



Relationship between anxiety and tension type headache among medical student

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ABSTRACT

Tension-type headache (TTH) is one of the most common types of primary headaches experienced by all age groups worldwide. The incidence of TTH among the medical students was also high. This study aimed to identify the relationship between anxiety and the incidence among medical students. We used an analytical descriptive research design and a cross-sectional study approach. A total of 119 students from Prima Indonesia University Faculty of Medicine participated in this study. Data were collected using the Back Anxiety Inventory (BAI) questionnaire to measure anxiety levels and Headache Screening Questionnaire (HSQ) to measure the incidence of TTH. The results of data analysis using the chi-square test showed a significant relationship between anxiety levels and the incidence of TTH ($p = 0.026$). This finding indicates that the higher a person's anxiety level, the more likely they are to experience TTH. Based on the results of the study, 84.87% (101 people) of the participants experienced TTH, while 15.13% (18 people) experienced possible TTH. The majority of the participants with high anxiety levels were female (94.4%). It can be concluded that there is a significant relationship between anxiety and the incidence of TTH among Prima Indonesia University Faculty of Medicine students in 2023. This finding supports the hypothesis that anxiety is a risk factor of TTH.

Keywords: TTH, anxiety, medical student

Introduction

Headache is a significant global health problem, affecting millions of people worldwide. Not only do they cause discomfort, but they also have a major impact on people's productivity, quality of life and economic burden.¹⁻³ Migraine, as one of the most common types of headache, contributes significantly to the total years of life lost due to disability.⁴ In addition, headaches experienced in adolescence may persist or worsen into adulthood, potentially leading to chronic condition with high personal and social costs.⁵

The 1-year prevalence of migraine in the Asia-Pacific ranges from 1.5% to 22.8%, while tension type headache (TTH) prevalence is 10.8-33.8%.⁶ The prevalence of chronic daily headache is estimated at 1.0-3.9%. The prevalence of chronic migraine in Asia is lower than the global average, affecting an estimated 23-65 million individuals worldwide.⁷ Chronic migraine is associated with greater disability and comorbidities than episodic migraine.⁸ A recent global study found that migraine cases increased by 16% from 1990 to 2019, with a higher prevalence in regions with high Socio-demographic Index (SDI). The

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burden of migraine and TTH is particularly pronounced among women and individuals aged 30-39.⁹ Epidemiological data show that headache is a common complaint experienced by both men and women. Research results from several major cities in Indonesia showed that more than a quarter of respondents experienced chronic tension-type headache, about a third experienced episodic tension-type headache, and almost 2% experienced migraine with aura.¹⁰

TTH is a type of headache that feels like something is binding the head, felt on both sides of the head, and mild to moderate in intensity.¹¹ These headaches can last from a few minutes to a few days and do not worsen with the activity. Unlike migraines, tension headaches are usually not accompanied by nausea or sensitivity to light and sounds. If they occur frequently, tension headaches may become chronic.^{12,13} Research indicates a significant relationship between anxiety and TTH. Studies have found that higher anxiety levels are associated with an increased risk of TTH among medical students.^{14,15} Anxiety has been shown to mediate the effect of headache frequency on quality of life domains such as vitality, social functioning, and mental health in patients with chronic TTH. Depression also plays a moderating role in the relationship between headache duration and mental health.¹⁶ Both anxiety and depression are prevalent comorbidities in episodic and chronic TTH patients, with anxiety rates ranging from 44% to 60% and depression rates ranging from 32% to 40%, respectively.¹⁷

Several studies, including those conducted at Universitas Andalas¹⁵ and Universitas Muhammadiyah Sumatera Utara¹⁸, have revealed a high prevalence of anxiety among medical students, especially women. Factors such as busy curriculum, high academic demands, and social pressure contribute to increased levels of anxiety. This condition is associated with an increased risk of TTH. The results showed a strong correlation between anxiety and TTH in the medical-student population. Studies on the impact of anxiety on TTH among medical students at Prima Indonesia University are still very limited. Therefore, this study aimed to measure the prevalence of anxiety among medical students and its relationship with TTH.

