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Relationship Between Sleep Quality and Primary Headache Among Employees of PT. Valeo Ac Indonesia

Harel Mega Serafine Simanjuntak[1*], Haflin Soraya Hutagalung[2], Indri Adriztina[3], Sri Amelia[4]

[1]*Undergraduate Program in Medicine, Faculty of Medicine, Universitas Sumatera Utara, Indonesia*
[2]*Department of Neurology, Faculty of Medicine, Universitas Sumatera Utara*
[3]*Department of Ear, Nose & Throat, Head & Neck, Faculty of Medicine, Universitas Sumatera Utara*
[4]*Department of Microbiology, Universitas Sumatera Utara, Indonesia*

***Corresponding Author**: Harel Mega Serafine Simanjuntak, E-mail: harelsimanjuntak10@gmail.com

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ABSTRACT

Introduction: Primary headaches, including migraines and tension-type headaches (TTH), are characterized by pain in the head without any underlying health issues. Poor sleep quality is a significant factor contributing to the occurrence of these headaches. Despite the prevalence of these conditions, many individuals neglect them and fail to seek appropriate treatment. This study analyzed the relationship between sleep quality and primary headache.
Methods: This analytical research utilized a cross-sectional approach. Primary data were collected directly from respondents using two validated questionnaires: the Pittsburgh Sleep Quality Index (PSQI) to assess sleep quality and the Headache Screening Questionnaire (HSQ) to identify primary headache characteristics. The study included 92 employees of PT. Valeo AC Indonesia as respondents.
Results: Among the 92 subjects, 32.6% were found to have poor sleep quality, while 35.9% experienced primary headaches. Tension-type headaches (TTH) were identified as the most common type of primary headache. Primary headaches were predominantly reported by individuals aged <30 years, male respondents, and those who were married. Bivariate analysis revealed a significant relationship between poor sleep quality and the occurrence of primary headaches, with a p-value of 0.015, indicating statistical significance.
Conclusion: This study demonstrates a significant relationship between sleep quality and the prevalence of primary headaches among employees of PT. Valeo AC Indonesia. These findings highlight the importance of improving sleep quality as a potential strategy to reduce the occurrence of primary headaches, particularly among at-risk populations.

Keywords

Migraine, Tension-Type Headache, Primary Headache, Sleep Quality, Employees

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INTRODUCTION

Headache is pain or discomfort in the head that arises due to stimuli such as traction, inflammation, or irritation in pain-sensitive structures.[1] The World Health Organization (WHO) shows that around 40% of the population, or 3.1 billion people, have experienced headaches.[2] Apart from causing pain, headaches also occupy the third position in women and fifth in men as a cause of years lived with disability (YLDs).[3]

The International Classification of Headache Disorder divides headaches into 3 types: primary headache, secondary headache, and cranial neuropathy pain. Migraine and tension-type headache (TTH) are two primary headaches that often occur in society.[4] In Indonesia, from 1990 to 2019, the prevalence of migraine reached 44.2 million cases, with an incidence of 3.5 million cases. Meanwhile, the prevalence of TTH reached 70.8 million cases with an incidence of 25.1 million cases.[5]

Poor sleep quality is one of the most common factor of primary headaches. Around 50 – 70 million adults in the United States experience poor sleep quality and are dominated by insomnia.[6] In addition, a company in China found that 25.4% of their employees had poor sleep quality.[7] There are many structures, pathways, and neurotransmitters involved in sleep disorders that are also part of the pathophysiology of headaches.

One of the large structures involved is the hypothalamus, the part that receives pain sensations and regulates circadian rhythms. In addition, melatonin plays a role and is produced primarily at night. Melatonin functions to increase inhibition of GABAergic pain pathways, modulate 5-HT signals, reduce the production of proinflammatory cytokines, inhibit nitric oxide synthesis, and have an antioxidant effect. Psychological factors are also involved in this pathophysiology, such as individuals who are susceptible to stress, low self-esteem, and anxiety disorders.[8] The aims of this study were to assess the quality of sleep, determine the incidence rate of primary headaches, identify the types of primary headaches experienced, and analyze the relationship between sleep quality and primary headaches among employees of PT. Valeo AC Indonesia. Additionally, the study aimed to determine the demographics of employees who experience primary headaches.

METHOD

Questionnaires were distributed to 107 employees of PT. Valeo AC Indonesia. The inclusion criteria for this research were employees who were Indonesian citizens, were willing to be respondents, and fill out the questionnaire sheet completely. Employees with a history of trauma and/or head surgery, diagnosed with secondary headaches by medical personnel, sinusitis or showing symptoms of sinusitis, hypertension, consumption of antihypertensive drugs, and uncorrected eye symptoms were excluded from this study.

