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## SLEEP QUALITY ANALYSIS OF VESTIBULAR VERTIGO PATIENTS IN SITI RAHMAH PADANG ISLAMIC HOSPITAL POLYCLINIC

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**Abstract:** *Vertigo can influence of the activity and productivity of patients, this is due to sleep quality disorders in patients so that they easily experience fatigue and irritability when working during the day. Therefore, it is necessary to analyze the sleep quality of vestibular vertigo patients who seek treatment at the hospital. This research is an observational study with a cross sectional design. The population in this research were vestibular vertigo patients who were treated at the polyclinic of Siti Rahmah Islamic Hospital in Padang City during January 2023 - February 2023, there are 36 samples were obtained using the total sampling technique. Univariate data analysis is presented in the form of frequency distribution and bivariate analysis using chi-square test, and data processing using computerized SPSS program IBM version 25.0. In this study, it was found that most patients with vestibular vertigo were central type, which 20 people (55.6%), the most sleep quality was poor, which 23 people (63.9%), and there was a significant relationship ( $p=0.022$ ) between vestibular vertigo and patient sleep quality. Most vestibular vertigo is central type with most sleep quality is poor, and there is a relationship between vestibular vertigo and sleep quality of patients who were treated at the polyclinic of Siti Rahmah Islamic Hospital in Padang City.*

**Keywords:** *vestibular vertigo, sleep quality, vertigo*

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### INTRODUCTION

Vertigo is one of the conditions or conditions where a person feels the environment or objects around him moving floating and as if rotating. This condition is often followed by vomiting, sweating and collapse but the patient never loses consciousness. Vertigo is one of the neurological diseases that often occurs and interferes with activity and productivity (Amin & Lestari, 2020). According to epidemiological data globally, in 2018 the incidence of vertigo was higher for women than men. The prevalence of vertigo in adults reaches 7.4% with an annual incidence rate of 1.4%. The prevalence of vertigo in Indonesia in 2010 is very high ranging from the age of 40 to 50 years around 50%. Vertigo is the third most common complaint by patients who come to the hospital, after headaches and strokes (Yanti & Retnaningsih, 2019).

Sleep is a basic need for everyone. A condition where the body rests and carries out the recovery process to restore stamina so that it is in optimal condition. Regular sleep patterns can have a positive effect on health. Therefore, every human being needs quality sleep (Handojo et al., 2018). Good sleep quality is not owned by everyone because there are some who experience sleep disorders. Sleep quality is defined as a measure by which a person can ease in initiating sleep and maintaining it. Sleep quality can be described by the length of sleep and complaints felt during sleep and after waking up (Mulyana et al., 2022).

Sleep quality is a complex condition consisting of various qualitative components felt by a person such as the perception of feeling tired, tired, and sleepy. Its quantitative components can be assessed such as assessment of sleep duration, sleep disturbances, sleep start time, sleep efficiency, sleep dysfunction during the day, sleep quality, and use of sleeping pills. When a problem occurs in one of the seven quantitative components, it can result in a decrease in sleep quality (Ahmad et al., 2020).

The prevalence of sleep quality disorders globally is estimated to be between 5-15% and develops into chronic insomnia problems around 31-75%, while the prevalence of sleep quality

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disorders in adolescents in Indonesia reaches 38% (Mulyana et al., 2022). The impact of poor sleep quality a person can experience fatigue, irritability and impaired productivity and activities carried out especially during the day. Amin and Lestari in their research found that the vertigo experienced by patients is caused by the burden of the mind and lack of rest intensity so that the body is vulnerable to disease (Mulyana et al., 2022).

Muhammad et al. (2019) stated that there is a significant relationship between vertigo and poor sleep quality. The results of this study are in line with Xue et al.'s (2021) research which states that there is a relationship between sleep disorders and vertigo due to its pathophysiological mechanism. The pathophysiology of vertigo includes cortical diffuse depression, activation and sensitization of the vascular trigemino system, and excitatory-inhibition imbalances of the duramater, brainstem, cortex and subcortical (Hasibuan et al., 2022).

Bush et al. (2012) conducted research on sleep quality measurement using a sleep quality measurement instrument known as the Pittsburgh Sleep Quality Index (PSQI). PSQI is an effective instrument used to measure sleep quality and sleep patterns in adults. PSQI consists of 19 questions covering seven components, including subjective sleep quality, sleep latency, sleep duration, sleep efficiency, sleep disorders, use of sleeping pills, and daytime dysfunction. Each of the seven component values is given the same weight on a scale of 0-3, 0 indicates no difficulty and 3 indicates severe difficulty. The sum of the scores for the value of these seven components will result in one overall score, ranging from 0 to 21.

