year and family history of migraine.

## DISCUSSION

In our study, headache attack in the previous 3 months was reported by 78% of participants, which is comparable to 83.6% in Oman and 72.5% in Qatar

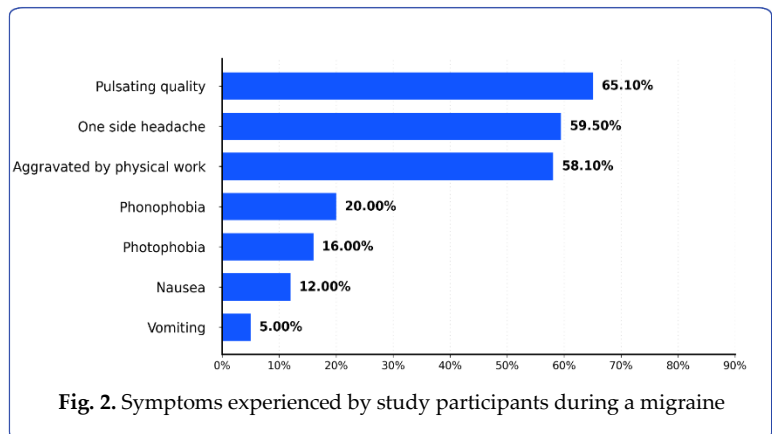


Fig. 2. Symptoms experienced by study participants during a migraine

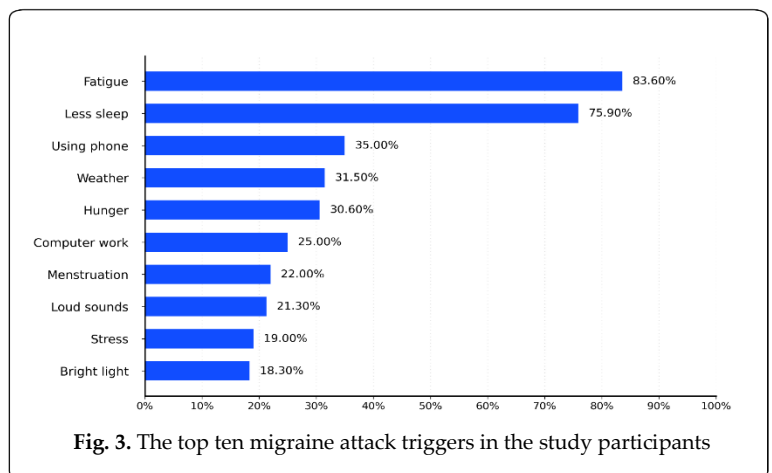


Fig. 3. The top ten migraine attack triggers in the study participants

(22). Conversely, 25.2% of our persons had migraine headache, which is in accordance with recent similar research from Saudi Arabia 26.3% (23), Kuwait 27.9% (16), Turkey 21.9% (12), and USA 24.8% (24). Conversely, the prevalence of migraines in the overall population was lower, with 10.4% in Africa, 10.1% in Asia, and 11.4% in Europe and 11.6% worldwide (25). Students may have a higher prevalence because of a number

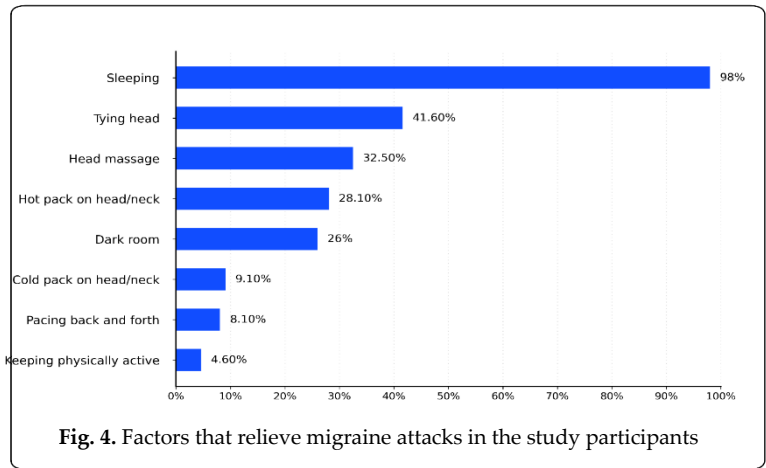


Fig. 4. Factors that relieve migraine attacks in the study participants

of triggers that include study pressure, sleep deprivation before tests, missing meals, and loud noises during student gatherings events (26). More than 75% of our subjects reported 2–4 headache episodes in the 3 months before the research. This finding is in agreement with a study conducted among Saudi Arabian university students (23). Previous research in Saudi Arabia (23) and Iran (25) identified the most common migraine triggers as sleep deprivation, stress, hunger or meal omission, and weariness.