Method

This was a non-experimental study with an analytical descriptive design using a cross-sectional study approach. This means that the researcher observes the subject only once at a certain time. The research participants encompassed all currently enrolled students in the Medical Education Program at the Faculty of Medicine, Universitas Prima Indonesia. The sample included 119 respondents who used the purposive sampling technique. The inclusion criteria for this study were active students in Semester 2 or more at the Faculty of Medicine, Universitas Prima Indonesia, who were willing to participate. Exclusion criteria are students who had graduated were excluded. This research was conducted at Universitas Prima Indonesia during the April-June 2024 period.

This study used two types of questionnaires to collect data. First, Beck Anxiety Inventory (BAI) with 21 items was used to measure the anxiety level of the respondents. Second, the Headache Screening Questionnaire (HSQ) with ten items was used to identify cases of tension-type headache (TTH). In this study, anxiety was considered an independent variable that was thought to affect TTH as the dependent variable. After the data were collected, an editing process was carried out to ensure that they were complete and accurate, and coding was carried out to convert qualitative data into quantitative data ready for analysis. The coded data were then inputted into statistical software for further analysis.

Results

The majority of the medical students in this sample are female, accounting for 85.71% of the total. This indicates a significant female predominance in the medical student population represented by this data. The most common age group among the medical students is 19 years old, comprising 43.70% of the sample. This suggests that a significant portion of the students are in their second year of medical school. The age range of the students is from 17 to 24 years old, indicating a relatively young population. While the majority of students are concentrated in the 18-20 age group, there is a fair amount of age diversity, with students ranging from 17 to 24 years old (see Table 1). The majority of the respondents (51.26%) had low anxiety levels. A total of 33.61% had moderate anxiety, while the rest (15.13%) had severe anxiety. Regarding the incidence of tension-type headache (TTH), most respondents (84.87%) experienced TTH, whereas the rest (15.13%) experienced probable TTH.

Table 1. Subject characteristics

Characteristics	n=119	%
Gender		
Female	102	85,71
Male	17	14,29
Age		
17 years	3	2,52
18 years	39	32,77
19 years	52	43,70
20 years	15	12,61
21 years	8	6,72
22 years	1	0,84
24 years	1	0,84
Anxiety level		
Middle	61	51,26
Moderate	40	33,61
Severe	18	15,13
Tension-Type Headache		
Probable	18	15,13
Yes	101	84,87

The table shows that the majority of medical students experienced moderate levels of anxiety, with 51.26% falling into this category. Female students were more likely to experience moderate levels of anxiety, with 39.50% reporting this level, compared to 11.76% of male students. Moderate levels of anxiety were also more common among the female students (31.93%) than among the male students (1.68%). Severe levels of anxiety were relatively rare, with only 14.29% of female students and 0.84% of male students reporting this level. Overall, the data suggest that female medical students are more likely to experience higher levels of anxiety than their male counterparts are.

Table 2. Anxiety level of medical students based on gender

Anxiety level	Gender (n (%))		
	Female	Male	Total
Middle	47 (39.50)	14 (11.76)	61 (51.26)
Moderate	38 (31.93)	2 (1.68)	40 (33.61)
Severe	17 (14.29)	1 (0.84)	18 (15.30)

Most practitioners (69.6%) were in the lightweight categories of roosters, light feathers, and feathers. This shows that BJJ is more popular among practitioners with lower body weights. The higher the weight category, the lower the number of practitioners. This suggests that the number of BJJ practitioners with higher body weights tended to be lower.

