



ASSESSMENT OF RISK FACTORS FOR MIGRAINE IN MEDICAL STUDENTS VS POSTGRADUATE MEDICAL STUDENTS IN COMPARISON TO NON-MEDICAL STUDENTS

General Medicine

**Dr. Nimmakayala
Jahnvi Durga
Naga Sai Tulasi***

MBBS, Department of General Medicine, Konaseema Institute of Medical Sciences, Amalapuram, Andhra Pradesh, India. *Corresponding Author

**Dr. Jaswitha
Kothapalli**

MBBS, Department of General Medicine, Konaseema Institute of Medical Sciences, Amalapuram, Andhra Pradesh, India.

ABSTRACT

Background: Migraine is a disabling primary headache disorder, especially prevalent among students due to academic pressure, erratic schedules, and psychological stress. However, few studies directly compare migraine burden across undergraduate medical, postgraduate medical, and non-medical student populations. **Objectives:** To determine and compare the prevalence and risk factors of migraine among different student groups using a validated screening tool, and assess associations with stress, sleep disturbances, screen time, and family history. **Methods:** A cross-sectional, interview-based study was conducted over two months with 600 students (200 from each group). The ID-Migraine™ tool and ICHD-3 criteria were used for diagnosis. Data included demographics, stress (Likert scale), sleep, screen time, caffeine intake, and family history. Statistical analysis included Chi-square tests, ANOVA, and logistic regression. **Results:** Overall migraine prevalence was 28.3%. PG medical students had the highest prevalence (37%), followed by UG medical (29%) and non-medical students (19%) ($p < 0.01$). Females constituted 81.8% of cases. Risk factors included female gender (OR=1.9), higher stress (OR=1.5), irregular sleep (OR=2.2), longer screen time (OR=1.4), and family history (OR=2.8). Caffeine use was not significant. **Conclusion:** Migraine prevalence is highest in postgraduate medical students, strongly associated with modifiable lifestyle factors. Interventions targeting stress reduction and sleep hygiene are needed, especially in medical institutions.

KEYWORDS

INTRODUCTION

Migraine is a common, chronic neurovascular disorder characterized by episodic headaches with associated symptoms like nausea, photophobia, and phonophobia. It ranks as the **second most disabling neurological condition globally**, affecting more than one billion people and peaking during early adulthood⁽¹⁾. Among students, the prevalence is alarmingly high, often linked to **academic stress, disrupted sleep, and excessive screen use**⁽²⁻⁴⁾.

Medical students, particularly postgraduates, experience unique stressors—night duties, emotional burden of clinical responsibilities, and intense academic load—that make them vulnerable to frequent and severe migraine episodes^(5,6). While studies have assessed migraine in isolated student groups, few have compared prevalence and risk factors across UG, PG, and non-medical cohorts in the same setting using structured screening tools⁽⁷⁻⁹⁾.

Thus, this study aimed to **compare migraine prevalence and associated risk factors** across these cohorts in a South Indian university using the ID-Migraine™ and ICHD-3 criteria.

METHODS

A cross-sectional, interview-based study was conducted in January–February 2025. A total of 600 students (200 each from UG medical, PG medical, and non-medical streams) were recruited using stratified random sampling. Ethical clearance was obtained. Data collection included a **validated questionnaire** with sections on demographics, migraine features (based on ID-Migraine™ and ICHD-3), stress, sleep, screen time, caffeine use, and family history. Interviews were conducted privately by trained researchers.

Migraine diagnosis was based on affirmative responses to ≥ 2 of 3 ID-Migraine™ questions (7). Statistical analysis was done using SPSS v26. Logistic regression identified independent predictors.

RESULTS

The study population included a total of 600 students, evenly distributed across three categories—undergraduate medical ($n=200$), postgraduate medical ($n=200$), and non-medical students ($n=200$). The mean age of participants varied across groups, with undergraduate medical students averaging 22.1 ± 2.3 years, postgraduate students 26.8 ± 2.9 years, and non-medical students 23.5 ± 2.1 years, giving an overall mean of 24.1 ± 3.1 years. This age distribution reflects the typical academic progression from undergraduate to postgraduate levels, with non-medical students falling closer in age to

undergraduates due to the nature of their courses. In terms of gender distribution, females made up the majority across all three groups, accounting for **58% of UG, 56% of PG, and 59.5% of non-medical students**, which resulted in an overall female representation of **57.8%**. This slight predominance of female participants allowed for a reliable gender-specific analysis of migraine burden.

