

## A DESCRIPTIVE STUDY OF MIGRAINE, RESILIENCE, AND QUALITY OF LIFE AMONG FINAL-YEAR MEDICAL STUDENTS IN INDONESIA

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### ABSTRAK

Penelitian ini bertujuan untuk mengetahui prevalensi migrain, serta tingkat resiliensi dan kualitas hidup pada mahasiswa kedokteran tahun terakhir. Penelitian observasional deskriptif ini dilakukan pada mahasiswa kedokteran tingkat akhir Fakultas Kedokteran Universitas Muhammadiyah Sumatera Utara dari tanggal 29 November 2023 hingga 20 Desember 2023. Hasil menunjukkan prevalensi migrain adalah 16,2%, dengan 72,4% mengalami migrain ringan dan 27,6% mengalami migrain berat. Di antara siswa dengan migrain ringan, 57% memiliki resiliensi sedang dan 61,9% melaporkan kualitas hidup yang baik. Pada siswa dengan migrain berat, 63% memiliki resiliensi sedang dan 62,5% melaporkan kualitas hidup yang baik. Temuan ini menunjukkan bahwa mahasiswa kedokteran dalam studi ini umumnya memiliki kualitas hidup yang baik dan resiliensi sedang, terlepas dari tingkat keparahan migrain. Hal ini mengindikasikan kemungkinan adanya mekanisme koping yang adaptif, meskipun ukuran sampel yang kecil, terutama pada kelompok migrain berat (n=8), menunjukkan perlunya penelitian lanjutan dengan populasi yang lebih besar untuk memvalidasi hasil ini.

### ABSTRACT

**A Descriptive Study Of Migraine, Resilience, and Quality Of Life Among Final-Year Medical Students In Indonesia.** This study aims to determine the prevalence of migraine and the level of resilience and quality of life in final-year medical students. This descriptive observational study was conducted on final-year medical students of the Faculty of Medicine, University of Muhammadiyah North Sumatra, from November 29, 2023, to December 20, 2023. The results showed that the prevalence of migraine was 16.2%, with 72.4% experiencing mild migraine and 27.6% experiencing severe migraine. Among students with mild migraine, 57% had moderate resilience, and 61.9% reported a good quality of life. Of students with severe migraine, 63% had moderate resilience, and 62.5% reported a good quality of life. These findings indicate that medical students in this study generally have good quality of life and moderate resilience, regardless of migraine severity. This indicates the possibility of adaptive coping mechanisms. However, the small sample size, especially in the severe migraine group (n=8), suggests the need for further research with a larger population to validate these results.

## INTRODUCTION

Migraine, derived from the Greek hemicrania and adopted into Latin as hemigranea before being translated into French as migraine, refers to intense headache attacks often accompanied by symptoms like vomiting and visual disturbances.<sup>1</sup>

Globally, migraines represent a significant public health burden. A systematic review and meta-analysis found that the global prevalence of migraine among medical students is 18.9%.<sup>2</sup> In Indonesia, migraines are also a pressing health concern. The Global Burden of Disease (GBD) Study 2019 estimated that Indonesia ranked fourth globally in terms of migraine cases, with approximately 3.5 million individuals affected.<sup>3</sup> However, despite this high prevalence, local data remain limited, especially among young adults or student populations.

Among medical students specifically, academic life and emotional stress are major migraine triggers,<sup>4</sup> and these stressors consequently can negatively impact daily functioning, academic performance, and quality of life.<sup>5</sup>

Quality of life is referred to as “an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards, and concerns.”<sup>6</sup> A recent study has shown that the severity of migraine is a predictor of deteriorated quality of life in young adults aged 20-40, often co-existing with anxiety and depression.<sup>7</sup> However, there is limited data available from Southeast Asian contexts, where cultural values, healthcare systems, and stress factors may differ significantly. Understanding the impact of migraine on quality of life, specifically within the Indonesian young adult population, is therefore essential to establish the prevalence and patterns of migraine-related quality of life impairment among Indonesian medical students, who represent a high-stress population at critical career development stages.

