Sleep Health Study Exploratory Data Analysis (EDA)

How different lifestyle factors affect overall sleep health?

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Sleep Health by Age & Gender

Null Hypothesis

Age and Gender have no effect on sleep health.

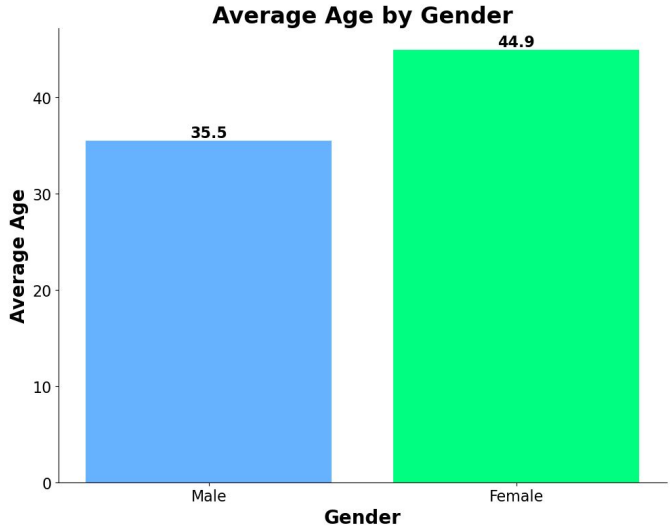
Alternate Hypothesis

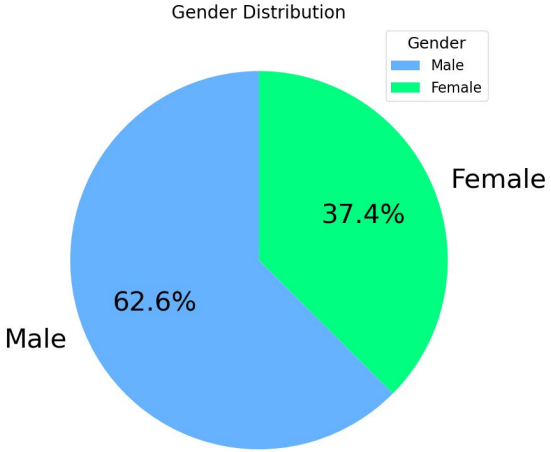
There is a significant effect of Age & Gender on sleep health.

Notes

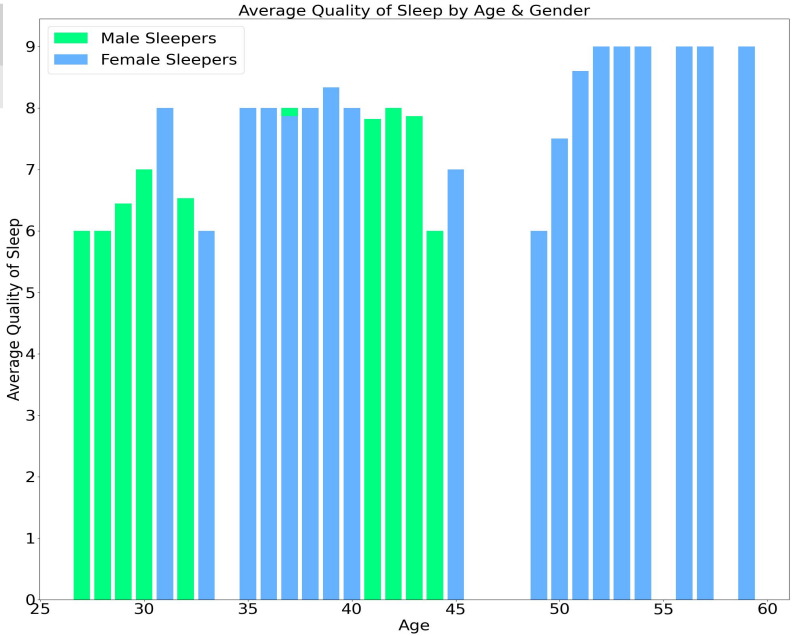
The pie chart on the right illustrates the gender distribution of the sleep health study showing that 62.6% of participants were male and 37.4% were female.

The bar graph displaying the average age distribution by gender demonstrates distinct patterns. Female participants, on average, exhibited an age of 45 years, while male participants had an average age of 35 years. This data reveals a notable age disparity of approximately 10 years between females and males in this study cohort.



