Vitamin B1, B6, Chronotype, and Sleep Duration in Patient with Neurotic, Stress and Somatoform Disorders

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Article Info	Abstract
	Sleep disorders are prevalent among individuals with neurotic, stress, and somatoform disorders. Nonetheless, the essential roles of vitamin B1 and B6 in sleep regulation and the insights provided by chronotype on circadian rhythms, and their interplay remains undiscovered in existing research. This study investigates the relationship between vitamin B1 and B6 levels, chronotype, and sleep duration in patients with neurotic, stress, and somatoform disorders. This study took time from December 2022 to January 2023 and recruited 42 patients diagnosed with neurotic, stress, and somatoform disorders and whoever willingly participated in the research. Vitamin B1 and B6 levels were measured using the Liquid Chromatography tandem-mass spectrometry (LC-MS-MS) method, while Chronotype was assessed using the Morningness Eveningness Questionnaire (MEQ). Sleep duration data were collected through structured interviews. The results found no statistically significant relationship between vitamin B1 and B6 levels, chronotype, and sleep duration. However, bivariate analysis revealed significant associations with monthly income (OR=0.21; 95% CI=0.05-0.94; p=0.042) and duration of diagnosis (OR=3.90; 95% CI=1.06-14.38; p=0.041), though this association did not persist in multivariate analysis.

Introduction

Human health consists of physical and mental health, both of which influence each other (Ohrnberger *et al.*, 2017). Neurosis, stress, and somatoform disorders are a group of diagnoses of mental health disorders that are usually accompanied by symptoms of anxiety, depression, and sleep disorders (Sivertsen *et al.*, 2021; World Health Organization, 2019). Sleep disorders are generally often experienced by sufferers of mental health disorders because sleep disorders are widely involved in the transdiagnosis process of several mental health disorders such as depression, anxiety, and stress through circadian rhythm and neurotransmitter mechanisms (Richards *et al.*, 2020). A study states that in general insomnia is more common among people with mental disorders than

healthy people, especially women. This study states that 59% of women who suffered from anxiety disorders experienced insomnia. In addition, 74.2% of men who experience eating disorders also experience insomnia (Sivertsen *et al.*, 2021). A review article stated that the results of previous cohort studies were that the prevalence of people who slept <6 hours reached 22.1 - 53.3% (Matsumoto & Chin, 2019; Matsumoto *et al.*, 2018; Mossavar-Rahmani *et al.*, 2017). Other research also states that 52.6% of the global population affected by the COVID-19 pandemic experiences insomnia (AlRasheed *et al.*, 2022).

Sleep is a necessity for living creatures, including humans, so the brain can work optimally. The benefit of sleep is basically to replenish glycogen in the brain, which

decreases when awake. After that, energy will be formed and spent at night to maintain body temperature to stay warm amidst cold environmental temperatures. Lack of sleep over a long period can result in severe physical and cognitive disorders or can even lead to death. Sleep duration is one of the parameters that can be used to measure sleep adequacy in a day because it reflects the sleep stage. Sleep stages consist of non-rapid eye movement (NREM) and rapid eye movement (REM) stages. When someone sleeping, he usually goes through the NREM stage for approximately 60-80 minutes and the REM stage for 15-40 minutes. In NREM stages 1 and 2, a person can usually still hear sounds from outside, so it is easy to wake up again. While in NREM stages 3 and 4, a person usually starts to forget or is not aware of their surroundings, and in the REM stage, a person usually enters the dream phase. The REM stage is a sleep stage that is qualitatively different, characterized by high brain activity and a level of physiological activity similar to that of a person who is awake. (Purves *et al.*, 2004; Sadock, 2015).

Recommendations for good sleep duration vary depending on a person's age. Newborn babies are said to get enough sleep if they reach 16-17 hours a day, while teenagers are said to get enough sleep if they reach 9 hours a day (Purves *et al.*, 2004). Adults can be said to be getting enough sleep if their sleep duration reaches 7-8 hours a day. So if someone sleeps less than the recommended time, this can result in serious physical and cognitive disorders or even death (Sadock, 2015). Previous research states that anxiety symptoms can increase in groups of people with shorter and longer sleep duration (Peng *et al.*, 2021). Other research states that lack of sleep duration can increase anxiety symptoms the next day (Bean & Ciesla, 2021).

