Sleep Duration and Depression Frequency: NLSY Dataset Analysis

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Introduction

Approximately 280 million people worldwide are affected by depression, a severe mental health issue affecting all aspects of life, including relationships with family, friends, and community (WHO, 2023). Depression manifests from complex social, psychological, and biological interactions. Depression and sleep are closely connected and share a bidirectional relationship, meaning poor sleep can worsen feelings of depression by inhibiting serotonin production, a chemical responsible for regulating mood (Newsom, 2023). Sleep is essential for preserving mental and physical health because it promotes healthy brain function and prevents disease. Insufficient sleep can impair the ability to concentrate, retain information, consolidate memory, and think clearly (Pacheco, 2023).

In this research, we examined the impact of sleep duration on depression frequency while controlling for computer time per week and hours worked per week. We utilized data from the National Longitudinal Survey of Youth (NLSY), which provides comprehensive information on various aspects of individuals' lives, including sleep and mental health. Our research question is whether sleep duration affects how frequently people experience depression after controlling for potential confounding factors. We hypothesize that individuals who sleep fewer hours each night are more likely to experience depression than those who sleep more extended hours. The research question is intriguing because depression is a common mental health condition, and sleep is essential to every health component. Understanding the association between sleep duration and depression frequency can advance ideas for depression prevention and treatment.

According to the findings of the NLSY dataset study, there is a weak, negative relationship between sleep duration and depression frequency. Individuals who sleep fewer hours per night are more likely to experience depression than those who sleep more extended hours. However, a study from the literature review also suggests sleeping past the recommended eight hours can increase the risk of depression. To be clear, our research primarily highlights the effect of insufficient sleep on depression, not excessive sleep.

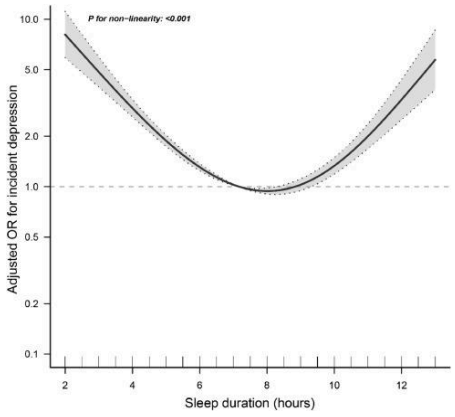
It is crucial to emphasize that these findings are correlational and do not imply causality. Based on the regression outputs, we inferred that sleep duration has a statistically significant negative relationship with depression frequency. When we added the control variable of computer usage per week, no statistically significant relationship was found between the variable and depression frequency. Additionally, when adding the variable hours worked per week, there was a weak negative association between the variable and depression frequency. Finally, when we added salary wages to the model, a statistically significant negative relationship was found between the variable and depression frequency. These results suggest that financial stability may contribute to reducing depression frequency. It is also worth noting that the magnitude of the coefficients for all variables in the model is small, indicating that the influence of each variable on depression frequency is minimal. Therefore, additional factors excluded in the model, such as genetic predisposition, social support, or lifestyle factors, may be more significant in determining depression frequency. Reverse causality can also affect the relationship between sleep duration and depression frequency. Insufficient sleep can increase depression, while depression can also increase inadequate sleep. Our analysis focuses on the former, although the latter is also important to consider.

The regression analysis highlights the importance of sleep duration as a protective factor against depression. However, the results should be interpreted with caution, given the low adjusted R-squared value and the limited magnitude of the coefficients. Further research is necessary to identify additional factors contributing to depression frequency and develop more comprehensive models to predict depression risk accurately.

Literature Review

Several studies explore the relationship between sleep duration and depression. One cross-sectional study by researchers Lu Dong, Yongwei Xie, and Xiaohua Zou found that sleep duration was independently associated with higher incident depression. Insufficient sleep and excessive sleep are associated with an increased risk of depression. Another study by Pedro Afonso, Miguel Fonseca, and Tomás Teodoro addresses the differences in mental health outcomes concerning lifestyle changes from the pandemic. With the increasing popularity of remote work, teleworkers reported higher rates of poor mental health symptoms.