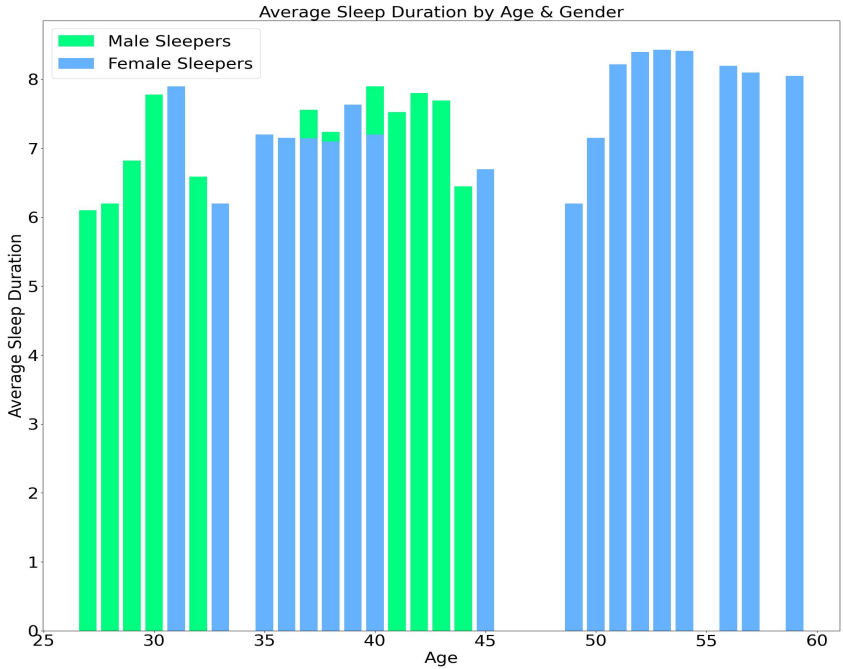


Sleep Health by Age & Gender (cont...)



Correlation coefficient value of 0.725

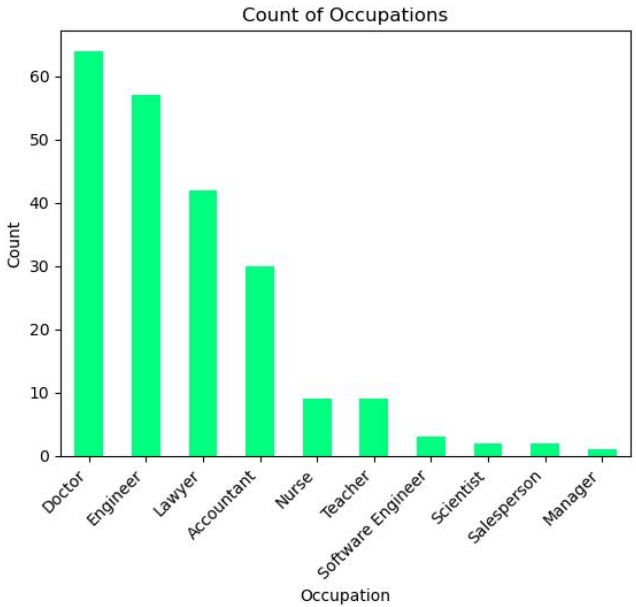
This is positive and greater than zero, we can reject the null hypothesis and accept the alternative hypothesis. This suggests that there is a significant positive correlation between 'Quality of Sleep' and 'Age'. It means that, on average, as the age increases, the quality of sleep tends to improve. However, keep in mind that correlation does not imply causation, and other factors might also contribute to this observed relationship.



Correlation coefficient value of 0.6

This is positive and not exactly zero, it suggests that there is some degree of positive linear relationship between "Sleep Duration" and "Age" in the study.

Sleep Health by Occupation



Null Hypothesis

Occupation has no effect on sleep quality or sleep duration.

