

Title: "Sleep on it: A study into sleep deprivation and its impact on medical ailments"

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Background: Based on previous research, problems with sleep have been closely linked with symptoms of depression (Stickley, et al, 2019). Previous studies have also linked the prevalence of sleep disorders with the usage of substances like drugs or alcohol (National Institute on Drug Abuse, 2021). The fact that many people develop sleep and mental health disorders is alarming, given that these disorders have been associated with fatal outcomes (Stickley, et al, 2019). Thus, our study aims to analyze the prevalence of sleep deprivation and their association with depression and substance usage.

Objective: The objective is to show how exposure to sleep deprivation and substance abuse can lead to the outcome of a patient having depression. The data would be provided through NHANES and machine learning would be used to predict depression using sleep-related and other features.

Methods: We will use NHANES 2017-2018 data to build independent sample t-tests based on patients with and without sleep deprivation with the following attributes: drug use, alcohol use, and depression. A logistic regression model will be created with the same attributes (represented like hours of sleep, etc) having weights to predict if an individual has depression.

Results: Using t-tests for sleep deprivation and the various attributes to test, we anticipate that there would be a significant difference between the patients with sleep deprivation and without sleep deprivation (P-value less than .05). The results would be displayed as a table with each respective attribute and their p-value. We could also create a histogram to show when patients begin to develop sleep deprivation. We could also make scatter plots to show the relationship between the hours of sleep a person receives and the various features related to substance abuse (alcoholic drink, drank in a day, etc).

Division of Labor:

Jonas: Using t-tests to compare the patients with or without depression among those with sleep deprivation, based on their substance use. Constructing a predictive model that would classify patients as having or not having depression based on sleep-related features and features related to substance abuse.

Zenry: Using t-tests to show the difference between patients with and without depression among those with sleep deprivation. Build a predictive model for depression based around sleep deprivation and the respective features.

Dilan: Build predictive models for depression and substance abuse for patients who have sleep deprivation and who don't.

References

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