[STUDY #1] In the *Journal of Affective Disorders*, researchers Dong, Xie, and Zou found a U-shaped association between sleep duration and depression. A U-shaped relationship exists when the dependent variable, depression, first decreases with the independent variable, sleep duration, at a decreasing rate to reach a minimum, after which sleep duration increases at an increasing rate as depression continues to rise. In other words, the relationship decreases and then increases, or vice versa, creating lower and upper ranges peaks. The study highlights that insufficient and excessive sleep increases the risk of depression. When sleep duration is less than eight hours, increased sleep duration is associated with a significantly lower risk of incident depression. In contrast, sleep duration greater than eight hours increases the risk of depression as sleep duration increases.



The U-shaped graph above shows that the risk of developing depression is negatively correlated with sleep duration until it bottoms out at eight hours. In contrast, a sleep duration greater than eight hours significantly increases the risk of depression. Furthermore, a nonlinear relationship between sleep duration and depression is characterized by the following: the risk of developing depression increases significantly with extreme sleep duration. The optimal and recommended sleep duration to reduce the risk

of depression is eight hours, the middle ground between insufficient sleep and excessive sleep (Dong et al., 2022).

[STUDY #2] In the journal article by Pedro Afonso, Miguel Fonseca, and Tomás Teodoro, researchers found a positive correlation between sleep duration and teleworkers. The study focuses on the impact of mental health and sleep duration due to job changes during the pandemic. Many workers needed to transition to remote or telework; hence, researchers sought to find how lifestyle change affected mental health. Researchers considered three dependent variables: the Hospital and Anxiety Depression Scale (HADS), Pittsburgh Sleep Index (PSQI), and productivity. The leading independent variables consisted of the sex of participants, job satisfaction, hypnotic medication use, and sleep hours. The study concluded a positive correlation between the HADS scale and the number of working days per week. The positive correlation signified that working more days causes changes in the teleworker's anxiety or depression levels. For the second dependent variable, lower PSQI scores were consistent with higher levels of job satisfaction. Lower PSQI scores under 5 suggest better sleep quality and a score higher than 5 implies a sleep disorder. Another significant finding revealed that PSQI scores and anxiety/depression connect to poor sleep quality. The study found a positive relationship between mental health quality and teleworkers. The study emphasizes the importance of considering all life factors to conclude a connection between sleep duration and mental health. Similar to our research, the study reports that lifestyle changes or a combination of factors can simultaneously affect sleep quality and depression.

Descriptive Analysis and Motivational Evidence

I. Data Variables and Description

We used the NLSY97 dataset, a nationally representative sample of 8,984 men and women in 2011, to conduct our analysis. This dataset contains various descriptive information about individuals, some of which we selected as variables for our study. After filtering out observations with missing data, we left 4651 observations with five variables of interest. Our primary independent variable is the number of hours of sleep per night (*sleep_hours_pernight*), which ranges from 0 to 16. The dependent variable is the frequency of individuals' feelings of depression in the last month (*depressed_lastmo*), which is measured by their self-reported experiences categorized into four groups: none of the time, some of the time, most of the time, and all of the time. To quantify this variable, we converted it into a binary variable, where a value of 0 represents no feelings of depression, and a value of 1 captures any depression in the previous month. Using binary variables can change the direction as we only measure depression from 0 to 1, which can modify the correlation since the variables are discrete.

In addition to the independent and dependent variables, we included two control variables in our analysis. The first control variable is the amount of computer time per week (computer_hours_perweek). We quantified by categorizing values reporting less than three computer hours per week as 0 and values reporting more than 3 hours per week as 1. Our second control variable is the number of hours worked in the previous year (*hours_wk_yr*), which we converted to hours worked per week to balance out the units of measurement.

We also added another control variable, salary wages (*wage_sal*), a significant factor in human lives. To account for this variable's skewed and potentially outlier-prone nature, we used the log functional form (*lnwages*) to represent the percentage change in our independent variable, sleep hours per night. This transformation allows for creating normally distributed data, better capturing the percentage difference in sleep hours per night.

