

## **SUMMARY OF THE ANALYSIS OF SLEEP DURATION AND WORKOUT QUALITY**

### **Statistical/Hypothetical Question:**

The primary research question explored in this study was: How does sleep duration before a workout influence workout quality, including calories burned, workout duration, and post-workout mood? The study aimed to determine whether the amount of sleep a person gets before exercising affects their workout performance and emotional state afterward. Additionally, the analysis examined potential variations based on age and gender.

### **The outcome of the EDA:**

The exploratory data analysis (EDA) revealed several key insights. First, the distribution of sleep hours showed that most users slept between 6 to 8 hours, with a mean of 6.98 hours. The analysis of calories burned, workout duration, and post-workout mood showed no statistically significant relationship with sleep duration. Pearson's correlation coefficients for sleep hours versus calories burned and workout duration were close to zero, indicating no linear relationship. Similarly, an ANOVA test showed no significant difference in post-workout mood across different sleep duration groups. Regression models for calories burned, workout duration, and post-workout mood also confirmed that sleep duration and age were not significant predictors of these outcomes.

### **What Was Missed During the Analysis?**

One potential limitation of the analysis was the lack of consideration for other factors that could influence workout quality, such as diet, stress levels, or the intensity of the workout. Additionally, the dataset did not account for the quality of sleep (e.g., deep sleep vs. light sleep), which could have provided more nuanced insights into how sleep affects workout performance.

### **Variables That Could Have Helped:**

Including variables such as sleep quality, pre-workout nutrition, and stress levels could have provided a more comprehensive understanding of the relationship between sleep and workout quality. Additionally, tracking the time of day when the workout occurred might have revealed patterns related to circadian rhythms and energy levels.

### **Incorrect Assumptions:**

The analysis assumed that sleep duration alone would be a significant predictor of workout quality. However, the results suggest that sleep duration, as measured in this dataset, does not have a meaningful impact on calories burned, workout duration, or post-workout mood. This indicates that other factors, such as sleep quality or overall health, may play a more critical role.

### **Challenges and Understanding:**

One of the main challenges was interpreting the lack of significant relationships between sleep duration and the dependent variables. It was initially assumed that sleep would have a more pronounced effect on workout outcomes. Additionally, understanding the implications of the low R-squared values in the regression models was challenging, as they indicated that the models had little to no predictive power. This raised questions about whether the dataset was sufficient to answer the research question or if other variables needed to be considered.

### **Conclusion**

While the analysis provided valuable insights into the dataset, it also highlighted the complexity of factors influencing workout quality and the need for more comprehensive data to fully understand the relationship between sleep and exercise.