This research was approved by the Clinical Research Ethics Committee of Faculty of Medicine, Universitas Sumatera Utara (Number : 254/ UN5.2.1.1.54/SPB/2024). Each respondent received an explanation regarding this research and had the right to participate or refuse to participate in this research without any form of coercion. Two questionnaires, the Pittsburgh Sleep Quality Index (PSQI) and Headache Screening Questionnaire (PSQI), are used. PSQI is a questionnaire often used globally to evaluate an individual's sleep quality in the past month. This questionnaire conducts seven sleep quality components : subjective sleep quality, sleep latency, sleep duration, sleep efficiency, sleep disorders, medication use, and daytime dysfunction. Each item within the PSQI is scored to generate a global score that ranges from 0 to 21. A score exceeding 5 indicates poor sleep quality, whereareas a score of 5 or below suggests good sleep quality. The Headache Screening Questionnaire (HSQ) is a standardized tool designed to evaluate primary headache disorders by the International Classification of Headache Disorders 3 (ICHD-3) guidelines. It comprises ten questions that simultaneously address two algorithms : migraine and tension-type headache.

This research was quantitative, using observational analytical methods and a cross-sectional approach. The findings were analyzed using SPS version 29.0. Sociodemographic data, sleep quality, and primary headache were analyzed through univariate analysis. Additionally, the relationship between sleep quality and primary headache was assessed bivariately using the Chi-Square test.

RESULTS

Ninety-two respondents met the inclusion and exclusion criteria. Then, they were analyzed univariately based on age, gender, and marital status. The results show that most respondents are under 30 (57.6%), with the youngest 20 years old, followed by the 30 – 39 age group (27.2%). 97.6% of respondents were men and only 3.3% were women. Based on marital status, 68.5% of respondents were married. More complete details are listed in Table 1.

Table 2 shows the respondents' sleep quality assessed using the PSQI. Respondents who had good sleep quality (PSQI≤ 5) were 62 respondents (67.4%) and 30 respondents (32.6%) had poor sleep quality (PSQI >5).

Table 1. Demographic characteristics of the subject of study

Characteristics	Total (n = 92)	Percentage (%)	Primary Headaches (n = 33)	Percentage (%)
Age				
<30 years	53	57.6	15	28.3
30 - 39 years	25	27.2	12	48
40 - 49 years	10	10.9	3	3
>50 years	4	4.3	3	75
Gender				
Male	89	96.7	30	33.7
Female	3	3.3	3	100
Marital status				
Married	63	68.5	24	38
Single	29	31.5	9	31

Table 2. Characteristics of respondent based on sleep quality

Sleep Quality	n	Percentage (%)
Good	62	67.4
Poor	30	32.6

Table 3 shows that 33 respondents experienced primary headaches (35.9%) while the remaining 59 did not experience primary headaches (64.1%).

Primary Headaches	n = 92	Percentage (%)
Yes	33	35.9
No	59	64.1

This study divides headaches into two groups: migraine and tension-type headaches. Table 4 shows that 12 respondents (36.3%) experienced migraine and 21 respondents (63.7%) experienced TTH.

Table 4. Characteristics of respondent based on types of primary headache

Types of primary headache	n = 33	Percentage (%)
Migraine	12	36.3
Tension-Type Headache	21	63.7

The 33 respondents who experienced primary headaches were analyzed univariately based on sociodemographic data in Table 1. This study found that the majority of respondents were aged <30 years (45.5%), followed by 30 – 39 years (36.4%). Meanwhile, primary headaches are dominated by men, with a percentage of 90.9%. Based on marital status, married respondents tend to experience primary headaches (72.7%). Table 5 shows a significant relationship between sleep quality and primary headache. The results is indicated by a p-value of 0.015 (p <0.015).

