Sleep Duration and Quality

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Question

Sleep is an important necessity for cognitive function.

Are aspects of sleep such as duration and quality, determined by other aspects such as age, physical activity, heart rate, or gender?

Variables

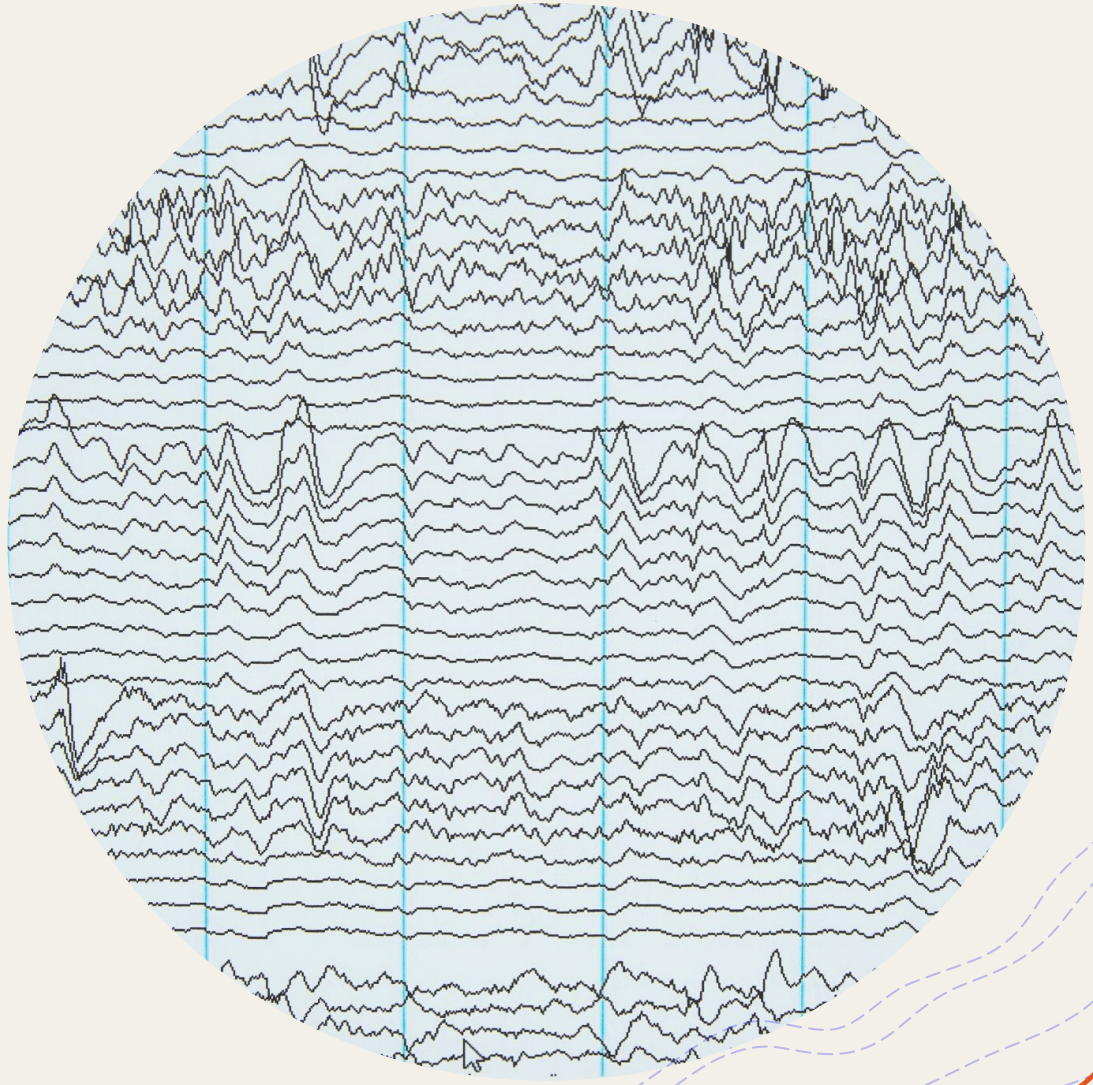
- Heart rate is the patient's heart rate.
- Sleep duration is how long the patient slept
- Sleep quality quantifies the quality of the sleep
- Physical activity level quantifies how active the patient is.
- Age is how old the subject is.
- Stress Level is how stressed the subject feels quantified.