Vitamins B1 and B6 are nutrients that have an important role in the neuronal system. A study states that vitamin B1 plays an important role in the synthesis of myelin and several neurotransmitters such as acetylcholine, serotonin, and gamma amino butyric acid (GABA) (Calderón-Ospina & Nava-Mesa, 2020; Sharma & Bist, 2018) where acetylcholine is also involved in the production REM stage

in the brain (Sadock, 2015) and GABA are involved in the process of circadian rhythm regulation (Ono *et al.*, 2018). Other research states that low intake of thiamine (vitamin B1) is associated with longer sleep duration (more than 9 hours a day) (Lee *et al.*, 2022). Vitamin B6 is also indirectly involved in the synthesis of the neurohormone melatonin which can stimulate the body to become sleepy (Purves *et al.*, 2004). A study states that a combination of melatonin, vitamin B6, and medicinal plants can improve sleep onset latency, sleep quality, and daytime function disabilities ((Lemoine *et al.*, 2019). Other research also states that poly-gamma-glutamic acid supplementation and vitamin B6 can increase sleep duration and improve sleep quality (García-García & Baik, 2021). Previous research also states that vitamin B6 levels are negatively related to short sleep duration, while high vitamin B6 levels are often found in groups of people with long duration. sleep normally (Ge *et al.*, 2022).

Another factor that influences sleep duration is the circadian rhythm. Circadian rhythms are endogenous oscillations or human biological clocks that run based on the Earth's 24-hour rotation or specifically, based on temperature and light (Waddell *et al.*, 2023; Yoshida *et al.*, 2023). Circadian rhythms in humans describe several complex phenotypes composed of various genes and form a chronotype, where human chronotypes are categorized into morningness, eveningness, and intermediate chronotypes (Montaruli *et al.*, 2021). A study states that people with eveningness chronotypes and tending to eveningness are significantly associated with longer sleep duration than those with morningness chronotypes (Merikanto & Partonen, 2020). Other research states that the chronotype tends to be eveninger, which is directly related to a higher BMI and indirectly related to insufficient sleep duration (Anothaisintawee *et al.*, 2018). So far there has been no research that combines the variables of vitamin B1, B6, and chronotype levels and analyzes their relationship with sleep duration, especially in people with mental health disorders, so researchers are interested in analyzing the relationship between vitamin B1 and B6 levels and sleep duration in people with

mental health disorders.

Methods

This research method is quantitative observation with a cross-sectional design. This research was declared ethically appropriate on November 7, 2022, by the ethics committee of the Faculty of Medicine, Sebelas Maret University. This research was conducted for two months, from December 2022 to January 2023, at RSJD Dr. Arif Zainuddin Surakarta. The population of this study was all patients with mental health disorders who underwent outpatient therapy and consultation at the Executive Psychology Building of RSJD Dr. Arif Zainuddin Surakarta. The inclusion criteria in this study were patients who were included in the neurosis, stress, and somatoform diagnosis groups, aged 18-59 years, domiciled in Solo Raya, able to communicate well, and agreeing to take part in the research as proven by signing an informed consent. The independent variables in this study were vitamin B1, B6 levels, and chronotype, while the dependent variable was sleep duration. Data collection on vitamin B1 and B6 levels is carried out by taking blood samples. Then, the samples will be analyzed using the Liquid Chromatography tandem-mass spectrometry (LC-MS-MS) method. Data

regarding chronotype was obtained by filling out the Morning Eveningness Questionnaire (MEQ) independently of the respondent, while data regarding sleep duration was collected by interviewing the respondent. Sleep duration was divided into three groups, namely <7 hours, 7-8 hours, and >8 hours. The ordinal logistic regression method was used to analyze the relationship between each respondent's characteristics, vitamin B1 and B6 levels, and chronotype with sleep duration.

Results and Discussion

This research was attended by 42 respondents aged 18-59 years, 67.4% of whom were adults. 66.7% were women, 62.8% were single, 64.3% were high school graduates, 41.9% were students, and 45.2% had an income of IDR 0 - <1 million. Diagnosis and treatment duration for most respondents was less than one year, and the majority's sleep duration was less than 7 hours a day. An overview of the characteristics of respondents is in Table 1.

The results of the analysis of the relationship between respondent characteristics, vitamins B1 and B6 levels, and chronotype with sleep duration using simple ordinal logistic regression are summarized in Table 2.