Alternative Hypothesis

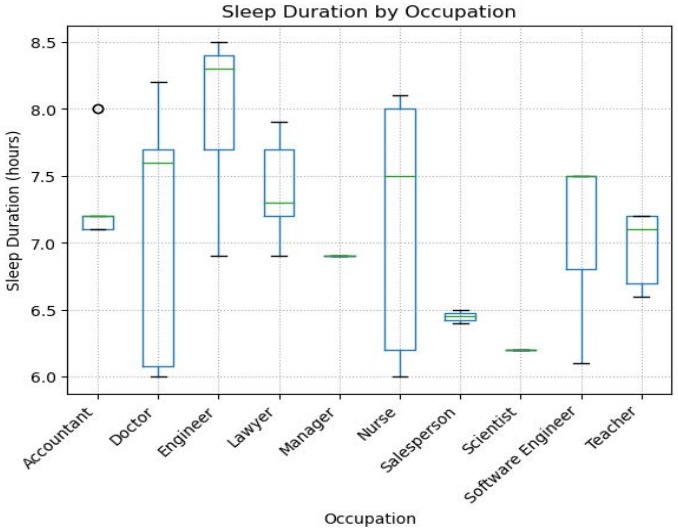
Occupation does have an effect on sleep quality or sleep duration.

Note:

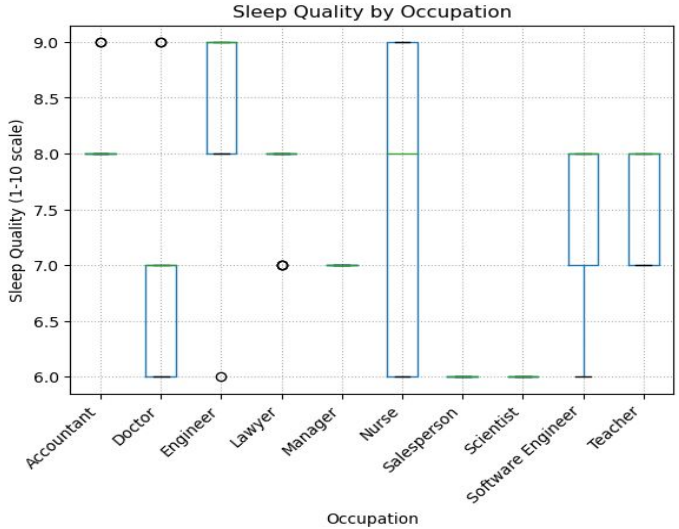
As shown in the graph to the left, this data set does not accurately represent the population. This sample alone has a disproportionately high number of certain occupations, and little to no representation of more physically intensive occupations.

Sleep Health by Occupation (cont.)

Shown below are the results of an ANOVA test on sleep duration and quality by occupation. Looking at the results for both ANOVA tests run on sleep health, we can safely reject the null hypothesis and confirm that occupation does impact sleep quality and sleep duration.

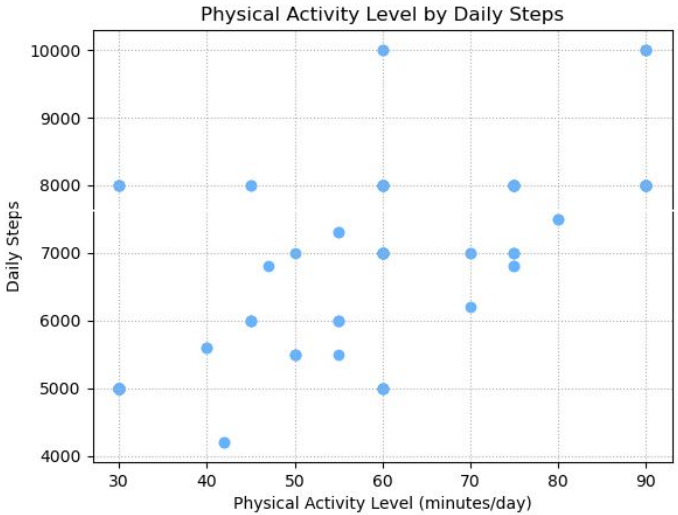


F-statistic: 14.41 P-value: 4.94e-18



F-statistic: 43.99 P-value: 1.46e-43

Sleep Health by Exercise



Physical Activity Level and Daily Steps: 0.79

Null Hypothesis

Physical Activity Level and Daily Steps have no effect on Sleep Quality or Sleep Duration.