Analysis

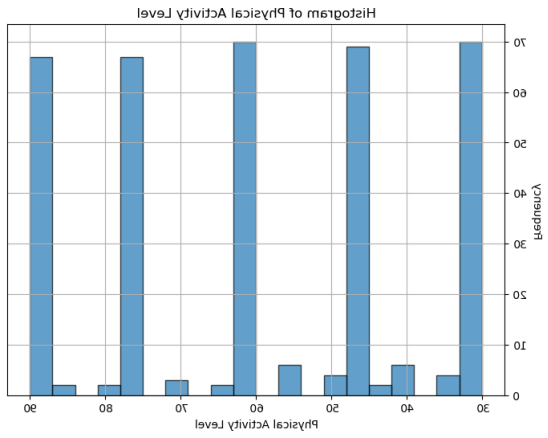
Includes comparing variables using multiple techniques to identify relationships before variables.

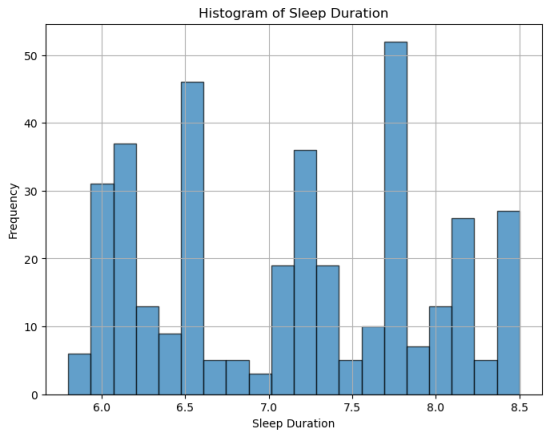
Methods used:

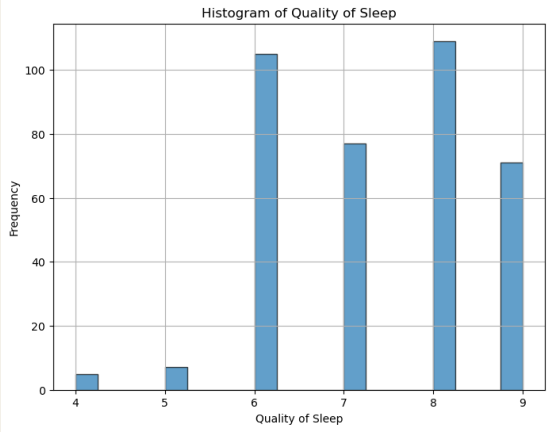
Histograms	Scatter Plots	Descriptive Stats	CDF	PDF	Analytical Distribution	Hypothesis Test	Regression Analysis



