

**Association of Sleep Duration and Stress Individuals Aged 18-35**

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## **Introduction**

Sleep is a critical yet often overlooked component of health, especially among young adults aged 18-35. The National Sleep Foundation recommends 7-9 hours of sleep per night to maintain optimal health. However, many in this age range fail to meet the requirement. Insufficient and even excessive sleep has been associated with negative mental health outcomes, including increased stress levels. This study investigates the relationship between sleep duration and stress levels in this population and to build on existing literature.

## **Literature Review**

Studies have shown that decreased sleep duration leads to increased stress levels. In a study conducted in 2019, data from the Community Health Survey in Korea was used, and participants were examined to determine the correlation between sleep duration and stress (Kim et al., 2019). The results showed that people who slept less than 7 hours reported higher stress levels than those who slept the recommended hours (Kim et al., 2019). Comparing different demographics, when within the same sleep duration, women reported higher levels of stress than men. A similar study in Mexico saw no notable differences between the sexes (Tafoya et al., 2023). The Korean study also noted that the younger population reported more stress than the older (Kim et al., 2019). This further showed that young people are more vulnerable to the negative effects of this relationship if it is not adequately balanced. Stefan et al. 's (2017) study findings were also similar. Ultimately, studies concluded that sleep deprivation is associated with heightened stress. Several studies have shown that short sleep duration is associated with elevated stress levels.

The focus is usually lack of sleep, but some studies have begun to explore if there are any effects from prolonged sleep durations. Both Stefan et al. (2017) and Kim et al. (2019) suggest that underlying issues may cause prolonged periods of sleep. Stefan et al. (2017) study noted that young adults who reported sleeping more than ten hours were more likely to report poorer health outcomes, which led to a diagnosis of mental health issues such as stress or depression. The results surrounding this, however, were less consistent than those for a short sleep. A study on sleep and executive functioning has revealed that long sleep durations are linked to poor cognitive function and higher stress levels (Sen & Tai, 2023). These findings were consistent across many cognitive functions, such as memory and processing speeds (Sen & Tai, 2023). This contradicts many thoughts that prolonged sleep is restorative. The Role of Psychological Factors Sleep quality can directly interfere with duration; however, things can affect both. Individuals who experience high-stress reactivity tend to experience more sleep disturbances during periods of stress (Nielsen et al., 2019). Nielsen et al. (2019) found that young adults with high sleep reactivity experience more disrupted sleep patterns and higher cortisol levels. The study shows that resilience and self-control are significant in stress, while sleep duration is not a deciding factor.

The relationship between sleep and stress raises important questions about the direction of causality. Is a lack of sleep contributing to increased stress, or are previous stressors responsible for sleeping difficulties? Although there may not be many studies on this topic, it is worth exploring. Investigating which one precedes the other requires more research. Understanding the driving force is important to handle the root cause appropriately.

While Kim et al. (2019) found significant correlations in Korea, Tafoya et al. (2023) reported no gender-based differences in Mexico, suggesting cultural factors may influence this relationship. The literature demonstrates a clear association between insufficient sleep and elevated stress levels. Studies show that individuals who sleep less than 7 hours per night are more likely to experience stress and poor health outcomes. These findings show the importance of promoting healthy sleeping habits and addressing short and prolonged sleep durations. Future research should begin exploring causality and continue with interventions that target sleep improvement and stress management for this population.

## **Hypothesis**

The hypothesis is that there is a strong association between sleep duration and stress levels in adults aged 18-35. Insufficient sleep is suspected to correlate with higher stress levels, while longer but not excessive sleep durations correlate with lower stress levels. This hypothesis builds upon prior findings that suggest both insufficient and excessive sleep durations negatively affect mental health and stress.

## **Methods**

### **Cross-sectional Design**

A cross-sectional design is helpful for observational studies that examine data from a population at a single point in time (Wang & Chen, 2020). It was chosen for its efficiency in identifying correlations between variables without needing interventions (Pajo, 2022). This design is cost-effective and time-efficient, making it suitable for this study. It creates foundational findings to support future studies.

## **Study Participants**

Overall, 20 participants were aged 18-35. The inclusion criteria required them to accurately self-report their sleep and stress data.

## **Sampling Method**

A convenience sampling method was employed, and participants were recruited from social media platforms like Facebook and Snapchat, university networks like GroupMe, and face-to-face recruitment in the workplace. The media that was chosen is to ensure that all aspects of the target population are hit and willing participants. A link to the survey was posted on social media platforms listed and posted on GroupMe for four classes and handed out to the participants recruited in person. While this will allow for suitable data, convenience sampling does not represent the total population and will be limited to participants.