Alternative Hypothesis

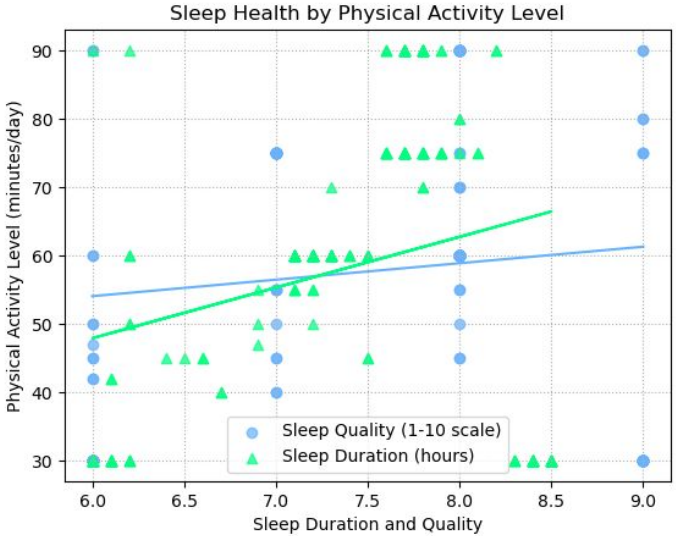
Physical Activity Level and Daily Steps do have an effect on Sleep Quality or Sleep Duration.

Note:

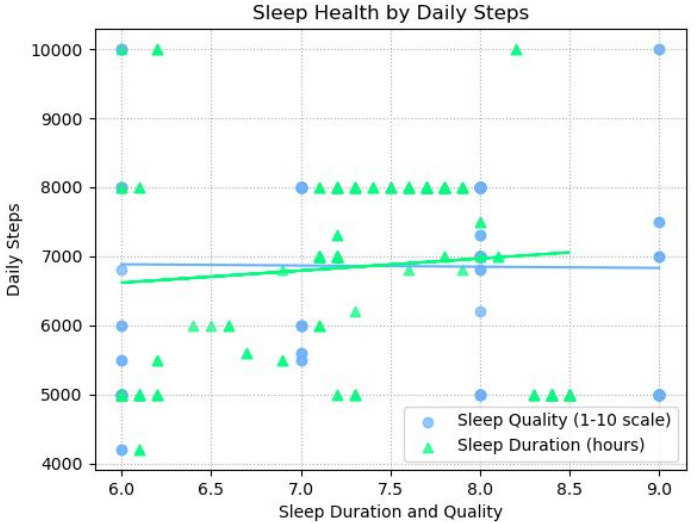
As shown in the graph to the left, the Pearson Correlation Coefficient between physical activity and daily steps is close to 1, indicating a strong relationship between them. For the purposes of this analysis, both factors will be considered in determining the effect exercise has on sleep health.

Sleep Health by Exercise (cont.)

The Pearson Correlation Coefficients for all of the items compared are very close to 0, which shows that none of the compared categories have a strong correlation. Due to this, we cannot reject the null hypothesis. The data shows that physical activity level and daily steps do not have a statistically significant impact on sleep quality or sleep duration.



Sleep Quality and Physical Activity Level: 0.11
Sleep Duration and Physical Activity Level: 0.26



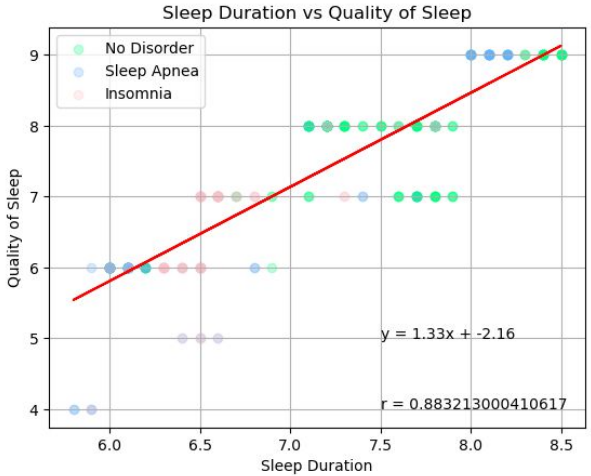
Sleep Quality and Daily Steps: -0.01
Sleep Duration and Daily Steps: 0.09