Table 1. Respondents Characteristics

Respondents Characteristics	Sleep duration category			
	<7 hours (n=18)	hours (n=23)	>8 hours (n=1)	Total (n=42)
Gender, n (%)				
Male	7 (38,9)	7 (30,4)	0 (0,0)	14 (33,3)
Female	11 (61,1)	16 (69,6)	1 (100,0)	28 (66,7)
Age, n (%)				
<20 years	7 (38,89)	6 (26,09)	0 (0,0)	13 (30,95)
20-44 years	8 (44,44)	13 (56,52)	1 (100,0)	22 (52,38)
45-59 years	3 (16,67)	4 (17,39)	0 (0,0	7 (16,67)
Marital Status, n (%)				
Married	4 (22,22)	10 (43,48)	0 (0,0)	14 (33,33)
Single/Divorce	14 (77,78)	13 (56,52)	1 (100)	28 (66,67)
Education, n (%)				
Elementary	2 (11,11)	2 (8,7)	0 (0,0)	4 (9,52)
Junior High	0 (0,0)	1 (4,35)	0 (0,0)	1 (2,38)
Senior High	12 (66,67)	15 (65,22)	0 (0,0)	27 (64,29)
College	4 (22,22)	5 (21,74)	1 (100)	10 (23,81)

Respondents Characteristics	Sleep duration category			
	<7 hours (n=18)	hours (n=23)	>8 hours (n=1)	Total (n=42)
Occupation, n (%)				
Housewife	2 (11,11)	3 (13,04)	0 (0,0)	5 (11,9)
College student	8 (44,44)	11 (47,83)	0 (0,0)	19 (45,24)
Entrepreneur	2 (11,11)	4 (17,39)	0 (0,0)	6 (14,29)
Government Employee	6 (33,33)	4 (17,39)	1 (100)	11 (26,19)
Private Worker	0 (0,0)	1 (4,35)	0 (0,0)	1 (2,38)
Income, n (%)				
Rp 0 - <1 million	5 (27,78)	13 (56,52)	1 (100)	19 (45,24)
Rp 1 - <2 millions	8 (44,44)	5 (21,74)	0 (0,0)	13 (30,95)
Rp 2 - <5 millions	4 (22,22)	4 (17,39)	0 (0,0)	8 (19,05)
Rp 50 - <10 millions	1 (5,56)	1 (4,35)	0 (0,0)	2 (4,76)
Diagnosed period, n (%)				
< 1 year	13 (72,22)	10 (43,48)	0 (0,0)	23 (54,76)
≥ 1 year	5 (27,78)	13 (56,52)	1 (100)	19 (45,24)
Treatment period, n (%)				
< 1 year	12 (66,67)	12 (52,17)	0 (0,0)	24 (57,14)
≥ 1 year	6 (33,33)	11 (47,83)	1 (100)	18 (42,86)
Chronotype, n (%)				
morningness	6 (33,33)	13 (56,52)	0 (0,0)	19 (45,24)
intermediate	9 (50,0)	8 (34,78)	1 (100)	18 (42,86)
eveningness	3 (16,67)	2 (8,70)	0 (0,0)	5 (11,90)
vitamin B1 level (ng/mL)				
Average ± SD	57,3 ± 18,5	65,2 ± 25,0	78,1 ± 0	62,3 ± 22,4
median (IQR)	32,7 (25,6 – 96,8)	39,1 (30,2-119)	0 (78,1-78,1)	32,6 (25,6-119)
vitamin B6 level (ng/mL)				
Average ± SD	35.4 ± 29.2	33,3 ± 24,03	26,6 ± 0	34,07 ± 25,8
median (IQR)	17,8 (9,4– 100)	10,5 (12,1-100)	0 (26,6-26,6)	10,5 (9,4 – 100)

SD, standard deviation; IQR, interquartile range

Table 2 shows that compared to the group of respondents with income below 1 million, the income group of IDR 1 - < 2 million is significantly related to sleep duration (p = 0.042). For a change in income level from Rp. <1 million to Rp 1-2 millions, then the *odds* or chance of sleep duration category > 8 hours compared to category combination of 7 hours and 7-8 hours will be 0,21 time lower, assuming that other variables in the bivariate model remain constant. Likewise, the odds for the IDR 1-2 million income group for the combination of the 7-8 hour and 8 hours sleep duration categories will be 0.21 times compared to the <7 hours category. The cutoff value for changing from the <7 hours category to a combination of the 7-8 hours and >8 hours category is -1.08, while the cutoff value for changing from the combination of the <7 hours and 7-8 hours category to the >8 hours category is 3. 18. Thus, we obtained two empirical models

of the relationship between sleep duration and income level as follows:
Sleep duration <7 hours *versus* [7-8 hours + >8 hours]:

