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The Relationship between Symptoms of Depression and Sleep Disorders in the Adult Population in Indonesia: A National Survey-Based Study

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ABSTRACT

Depression and sleep disorders are interrelated mental health problems that have a significant impact on the quality of life of the community. This study aims to analyze the relationship between depressive symptoms and sleep disorders in the adult population in Indonesia using data from the 2023 Indonesian Health Survey (SKI). This study used a quantitative analytical design with a cross-sectional approach based on secondary data, involving 596,589 respondents aged ≥18 years. Analysis was performed using logistic regression to estimate the odds ratio (OR). Results showed that respondents with depressive symptoms were 20.2 times more likely to experience sleep disorders than respondents without depression (OR = 20.206; 95% CI: 19.492–20.945; $p < 0.001$). Age was also significantly associated with sleep disorders (OR = 1.014; $p < 0.001$). The model was significant overall ($p < 0.001$), with a pseudo-R^2 of 0.112. These findings confirm that depression is a strong predictor of sleep disorders in the adult population. The implications of this study emphasize the importance of integrated screening for depression and sleep disorders in nursing care, particularly in primary and community services.

INTRODUCTION

Depression is a mood disorder characterized by prolonged feelings of sadness, loss of interest or pleasure, feelings of worthlessness, difficulty concentrating, changes in appetite, and sleep disturbances (Rohmah et al., 2023). One of the most common symptoms accompanying depression is sleep disturbance, particularly insomnia, which is difficulty initiating or maintaining sleep that leads to fatigue, decreased energy, and impaired daily functioning (Abdulrahman et al., 2018). On average, depression can onset as early as adolescence, around 14–15 years of age, and has the potential to continue into adulthood if not treated appropriately (Abdulrahman et al., 2018). Clinically, the relationship between depression and sleep disorders is bidirectional. Sleep disorders not only appear as symptoms of depression but can also increase the risk of developing or relapsing into depression (Bai et al., 2026). Studies show that insomnia is one of the most common sleep disorders found in individuals with depression and can worsen emotional regulation and stress responses (Zhou et al. 2026).

In the context of disasters, research by Rohmah et al. (2023) found that more than half of earthquake victims experienced sleep disorders, and many respondents also experienced symptoms of post-disaster depression. In addition, another study on disaster victims showed that 40% of respondents experienced poor sleep quality (Abdulrahman et al., 2018). These findings reinforce that the incidence of sleep disorders and depression is high in vulnerable populations, and indicate the urgency of examining the relationship between the two in greater depth. Research on sleep disorders caused by depression shows that changes in sleep patterns are closely related to emotional dysregulation and stress responses (AbdulRahman et al., 2018).

The relationship between depression and sleep disorders is bidirectional and mutually reinforcing. High levels of depression are known to contribute to an increase in insomnia, and conversely, sleep disorders can exacerbate symptoms of depression (AbdulRahman et al., 2018). In another study by Zhou et al. (2026), it was shown that sleep disorders in the elderly population are associated with a decline in function and quality of life, especially when accompanied by symptoms of depression. Meanwhile, a recent neurology study by Bai et al. (2026) highlights the link between sleep disorders, changes in brain function, and symptoms of depression, suggesting that the relationship between the two is not only psychological but also involves neurobiological mechanisms.

Although various studies have described the high incidence of depression and sleep disorders, most studies are still descriptive and have not specifically analyzed the strength of the correlational relationship between depressive symptoms and sleep disorders in the adult population more comprehensively. In addition, variations in respondent characteristics such as age and health conditions can affect the relationship patterns between these two variables. Thus, there is still a research gap in systematically understanding the relationship between depressive symptoms and sleep disorders (Zhou et al., 2026).

This study is important because identifying a clear relationship between symptoms of depression and sleep disorders

can support early detection efforts and the development of more integrated interventions. Theoretically, this study is expected to enrich our understanding of the psychological and neurobiological mechanisms underlying the relationship between depression and sleep disorders. Practically, the results of this study can form the basis for planning promotional and preventive strategies in mental health services. Based on the above description, the objective of this study is to analyze the relationship between depressive symptoms and sleep disorders in the adult population.

METHOD

This study is an analytical, quantitative, cross-sectional study using secondary data from the 2023 Indonesian Health Survey (SKI), a nationally representative survey. The study sample included 602,982 adult respondents (≥18 years) with complete data on depression symptoms and sleep disorders. Data analysis was performed using Stata statistical software version 16.0. The initial stage involved descriptive analysis to describe the characteristics of the respondents and the distribution of the study variables in the form of means and standard deviations. Furthermore, to analyze the relationship between depressive symptoms and sleep disorders, simple linear regression (Ordinary Least Squares/OLS) was used, with sleep disorders as the dependent variable and depressive symptoms as the independent variable. Parameter estimates were reported in the form of regression coefficients (β), standard errors (SE), t-values, p-values, and 95% confidence intervals. Model significance was tested using the F-test, and the model's ability to explain the variation in the dependent variable was evaluated using the R-squared value. The level of statistical significance was set at $p < 0.05$.