Sleep Health by Sleep Duration/Stress Level

Null Hypothesis - Sleep duration has no influence on your quality of sleep

Alternative Hypothesis - Sleep duration does have an influence on quality of sleep

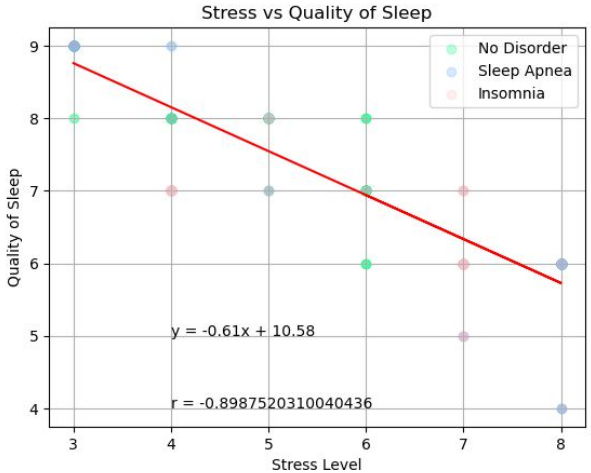
Correlation coefficient of r=0.88 so there is a strong positive relationship between sleep duration and quality of sleep.



Null Hypothesis - Stress has no influence on your quality of sleep

Alternative Hypothesis - Stress does have an influence on your quality of sleep

Correlation coefficient of r=-0.90 meaning there is a strong negative relationship between stress and quality of sleep



How does your BMI influence your quality of sleep?

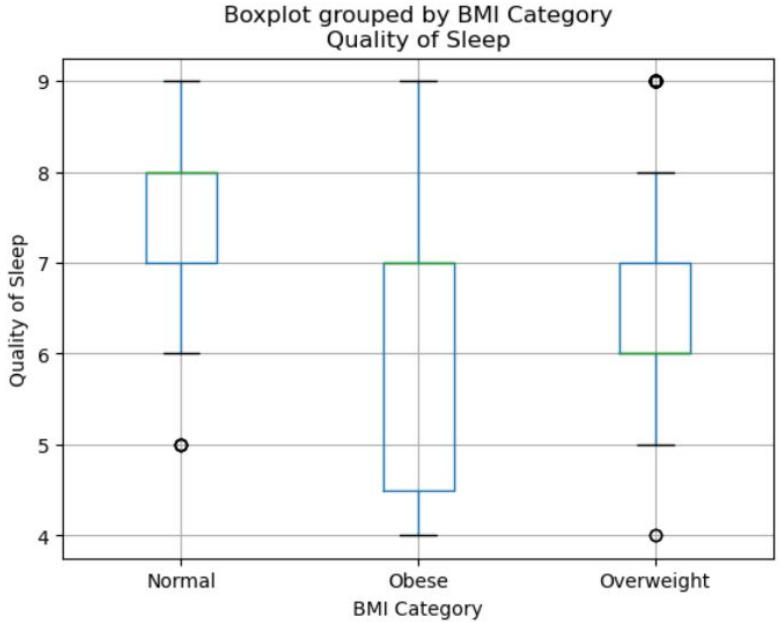
Null Hypothesis - Your BMI Category has no effect on your quality of sleep

Alternative Hypothesis- Your BMI Category does have an effect on your quality of sleep