Table 5. Relationship between sleep quality and primary headaches

		Primary Headaches						p
		Yes		No		Total		
		n	%	n	%	N	%	
Sleep	Good	17	51,5	45	76,3	62	67,4	0,015
Quality	Poor	16	48,5	14	23,7	30	32,6	
Total		33	100	59	100	92	100	

DISCUSSION

Among the 92 respondents, this study found that 32.6% reported poor sleep quality. The results of this study are similar to the findings of Songkham et al. (2019), who found that 33.7% of employees from three large companies in Thailand had poor sleep quality.[9] Yang et al. (2020) also found that 25.4% of employees in China had poor sleep quality. When analyzed further, poor sleep quality was higher in individuals with long working hours, poor general health, and psychological factors such as high job demands.[7]

This research indicates that 35.9% of respondents reported experiencing primary headaches. A study conducted in Estonia with a sample size of 1,215 adults demonstrated that 41% of respondents similarly experienced primary headaches.[10] Additionally, research by Li et al. (2020) revealed that 30.8% of employees from nine companies in China reported primary headaches as well.[11]

In this study, 33 respondents who experienced primary headaches were classified into two categories: migraines, which accounted for 36.3%, and tension-type headache (TTH), which comprised 63.7%. These findings align with research conducted in China and in Saudi Arabia; both studies found that TTH is the most prevalent type of primary headache.[11,12] Respondents who experienced primary headaches were analyzed based on age, gender, and marital status. The results of this study revealed that primary headaches were most commonly reported by respondents aged under 30 years (45.5%), followed by those aged 30 – 39 years (36.4%). However, it is essential to note that among the initial number of respondents, the percentage of those aged 30 – 39 years who experienced primary headaches was higher (48%) compared to about 28.3% for those under 30. This aligns with the Global Burden Of Disease Data, indicating that the highest prevalence of migraine and tension-type headache occurs at ages 35 to 39 years.[5] Furthermore, when considered across a broader age range, the peak incidence of primary headaches is found in individuals aged 20 to 40.[13]

When analyzing gender, this study found that men experienced more primary headaches than women. This finding differs from several previous studies due to significant differences between male and female respondents. The meta-analysis of 29 studies found that women are more likely to experience primary headaches.[14] Many factors can affect this, such as the fluctuation hormone estrogen, which can trigger migraines.[15] In addition, women tend to have more active trigger points (TrPs) than men, making them more likely to experience tension-type headache.[16] Based on marital status, the incidence of primary headaches appears to be higher among married employees, with a reported percentage of 72.7%. Similar findings have been documented in studies conducted in Serbia and Pakistan.[17,18] Additionally, individuals who do not reside with their partner or who have a partner suffering from obstructive sleep apnea may experience a decline in sleep quality, which can subsequently affect the prevalence of primary headache.[19]

This study examined the relationship between sleep quality and primary headaches, revealing a significant relationship ($p = 0.015$). Furthermore, similar findings have been reported in research conducted across various regions of Indonesia, including Medan, Lampung, and Bali, consistently demonstrating that poor sleep quality is intricately linked to primary headaches.[20-22] A 2019 study in Türkiye examined the link between sleep quality and primary headaches by involving 102 individuals with migraines and tension-type headaches, compared to a control group of 100 healthy individuals.[23] The PSQI results indicated significantly higher PSQI scores in the primary headache group. Similarly, research by Stanyer et al. (2021) found that the PSQI scores were higher and there was a decrease in REM sleep (measured by polysomnography) when compared to control group. Another study also found individuals with poor sleep quality are linked to greater headaches intensity and the progression from episodic to chronic tension-type headaches.[24]

Several underlying theories support the relationship between sleep quality and primary headaches. For example, the hypothalamus, a place where pain sensation are received and circadian rhythms are regulated, also plays an active role in this pathophysiology.[8] The limitation of this research is that most respondents are male, resulting in a lack of information about female participants.

CONCLUSION

There is a significant relationship between sleep quality and primary headaches ($p = 0.015$). There were 32.6% of respondents with poor sleep quality and 35.9% of respondents experienced primary headaches. The most common primary headache experienced is tension-type headache and occurs more frequently in those aged <30 years (45.5%), male gender (90.9%), and married individuals (72.7%).

DECLARATIONS

Ethics approval and consent to participate. Permission for this study was obtained from the Ethics Committee of Faculty of Medicine, Universitas Sumatera Utara

CONSENT FOR PUBLICATION

This study was approved by Ethical Committee of Universitas Sumatera Utara, Medan, Indonesia. No : 778/KEPK/USU/2024. The sampels provided the consent to participated in the study.

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COMPETING INTERESTS

The authors declare that there is no conflict of interest in this report.

AUTHORS' CONTRIBUTIONS

All authors significantly contribute to the work reported execution, acquisition of data, analysis, and interpretation, or in all these areas. Contribute to drafting, revising, or critically reviewing the article. Approved the final version to be published, agreed on the journal to be submitted, and agreed to be accountable for all aspects of the work.

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