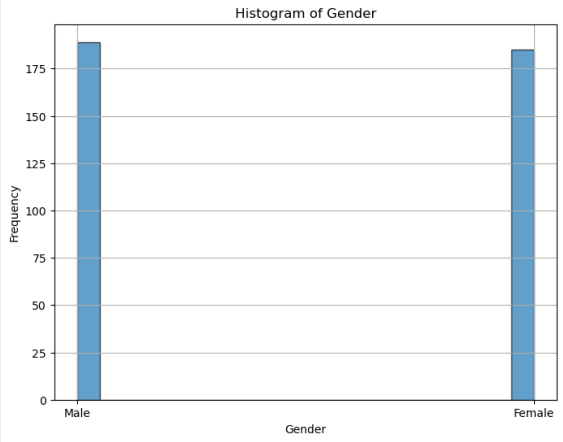
Variables Plotted

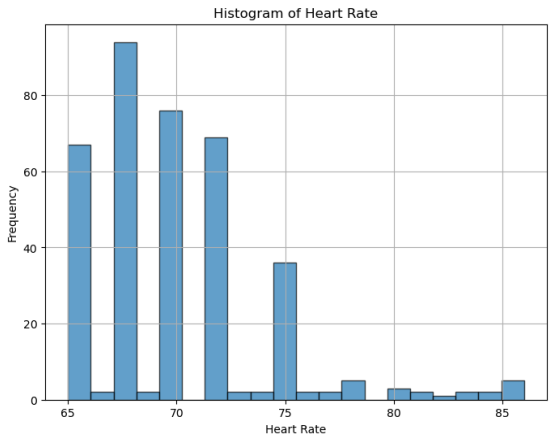


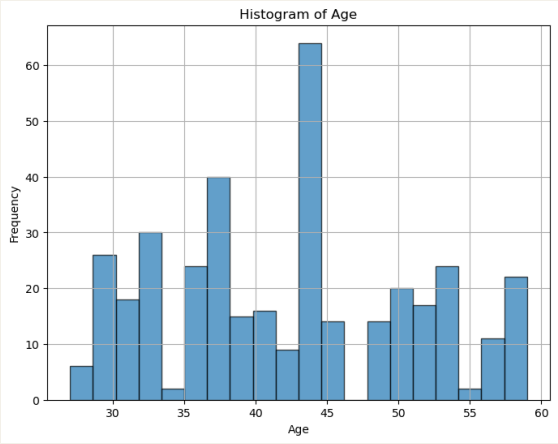


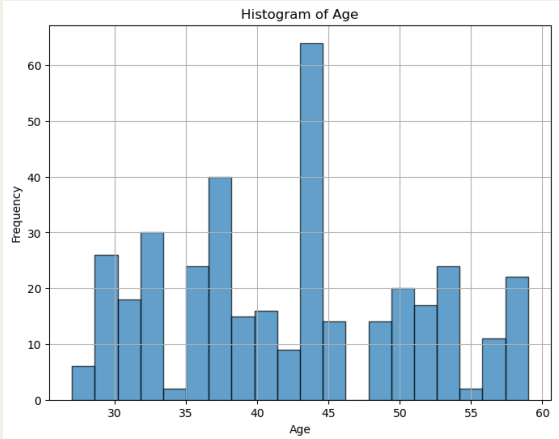


+ No obvious outliers present in data.