Table 3. Incidence of Tension-Type Headache by gender

Incidence of Tension-Type Headache	Gender (n (%))		
	Female	Male	Total
Probable	17 (14.29)	1 (0.84)	18 (15.13)
Yes	85 (71.43)	16 (13.45)	101 (84.87)

The data presented in the table illustrates the prevalence of TTH based on gender. Among female participants, 14.29% (17) were classified as having probable TTH, while 71.43% (85) were confirmed to have TTH. In contrast, male participants showed lower rates, with 0.84% (1) categorized as probable TTH and 13.45% (16) confirmed with TTH. Overall, 15.13% (18) of all patients were identified as having probable TTH, and 84.87% (101) were confirmed to have TTH. The results indicate a significant gender disparity in TTH occurrence, with females exhibiting a substantially higher rate of confirmed TTH (71.43%) compared to males (13.45%).

Table 4. Relationship between anxiety level and the incidence of Tension-Type Headache

Anxiety level	TTH (n (%))			p
	Probable	Yes	Total	
Middle	5 (4.20)	56 (47.06)	61 (51.26)	0.026
Moderate	11 (9.24)	29 (24.37)	40 (33.61)	
Severe	2 (1.68)	16 (13.45)	18 (15.30)	

The table shows the relationship between anxiety levels and the incidence. Individuals with middle anxiety levels exhibited a higher incidence of TTH, with 47.06% reporting "Yes" to TTH. This group showed a statistically significant association with TTH ($p=0.026$). The moderate anxiety group had a substantial proportion (24.37%) reporting "Yes" to TTH. While the severe anxiety group had a smaller sample size, 13.45% reported "Yes" to TTH. Overall, the table suggests a positive correlation between increasing anxiety levels and the likelihood of experiencing tension-type headaches. Individuals with moderate and moderate anxiety levels were more prone to TTH than those with severe anxiety levels.

Discussion

The data indicates a significant female predominance in the medical student population, with 85.71% of respondents being female. This trend aligns with broader national statistics showing that women now comprise more than 50% of medical students in the U.S. For instance, a 2019 report from the Association of American Medical Colleges (AAMC) highlighted that women made up 50.5% of all medical school students, marking a significant increase from previous years.^{19,20} This suggests a growing trend towards gender parity in medical education. Studies indicate that female enrollment in medical schools has steadily increased over the years, reaching record highs in recent application cycles.²⁰ The implications of this shift include potential changes in specialty choices and workforce dynamics. Research shows that certain specialties are becoming female-predominant, which could affect future workforce composition and leadership roles within medicine.²¹

The most common age group among medical students in this sample is 19 years old, representing 43.70% of respondents. The age range is from 17 to 24 years old, indicating a relatively young population. This finding is consistent with trends observed in other studies where younger individuals dominate medical school demographics. Similar studies have noted that younger students are increasingly enrolling in medical programs, reflecting societal shifts towards earlier career decisions in medicine.²² The study reveals that 51.26% of participants reported low anxiety levels, while 33.61% experienced moderate anxiety and 15.13% severe anxiety. Notably, female students exhibited higher levels of anxiety compared to their male counterparts—39.50% of females reported moderate anxiety compared to only 11.76% of males. Other studies have documented higher anxiety levels among female medical students, often attributed to various stressors inherent in medical training.²¹ The correlation between gender and anxiety levels is significant and suggests a need for targeted mental health resources. Research indicates that heightened anxiety can adversely affect academic performance and well-being among medical students.²²

A striking finding is that 84.87% of respondents experienced TTH, with a notable gender disparity: 71.43% of females confirmed having TTH compared to only 13.45% of males. Furthermore, individuals with moderate anxiety levels showed a higher incidence of TTH (47.06%). Previous research has established a clear link between anxiety levels and the prevalence of TTH, particularly among females.²¹ This correlation underscores the importance of addressing mental health issues to mitigate physical health problems. The higher prevalence of TTH among women aligns with broader findings in health literature that document gender differences in pain perception and reporting.²⁰

Conclusion

The research results reveal significant insights into the demographics and mental health challenges faced by medical students, particularly concerning gender disparities in anxiety levels and TTH incidence. These findings not only reflect current trends in medical education but also highlight areas for further investigation and intervention to support student well-being. By structuring the discussion around these key themes—gender distribution, age demographics, anxiety levels, and health outcomes—we can better understand the implications of these findings within the context of existing literature and ongoing trends in medical education.

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