Poor sleep quality can be identified from higher questionnaire scores, and if the overall PSQI score > 5 then a person has poor sleep quality, to answer the PSQI questionnaire takes 5-10 minutes. PSQI has been validated by the University of Pittsburgh with 89.6% sensitivity and 86.5% specificity. The reliability of this questionnaire has also been tested and the value of the reliability coefficient (Cronbach's  $\alpha$ ) is 0.83. Sleep quality is related to quality of life. In the general population, one-third of adults are affected by poor sleep quality. Poor sleep quality can be caused by vertigo which is characterized by headaches such as spinning, making a person lose balance and prone to falling. For people with vertigo, sleep is a challenge, because often, symptoms actually occur during sleep (BANU (Bali Neurology Update), 2017).

Vertigo can influence of the activity and productivity of patients, this is due to sleep quality disorders in patients so that they easily experience fatigue and irritability when working during the day. Therefore, it is necessary to analyze the sleep quality of vestibular vertigo patients who seek treatment at the hospital and the research would like to reveal this topic. The researcher hopes that this study can contribute to a wider scope of sleep quality and vertigo studies

## **MATERIALS AND METHODS**

This study was an observational study with a cross sectional design that used primary data from PSQI questionnaires and secondary data from medical records. The population targeted by the study is vestibular vertigo patients seeking treatment at the Polyclinic of Siti Rahmah Islamic Hospital Padang in 2023. This study took place during January 2023 - February 2023 and obtained 36 samples using accidental sampling techniques. These research data were analyzed by univariate analysis for frequency distribution data and bivariate analysis using chi-square tests with computer programs and the data were presented in the form of tables and narratives.

## **RESULTS AND DISCUSSION**

### **Vertigo Vestibular**

In this study, the frequency distribution of vestibular vertigo patients at Siti Rahmah Islamic Hospital in Padang City was described as follows:

**Table 1.** Frequency Distribution of Vestibular Vertigo Patients at Siti Rahmah Islamic Hospital in Padang City

<b>Vertigo Vestibular</b>	<b><i>f</i></b>	<b>%</b>
Vertigo Vestibular Sentral	20	55,6
Vertigo Vestibular Perifer	16	44,4
<b>Total</b>	<b>36</b>	<b>100,0</b>

Based on table 1, it can be concluded that from 36 samples, the most vestibular vertigo is the central type, which is 20 people (55.6%). In a study conducted by Hasibuan et al. (2022) on students of the Faculty of Medicine, Universitas Prima Indonesia, the results of the study found that most respondents experienced central vertigo in the moderate category, which was as much as 25%.

The incidence of vertigo can interfere with daily activities, decrease motor capacity and create psychological stress (Ahmad et al., 2020). Students with vertigo will spend more time in bed, have more school absences and limited social activities. This can lead to reduced quality of life in people with vertigo by negatively affecting family, professional and social life (Hasibuan et al., 2022).

### Sleep Quality

In this study, the frequency distribution of sleep quality of vestibular vertigo patients at Siti Rahmah Islamic Hospital in Padang City was described as follows:

**Table 2.** Frequency Distribution of Sleep Quality of Vestibular Vertigo Patients at Siti Rahmah Islamic Hospital Padang City

<b>Sleep Quality</b>	<b><i>f</i></b>	<b>%</b>
Good	13	36,1
Bad	23	63,9
<b>Total</b>	<b>36</b>	<b>100,0</b>

Based on table 2, it can be concluded that from 36 samples, the highest sleep quality is poor, namely 23 people (63.9%). Research conducted by Maryanti and Setiawan (2021) at Sentra Medika Hospital Cibinong Tahun on peripheral vertigo patients, found that the most patients experienced poor sleep quality, which was as much as 77%. In another study, conducted by Farizy and Graharti (2021), it was found that college students who experienced migraines had the most poor sleep quality, which was 55%. Research by Hasibuan et al. (2022) found that most students experience low category insomnia.