Among our pupils and Saudi Arabian students, sleeping and binding one's head were the most favored relaxation practices followed by staying in a quiet, dim lit chamber (27). The most commonly reported level of pain was moderate to severe, as has been shown in other studies (16), (28). Beyond pain, there were related symptoms and our study was in accord with past studies which included nausea, vomiting, photophobia, and phonophobia (29).

Table II. The impact of migraine on students' quality of life based on the MIDAS (Migraine Disability Assessment Score), score, n = 174

Score	Interpretation	N (%)
0 - 5	Degree I, Little or No Disability	14.3% (25)
6 - 10	Degree II, Mild Disability	28.7% (50)
11 - 20	Degree III, Moderate Disability	36.7% (64)
≥ 21	Degree IV, Severe Disability	20.1% (35)

MIDAS score measures how much migraine affects daily life. Higher score means more disability

In our study, the average percentage of MIDAS categories III and IV moderate to severe disability was 28.5%. This is consistent with a systematic analysis which found that in 8 of 13 studies reported according to MIDAS grading, over fifty percent of individuals with migraines experienced moderate to severe disability due to their headaches (30). Numerous research (31-33), demonstrate that a significant proportion of students utilize over-the-counter medications and this may be a factor that predisposes to poor medical consultation for migraine. The severity of the migraine may cause students to take an overdose of over the counter analgesics that can be dangerous to health. To manage migraines more successfully, it is important to boost student understanding and to promote medical consultation (5). Twenty-three percent of students who had migraines required hospitalization. However, a recent study from the UK also found that a significant portion of emergency room visits (17.4%) resulted in hospitalizations because of migraines (34). This demonstrates the psychological and physical toll that migraines take on students, which could affect their output.

Although the prevalence and baseline symptomatology of migraine in this study generally correspond with worldwide trends noted in the USA, Turkey, and the Gulf region (35), significant differences arise in regional trigger profiles and clinical manifestations. These differences are inherently linked to Pakistan's distinctive environmental and socio-demographic context (36). In contrast to the meticulously climate-regulated facilities of Saudi Arabia and the USA, the interplay of severe seasonal temperatures and pervasive electricity load-shedding in Pakistan intensifies dehydration and heat stress two extensively documented catalysts within our cohort (37). Current socioeconomic stresses, inflation, and

fluctuating daily salary structures usually result in irregular eating patterns or skipped meals, which are commonly identified as primary migraine triggers in Pakistani cross-sectional data (38, 39). In Pakistan, migraines are seldom recognized as a separate neurological illness at their inception (40). Owing to insufficient public knowledge, elevated out-of-pocket expenses, and deficiencies in basic care, patients often regard migraines as ordinary tension headaches (41). These considerations emphasize the importance of analyzing local neurological data within a regional, socio-economic context instead of solely depending on Western or Middle Eastern treatment models (42).

To our knowledge, this is the first study to investigate the prevalence, awareness and effect of migraine in Pakistani students. However, there are certain limitations to the present study. The use of a self-administered questionnaire may add a possible recall bias. Another limitation was the lack of confirmation of migraine diagnosis by neurologist through interviewing the individuals. Moreover, thorough information on the usage of analgesic drugs as a factor of migraine relief was not collected in the present investigation. Furthermore, given this was not a population-based study, the generalizability of our results is limited. Given that participation was voluntary and nonprobability quota sampling was employed, the potential for selection bias cannot be entirely ruled out.

## CONCLUSION

Migraine is highly prevalent among university students in Lahore, yet most remain undiagnosed, impacting productivity and quality of life. Key triggers include sleep deprivation, exhaustion, and screen time, while relief methods include sleeping and head wrapping. Universities should implement screening programs, awareness campaigns, and digital mental health checks (e.g., PHQ-9) during orientation and registration, with high-risk cases referred within 48 hours. Future research must distinguish headache subtypes for better clinical accuracy.

### Conflict of interest:

The authors report no conflicts of interest

### Author's contributions:

MN Data collection, study design and manuscript drafting; MAK Supervision, WA Intellectual content contribution, HFJ Literature Screening and data extraction, MR Data verification and cross-checking references, AA Critical revision, overall supervision and correspondence.

### Declaration of generative AI-Assisted Tools:

No AI-assisted tools were used.

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