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Anxiety as a risk factor of tension type headache

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ABSTRACT

Tension-type headache is a primary headache frequently encountered by young individuals. Anxiety is a contributing factor to tension-type headaches. A rigorous curriculum and schedule, transfers within the educational system, competitive academic performance, and similar factors induce anxiety among medical students. This study aims to assess the impact of anxiety on tension-type headaches. We conducted a cross-sectional study that included 73 medical students who were preparing for the Objective Structured Clinical Examination (OSCE). Data was collected about 2-5 days before the OSCE at the final tutorial. Anxiety is assessed using the Hamilton Anxiety Rating Scale (HARS). At the same time, tension-type headaches are identified via the ICHD III criteria. A total of 73 individuals exhibiting anxiety were examined. Specifically, mild anxiety was observed in 13 participants (17.8%), moderate anxiety in 7 subjects (9.6%), severe anxiety in 21 subjects (28.8%), and highly severe anxiety in 32 subjects (43.8%). Among the 73 participants, 26 (35.6%) suffered tension-type headaches, while 47 (64.4%) did not. The Spearman Rank test revealed a correlation coefficient of r = 0.263 and a p-value of 0.025 (<0.05), indicating a weak yet significant association. Anxiety exhibits a weak yet substantial link with the occurrence of tension-type headaches.

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INTRODUCTION

A *headache* is a head-on pain that may be diffuse, resulting in discomfort throughout the entire head. It is the most prevalent neurological disorder in society(Sabah et al., 2022). The incidence of headaches grows during infancy, reaching its height between the ages of 11 and 13 in both genders(Lee et al., 2023)(Onofri et al., 2023) Headaches are categorized as main or secondary based on their origin. Primary headaches arise independently of other illnesses and constitute the majority of headache cases. Secondary headaches are those with an identifiable etiology, including head and neck trauma and cranial and cervical vascular diseases, among other causes (ICHD - II).

The two most prevalent primary headache forms are migraines and tension-type headaches (TTH)(Kelly et al., 2018).

The International Classification of Headache Disorders (ICHD) classifies headache pain into primary and secondary types(Scotton et al., 2019). A primary headache is not attributable to intracranial structural problems. Tension-type headache (TTH) is the most prevalent primary headache. The mechanisms involved in the pathophysiology of TTH are categorized into peripheral and central mechanisms(Bilahmar et al., 2023).

Tension-type headache (TTH) is a bilateral headache characterized by a pressing or squeezing sensation, non-pulsatile in nature, unaffected and unexacerbated by physical activity, ranging from mild to moderate intensity, and accompanied by minimal nausea and vomiting, without photophobia or phonophobia(Vos et al., 2020). The global one-year prevalence of tension-type headache (TTH) is estimated at 26.8%. The prevalence of TTH exhibits a more equitable distribution, with a female-to-male ratio of 1.2:1. The age of onset for TTH is generally lower than that of migraine, occurring before 30 years compared to after 30 years(Onan et al., 2023).

The precise etiology of TTH needs to be explained. Nonetheless, there are correlations to other factors, including dietary, muscular, environmental, and genetic factors. Environmental and muscle variables may also be potential etiologies of tension headaches. Stress and posture seem to be the two primary causes. Nevertheless, incorrect posture, including excessive neck flexion during video gaming and computer use, elevates stress on the atlantoaxial joint and upper cervical vertebrae. The shoulders endeavor to compensate by lowering forward to alleviate stress, resulting in muscle imbalances, with certain regions contracting and causing a tension headache(Shah & Hameed, 2020).

Conversely, it is recognized that psychosomatic variables, including anxiety, can heighten sensitivity to pain perception(Sait et al., 2021). Numerous prior research indicates that sadness and anxiety are more common in patients with tension-type headaches (TTH) than in the general population devoid of headache pain (Ashina et al., 2017)(Kim et al., 2017)(Thiriveedhi et al., 2023). The correlation between anxiety disorders and headache disorders, such as tension-type headaches, has been extensively documented in clinical settings. While psychiatric problems seldom serve as the exclusive source of headache symptoms, their comorbidity may severely impact patient outcomes and treatment approaches. Individuals with primary headache disorders and multiple comorbid psychiatric disorders require a comprehensive examination and suitable treatment(Repiso-Guardeño et al., 2023).