In addition to quality of life deterioration, psychiatric comorbidities such as anxiety and depression are also frequently reported in individuals with migraine, prompting further investigation into psychological factors like resilience.<sup>8</sup> Resilience refers to the capacity of individuals to adapt positively to stress, adversity, or trauma.<sup>9</sup> Previous studies have demonstrated that migraine patients generally show lower resilience levels compared to healthy individuals.<sup>10</sup> While those with higher resilience levels report less migraine-related disability, emphasizing the importance of resilience in improving the quality of life of individuals suffering from migraine.<sup>11</sup>

Since medical students face unique academic stressors and will become future healthcare providers, understanding the relationship between migraine, resilience, and quality of life in this population is crucial. Therefore, this study aims to describe these aspects among Indonesian medical students, as such data have not been previously documented in this population.

## **METHOD**

A descriptive observational study was conducted among final-year medical students of the University of Muhammadiyah Sumatera Utara, Medan, Indonesia, from November 29, 2023, to December 20, 2023, after obtaining ethical approval from the Institutional Review Committee (Number: 1105/KEPK/FKUMSU/2023). Final-year medical students who gave informed consent were included, while students with a history of head trauma, head tumors, hypertension, brain infections, or head or brain surgery were excluded. Convenience sampling was used as the sampling method.

The minimum sample size was calculated using a standard formula for prevalence studies, with a 95% confidence interval, a 5% margin of error,<sup>12</sup> and an estimated migraine prevalence of 7% based on a previous study. The required sample size was 100, but 179 students participated in this study.<sup>13</sup> Data collection utilized questionnaires: the Migraine Screen Questionnaire (MSQ), the

Resilience Evaluation Scale (RES), and the World Health Organization Quality of Life-BREF (WHOQOL-BREF).

Migraine was assessed using the Migraine Screen Questionnaire (MSQ), a five-item tool based on the International Headache Society (IHS) criteria. Each 'yes' response was scored as 1, with a score of  $\geq 4$  indicating suspected migraine.<sup>14</sup> For further analysis, migraine severity was categorized as mild (score = 4) and severe (score = 5). The classification was based on symptom distribution, where participants with a score of 5 experienced all five migraine-related symptoms (frequent headaches, duration  $>4$  hours, nausea, photophobia/phonophobia, and activity limitation), while those with a score of 4 exhibited variations in symptom presentation.

The Indonesian version of the Resilience Evaluation Scale (RES) measures respondents' resilience, featuring eight statements assessing self-confidence and self-efficacy. Respondents rate the applicability of each statement using a 5-point Likert scale, from 0 = "strongly disagree" to 4 = "strongly agree." Total scores range from 0 to 36, with higher scores indicating greater psychological resilience.<sup>15</sup> For further analysis, resilience scores were categorized into three levels based on the distribution of scores within the study population.

**Table 1. Categorization of resilience scores<sup>16</sup>**

No	Category	Score Range (Interval)
1	Low	$X < M - 1SD$
2	Moderate	$M - 1SD < X < M + 1SD$
3	High	$M + 1SD < X$

The World Health Organization Quality of Life-BREF (WHOQOL-BREF) assesses respondents' quality of life with 26 items across four domains: physical health, psychological health, social relationship health, and environmental health. Each domain score (raw score) is transformed to a scale of 0-100 using a standard WHO formula. Interpretations of the transformed scores range from very poor to excellent quality of life.<sup>17</sup>

While all 179 participants completed the demographic questionnaire and MSQ, a detailed analysis of resilience and quality of life scores was explicitly conducted for students identified with migraine ( $n=29$ ), as the primary objective was to characterize these psychological factors within the migraine-affected population. This focused approach aligns with the study's descriptive aim to understand resilience and quality of life patterns among medical students experiencing migraine.

Data processing involved editing and collecting all completed questionnaires and verifying their completeness. Codes were assigned to facilitate computerized data analysis. Data were entered into IBM Statistical Packages for Social Science (SPSS) version 26 and Microsoft Excel 2013 for analysis, ensuring meticulous entry to minimize errors.

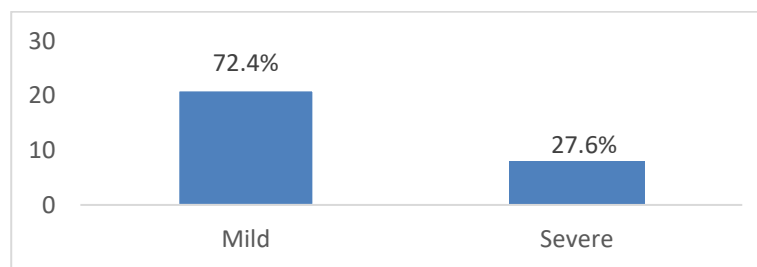
## RESULTS

Among 179 university students, 150 (83.8%) did not experience migraines, while 29 (16.2%) were identified as having migraines. Among non-migraine respondents, the majority were female (74.0%), and the most common age was 21 years (56.7%), followed by 22 years (21.3%) and 20 years (17.3%). A small proportion were aged 23 (4.0%) and 24 (0.7%).