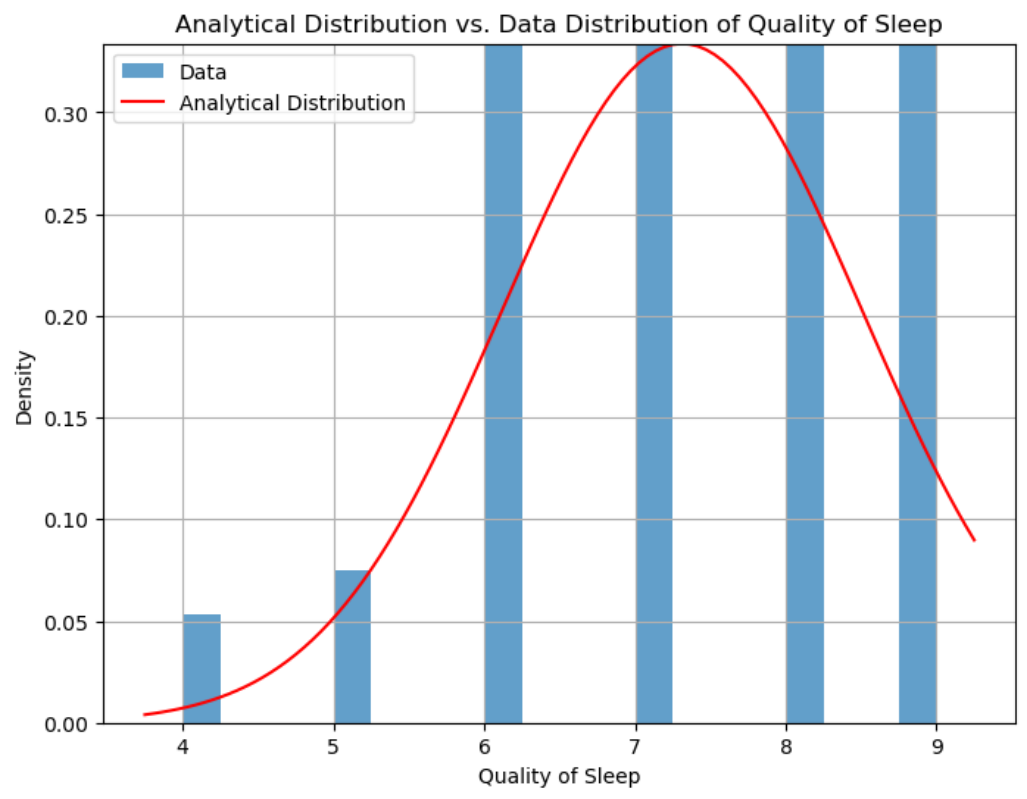








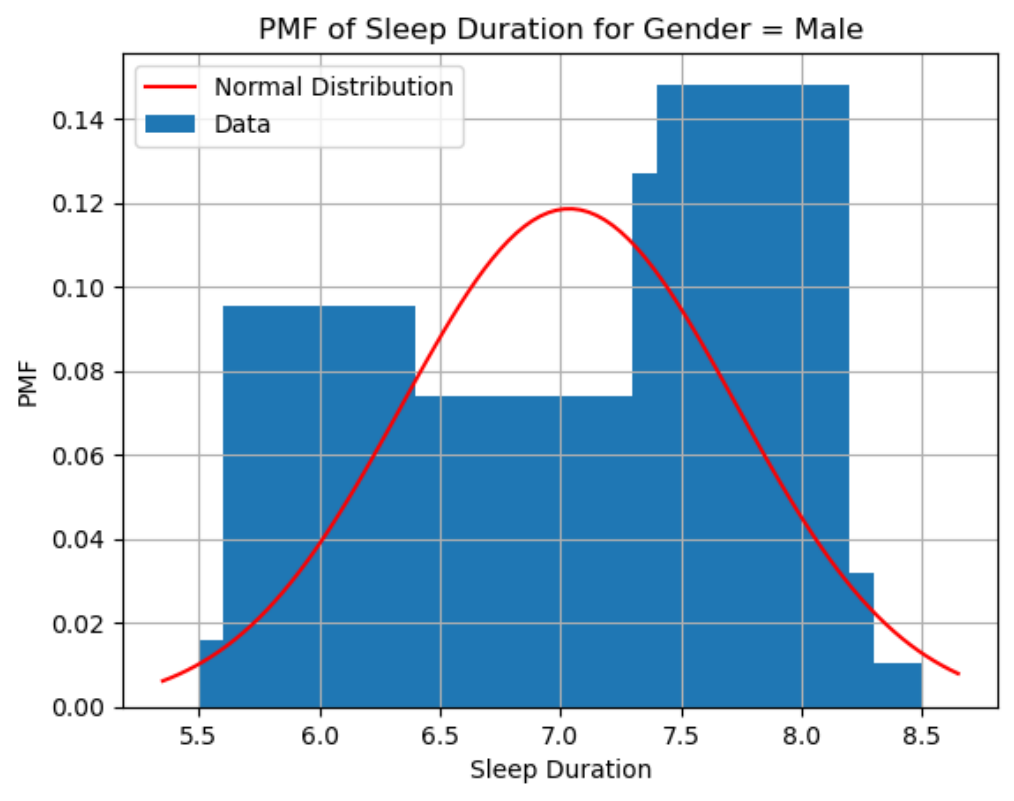
Analytical Distribution



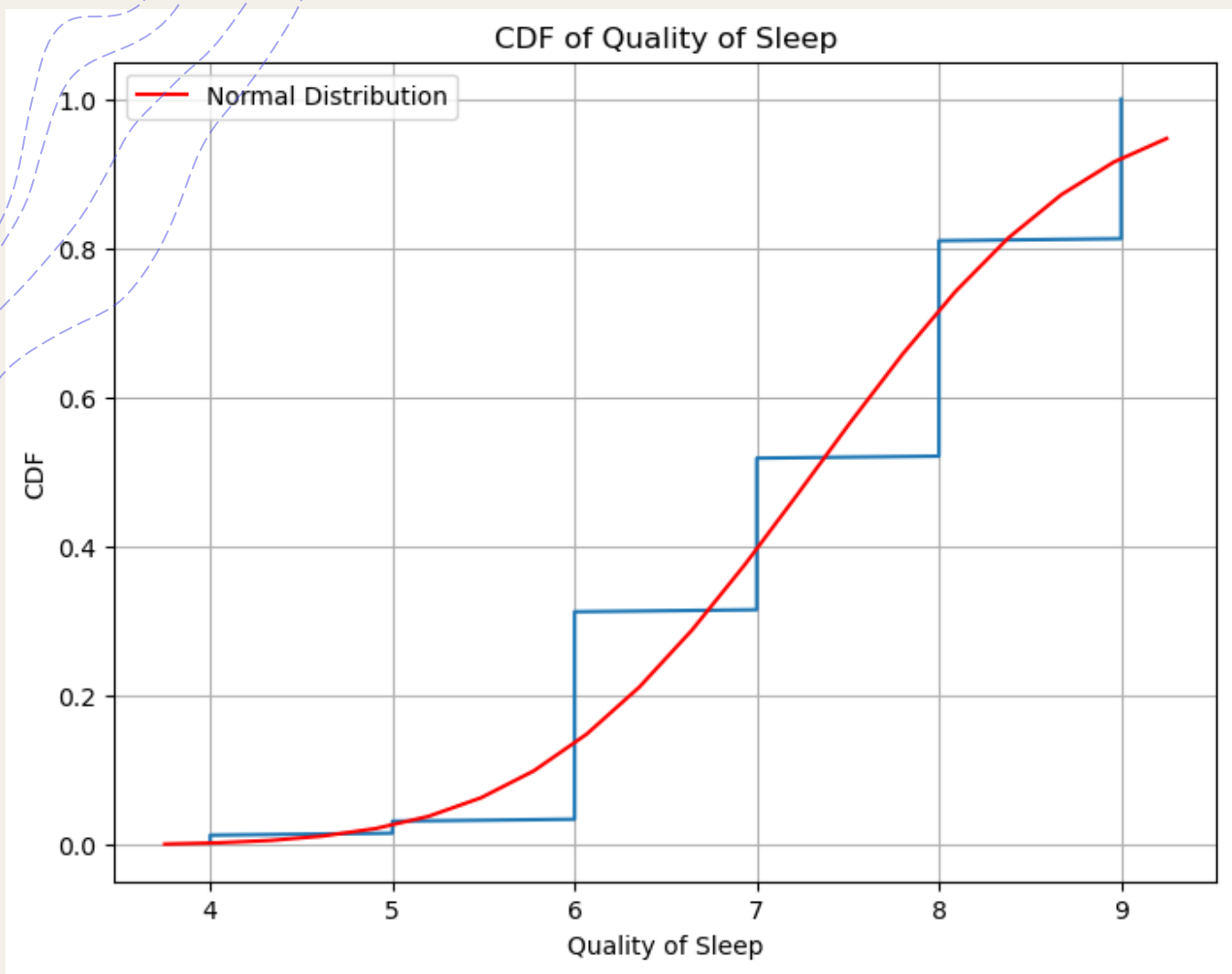
The analytical distribution is mostly normal with a few data points outside of the cure.