This study aims to ascertain the correlation between anxiety levels and the prevalence of tension-type headaches in medical students.

RESEARCH METHOD

This type of analytical research utilizes a cross-sectional design to examine the correlation dynamics between risk factors and effects conducted at a specific time. This study aimed to ascertain the correlation between anxiety levels and the prevalence of tension-type headaches. The research participants were medical students who satisfied the inclusion and exclusion criteria.

The inclusion criteria encompassed active medical students aged 17 to 25 who were prepared to complete an informed consent form. The exclusion criteria were individuals currently experiencing or with a history of mental problems and those with a history of head trauma. Data was gathered from November 2017 to January 2018. The independent variable in this research was the level of anxiety. The dependent variable is a tension-type headache.

Participants completed personal information and provided informed consent before administering the Hamilton Anxiety Rating Scale questionnaire, comprising 14 symptom clusters. Anxiety levels are categorized as mild, moderate, severe, and very severe. Participants subsequently completed a questionnaire regarding tension-type headaches, which will be classified according to ICHD III criteria. The gathered data will undergo normality testing. Statistical

analysis was performed with the SPSS for Windows version 21.0 software. Statistical test outcomes were deemed significant if $p < 0.05$.

RESULTS AND DISCUSSIONS

Subject data was collected via a form that included an informed consent document, the Hamilton Anxiety Rating Scale (HARS) questionnaire, and a tension-type headache questionnaire based on ICHD III, administered to medical students from the classes of 2016 and 2017 preparing for the OSCE examination. The study comprised 73 respondents, including 49 women (67%) and 24 men (33%). Three participants were aged 20 years (4%), and only one was 21 (1%). Forty-one individuals (56%) were 18 years old; twenty-three subjects (32%) were 19 years old, and five subjects (7%) were 17 years old.

An analysis of the anxiety levels among 73 research participants revealed that 13 subjects (17.8%) exhibited mild anxiety, seven subjects (9.6%) exhibited moderate anxiety, 21 subjects (28.8%) exhibited severe anxiety, and 32 subjects (43.8%) exhibited extreme anxiety. The attributes of the research subjects are presented in Table 1 below:

Table 1. Subject characteristics

Variable	N = 73	%
Gender		
Men	24	32.88
Women	49	67.12
Age		
17 years old	5	6.85
18 years old	41	56.16
19 years old	23	31.51
20 years old	3	4.11
21 years old	1	1.37
Anxiety Level		
Mild	13	17,8
Moderate	7	9,6
Severe	21	28,8
Very severe	32	43,8
Tension-Type Headache		
No	47	64,4
Yes	26	35,6

The data indicates that 47 medical students (64.4%) did not suffer from tension-type headaches, while 26 (35.6%) did experience them. The data indicates that most research subjects did not have tension-type headaches.

The normality test is conducted to ascertain whether the data follows a normal distribution. The data normality test will ascertain the subsequent step, which is precisely the statistical analysis, either the Pearson or Spearman Rank tests. Table 2 below presents the outcomes of the normality test conducted on the research data collected from each group of subjects.

Table 2. Normality test

Sample Group	Kolmogorov-Smirnov Z	Asymptotic significant	Results
Anxiety Level	2,177	0.001	Data is not normal
Incidence Rate of Tension-Type Headache	3,535	0.001	Data is not normal

According to Table 2, the Asymptotic significant value for anxiety level is 0.001, with a Kolmogorov-Smirnov Z value of 2.177. The incidence rate of tension-type headache also shows an Asymptotic significance of 0.001, accompanied by a Kolmogorov-Smirnov Z value of 3.535. The

data on anxiety levels and the prevalence of tension-type headaches are often not normally distributed, as shown by an asymptotic significance value of less than 0.05.