II. Summary Statistics

Table 1 summarizes the statistics for all our variables of interest: *sleep_hours_per night*, *computer_hours_perweek*, *depressed_lastmo*, *hrs_wk_pwk,* and *lnwages*.

Table 1: Summary Statistics

Statistic	N	Mean	St. Dev.	Min	Median	Max
sleep_hours_pernight	4,651	6.64	1.24	2	7	16
computer_hours_perweek	4,651	0.76	0.43	0	1	1
depressed_lastmo	4,651	0.24	0.43	0	0	1
hrs_wk_pwk	4,651	31.84	13.46	0.31	32.02	149.62
lnwages	4,651	10.15	0.94	1.61	10.31	11.89

According to Table 1, the average number of sleep hours per night is 6.64, slightly less than the 7-9 recommended for adults. In the data, the minimum number of hours a person slept is 0, while the maximum was 16. Furthermore, the median number of hours slept per night is 7, indicating that the distribution of sleep hours per night is not skewed.

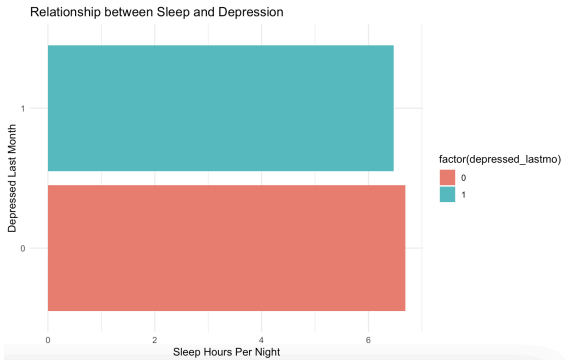
On average, 31 percent of people were depressed some or most of the time. This variable is binary, with 0 indicating individuals are not depressed and 1 suggesting individuals are depressed. The mean for computer hours per week is 0.76, showing sample members spend less than one hour per week on average using a computer. This variable is also binary, with a value of 0 indicating no computer usage and a value of 1 indicating moderate computer usage. The sample's participants worked roughly 32 hours per week on average, according to the mean value for the *hrs_wk_pwk* variable. The standard deviation of 13.46 indicates a wide range of hours worked across the sample's participants.

These summary statistics offer an overview of the distribution of the sample's variables and can be used to spot any potential data quality or sampling problems.

III. Relationship Between Depressed Last Month and Sleep Hours per Night

Figure 1 represents the relationship between depression last month on the x-axis and sleep hours per night on the y-axis.

Figure 1: Bar Graph



The bar graph depicts the mean hours of sleep per night for each level of the depressed last month variable (0 = not depressed, 1 = depressed). Those who said they felt depressed in the past month had fewer hours of sleep on average per night than people who said they did not feel depressed at all. Since people who report feeling depressed also generally report getting less sleep, this raises the possibility that there may be a correlation between sleep and depression. Additional research is necessary to establish causation and exclude other possibilities. It is also crucial to remember that although there is a relatively minor mean difference between the groups, there is probably more individual variation. The graph shows a slight difference between individuals experiencing no depression and having slightly greater hours of sleep per night and individuals experiencing depression.

Table 2 displays the linear regression between our independent variable, *sleep_hours_pernight*, to the dependent variable, *depressed_lastmo*.

Table 2: Linear Regression

```
Call:
lm(formula = depressed_lastmo ~ sleep_hours_pernight, data = new_data)

Coefficients:
         (Intercept)  sleep_hours_pernight
             0.41810              -0.02458

> model1 <- lm(depressed_lastmo ~ sleep_hours_pernight, data=new_data)
> summary(model1)

Call:
lm(formula = depressed_lastmo ~ sleep_hours_pernight, data = new_data)

Residuals:
    Min      1Q  Median      3Q     Max
-0.3935 -0.2706 -0.2460  0.6556  0.9506

Coefficients:
                     Estimate Std. Error t value Pr(>|t|)
(Intercept)          0.418095   0.030400  13.753  < 2e-16 ***
sleep_hours_pernight -0.024582   0.004499  -5.464 4.85e-08 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.4348 on 5601 degrees of freedom
Multiple R-squared:  0.005303,  Adjusted R-squared:  0.005125
F-statistic: 29.86 on 1 and 5601 DF,  p-value: 4.849e-08
```

The residuals are the differences between observed y values and predicted y values, and the minimum value of -0.39 is moderately below the regression line. The median residual value of -0.24 is slightly

below the regression line, while the maximum residual value of 0.95 is farthest above the regression line. Values closer to zero indicate that the line fits the data well.