**Table 2. Distribution of non-migraine and migraine respondents by demographic data**

	Non-Migraine		Migraine		Total	
	n	%	n	%	n	%
<b>Sex-wise</b>						
Male	39	26	7	24,1	46	25.7
Female	111	74	22	75,9	133	74.3
<b>Total</b>	<b>150</b>	<b>100</b>	<b>29</b>	<b>100</b>	<b>179</b>	<b>100</b>
<b>Age</b>						
20 years	26	17.3	4	13,8	30	16.8
21 years	85	56.7	15	51,7	100	55.9
22 years	32	21.3	8	27,6	40	22.3
23 years	6	4	2	6,9	8	4.4
24 years	1	0.7	0	0	1	0.6
<b>Total</b>	<b>150</b>	<b>100</b>	<b>29</b>	<b>100</b>	<b>179</b>	<b>100</b>

Of the 29 students with migraines, most were female (75.9%), and the majority of students experiencing migraines are aged 21, with a total of 15 individuals (51.7%).

**Figure 1. The categories of migraine**

The majority of students experienced mild migraine, with a total of 21 individuals (72.4%).

**Table 3. Distribution of resilience scores based on mean and standard deviation**

Variable	Mean	Standard deviation
Resilience	22.62	5.722

\*Note: Scores represent students with migraine only (n=29)

Based on the data, the average resilience score among students with migraines was 22.62 (SD = 5.722), suggesting a moderate level of resilience in this group.

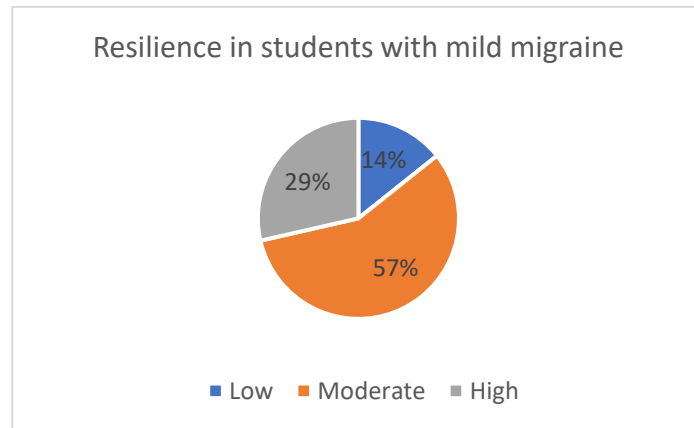
**Table 4. Distribution of quality of life scores based on mean and standard deviation**

Variable	Mean	Standard deviation
Quality of life	63.63	9.222

\*Note: Scores represent students with migraine only (n=29)

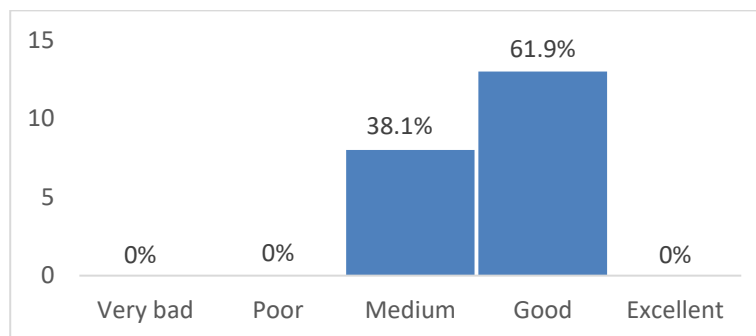
The mean quality of life score among students with migraines was 63.63 (SD = 9.222), indicating that most students experienced a good overall well-being.