Log odds sleep duration = -1,08 +0,21 (income Rp 1-2 million)

Sleep duration [<7 hours and 7-8 hours] *versus* >8 hours:

Log odds sleep duration = 3,18 + 0,21 (income Rp 1-2 millions)

Table 2 also indicates that the duration of being diagnosed with a mental health disorder ≥ 1 year is significantly related to sleep duration (p=0.041). For a diagnosis duration of ≥ 1 year, the odds for the sleep duration category > 8 hours compared to the combination of the categories < 7 hours and 7-8 hours will be 3.9 times greater, provided other variables in the model remain constant. Based on the proportional

Table 2. Relationship between Respondent Characteristics, Vitamins B1 and B6 Levels, and Chronotype with Sleep Duration

Respondents Characteristics	Odds ratio (OR)	IK 95%	p-value
Gender			
Male (reference category)	1		
Female	1.63	0.46 - 5.85	0.450
Age			
<20 years (reference category)	1		
20-44 years	2.19	0.55 - 8.72	0.267
45-59 years	1.52	0.25 - 9.31	0.651
Marital Status			
Married (reference category)	1		
Single/divorce	0.47	0.13 - 1.74	0.259
Education			
Elementary (reference category)	1		
Junior High	8.02	0.06 - 1042.55	0.402
Senior Hig	1.24	0.16 - 9.77	0.841
College	1.89	0.18 - 19.58	0.593
Occupation			
Housewife (reference category)	1		
College Student	0.92	0.13 - 6.46	0.936
Entrepreneur	1.29	0.12 - 13.76	0.831
Government Employee	0.68	0.08 - 5.70	0.725
Private Worker	5.48	0.05 - 654.35	0.485
Income			
< Rp 1 million (reference category)	1		
Rp 1 - <2 millions	0.21	0.05 - 0.94	0.042*
Rp 2 - <5 millions	0.33	0.06 - 1.81	0.202
Rp 5 - 10 millions	0.33	0.02 - 6.104	0.457
Diagnosed period			
<1 year(reference category)	1		
≥ 1 year	3.90	1.06 - 14.38	0.041*
Chronotype			
morningness (reference category)	1		
intermediate	0.55	0.15 - 2.04	0.373
eveningness	0.33	0.05 - 2.47	0.282
vitamin B1 level (ng/mL)	1.02	0.99 - 1.05	0.190
vitamin B6 level (ng/mL)	1.00	0.97 - 1.02	0.739

OR, odds ratio; CI 95%, Convidence Interval 95%.

odds assumption, the same increase of 3.9 times was also found between the categories of sleep duration <7 hours with a combination of 7-8 hours and >8 hours. In the length of diagnosis variable, the cutoff value for changing from the combination of the categories <7 hours and 7-8 hours to the category > 8 hours is 4.54 so that an empirical model of the relationship between sleep duration and time of diagnosis is obtained as follows:

Sleep duration <7 hours *versus* [7-8 hours + >8 hours]:

Log odds sleep duration = 0,28 + 3,90 (diagnosed ≥ 1 a year)

Sleep duration [<7 hours and 7-8 hours] *versus* >8 hours:

Log odds sleep duration = 4,54 + 3,90 (diagnosed ≥ 1 a year)

Multivariate analysis was carried out to find the influence of respondent characteristics that were significant in bivariate analysis on the dependent variable simultaneously, where in this study, the relationship between income level and time of diagnosis was analyzed, together with sleep duration. The results of multivariate analysis with multiple ordinal logistic regression will be presented in Table 3.

Multivariate analysis was carried out to find the influence of respondent characteristics that were significant in bivariate analysis on the dependent variable simultaneously, where in this study, the relationship between income level and time of diagnosis was analyzed, together with sleep duration. The results of multivariate analysis with multiple ordinal logistic regression are in Table 4.