The first column displays the coefficients. The estimated coefficient for the intercept is positive and has a value of 0.41, suggesting average feelings of depression would be 0.41 points, or 41 percent, if sleep hours per night were equal to zero. The estimated coefficient value of *sleep_hours_pernight* is negative and has a value of -0.024, suggesting every additional hour of sleep per night reduces the probability of depression by 0.024 points, or 2.4 percent.

The second column displays the standard error, and good models typically indicate a standard error is five to ten times smaller than the corresponding coefficient. The standard error for *sleep_hours_pernight* is -5.46 times smaller than the coefficient, suggesting more significant slope variability than the larger intercept value ratio at 13.75, which has lesser variability.

The last column, Pr (>|t|), indicates the probability the corresponding coefficient is irrelevant to the model. The p-value of the intercept is 2e-16, a small value, and is statistically significant at the one percent level, suggesting the estimate is significant. Similarly, the p-value for *sleep_hours_pernight* is 4.89e-08, a tiny value, also statistically significant at the one percent level, suggesting the estimate is significant.

The second to last row displays the r-squared values, and the multiple R-squared value of 0.005 indicates the model explains 0.05 percent of the data's variation. Meanwhile, the adjusted r-squared value of 0.0051 is slightly smaller and corrects for the number of x variables included in the predictive model.

IV. Exploring Other Factors

After exploring the relationship between depression last month and sleep hours per night, we now explore how other lifestyle factors influence this relationship. Specifically, we investigate the impact of two variables: computer hours and hours worked per week.

Table 3 displays the correlation between these three additional variables: *computer_hours_perweek*, *hrs_wk_pwk*, and *lnwages*.

Table 3: Correlation Matrix

	sleep_hours_pernight	computer_hours_perweek	depressed_lastmo	hrs_wk_pwk	lnwages
sleep_hours_pernight	1	0.02	-0.07	-0.05	-0.03
computer_hours_perweek	0.02	1	-0.05	0.06	0.20
depressed_lastmo	-0.07	-0.05	1	-0.08	-0.16
hrs_wk_pwk	-0.05	0.06	-0.08	1	0.44
lnwages	-0.03	0.20	-0.16	0.44	1

We observe a weak negative correlation between sleep hours per night, depression last month, and hours worked weekly. The negative correlation between sleep hours per night and feelings of depression suggests an additional hour of sleep per night reduces the probability of depression by 0.07 points or 7

percent. Furthermore, the negative correlation between sleep hours per night and hours worked per week suggests an additional hour per night reduces the number of hours worked per week by 0.05 points, or 5 percent.

Interestingly, there is a weak positive correlation between sleep hours per night and computer hours per week, where an additional hour of sleep increases computer hours by 0.007 points, or 0.07 percent. However, this correlation could be stronger and likely due to variance, so a sensible interpretation cannot be made. Another weak negative correlation is identified between computer hours per week, feelings of depression, and hours worked per week. The negative correlation between computer hours per week and feelings of depression could suggest that an additional hour of computer time reduces the probability of depression by 0.05 points or 5 percent. It's important to note that the variable *computer_hours_perweek* does not decipher whether computer time is spent through leisure or work. Therefore, it is reasonable to assume computer hours per week are mostly spent at work since the two variables are positively correlated. An additional hour spent at the computer increases the number of work hours by 0.06 points or 6 percent.