This could be due to the subjectiveness of quality of sleep.

PMF of Sleep Duration for Men



+ The PMF does not appear to be normally distributed with high peaks at both the lower and higher ends of sleep duration.

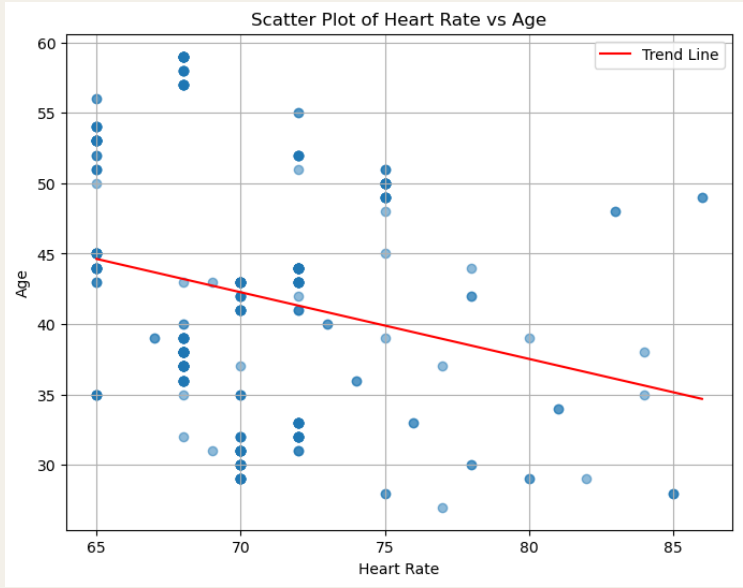


CDF of Quality of Sleep

The CDF plot is normally distributed

Scatter Plots

- Both scatterplots show a negative correlation.
  - As heart rate increases, age decreases.
  - As quality of sleep increases, heart rate decreases.



Results

There were not outliers present in the data and no need for cleansing of the data.

According to the analysis, there is a strong significant difference between quality of sleep and gender.

The regression analysis showed that 26.9% of the variability in heart rate can be explained by sleep duration and age.

When controlling for sleep duration and age, sleep duration has a statistically significant negative affect on heart rate.

Sleep duration and age are also statistically significant predictors of heart rate.

JB and Omnibus indicate that the data may not be normally distributed.

Assumptions

When making the choice for variables, I chose the variables I assumed had the greatest possibility of affecting sleep.

I also assumed that the subjective data such as quality of sleep was accurate.

I also assumed that the uneven distribution of careers had little to no effect on the data.

I felt as though the careers were not evenly distributed. There was a large amount of healthcare professionals who often work long and possibly overnight shifts which can affect not only quality, but also duration of sleep.

I also assumed that physical activity level was in direct correlation with the number of daily steps

Conclusion

Inclusion of other variables from the data could improve the analysis.

Several assumptions were made in analysis and should be considered in validity of results.

There is a significant relationship between:

Sleep and Gender

Age with both Sleep Duration and Heart Rate