The results of the multivariate analysis showed that the variables income and length of diagnosis together did not have a significant relationship with sleep duration in patients with neurosis, stress, and somatoform disorders. Sleep duration is an important health parameter to pay attention to because it is related to a person's neurocognitive development. If someone experiences a deficiency in sleep duration can result in cognitive and emotional dysfunction (Hehr *et al.*, 2023). The results of this study show that income level and time of diagnosis are two variables that are each significantly related to sleep duration in sufferers of neurosis, stress, and somatoform disorders, but no longer show statistical significance when both are analyzed simultaneously. In addition, the results of the study confirmed that the variables of vitamin B1, B6, and chronotype levels were not significantly related to sleep duration. Previous research states that sleep duration can be influenced by several factors such as gender (Wehrmeister *et al.*, 2020), age (Cassidy *et al.*, 2023; Lu *et al.*, 2021; Wang *et al.*, 2017), income

Table 3. Results of Analysis of the Influence of Respondent Characteristics on Sleep Duration Simultaneously

Respondents Characteristics	Odds ratio (OR)	CI 95%	p-value
Income			
< Rp 1 million (reference category)	0		
Rp 1 - <2 millions	0,24	0,04 – 1,14	0,074
Rp 2 - <5 millions	0,36	0,06 – 2,12	0,258
Rp 5 - 10 millions	0,15	0,006 – 3,22	0,224
Diagnosed period			
< 1 year (reference category)	0		
≥ 1 year	4,10	0,97 – 17,26	0,054
Cutoff Value	**Coefficient**	**CI 95%**	
7 hours versus [7-8 hours & >8 hours]	-0,48	-1,66 – 0,70	
[7 hours & 7-8 hours] versus >8 hours	4,07	1,79 – 6,35	

OR, odds ratio; CI 95%, Convidence Interval 95%

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Respondents Characteristics	Odds ratio (OR)	CI 95%	p-value
Income			
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Rp 2 - <5 millions	0,36	0,06 – 2,12	0,258
Rp 5 - 10 millions	0,15	0,006 – 3,22	0,224
Diagnosed period			
< 1 year (reference category)	0		
≥ 1 year	4,10	0,97 – 17,26	0,054
Cutoff Value	**Coefficient**	**CI 95%**	
7 hours *versus* [7-8 hours & >8 hours]	-0,48	-1,66 – 0,70	
[7 hours & 7-8 hours] *versus* >8 hours	4,07	1,79 – 6,35	

OR, odds ratio; CI 95%, Convidence Interval 95%

(Cassidy *et al.*, 2023; Wehrmeister *et al.*, 2020), marital status (Wang *et al.*, 2017), mental health status (Lu *et al.*, 2021; Wehrmeister *et al.*, 2020), cigarette and alcohol consumption (Gong *et al.*, 2017; Lu *et al.*, 2021), as well as chronotype (Nowakowska-Domagała *et al.*, 2022).

There are not many studies analyzing the relationship between vitamin B1 and sleep duration, especially in people with neurosis, stress, and somatoform disorders. The results of this study are not in line with previous research, which states that there is a significant relationship between vitamin B1 levels and sleep duration and that vitamin B1 levels have a negative relationship with sleep duration, which means that low vitamin B1 levels are associated with longer sleep duration and vice versa (Lee *et al.*, 2022). This research differs from previous research in terms of the study population. Previous research involved groups without mental disorders as respondents. Meanwhile, this study involved patients with neurosis, stress, and somatoform disorders who had different exposures to environmental stress as well as disorders of brain structure and chemical compounds (neurotransmitters) (Sadock, 2015). One of the symptoms of anxiety in patients with neurosis, stress, and somatoform disorders is influenced by disorders of neurotransmitters such as serotonin and gamma amino butyric acid (GABA), both of which play an important role in sleep regulation in humans. Serotonin is a precursor to melatonin, a neurohormone that triggers sleepiness (Okoshi *et al.*, 2014; Purves *et al.*, 2004). Other research suggests that decreasing levels of the neurotransmitter GABA can increase activity in the anterior cingulate cortex or medial prefrontal cortex which can result in insomnia and hyperarousal (Park *et al.*, 2020). Apart from that, previous research stated that the influence of vitamin B1 levels on sleep duration was strengthened by the behavior of respondents who had a high tendency to consume alcohol (Lee *et al.*, 2022).