Resilience and quality of life among students experiencing mild migraines



**Figure 2. Resilience among students experiencing mild migraines**

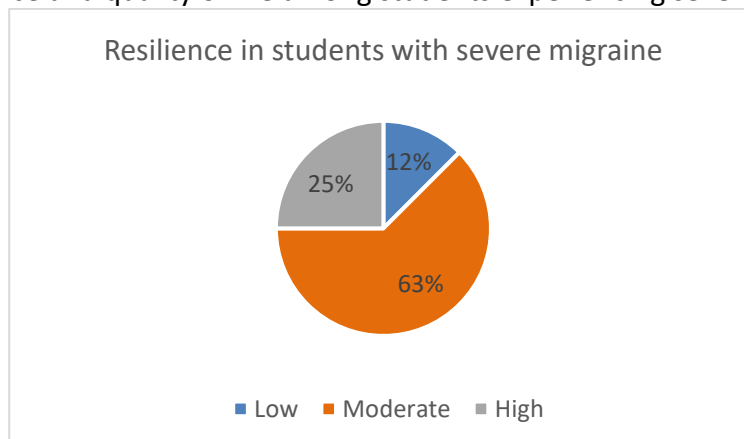
In students who experience mild migraine, 3 people (14%) have low resilience, 12 people (57%) have moderate resilience, and 6 people (29%) have high resilience.



**Figure 3. Quality of life among students experiencing mild migraines**

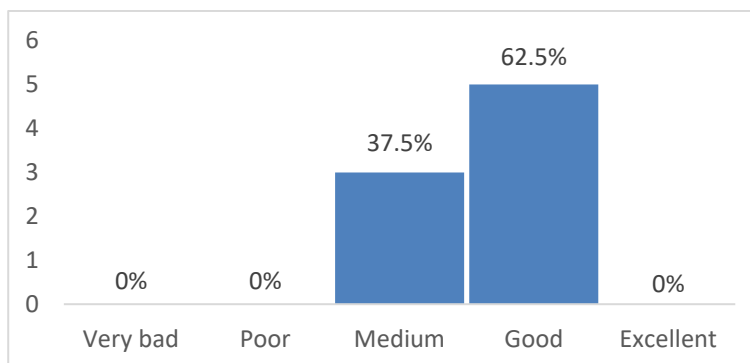
Among students with mild migraine, 8 students (38.1%) showed moderate quality of life, while 13 students (61.9%) reported good quality of life.

Resilience and quality of life among students experiencing severe migraines



**Figure 4. Resilience among students experiencing severe migraines**

In students who experience severe migraine, 1 people (12%) have low resilience, 5 people (63%) have moderate resilience, and 2 people (25%) have high resilience.



**Figure 5. Quality of life among students experiencing severe migraines**

Among students with severe migraine, 3 students (37.5%) showed moderate quality of life, while 5 students (62.5%) reported good quality of life.

## DISCUSSION

The prevalence of migraine among medical students varies. In this study, the prevalence of migraine was found to be 16.2%, which is higher than the 7% prevalence reported in other studies conducted on medical students in Indonesia.<sup>13</sup> However, it is lower than the migraine prevalence of 17.27% in Egypt,<sup>18</sup> and 24.4% in Pakistan.<sup>19</sup>

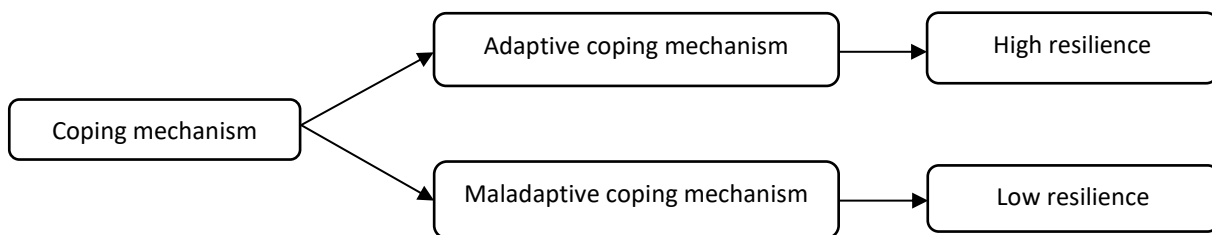
In this study, the prevalence of migraine was higher in women compared to men, consistent with findings from studies conducted on medical students in Egypt,<sup>18</sup> Pakistan,<sup>19</sup> and other universities in Indonesia.<sup>13</sup> This difference could be attributed to hormonal variations, particularly in women experiencing hormonal fluctuations during the menstrual cycle, pregnancy, and menopause, which can trigger or exacerbate migraines. Additionally, differences in brain structure, genetic polymorphisms, and neural pathways may also contribute to this disparity.<sup>20</sup>