Moreover, it is also reasonable to assume the reason why there is a negative correlation between computer hours per week and feelings of depression is that additional time spent at the computer, which increases the number of work hours, produces higher income. Specifically, an extra hour of work per week decreases the probability of depression by 0.08 points or 8 percent. Higher-income could reduce feelings of depression, considering how income can affect an individual's quality of life and mental health.

Empirical Strategy

Our study investigates the relationship between sleep duration and the frequency of depression while considering potential confounding factors. Specifically, we are interested in whether sleep duration significantly affects how often individuals experience depression, even after controlling for other factors that could influence this relationship. We expect this effect to persist even after controlling for factors influencing mental health, such as computer usage per week, hours worked per week, and wage compensation. We hope to better understand the role of sleep in mental health and identify potential avenues for intervention to reduce the prevalence of depression in the population.

depression_permo = a + b1*Sleeps_hrs_pernight+ b2*Computer_hrs_perweek + b3*hrs_wrk_perweek + b4*wage_sal + e

The presented regression equation is a multiple regression model that investigates the link between the independent variable, hours of sleep per night, and the dependent variable, how frequently individuals experience depression in the previous month. Several control variables are also included in the equation to account for potential confounding factors that may influence the association between sleep and depression. Here, a is the intercept, which indicates the expected value of the dependent variable (depression in the last month) when all of the independent and control variables are set to zero. B1 is the coefficient for the independent variable, hours of sleep per night. It captures the influence of sleep on depression while holding all other variables constant. b2, b3, and b4 are the coefficients for the control

variables, computer time per week, hours worked per week, and wage salary, respectively. These coefficients represent the effect of each control variable on depression while holding all other variables constant. The error term, denoted by *e*, captures the random fluctuation in the dependent variable that is explained by the independent and control variables.

The regression makes sense because sleep relates to mental health, and there is evidence that insufficient sleep is linked to an increased risk of depression. Furthermore, the chosen control variables, computer time per week, hours worked per week, and wage salary, are all known to impact mental health and may obfuscate the association between sleep and depression.

The independent variable's coefficient, b1, quantifies the effect of sleep on depression. A positive coefficient indicates that increasing the hours of sleep per night is associated with a decrease in the frequency of depressive symptoms in the previous month. The control variables, b2, b3, and b4, capture each control variable's effect on depression while holding all other factors constant. Holding all other variables fixed, a positive coefficient for computer time per week, b2, shows that an increase in computer time per week is associated with an increase in the frequency of feelings of depression in the previous month. The selected controls appear adequate because they are known to impact mental health. Classifying the computer time per week variable and using the log transformation for pay salary mitigate possible difficulties with outliers and skewed data. However, any confounding variables excluded from the model could vary the results.

Results and Analysis

Regression Output #1: Dependent and Independent Variables *(depressed_lastmo & sleep_hours_pernight)*

	Dependent variable:
	depressed_lastmo
sleep_hours_pernight	-0.026***
	(0.005)
Constant	0.412***
	(0.034)
Observations	4,651
Adjusted R2	0.005
Note:	*p<0.1; **p<0.05; ***p<0.01

Regression Output #1 presents a linear regression analysis that examines the relationship between sleep hours per night (*sleep_hours_pernight)* and the frequency of depression (*depressed_lastmo*).

The coefficient for *sleep_hours_pernight* is negative, suggesting an additional hour of sleep reduces the probability of depression by 0.026, or 2.6 percent, holding all other factors constant.

When sleep duration is zero, the constant term of 0.412 indicates the predicted value of the dependent variable (depression frequency). This number is statistically significant at the 0.01 level; however, its interpretation could be more valuable because zero sleep duration is not feasible. The adjusted R-squared value is 0.005, meaning 0.5 percent of the independent variable (*sleep_hours_pernight*) alone can explain

just a tiny amount of the variance in the dependent variable. This implies that other factors not included in the model may potentially play a role in influencing the frequency of depression. The magnitude of the influence is insignificant, and other factors may be more critical in determining depression frequency.

