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The Relationship Between Sleep Quality and Cephalalgia Among Medical Students

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Abstract

This study aims to determine the relationship between sleep quality and the incidence of cephalgia among medical students at X University, Class of 2023. Cephalgia, or headache, is a common neurological disorder influenced by several factors, including poor sleep quality. This study used a cross-sectional analytical design with total sampling involving 139 student respondents. Data were collected using a questionnaire covering questions on sleep quality and cephalgia occurrence. The results showed that most students (56.1%) had poor sleep quality, while 43.9% had good sleep quality. Furthermore, 48.2% of students experienced cephalgia, while 51.8% did not. Bivariate analysis using the chi-square test indicated a significant relationship between sleep quality and the incidence of cephalgia, with a significance value of 0.000 (<0.05). Students with poor sleep quality were more likely to experience cephalgia compared to those with good sleep quality. This study concludes that poor sleep quality is associated with an increased risk of cephalgia. Therefore, students are advised to maintain good sleep patterns to reduce the risk of cephalgia, and educational institutions are expected to promote awareness of sleep quality through education and counseling programs.

***Keywords**: sleep quality, cephalgia, medical students*

INTRODUCTION

Cephalgia, or headache, is a pain or discomfort experienced in the head region extending from the chin to the back of the head. It represents one of the most common neurological disorders affecting humans globally. Headache is a disabling symptom of primary headache disorders such as migraine, tension-type headache, and cluster headache, while secondary headaches may result from other underlying conditions (Smith, 2019). According to the World Health Organization (WHO, 2021), headache disorders affect approximately 40% of the global population—equivalent to 3.1 billion individuals—with a higher prevalence among women. Cephalgia can occur across all age groups, from early childhood to the elderly, and it affects people of all races, income levels, and geographic regions (WHO, 2021; Evans, 2020).

Beyond physical discomfort, cephalgia also significantly impairs quality of life and poses financial burdens. Recurrent attacks often cause anxiety and fear of recurrence, disrupting social, familial, and occupational functioning. Chronic headache sufferers are also more prone to other conditions such as anxiety and depression (Taylor, 2020; GBD, 2019). According to Global Health Estimates (2019), headache ranks as the third leading cause of years lived with disability globally, following stroke and dementia.

One of the factors associated with the occurrence of cephalgia is poor sleep quality. Sleep is an essential physiological need and plays a vital role in maintaining physical and mental health. However, nearly 50% of the global population experiences sleep disorders of varying types and severity (WHO, 2021). Sleep disturbance has been identified as a significant clinical problem contributing to various neurological and psychosomatic conditions. The hypothalamus is a key link between sleep and headache, functioning as both a sensory modulator and circadian pacemaker. Sleep disturbances and headache are related through the trigeminal nerve pathway, as trigeminovascular activation influences both pain perception and sleep induction mechanisms (Dodick, 2018).

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In addition, melatonin—a neurohormone produced by the pineal gland—plays an important role in regulating sleep and pain. Its secretion follows a diurnal rhythm controlled by the suprachiasmatic nucleus. Melatonin has analgesic, antioxidant, and anti-inflammatory effects, and disrupted secretion may trigger headache attacks. The underlying mechanisms involve enhanced GABAergic inhibition in pain pathways, regulation of serotonergic signaling, reduction of proinflammatory cytokines, and inhibition of nitric oxide synthesis (Peres & Masruha, 2019).

Based on this background, this study aims to examine the relationship between sleep quality and the incidence of cephalgia among medical students of the Faculty of Medicine at X University, Class of 2023. Understanding this relationship is expected to help improve students' awareness of healthy sleep habits and prevent the occurrence of recurrent or chronic headaches that may affect academic performance and overall well-being.

RESEARCH METHODS

This study used an analytical cross-sectional design to determine the relationship between sleep quality and the incidence of cephalgia among medical students at X University, Class of 2023. Data were collected in December 2024 using a validated online questionnaire distributed via Google Form. The population consisted of 139 students, all included through a total sampling technique. The independent variable was sleep quality measured using the Pittsburgh Sleep Quality Index (PSQI), and the dependent variable was cephalgia assessed through a structured questionnaire. Data were analyzed using IBM SPSS Statistics with descriptive (univariate) and Chi-square (bivariate) tests at a 0.05 significance level.

