

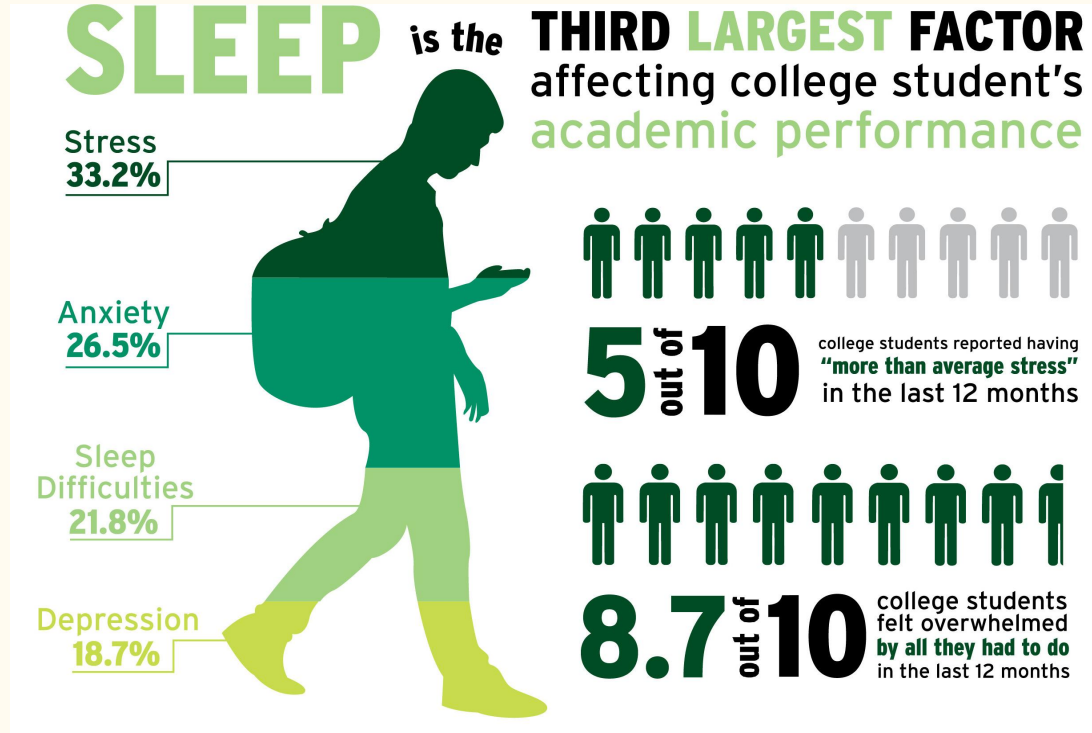
# **Short Sleep Duration(Insomnia) and its Impact**

---

Coco Cheng  
Mingyang Xue

# The motivation and background

- ❑ We want to research short sleep durations because we are college students, and most of the college students either do not have enough sleeping time due to coursework or having psychological related sleeping troubles, leading to short sleep durations.



# Research Question 1 and Methodology

**As time goes, do the number of people with the problem of short sleep duration or insomnia in the U.S. increase or decrease?**

- ❑ Participants who are under 25 years old and sleep less than 8.6 hours per day and above 25 years old or sleep less than 9.3 hours per day as people with short sleep duration.
- ❑ With the counting number, we plotted out a line chart to indicate as time goes, if the people with the problems of short sleep duration increase or decrease.

# Research Question 2 and Methodology

**What kind of characteristics of people like their ages and sexes attribute to sleep problems?**

- ❑ The second research question is to show how does different characteristics of people relate to sleep problems. The answer may lead us to further interpretation of sleep problems and offer more available information when we try to find the solutions.
- ❑ We classify the data into different groups based on characteristics of patients. Then we calculate average sleep quality for each group. For sexuality, we construct a hypothesis test; for age, education level and BMI, we plot best fit lines for each of them to show the relationship between sleep quality and these three characteristics.

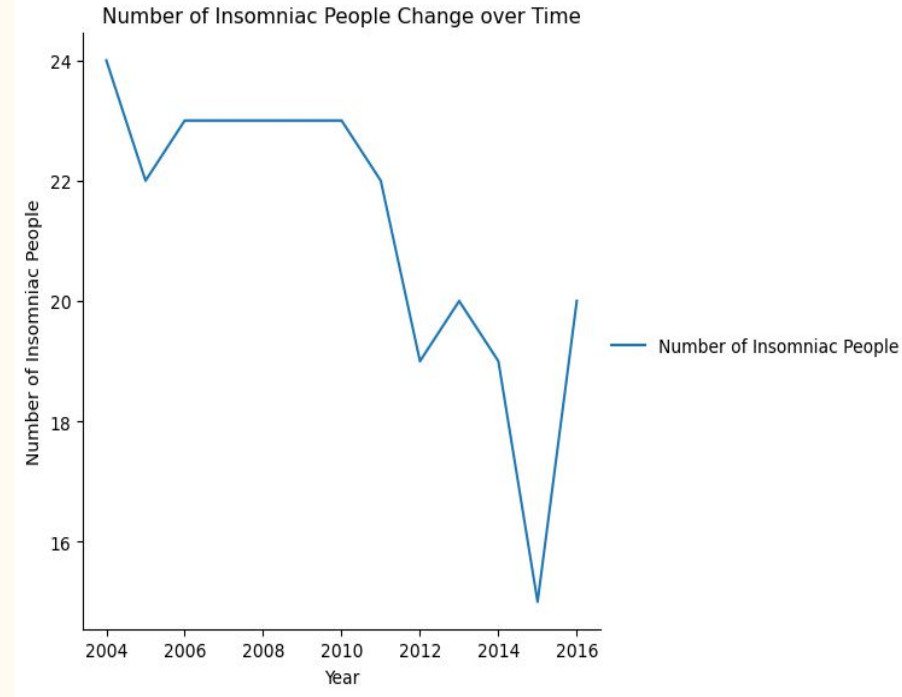
# Research Question 3 and Methodology

**What is the impact of insomnia have on people like damaging people's health?**

- ❑ Set ISI which is the Insomnia Severity Index as the independent variable and have the anxiety index, depression index, bmi, and health problem index as the dependent value.
- ❑ Plot those value into four graphs to see if there's a positive or negative, linear or nonlinear relationships between the independent variables and dependent variables.
- ❑ Using scatter plot may not necessarily show the relationship between variables since it may easily overfit so that we also include the best fit line in the graph.