Several factors could explain the differences between the results of this study and previous studies, including the gender ratio among participants. Compared to the study of medical students in Saudi Arabia, the ratio of female to male respondents was higher in our study. The number of female and male participants in that study was 238 and 158, respectively, while in our study, it was 133 and 46. In addition, the prevalence of migraine in women and men in the study in Saudi Arabia was 4.6% and 3.1%, respectively. In our study, the prevalence of migraine in women and men was 16.5% and 15.2%, respectively. This brings the overall prevalence of migraine to 4.04% in the Saudi Arabia study compared to 16.2% in our study.<sup>21</sup> These differences might be attributed to the higher female-to-male ratio in our study or variations in cultural stressors between Saudi Arabia and Indonesian populations.

The results of this study indicate that respondents aged 21 years were more likely to experience migraines. This finding aligns with other studies that have shown most migraine sufferers experience their first attack around the age of 30, with university students experiencing it even earlier, typically around the age of 20.<sup>22</sup>

The majority of students experiencing migraines, whether mild or severe, exhibit moderate resilience. However, these findings contradict those of a previous study, which reported lower levels of resilience among migraine patients compared to healthy control groups. This disparity may stem from differences in sample characteristics and research methodologies. While this study focused on respondents aged 20 to 23 years, the previous study included a broader age range from 18 to 65 years. Additionally, there was variation in the questionnaires used; this study employed the Resilience Evaluation Scale (RES), whereas the previous study utilized the Psychological Resilience Scale for Adults.<sup>10</sup>

In this study, the majority of students with migraine, whether mild or severe, exhibited moderate levels of resilience and a good quality of life. However, coping strategies still play a role in how they manage the impact of migraine in their daily lives. Students with mild and severe migraines may adopt adaptive coping strategies, such as seeking social support or cultivating a positive mindset, contributing to their resilience.<sup>23</sup> Conversely, some individuals with severe migraine may face greater challenges, increasing their risk of relying on less effective coping strategies, such as avoiding activities or experiencing excessive anxiety. These findings align with previous research highlighting the crucial role of coping mechanisms in shaping resilience and quality of life among individuals with migraine.<sup>10</sup>



**Figure 6. The relationship between coping mechanisms and resilience**

Figure 6 illustrates the relationship between coping mechanisms and resilience. Students who use adaptive coping mechanisms such as maintaining healthy routines, practicing stress management techniques, getting adequate sleep, engaging in regular physical activity, and adjusting their diet tend to develop higher levels of resilience. On the other hand, students who rely on maladaptive coping strategies such as avoidance, denial, or excessive worry are more likely to have lower resilience. This model supports previous research findings that suggest coping style is a key factor influencing psychological resilience, particularly among individuals living with migraine.<sup>10</sup>

On quality of life, students experiencing both mild and severe migraines reported moderate to good quality of life. This contrasts with findings from a cross-sectional study, which indicated that college students with migraines reported lower quality of life compared to non-migraine students.<sup>24</sup> Additionally, a study in India demonstrated that migraine sufferers experienced diminished quality of life, with very severe disability being associated with further reductions in quality of life among migraine patients.<sup>25</sup> This finding may suggest that Indonesian medical students might have better coping strategies, thus leading to a better quality of life than those in India.

The limitations of this study include the narrow diagnostic approach due to the use of a scoring system limited to the population of final-year medical students at a single university. Therefore, the results may not be generalizable to a broader population. Additionally, subjective

responses from respondents when filling out the questionnaire could potentially impact the validity of the results.

The role of coping strategies, such as lifestyle modification, stress management techniques, adequate sleep, regular physical activity, and dietary adjustments, needs to be investigated to determine which ones are most effective for treating migraines. Additionally, differences in cultural stressors and gender ratios may influence the efficacy of these strategies, as observed in comparisons between Indonesian and Indian populations. Further research on these factors could help develop targeted interventions to improve migraine management among medical students.

## CONCLUSIONS

The prevalence of migraine among fourth-year medical students is 16.2%, with female students being more commonly affected. Most respondents experiencing migraines are around 21 years old. Students with mild and severe migraines generally tend to have good quality of life and moderate resilience. These findings suggest possible adaptive coping mechanisms among medical students with migraine. However, the small sample size, particularly in the severe migraine group, warrants further research with a larger population to validate these observations.

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