## **Data Collection Procedures, Variables, and Materials**

Demographic information, such as age and gender, was collected on each participant. Gender may play a role in sleep duration and stress; however, it is not a significant factor in this study. Study-specific data will include an independent variable, sleep duration, assessed by average hours of sleep, quality of sleep, frequency of awakenings, and stress levels. The dependent variable was gauged by assessing the lack of control over life events, feeling stressed, and confidence in handling personal problems. The use of sleep aids was also obtained to account for any skewing of results.

## **Statistical Methods**

Data analysis was conducted using IBM SPSS software to determine if a strong relationship between sleep duration and stress levels exist. Descriptive statistics were computed to summarize demographic characteristics, including age, gender, and average sleep duration. Frequency distributions were used to categorize responses to sleep quality and perceived stress levels.

A chi-square test of independence was performed to determine whether there was a statistically significant association between sleep duration and perceived stress levels. The chi-square test evaluates the observed frequencies of responses against the expected frequencies under the null hypothesis of no association (Jin et al., 2016). The results were reported with the corresponding p-value.

A graphical representation, such as a scatterplot, was generated to examine the trend between variables visually. This visualization helps to understand the statistical findings and provides a clear understanding of data distributions.

The alpha level was set at 0.05 to determine significance. Findings with p-values less than this threshold were interpreted as significant, while p-values above 0.05 indicated no significant association.

***Average hours of sleep per night.*** Participants varied in their reported sleep durations. The most frequent response was hours per --night, with eight participants selecting this option. This was followed by 7-8 hours per night with six responses, and fewer participants reported sleeping either less than 5 hours or more than 8 hours.

***Sleep Quality.*** Most participants rated their sleep quality as “Good” or “Average”. A smaller proportion reported “Excellent” sleep quality, while few indicated “Fair” or “Poor” sleep quality.

***Use of Sleep Aids.*** Responses indicated that 70% of participants did not use sleep aids, while the remaining 30% reported using aids such as medication or apps to help them fall or stay asleep.

***Frequency of Night Awakenings.*** Most participants reported waking up occasionally, five indicated waking rarely, and only two reported waking frequently or every night.

***Perceived Stress Levels.*** Perceived stress levels were questions regarding control over life, feeling stressed, and confidence in handling problems. Most participants felt that they “occasionally” could not control important things going on in their lives. 60% of the participants reported feeling stressed “often” or “very often.” Responses to this question were even across the board, between “occasionally” and “often,” with a small number of participants reporting “very often.”

## Results

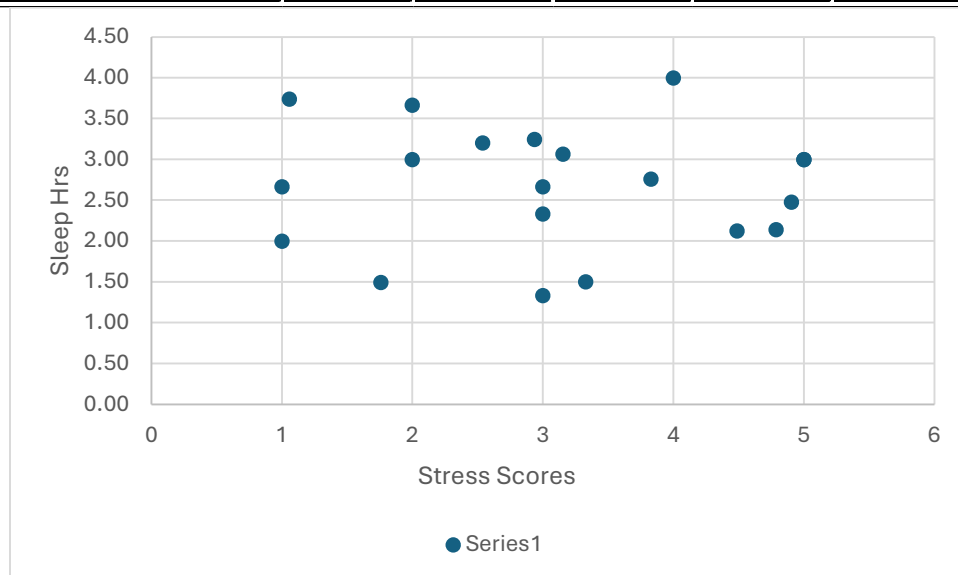
*Table 1: Observed Frequencies for stress level by sleep duration*

<b>Stress Level / Sleep Hours</b>	<b>&lt;5 hours</b>	<b>5-6 hours</b>	<b>6-7 hours</b>	<b>7-8 hours</b>	<b>&gt;8 hours</b>
<b>Never</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>Rarely</b>	<b>2</b>	<b>3</b>	<b>5</b>	<b>3</b>	<b>2</b>