Ethical Considerations

This study used secondary data from the 2023 Indonesian Health Survey (SKI), which had obtained ethical approval from the authorized Health Research Ethics Committee. The data used in this study were anonymized so that individual respondents could not be identified. The researchers obtained permission to access the data in accordance with applicable procedures and maintained the confidentiality and security of the data during the analysis process.

RESULTS AND DISCUSSION

This study involved 602,982 adult respondents (≥18 years) analyzed using SKI 2023 data. The results of the descriptive analysis are presented in the following table:

Table 1. Sociodemographic data of respondents

Higher Education	**Freq.**	**Percent.**
Never attended school	30542	5.07
Did not complete elementary school/MI (Islamic elementary school)	43274	7.18
Completed elementary school/MI (Islamic elementary school)	152772	25.34
Completed junior high school/MTS (Islamic junior high school)	107976	17.91
Completed senior high school/MA (Islamic senior high school)	196019	32.51
Completed D1/D2/D3 (one-year/two-year/three-year college)	30212	5.01
Completed university	42187	7.00
Total	602.982	100.00
Employment Status	**Freq.**	**Percent**
Not working	184888	30.66
School	19666	3.26

Civil servant/ military/ police/ state-owned enterprise/ regional-owned enterprise	31097	5.16
Private employee	50939	8.45
Entrepreneur	88924	14.75
Farmer	130424	21.63
Fisherman	9006	1.49
Laborer/ driver/ route assistant	35683	5.92
Other	52355	8.68
Total	602.982	100.00
Respondent Age	**Freq.**	**Percent**
18-44 (Young Adults)	324760	53.86
45-59 (Middle-aged Adults)	180883	30.00
60-74 (Early Elderly)	82808	13.73
>= 75 (Late Elderly)	14531	2.41
Total	602.982	100.00

Based on the table above, it is known that the majority of respondents are in the 18–44 age group (53.86%), followed by the 45–59 age group (30.00%), while the early elderly (13.73%) and late elderly (2.41%) groups have smaller proportions. The dominance of young adults indicates that the research population is mostly in the productive phase, which is psychosocially vulnerable to work, economic, and social role pressures, which can potentially contribute to the emergence of symptoms of depression and sleep disorders. Based on educational level, most respondents were high school/MA graduates (32.51%), followed by elementary school/MI graduates (25.34%) and junior high school/MTS graduates (17.91%). The proportion of respondents with higher education was relatively lower (D1/D2/D3 at 5.01% and college at 7.00%). This distribution shows that the majority of the population has a lower secondary education level, which in various studies is often associated with vulnerability to mental health problems due to limited access to health information, decent work, and health services.

Based on employment status, 30.66% of respondents were unemployed, while most of the others worked in the informal sector, such as farmers (21.63%) and entrepreneurs (14.75%). The proportion of formal workers, such as civil servants/military/police/state-owned enterprises/regional-owned enterprises, was relatively small (5.16%). The high proportion of informal and unemployed sectors can be a relevant economic stressor in the context of depression and sleep disorders, given the instability of income and heavy physical workload. Overall, the characteristics of the respondents show a predominance of productive age with a secondary education background and informal sector employment, which theoretically could be contributing factors to the emergence of symptoms of depression and sleep disorders in the adult population in Indonesia.

Table 2. Cross-tabulation of Depression Symptoms with Sleep Disorders in Adults

C01. During the past 2 weeks, has [NAME] felt sad most of the time?	C05. During the past 2 weeks, has [NAME] had trouble sleeping almost every night?		
	Yes	No	Total
Yes	5.907	10.014	15.921
Percent	37.10	62.90	100.00
No	16.132	564.536	580.668
Percent	2.78	97.22	100.00
Total	22.039	574.550	596.589
Percent	3.69	96.31	100.00

The cross-tabulation results show that the proportion of sleep disorders is much higher in respondents who report symptoms of depression (37.10%) than in respondents without symptoms of depression (2.78%). Although the absolute number of sleep disorders is higher in the non-depressed group due to its larger population size, proportionally, the risk of sleep disorders in the depressed group is much higher. These findings indicate a strong association between depressive symptoms and sleep disorders in the adult population.

The table above also shows a difference in the number of respondents between the total adult population (≥18 years) and the number of respondents with data on the variables of depressive symptoms and sleep disorders. This difference may be due to missing data or non-response to questions related to depression and sleep disorders. Therefore, prevalence and relationship analyses were conducted using a complete case analysis approach, which only included respondents with complete data on the variables analyzed.