Regression Output #2: Adding Computer Hours per Week *(computer_hours_perweek)*

	Dependent variable:	
	depressed_lastmo	
	(1)	(2)
sleep_hours_pernight	-0.026***	-0.025***
	(0.005)	(0.005)
computer_hours_perweek		-0.048***
		(0.015)
Constant	0.412***	0.447***
	(0.034)	(0.036)
Observations	4,651	4,651
Adjusted R2	0.005	0.007
Note:	*p<0.1; **p<0.05; ***p<0.01	

Regression Output #2 presents the results of a linear regression analysis that examines the relationship between sleep hours per night (*sleep_hours_pernight)* and the frequency of depression (*depressed_lastmo*) with an addition of a variable control number of screen hours/usage of computer in a week (*computer_hours_perweek).*

Adding the control variable *computer_hours_perweek* to the regression model did not result in a statistically significant relationship between the variable and the dependent variable *depressed_lastmo*. The coefficient for *computer_hours_perweek* is -0.048. The value suggests that an additional hour spent at the computer decreases the probability of depression by 0.048 points, or 4.8 percent, holding all other variables constant. There is insufficient evidence to conclude that there is a significant relationship between computer hours per week and the frequency of depression after controlling for sleep hours per night.

However, the coefficient for *sleep_hours_pernight* remains statistically significant with a negative relationship with the dependent variable, *depressed_lastmo*. Specifically, for every additional hour of sleep per night, the probability of depression in the last month decreases by 0.025 points, or 2.5 percent, holding other variables constant.

The adjusted R-squared increased from 0.005 to 0.007 when adding this additional variable, showing that this model could better predict depression than the previous model. Since an adjusted R-squared remains 0.7%, it indicates that the model has little predictive power for determining depression frequency.

Regression Output #3: Adding hours worked per week *(hrs_wk_pwk)*

	Dependent variable:		
	depressed_lastmo		
	(1)	(2)	(3)
sleep_hours_pernight	-0.026***	-0.025***	-0.027***
	(0.005)	(0.005)	(0.005)
computer_hours_perweek		-0.048***	-0.043***
		(0.015)	(0.015)
hrs_wk_pwk			-0.003***
			(0.0005)
Constant	0.412***	0.447***	0.537***
	(0.034)	(0.036)	(0.039)
Observations	4,651	4,651	4,651
Adjusted R2	0.005	0.007	0.014
Note:	*p<0.1; **p<0.05; ***p<0.01		

Regression Output #3 presents the results of a linear regression analysis that examines the relationship between sleep hours per night (*sleep_hours_pernight)* and the frequency of depression (*depressed_lastmo*) with the addition of a control variable (*computer_hours_perweek)* and other variable hours worked per week (*hrs_wk_pwk*).

Next, we added another variable: hours worked per week (*hrs_wk_pwk*). The coefficient is negative and statistically significant at the one percent level. An additional hour worked per week decreases the probability of depression by .003 points, or 0.03 percent, holding all other variables constant. Notably, these associations are weak because their magnitude is less than 0.3, or 30 percent.

The variable *sleep_hours_pernight* decreased by 0.002 points, or 0.02 percent, while *computer_hours_per_week* increased by 0.005 points or 0.05 percent.

The adjusted R-squared increased from 0.007 to 0.014 when adding this additional variable indicating that the added variable strengthens the predictive power of the model.

Regression Output #4: Adding Wages (*lnwages*)

	Dependent variable:			
	depressed_lastmo			
	(1)	(2)	(3)	(4)
sleep_hours_pernight	-0.026***	-0.025***	-0.027***	-0.028***
	(0.005)	(0.005)	(0.005)	(0.005)
computer_hours_perweek		-0.048***	-0.043***	-0.015
		(0.015)	(0.015)	(0.015)
hrs_wk_pwk			-0.003***	-0.0005
			(0.0005)	(0.001)
lnwages				-0.071***
				(0.007)
Constant	0.412***	0.447***	0.537***	1.173***
	(0.034)	(0.036)	(0.039)	(0.077)
Observations	4,651	4,651	4,651	4,651
Adjusted R2	0.005	0.007	0.014	0.033
Note:		*p<0.1; **p<0.05; ***p<0.01		

Regression Output #4 presents the results of a linear regression analysis that examines the relationship between sleep hours per night (*sleep_hours_pernight)* and the frequency of depression

(*depressed_lastmo*) with the addition of a control variable (*computer_hours_perweek)*, (*hrs_wk_pwk)*, and finally, the last variable, salary wages *(lnwages)*.