The prevalence of migraine among all participants was **28.3%** ($n=170$). However, when stratified by academic background, **postgraduate medical students showed the highest prevalence at 37%**, followed by **undergraduate medical students at 29%**, and **non-medical students at just 19%**. This difference was statistically significant (**Chi-square $p < 0.01$**), indicating that academic and professional demands likely contribute to migraine occurrence. The heightened prevalence in medical groups, particularly among PG students, may be attributable to night shifts, academic pressure, and emotional exhaustion related to clinical duties.

A gender-wise analysis revealed a consistently higher prevalence of migraine among female students across all groups. In undergraduate medical students, **34.5% of females** reported migraine versus **21.4% of males**. This trend was even more striking in the postgraduate group, where **46.4% of females** were affected compared to **25% of males**. Among non-medical students, **21.8% of females** experienced migraine compared to **14.8% of males**. The **Chi-square test was significant ($p < 0.05$)**, confirming that **female gender is a major risk factor**, potentially due to hormonal fluctuations, particularly in relation to the menstrual cycle, and increased vulnerability to stress-induced triggers.

When assessing the clinical characteristics of migraine episodes, postgraduate students experienced significantly **more frequent attacks**, averaging 3.4 ± 1.2 episodes per month, compared to 2.1 ± 0.9 in undergraduates and 1.8 ± 0.7 in non-medical students. The differences were statistically significant (**ANOVA $p < 0.01$**). Additionally, PG students reported **greater severity**, with only **15%** of attacks being classified as mild, whereas non-medical students had a higher proportion (**25%**) of mild attacks. These findings underline the higher clinical burden of migraine among PG medical students, which not only affects quality of life but also has implications for academic and clinical productivity.

Further evaluation of risk factors showed a strong association between migraine and several modifiable lifestyle variables. **Stress levels**, measured on a 10-point Likert scale, were significantly elevated in the

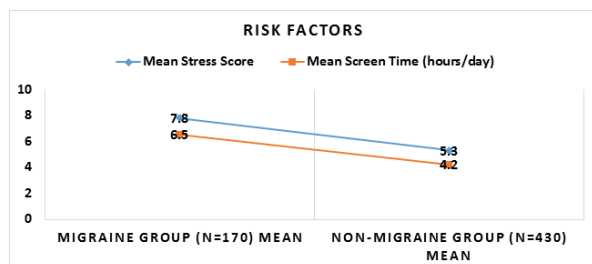
migraine group (7.8 ± 1.2) compared to those without migraine (5.3 ± 1.5) ($p < 0.001$). Similarly, **irregular sleep patterns** were present in **68% of migraine sufferers**, compared to 42% in the non-migraine group ($p < 0.01$). These results suggest that poor sleep hygiene and high perceived stress are critical contributors to migraine development in student populations. Another notable factor was **screen time**, with migraine sufferers reporting an average of 6.5 ± 1.3 hours/day compared to 4.2 ± 1.1 hours/day in non-migraine individuals ($p < 0.01$). The excessive use of screens—particularly laptops and smartphones for academic and recreational purposes—could lead to visual strain and trigger headaches through mechanisms involving prolonged light exposure and posture-related musculoskeletal tension.

To further refine the understanding of these associations, a **multivariate logistic regression analysis** was conducted. This analysis confirmed several **independent predictors of migraine**. Female gender emerged as a significant risk factor with an **odds ratio (OR) of 1.9 (95% CI: 1.3–2.8, $p < 0.01$)**. Stress level was another major contributor; each unit increase in stress score increased migraine odds by **50% (OR = 1.5, 95% CI: 1.3–1.7, $p < 0.001$)**. Students with **irregular sleep patterns** had more than twice the risk (**OR = 2.2, 95% CI: 1.5–3.2, $p < 0.01$**), while those with longer **screen exposure** had a **40% increased risk per additional hour of screen time (OR = 1.4, 95% CI: 1.2–1.6, $p < 0.01$)**. The most robust predictor, however, was **family history of migraine**, which increased the odds by nearly threefold (**OR = 2.8, 95% CI: 1.9–4.1, $p < 0.001$**), indicating a strong genetic predisposition in migraine pathophysiology. The regression model was deemed statistically appropriate with a **Hosmer-Lemeshow p-value of 0.45**, suggesting good model fit.