Table 3. Logistic regression

Sleep_disorder	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
depressiom	20.206	.371	163.89	0	19.492	20.945	***
B4K7THN	1.014	0	30.49	0	1.013	1.015	***
Constant	.015	0	-179.58	0	.014	.016	***

Mean dependent var	0.037	SD dependent var	0.189
Pseudo r-squared	0.112	Number of obs	596589
Chi-square	21137.421	Prob > chi2	0.000
Akaike crit. (AIC)	167509.735	Bayesian crit. (BIC)	167543.632

*** $p<.01$, ** $p<.05$, * $p<.1$

The logistic regression model shows that symptoms of depression are significantly associated with sleep disorders in the adult population in Indonesia. Respondents who experience depression are 20.206 times more likely to experience sleep disorders than respondents who do not experience depression (OR = 20.206; 95% CI: 19.492–20.945; $p < 0.001$). In addition, age is also significantly associated with sleep disorders (OR = 1.014; 95% CI: 1.013–1.015; $p < 0.001$). This indicates that each additional year of age increases the likelihood of experiencing sleep disorders by 1.4%. The overall model was significant (Chi-square = 21.137,421; $p < 0.001$). The Pseudo R^2 value of 0.112 indicates that approximately 11.2% of the variation in sleep disorders can be explained by depression and age in this model. With a very large sample size (N = 596,589), the estimation results have high precision.

The results of this study indicate that in the adult population, there is a significant correlation between symptoms of depression and sleep disorders. Table 1

shows that the majority of respondents were young adults (aged 18–44 years), and the results of the analysis indicate a significant correlation with sleep disorders (OR = 1.014). This means that every one-year increase in age increases the likelihood of sleep disorders by 1.4%. In young adulthood, work pressure and economic demands increase psychosocial stress, which can activate the hypothalamic–pituitary–adrenal (HPA) axis and disrupt sleep regulation. Sleep disorders and depression have a bidirectional relationship mediated by neurobiological changes, including serotonin, dopamine, and GABA dysregulation. Chronic stress activation also increases cortisol levels, which affects sleep fragmentation and overall sleep quality (Steiger et al., 2019).

As we age, physiological changes occur, such as a decrease in slow-wave sleep, changes in circadian rhythms, and an increase in sleep fragmentation, which naturally reduce sleep efficiency. These biological changes interact with psychosocial factors such as changes in social roles and decreased physical function, which can increase the risk of depression in older age groups (Priasmoro & Lestari, 202). Other literature explains theoretically that young adults are in a phase of life that is fraught with social role demands, work, and economic pressures.

The burden of professional responsibilities, career competition, and financial instability can increase psychological stress, which impacts sleep quality. Chronic stress is known to activate the sympathetic nervous system and increase stress hormone levels such as cortisol, which ultimately disrupts the regulation of the sleep-wake cycle (Fitrianti et al., 2024). Psychological disorders such as anxiety and depression are closely related to sleep disorders and involve biological mechanisms such as neurotransmitter dysregulation (e.g., serotonin and GABA) and increased stress responses.

This mechanism reinforces the argument that psychosocial stress in young adults can trigger sleep disorders through neurobiological pathways. The results of logistic regression analysis show that depression increases the likelihood of sleep disorders by almost 20 times (OR ≈ 20), indicating a very strong relationship both epidemiologically and clinically. These findings are consistent with the article in Goshn et al. (2026), which confirms that sleep disorders are a core symptom of depression and have a close and mutually influential relationship. Biologically, the underlying mechanisms include the dysregulation of neurotransmitters such as serotonin and dopamine, which play a role in regulating mood and the sleep-wake cycle, as well as HPA axis hyperactivation, which increases cortisol levels and triggers insomnia.

From a psychological perspective, rumination and cognitive arousal cause increased cognitive activity before sleep, thereby worsening sleep quality (Ma et al., 2026). This relationship is bidirectional, whereby sleep disorders can exacerbate depression, and depression worsens sleep disorders through mutually reinforcing neurobiological and psychological mechanisms. The Pseudo R^2 value of 0.112 indicates that the model explains only 11.2% of the variation in sleep disorders, suggesting that other factors such as chronic illness, environment, substance use, and psychosocial factors may also contribute to the complexity of this relationship (Hardhanti et al., 2026).

The results of this study imply that sleep disorders cannot be considered solely as physical problems (Selim et al., 2026), as the study shows a strong relationship between depression and insomnia in the elderly (ρ=0.001; r=0.552). These findings confirm that psychological factors play an important role in the occurrence of sleep disorders, so that treatment with medical therapy alone is not sufficient (Zhou et al., 2026). An integration of services through a multidisciplinary approach involving medical personnel, nurses, and mental health professionals is needed to enable early detection of depression and comprehensive intervention (Priasmoro et al., 2023). A bio-psycho-social approach, including family support and stress management, is key to improving sleep quality and overall quality of life (Wibowo et al., 2025).

CONCLUSIONS AND RECOMMENDATIONS

Sleep disorders are closely related to depression and cannot be understood solely as physical disorders, as evidenced by (OR = 1.014; 95% CI: 1.013–1.015; p < 0.001). Psychological factors play a significant role in triggering and exacerbating insomnia, thus requiring a comprehensive approach. Recommendations include the integration of health services through multidisciplinary collaboration as an important strategy for early detection, prevention, and more effective management. A biopsychosocial approach involving medical, psychological, and social support aspects is expected to improve sleep quality and overall quality of life.

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