<b>Occasionally</b>	3	4	6	3	2
<b>Often</b>	5	6	4	5	3
<b>Very Often</b>	2	1	2	1	1

*Table 2: Table 2: Expected Frequencies of Stress Levels by Sleep Duration*

<b>Stress Level / Sleep Hours</b>	<b>&lt;5 hours</b>	<b>5-6 hours</b>	<b>6-7 hours</b>	<b>7-8 hours</b>	<b>&gt;8 hours</b>
<b>Never</b>	2.2	3.3	4.4	3.3	1.8
<b>Rarely</b>	2.6	3.9	5.2	3.9	2.1
<b>Occasionally</b>	3.5	5.2	7.0	5.2	2.8
<b>Often</b>	4.8	7.2	9.6	7.2	3.8
<b>Very Often</b>	1.9	2.9	3.8	2.9	1.5



*Figure 1: Scatterplot of sleep hours vs stress scores*



## **Data Analysis Results**

The chi-square test indicated no association between sleep duration and stress levels (chi-square=3.24,  $p=0.896$ ). Figure 1 also supports this conclusion. Most participants reported sleeping 6-7 hours per night and experiencing moderate stress. However, the sample size may have limited the ability to detect an association.

## **Discussion**

### **Main findings**

The findings from this study revealed no statistically significant correlation between sleep duration and stress levels among young adults aged 18-35. While prior research suggested a strong association, our data indicated that participant' stress levels were not directly influenced by their reported sleep duration. This discrepancy may highlight the complexity of stress, which can be affected by various factors beyond sleep, such as socioeconomic status, work demands, and mental health conditions. The chi-square test for sleep duration and perceived stress levels confirmed no significant association (chi-square=3.24,  $p=0.896$ ). This suggests that interventions addressing stress may require a broader approach that includes but is not limited to sleep regulation.

### **Limitations**

The study faced several limitations that may have influenced the results. The small sample size restricted the statistical power, making detecting potentially significant associations

difficult. The reliance on self-reported data can introduce biases such as inaccuracies in reporting sleep habits or stress levels. The cross-sectional design further limited the ability to infer causality, as it captured data at only one point, preventing an understanding of how sleep and stress interact over a more extended period. These limitations highlight the need for more research designs in future studies to better understand the relationship between sleep duration and stress.

### **Future Studies**

Future studies should build upon the findings of this study. First, it would benefit to utilize larger and more diverse samples to enhance variability in sleep and stress patterns. Incorporating objective measures, such as wearable devices or sleep trackers, could provide more accurate and reliable data compared to self-reporting, which could leave room for bias. Longitudinal and experimental studies can be conducted to further assess the relationship between sleep and stress. These studies can see how these variables affect one another and highlight outcome impact with the addition of interventions. Finally, future research should examine other variables contributing to the relationship between sleep and stress, such as physical activity, diet, and social support.

### **Course Reflection**

The project enhanced my understanding of how much goes into research, specifically obtaining participants and analyzing the results. The course's focus on application was invaluable. However, I would suggest incorporating more guidance on statistical analysis for students unfamiliar with SPSS because that was difficult to maneuver for the first time,

especially through the remote process through ODU. Overall, this was a challenging but knowledgeable experience.

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## Appendix

### 1. Demographic Questions

1. What is your age?
  - a. 18-21
  - b. 22-25
  - c. 26-29
  - d. 30-35
2. What is your gender?
  - a. Male
  - b. Female
  - c. Non-binary
  - d. Prefer not to answer

### Independent Variable (Sleep Duration)

1. On average, how many hours do you sleep per night?
  - a. <5
  - b. 5-6
  - c. 6-7
  - d. 7-8
  - e. >8
2. How would you rate the quality of your sleep in the past week?
  - a. Poor
  - b. Fair
  - c. Average
  - d. Good
  - e. Excellent
3. Do you use sleep aids (medication, apps, etc.) to fall or stay asleep?
  - a. Yes
  - b. No
  - c. If yes, list what aid(s) you use \_\_\_\_\_
4. On average, how often have you awakened during the night in the last month?
  - a. Never
  - b. Rarely (1-2 times per week)
  - c. Occasionally (3-4 times per week)

- d. Frequently (5-6 times per week)
- e. Every night

Dependent Variable (Stress Level)

1. In the last month, how often have you felt you could not control important things in your life?
  - a. Never
  - b. Rarely
  - c. Occasionally
  - d. Often
  - e. Very often
2. How often have you felt “stressed” in the last month?
  - a. Never
  - b. Rarely
  - c. Occasionally
  - d. Often
  - e. Very often
3. In the last month, how often have you felt confident about your ability to handle your personal problems?
  - a. Never
  - b. Rarely
  - c. Occasionally
  - d. Often
  - e. Very often
4. Do you believe your sleep duration affects your daily stress levels?
  - a. Yes
  - b. No