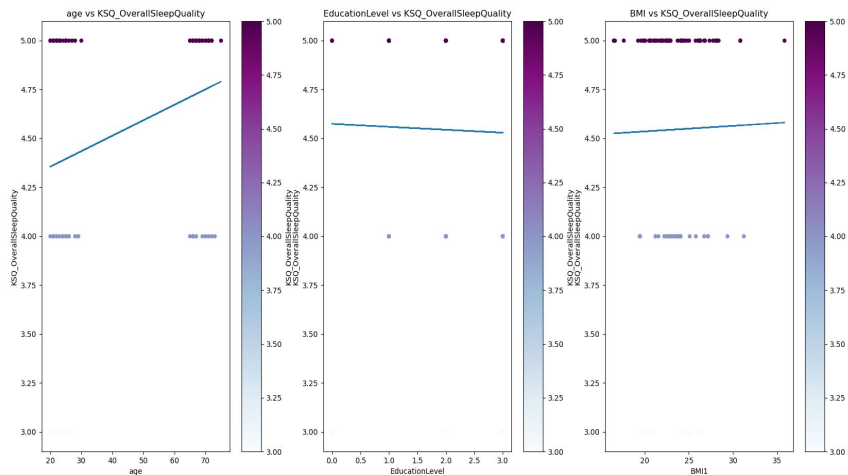
# Summary of Key Results

- ❑ The line plot on the right shows that as time goes, the number of people with the problem of short sleep duration decreases in the U.S, roughly 30% of the population struggling to sleep.
- ❑ The number reaches the minimum at the year of 2015. The reason for the significant drop at the year of 2015 can be that there were two new drugs for treatments that had been approved by the FDA which were tasimelteon in January 2014 and suvorexant in August 2014.



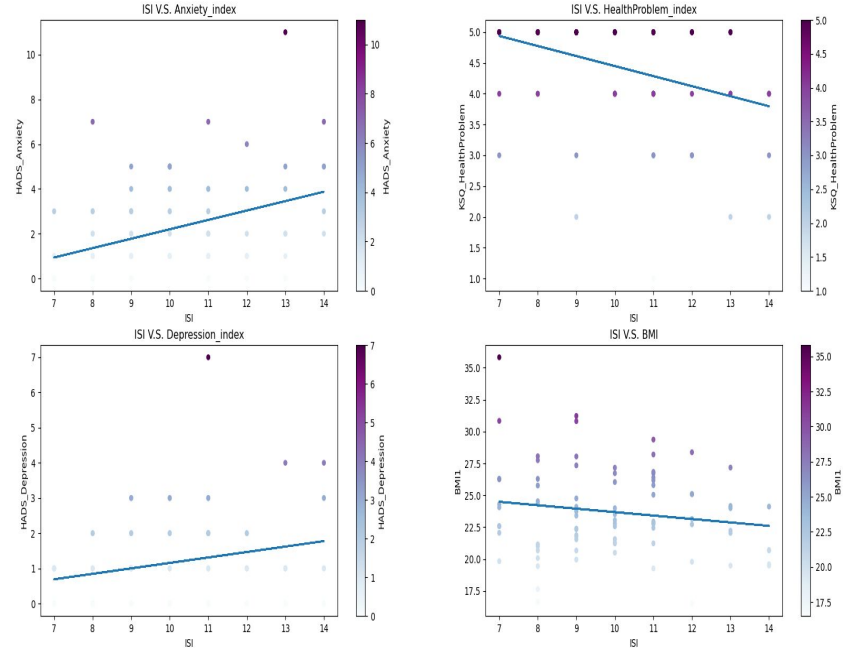
# Summary of Key Results

- ❑ We assume there is a negative relationship between overall sleep quality and degree of sleep problems. According to plots and analysis, we get the following results.
- ❑ Sex has little contribution on sleep problems.
- ❑ Old people have fewer sleep problems than young people.
- ❑ More educated people have more sleep problems. Students in university typically have the most sleep problems in this dataset.
- ❑ Fat people have fewer sleep problems than thin people.



# Summary of Key Results

- ❑ People with insomnia are more likely to experience some mental health problems like anxiety and depression. Based on the graph shown there is a positive relationship between the variables
- ❑ There is a negative relationship between insomnia severity index and health problem index which is not matching what psychologists and other scientists have suggested. The reason for it may be that the KSQ\_HealthProblem indexes are collected from the Karolinska Sleep Questionnaire. There may be a report bias since most of the people tend to not admit that they are not healthy.





# Future Work

- ❑ According to the results we get from analysis, it is clear that short sleep duration and sleep problems will cause other health problems in long term. But more research and experiments are needed if we want to quantify the effect on health issues.
- ❑ We would like to suggest people to sleep more and form a good sleeping habitat. However, nowadays there are very limited solutions for insomnia or other sleep problems. One common drugs many people prefer to take is melatonin, but this drug only works for certain groups of patients and has little help for others.