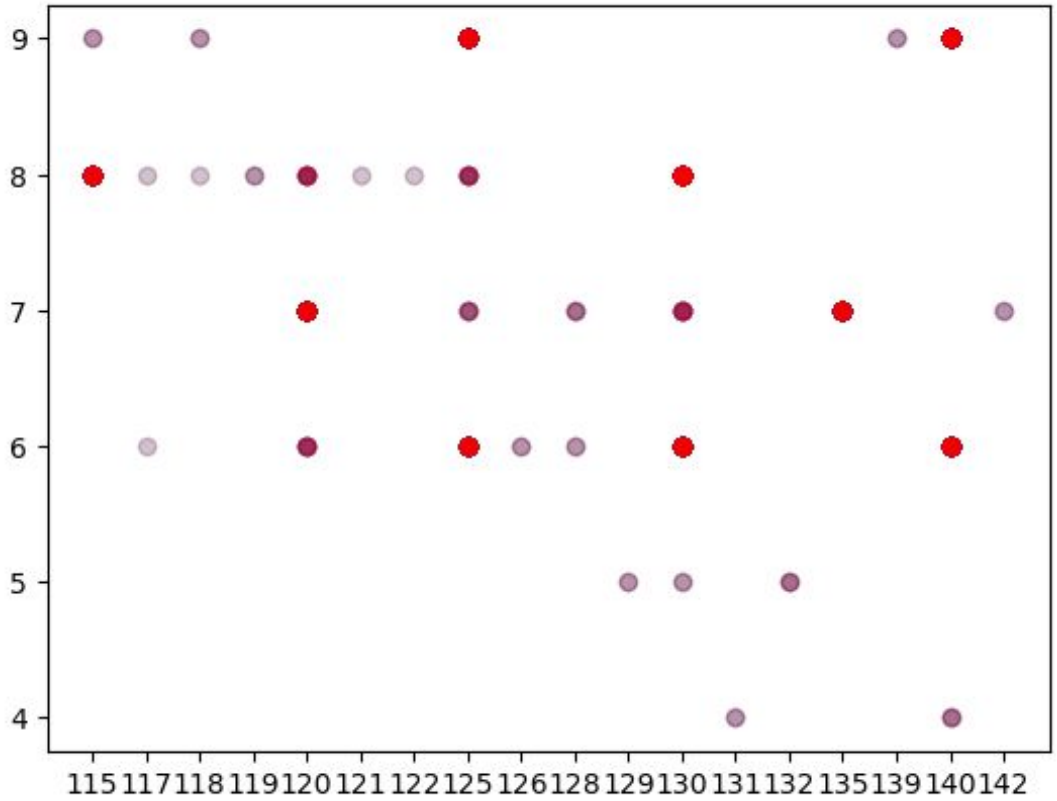
Average Quality of Sleep by BMI Category
Overall 7.31
Normal - 7.64
Overweight - 6.90
Obese - 6.40

p-value=7.31e-14

According to the ANOVA test the p-value is less than α=.05 we can reject the null and accept the alternative with 95% confidence.



Blood Pressure vs Quality of Sleep

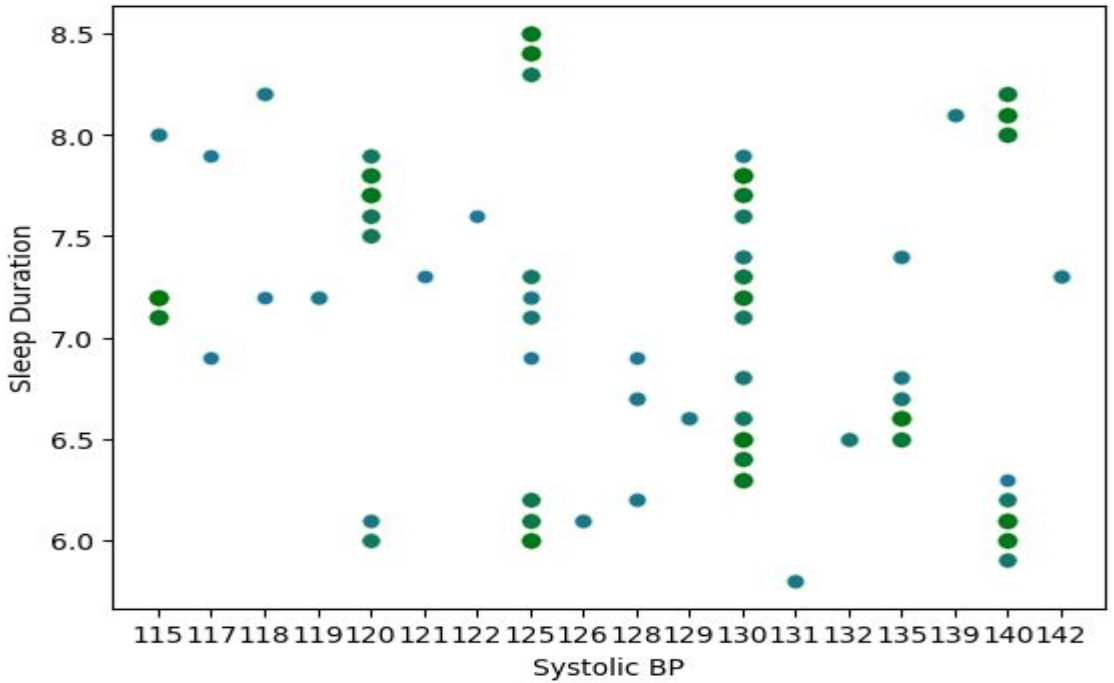


Null Hypothesis: Blood pressure has no effect on Quality of sleep

Alternate Hypothesis: Blood pressure has a direct effect on your overall quality of sleep.