This study also found that vitamin B6 did not have a significant relationship with sleep duration, which is in line with previous research which stated that giving vitamin B6 supplements did not have a relevant effect on sleep indicators such as sleep quality, nighttime wakefulness, and feeling tired after waking up. Sleep. The insignificant results in this study were probably because most respondents belonged to a group of people with sufficient vitamin B6 levels (>30 ng/mL). The results might be different if carried out in a group with vitamin B6 deficiency. (Adventure-Heart *et al.*, 2018).

This study shows that chronotype does not significantly relate to sleep duration. Previous research shows varying results, one of which states that chronotype modulates sleep duration, sleep quality, and social jet lag (Juda *et al.*, 2013). Other research states that there is a tendency for sleep disorders and short sleep duration in the eveningness group, which may not only be influenced by chronotype factors but may also be influenced by symptoms of depression and anxiety (Salfi *et al.*, 2022; Zou *et al.*, 2022). The results of this study show that the largest distribution of respondents was in the normal sleep duration group, namely 7-8 hours, so the research results could be different when the research was carried out specifically in the group with short sleep duration.

This research shows that the income variable of IDR 1 million per month shows a significant bivariate relationship with sleep duration. The income category of IDR 1 million per month can be said to be low because the Regency/City Minimum Wage (UMK) is IDR 2,174,162. Previous research states that the monthly income variable has a significant effect on sleep duration (Lallukka *et al.*, 2012; Nyarko *et al.*, 2023; Peng & Wu, 2022). One study states that groups with low incomes are likely to give up their sleep time to obtain more education or training to increase their abilities and income in the future. In addition, it is possible that low-income groups tend to increase their leisure time to compensate for the time spent working (Peng & Wu, 2022).

This research also shows that the variable length of time diagnosed with a mental health disorder has a significant bivariate relationship with sleep duration. This relationship could be mediated by the anxiety symptoms experienced by the respondent. Previous research states that people with anxiety disorders generally experience shorter sleep duration (Albrecht-Bisset *et al.*, 2023; Kim *et al.*, 2022; Roberts & Duong, 2017). Other research states that a

sleep duration of more than 8.5 hours a day is associated with reduced symptoms of depression and/or anxiety (Ojio *et al.*, 2016). Not many studies have analyzed the exact mechanisms underlying the relationship between anxiety disorders and sleep duration, but several studies have stated that anxiety disorders and sleep regulation are both influenced by the work of neurotransmitters and circadian rhythms (Sadock, 2015). The neurotransmitter serotonin acts as a precursor for metonin, a neurohormone that stimulates sleepiness, while the neurotransmitter dopamine works the opposite, namely reducing melatonin levels according to light stimulation (Lee *et al.*, 2021; Richards *et al.*, 2020). Other research states that the relationship between anxiety disorders and sleep disorders is influenced by genetic factors, social environment, hormones, regulatory systems such as the HPA axis (hypothalamus-pituitary-adrenal), and cognitive processes such as cognitive arousal (Roberts & Duong, 2017).

Previous research stated that the average duration of someone suffering from anxiety disorders was 15.2 months with a range of 6-36 months. Anxiety symptoms generally decrease gradually over time. The length of time a person experiences an anxiety disorder is influenced by factors such as being older, not having a job, having a higher neuroticism score, experiencing physical health problems, and experiencing a decline in physical function (Ten Have *et al.*, 2021). Neuroticism is a personality concept related to anxiety, worry, moodiness, and negative emotions (Friedman, 2019). A limitation of this research is that it did not dig deeper into the data regarding respondents' food intake, especially consumption of food sources of vitamin B1. Apart from that, this study also did not analyze in more depth the mediating role of anxiety symptoms in the relationship between length of diagnosis and sleep duration in patients with neurosis, stress, and somatoform disorders.

Conclusion

This study analyzed the relationship between levels of vitamins B1 and B6, and chronotype with sleep duration in patients experiencing neurosis, stress, and somatoform

disorders. The results of this research analysis state that there is no significant relationship between levels of vitamins B1 and B6 and chronotype and sleep duration, but there is a significant relationship between monthly income and length of diagnosis and sleep duration in patients with neurosis, stress, and somatoform disorders. This research provides additional insight into the relationship between nutrition and sleep characteristics in individuals who experience certain mental health disorders so that these findings are expected to provide a strong basis for the development of further research in this area and provide useful directions in efforts to prevent and/or treat neurosis disorders, stress, and somatoform

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