Sleep quality is the level of a person's satisfaction with his sleep which includes quantitative and qualitative aspects of sleep such as the length of sleep, the time needed to be able to fall asleep, the frequency of awakening, and also the depth and review of sleep (Buysse et al., 1989). A person is said to have good sleep quality, if the person meets the criteria of having more sleep time in bed (85%), can fall asleep within  $\leq 30$  minutes, wake up from sleep no more than once each night, and wake up for  $\leq 20$  minutes after falling asleep (Hirshkowitz et al., 2015).

Poor sleep quality can have adverse effects in daily life such as getting tired, irritable, having difficulty staying focused and making decisions (Hasibuan et al., 2022). Long-term appearance of poor sleep quality is the onset of heart problems and diabetes (Chattu et al., 2019). A person who has sleep quality problems will deal with a number of problems, including poor performance in college, irritation, psychological problems and health problems. Poor sleep quality can also cause time management irregularities, impaired concentration and decreased quality of life (Hidayat, 2020).

### Quality Analysis of Vestibular Vertigo Patients

In this study, an analysis of sleep quality of vestibular vertigo patients at Siti Rahmah Islamic Hospital in Padang City was obtained which was described as follows:

**Table 3.** Sleep Quality Analysis of Vestibular Vertigo Patients at Siti Rahmah Islamic Hospital in Padang City

Vertigo Vestibular	Sleep Quality						P value
	Good		Bad		Sum		
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	
Vertigo Vestibular Sentral	11	30,6	9	25,0	20	55,6	0,022
Vertigo Vestibular Perifer	2	5,6	14	38,9	16	44,4	
<b>Total</b>	<b>13</b>	<b>36,1</b>	<b>23</b>	<b>63,9</b>	<b>36</b>	<b>100,0</b>	

Based on table 3 it can be concluded that from 36 samples, poor sleep quality was more prevalent in respondents with peripheral vestibular vertigo (38.9%) compared to those with central vestibular vertigo (25.0%). The results of statistical tests using the chi square test obtained a value of  $p = 0.022$  ( $p < 0.05$ ) which means that there is a significant relationship with sleep quality disorders of vestibular vertigo patients at Siti Rahmah Islamic Hospital Padang City.

Research conducted by Hasibuan et al. (2022) found that there is a relationship between vertigo and the quality of sleep of college students. Also, the research conducted by Maryanti (2021) which found that there was a meaningful relationship between sleep quality and the incidence of vertigo.

The relationship of vertigo with insomnia can be caused through several mechanisms, namely, the mechanism of the impact of insomnia on headaches. Previous research has shown that sleep deprivation can increase pain (Chattu et al., 2019; Harnod et al., 2015; Hidayat, 2020; Hirshkowitz et al., 2015; Holland et al., 2018). Then the mechanism of the impact of headaches on sleep, where chronic pain can cause changes in neuronal activity in *raphe magnus*, which can disrupt sleep cycles. Furthermore, vertigo and insomnia have mechanisms in the form of diffuse depression in cortical, activation and sensitization of the trigeminovascular system, and excitatory-inhibition imbalance of duramater, brain stem, cerebral cortex and subcortical.

The orexinergic system in the hypothalamus plays a role in the relationship between sleep and insomnia. Orexin-containing neurons in the hypothalamus fire in a wakefulness state and disruption of orexinergic signaling can cause excessive sleepiness (Buysse et al., 1989). Orexinergic cells not only affect monoaminergic activity throughout the sleep cycle, but also modulate pain. Orexin may affect trigeminovascular tone. Vertigo attacks can be triggered by stress, fatigue, lack of sleep, or poor sleep habits, which activate the hypothalamic system and orexin simultaneously (Hirshkowitz et al., 2015).

The pineal gland synthesizes and secretes melatonin, which is stimulated by darkness and inhibited by light in a 24-hour circadian pattern. Low urinary melatonin levels and 6-sulfatoxymelatonin have been linked to vertigo. Melatonin levels may not only play a role in the pathophysiology of vertigo, but may also predispose people to waking up from Rapid Eye Movement sleep with headaches. Overall, the above research and theories show a two-way relationship between sleep quality disorders and vertigo (Chattu et al., 2019; Harnod et al., 2015; Hidayat, 2020; Hirshkowitz et al., 2015; Holland et al., 2018).

### CONCLUSION

Based on this study, it was found that the most vestibular vertigo was the central type with the most sleep quality was poor, and there was a relationship between vestibular vertigo and the quality

of sleep of patients who sought treatment at the Polyclinic of Siti Rahmah Islamic Hospital in Padang City.

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