Table 1: Association of Risk Factors with Migraine

Risk Factor	Migraine Group (n=170)	Non-Migraine Group (n=430)	p-value
Mean Stress Score	7.8 ± 1.2	5.3 ± 1.5	< 0.001
Irregular Sleep Patterns (%)	68%	42%	< 0.01
Mean Screen Time (hours/day)	6.5 ± 1.3	4.2 ± 1.1	< 0.01

Independent t-tests and chi-square tests were used as appropriate.



Graph.1 A line graph representation of risk factors

Multivariate Logistic Regression Analysis

To identify independent predictors of migraine, a multivariate logistic regression was performed. The model included variables such as age, gender, stress score, sleep patterns, screen time, caffeine intake, and family history of migraine.

Table 2: Multivariate Logistic Regression Analysis for Migraine Risk Factors

Variable	Odds Ratio (OR)	95% Confidence Interval (CI)	p-value
Female Gender	1.9	1.3 – 2.8	< 0.01
Stress Score (per unit increase)	1.5	1.3 – 1.7	< 0.001
Irregular Sleep Patterns	2.2	1.5 – 3.2	< 0.01
Screen Time (per hour increase)	1.4	1.2 – 1.6	< 0.01
Family History of Migraine	2.8	1.9 – 4.1	< 0.001

The model demonstrated good fit with a Hosmer-Lemeshow test p-value of 0.45.

DISCUSSION

This study assessed the prevalence and risk factors of migraine among undergraduate medical, postgraduate medical, and non-medical students using a validated screening questionnaire. The findings showed that postgraduate medical students had the highest migraine prevalence (37%), followed by undergraduates (29%) and non-medical students (19%), underscoring the impact of academic pressure and clinical responsibilities. A significant gender disparity was observed, with females experiencing nearly double the prevalence of migraines compared to males. The study further revealed that PG students not only suffered more frequent (3.4 episodes/month) but also more severe attacks. Stress, irregular sleep, and prolonged screen time emerged as major contributors, with migraine sufferers reporting higher stress scores (7.8 vs 5.3), disrupted sleep (68%), and extended daily screen exposure (6.5 hours/day). These factors, along with female gender and family history, were confirmed as independent predictors in multivariate analysis, with family history showing the strongest association (OR 2.8).

The study highlights the growing burden of migraine in academic settings, especially among medical trainees, where it remains underdiagnosed and often self-managed. Despite caffeine often being cited as a trigger, it showed no significant association here. The implications are clear: institutions must prioritize student well-being through migraine awareness, stress reduction strategies, sleep hygiene education, and accessible healthcare support. While the study's strengths include its structured, comparative design and use of validated tools, limitations such as self-reported data, absence of neurological evaluations, and cross-sectional design must be acknowledged. Longitudinal research is warranted to better understand the evolving impact of academic life on migraine prevalence.

CONCLUSION

Migraine affects over one-fourth of university students, with the highest prevalence (37%) in postgraduate medical trainees. Risk is strongly linked to **female gender, high stress, irregular sleep, screen exposure, and family history**—factors that are largely modifiable. Interventions in academic environments are urgently needed to address this burden.

REFERENCES

- Lebedeva ER, Kobzeva NR, Gilev DV, Olesen J. Prevalence of primary headache disorders in a population of medical students in Russia. *Cephalalgia*. 2016;36(9):807–815.
- Buse DC, Loder EW, Gorman JA, et al. Sex differences in the prevalence and features of migraine: AMPP Study. *Headache*. 2013;53(8):1278–1299.
- Singh P, Kaur M, Sidhu GK. Prevalence and risk factors of migraine among medical students. *Int J Basic Clin Pharmacol*. 2019;8(1):54–58.
- Bigal ME, Lipton RB. Stress, migraine and their interaction: population studies. *Cephalalgia*. 2006;26(4):368–375.
- Ashina M, Katsarava Z, Do TP, et al. Migraine: epidemiology and care systems. *Lancet*. 2021;397(10283):1485–1495.
- Anttila V, Stefansson H, Kallela M, et al. Genome-wide study implicates susceptibility locus for migraine. *Nat Genet*. 2010;42(10):869–873.
- Lipton RB, Dodick D, Sadosky R, et al. A self-administered screener for migraine: the ID Migraine™ validation study. *Neurology*. 2003;61(3):375–382.
- Manandhar K, Risal A, Steiner TJ, et al. The prevalence of headache disorders in Nepal. *J Headache Pain*. 2015;16:95.
- Singh AK, Singh G, Ahluwalia P, et al. Migraine triggers in medical students. *Int J Med Sci Public Health*. 2016;5(5):988–992.