RESULTS AND DISCUSSION

This study involved 139 medical students from the Faculty of Medicine, X University, Class of 2023. The results showed that most respondents were female (Table 1), had poor sleep quality (Table 2), and nearly half experienced cephalgia (Table 3).

Table 1.
Distribution of Respondents by Gender

Variable	Frekuensi (n)	Persentase (%)
Gender		
Male	33	23,7 %
Female	106	76,3 %
Total	**139**	**100,0 %**

Based on Table 3.1, regarding the gender variable, there were 106 female respondents (76.3%) and 33 male respondents (23.7%).

Table 2.
Distribution of Respondents' Characteristics Based on Sleep Quality

Sleep Quality	Frekuensi (n)	Persentase (%)
Good	61	43,9 %
Poor	78	56,1 %
Total	**139**	**100,0 %**

Based on Table 3.2, 61 students (43.9%) had good sleep quality, while 78 students (56.1%) had poor sleep quality.

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Table 3.
Distribution of Respondents' Characteristics Based on the Incidence of Cephalgia

Cephalgia Status	Frekuensi (n)	Persentase (%)
Cephalgia	61	43,9 %
No Cephalgia	78	56,1 %
Total	**139**	**100,0 %**

Based on Table 3. 72 students (51.8%) did not experience cephalgia, while 67 students (48.2%) experienced cephalgia.

Table 4.
Distribution of the Relationship Between Sleep Quality and the Incidence of Cephalgia Among Medical Students at X University, Class of 2023

Quality Sleep	*Cephalgia*				Total	%	P	OR
	No *Cephalgia*		*Cephalgia*					
	n	%	n	%				
Good	51	36,7 %	10	7,2 %	61	43,9 %		
Poor	21	15,1 %	57	41,0 %	78	56,1 %	0,000	44,050
Total	**72**	**51,8 %**	**67**	**48,2 %**	**139**	**100 %**		

The chi-square test showed a p-value of 0.000 (<0.05), indicating a significant relationship between sleep quality and the incidence of cephalgia among medical students at X University. The odds ratio of 44.050 suggests that students with poor sleep quality are 44 times more likely to experience cephalgia, and the risk decreases with better sleep quality.

Table 5.
Distribution of the Relationship Between Gender and the Incidence of Cephalgia Among Medical Students at X University, Class of 2023

Gender	*Cephalgia*				Total	%	P
	No *Cephalgia*		*Cephalgia*				
	n	%	n	%			
Male	16	11,5%	17	12,2%	33	23,7%	
Female	56	40,3%	50	36,0%	106	76,3%	0,663
Total	**72**	**51,8%**	**67**	**48,2%**	**139**	**100 %**	

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The analysis showed a significance value of 0.663, which exceeds the threshold of <0.05. This indicates that there is no statistically significant relationship between gender and the incidence of cephalgia among medical students at X University, Class of 2023.

CONCLUSION

Based on the study examining the relationship between sleep quality and the incidence of cephalgia among medical students at X University, Class of 2023, several key findings were obtained. Most students (56.1%) were found to have poor sleep quality, while 43.9% maintained good sleep quality. In terms of cephalgia occurrence, 48.2% of students reported experiencing headaches, whereas 51.8% did not. Furthermore, analysis of gender differences revealed a significance value of 0.663, indicating no statistical relationship between gender and cephalgia incidence.

However, a significant correlation was identified between sleep quality and the occurrence of cephalgia. The chi-square test produced a p-value of 0.000, confirming that students with poor sleep quality were 44.050 times more likely to experience cephalgia compared to those with good sleep quality. This finding aligns with previous studies showing that inadequate sleep contributes to higher risks of cephalgia through neurophysiological mechanisms involving the hypothalamus and melatonin regulation. Therefore, maintaining adequate sleep quality is essential to prevent cephalgia and support overall neurological and psychological well-being.

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