Bivariate data analysis employed the Spearman Rank due to the non-normal distribution of the data. The table below indicates a notable correlation between anxiety levels and the occurrence of tension-type headaches in medical students, with a significance value of p = 0.025 (<0.05). The correlation coefficient indicates a weak association, with a value of r = 0.263.

Table 3. Relationship between anxiety level and incidence rate of tension-type headache in medical students

Anxiety Level	Tension-Type Headache Incidence Rate						*r*	*p*
	No		Yes		Total			
	n	%	n	%	n	%		
Mild	10	13,7	3	4,1	13	17,8	0,263	0,025
Moderate	6	8,2	1	1,4	7	9,6		
Severe	15	20,5	6	8,2	21	28,8		
Very Severe	16	21,9	16	21,9	32	43,8		
Total	47	64,4	26	35,6	73	100		

The research subjects exhibited features predominantly categorized as experiencing severe anxiety, with 32 subjects (43.8%) falling into this classification among medical students. Forty-seven participants (64.4%) did not have tension-type headaches. The incidence of tension-type headaches observed in this study (35.6%) differs from the findings of a study conducted in Lahore, which reported a prevalence of 72.9% among medical students(Saleem et al., 2024).

Anxiety is a common experience for all individuals, especially students. Anxiety frequently manifests in individuals as worry, nervousness, confusion, and fear about situations that have yet to occur (Ibrahim et al., 2023)(Wakhyudin & Putri, 2020). The prolonged study duration, competition, rigorous schedule, curriculum, and transition from prior school are strongly believed to contribute to the prevalence of anxiety among medical students.

The frequency of examinations was significantly associated with heightened anxiety levels, suggesting a potential stressor in the educational setting(Asfar, 2021)(Puspitasari et al., 2024)(Tanjung, 2024). Research suggests that repeated examinations may create competitive pressure, worry about failure, and an obsessive demand for academic success, hence exacerbating anxiety levels(Saputri, 2017)(Masruroh, 2020)(Thiriveedhi et al., 2023). Unexpectedly, all-night studying correlated with a lower risk of elevated anxiety. This may be an unexpected discovery and necessitates additional inquiry. It is essential to acknowledge the subjective experience of anxiety. Students who engage in intensive study may view themselves as better prepared, reducing their anxiety around the upcoming examination(Lanahan et al., 2022).

Furthermore, people with good study habits, better time management abilities, or reduced baseline anxiety may be able to engage in all-night studies, hence adding to the identified correlation(Yu et al., 2018). People without a history of psychological issues exhibited a lower risk of having elevated anxiety. People lacking a history of psychiatric issues may have intrinsic resilience or coping strategies that make them less vulnerable to elevated anxiety levels. This resilience may arise from adaptive coping mechanisms or a more stable mental health base(Song et al., 2021).

The data presented illustrates the correlation between anxiety levels and the occurrence of tension-type headaches. The correlation between anxiety levels is relatively weak (r = 0.263). The correlation between anxiety levels and the prevalence of tension-type headaches among medical students is statistically significant, with a p-value of 0.025 (<0.05). This study's positive correlation between recurrent tension-type headaches and anxiety aligns with earlier research from(Song et al., 2021), highlighting that the problematic demands of medical education and the extensive curriculum contribute to heightened anxiety levels. This then results in diminished serotonin levels and activates pain signals in the brain, resulting in recurrent tension-type headaches.

CONCLUSION

Based on the results of research on the relationship between anxiety levels and the incidence of tension-type headaches in medical students, it can be concluded that there is a significant weak relationship between anxiety levels and the incidence of tension-type headaches. The rising incidence of recurrent tension headaches and its correlation with anxiety among medical students emphasizes the necessity of medical programs to offer mental health services. These interventions must be affordable and accessible, including proactive evaluations of mental health upon admission to medical schools to identify and assist at-risk individuals.

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