Conclusion: Blood pressure has a clear relationship to quality of sleep.

Blood Pressure vs Amount of Sleep

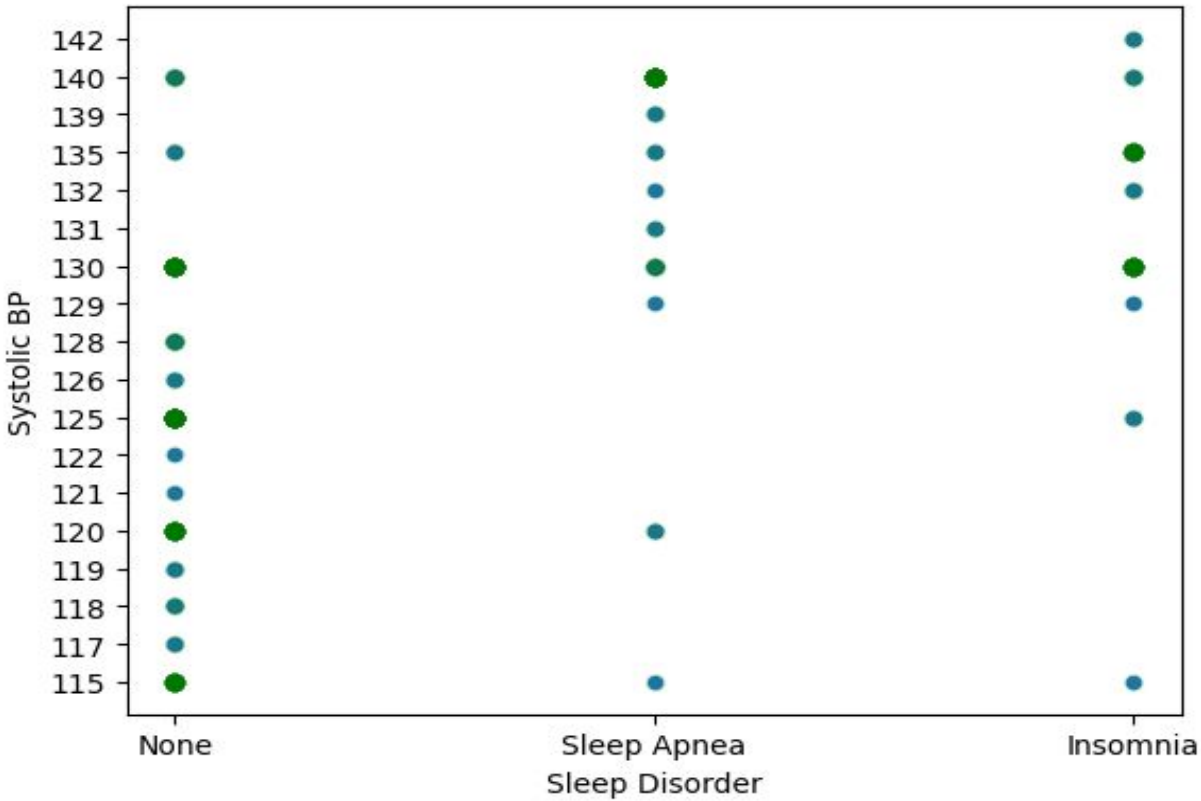


Null Hypothesis: Blood Pressure has no relation to amount of sleep.

Alternate Hypothesis: Blood pressure does have a relation to amount of sleep.

Conclusion: Blood pressure has a clear relationship to Amount of Sleep.

Blood Pressure vs Sleeping Disorders



Null Hypothesis: Blood Pressure has no relation to sleeping disorders.

Alternate Hypothesis: Blood pressure has a relation to Sleeping disorders.

Conclusion: Blood pressure has a clear relationship to Sleep disorder.

Questions?