The coefficient for salary wages is negative and statistically significant at the one percent level, suggesting an additional wage increase reduces the probability of depression by 0.071 points, or 7.1 percent, holding all other variables constant.

The variable *sleep_hours_pernight* decreased by 0.001 points or 0.1 percent, and *computer_hours_perweek* increased by 0.028, or 2.8 percent. The variable *hrs_wk_pwk* decreased by 0.0025 points or 0.025 percent.

When adding the additional variables, the adjusted R-squared increased from 0.014 to 0.033, which slightly strengthens the predictability.

Based on the regression results, we concluded that sleep length has a statistically significant negative link with the frequency of depression. Holding all other variables equal, the likelihood of suffering depression in the previous month lowers by 2.6 percent for every additional hour of sleep per night. However, the adjusted R-squared value is relatively low, implying that other factors not included in the model may potentially have a role in determining depression frequency. The adjusted R-squared improved when adding more independent variables implying that the model needs additional factors to provide an accurate analysis of depression frequency. When the control variable of weekly computer usage was included, no statistically significant association was identified between the variable and depression frequency. Furthermore, when the variable hours worked per week were included, there was a weak negative correlation between the variable and depression frequency. Finally, when salaries were included in the model, a statistically significant negative connection was discovered between the variable and depression frequency. These findings imply that financial stability may help to reduce the frequency of depression.

Notably, the size of the coefficients for all variables in the model is relatively tiny, indicating that each variable has a minimal influence on depression frequency. As a result, additional factors not included in the model, such as genetic predisposition, social support, or lifestyle factors, may play a larger role in determining depression frequency.

Finally, this regression analysis emphasizes the significance of sleep duration as a possible buffer against depression. However, given the low corrected R-squared value and the small size of the coefficients, the results should be regarded with caution. More study is needed to find additional characteristics that contribute to the frequency of depression and to develop more complete models that may effectively predict depression risk.

Conclusion

The findings of this study are consistent with prior studies, which suggest a link between sleep duration and mental health outcomes, including depression. Several prior research has revealed that shorter sleep duration is related to an increased risk of depression, whereas longer sleep duration may be protective against depression. The study we reviewed found a U-shaped relationship between two variables, while the regression analysis we conducted assumes a linear relationship between those variables. The findings of this study are correlational rather than causative; therefore, we cannot conclusively say that sleep length causes depression. Other lifestyle factors, such as job satisfaction and productivity, that may influence sleep length and depression were not considered in the first study but were included in the second study. The second study highlighted the effects of the pandemic. The new way of employment and day-to-day life leads to increased depression and lower sleep quality. This study supports our model in concluding that adding co-founding factors shows a link between sleep quality and depression. It is necessary to consider a multitude of lifestyle variables in order to conclude a relationship accurately.

As per our regression analysis, there is a negative correlation between sleep hours per night and the frequency of depression, holding other factors constant. This implies that individuals who sleep fewer hours each night are more likely to experience depression than those who sleep longer hours. However, the magnitude of the influence is small, and other factors not included in the model may potentially play a role in influencing the frequency of depression.

It is important to note that the results of this study have important policy implications. Healthcare providers and policymakers should prioritize promoting healthy sleep habits, especially among individuals at risk of depression. Such efforts may include public health campaigns that stress the importance of sleep. These workplace policies encourage employees to take breaks, prioritize sleep, and improve access to mental health services.

In terms of future research, this study might be expanded by utilizing a more varied sample and considering more potential confounding factors. Future research could also explore deeper into the processes underlying the sleep-depression association, such as the impact of sleep on mood regulation or stress reactions. In-depth studies would provide a more sophisticated understanding of the link between sleep and mental health. It may help to guide the development of more tailored strategies to prevent or cure depression.

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