

Project Milestone 1: Factors Related to Student Mental Health

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Description:

The [dataset from Kaggle.com](https://www.kaggle.com/datasets/ashna-gupta/mental-health-evaluations) includes mental health evaluations of a random sample of students aged 18 and above, aiming to provide insights into their mental well-being by examining various factors that may influence it. It features carefully selected records from anonymous sources to ensure privacy. Although the collection year is not specified, the dataset was updated 7 months ago.

The dataset includes (self-rated) scores for stress, depression, and anxiety from 0 to 5, as well as a variety of factors that might influence these mental health parameters. The general demographics collected are the age and gender of the student. To provide information about their academics, their major, GPA, semester credit load, and level of extracurricular involvement were collected. Physical health parameters include measures for sleep quality, physical activity, and diet quality. It also records the frequency of substance use and whether the individual has a family history of mental health issues. Finally, there are several social/environmental factors such as social support, financial stress, residence type, relationship status, and counseling service use. There are a total of 20 variables recorded and over 7000 data entries, with no null entries. This will provide a sufficient sample size to analyze and make speculations about general trends among students of college age.

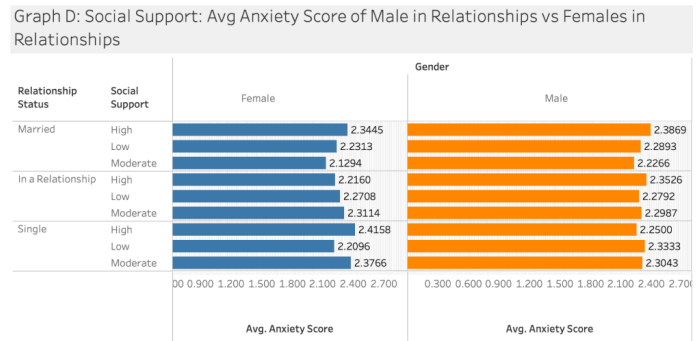
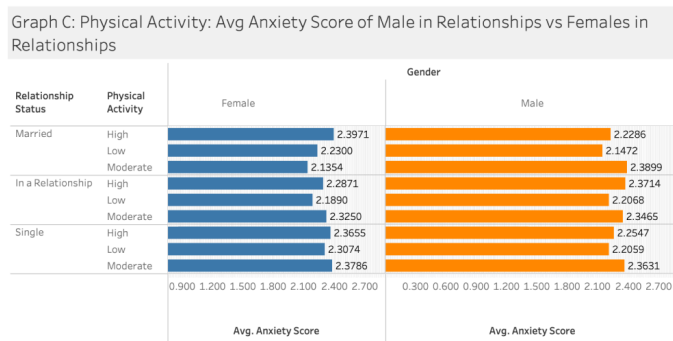
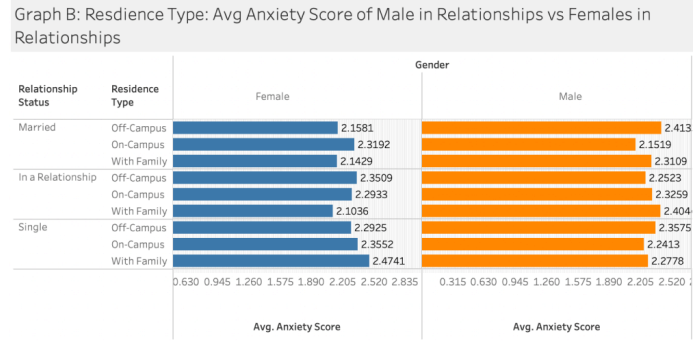
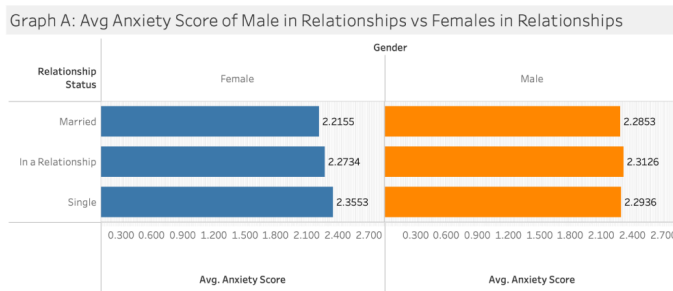
Questions:

1. How do anxiety scores compare between males and females in relationships, and are there any factors contributing to any observed differences?
2. To what extent does academic workload (measured in credit hours) predict anxiety levels among students, and how do their respective majors modulate this relationship?
3. In which majors do students report the highest average anxiety scores?

Motivations:

1. Gender norms and dynamics within interpersonal relationships can significantly influence mental health outcomes, particularly for students navigating complex social environments. By gaining a more nuanced understanding of gender-related influences, educational institutions can develop more targeted and effective intervention mechanisms to support student well-being.
2. The relationship between academic workload and student mental health is a pressing issue for many educational institutions. This question aims to quantify the impact of academic stressors and explore whether certain majors influence the resilience or vulnerability of students to an increase in academic stress. Insights from this analysis could guide policy changes to optimize educational practices for students' mental well-being.
3. Exploring the relationship between students' chosen majors and their reported anxiety levels offers significant implications for curriculum development and resource allocation within schools. By identifying majors that are associated with higher levels of anxiety, schools can preemptively allocate resources and support to these areas.

Visualization 1: Bar graphs



Insights: (Answering Question 1)

We chose to investigate the potential factors that can induce anxiety when being in a relationship during school through bar graphs because they are effective in presenting categorical data, allowing for easy comparison between different categories. Additionally, bar graphs can display both individual data points and summary statistics, like the average or mean. Using the average can be more informative than using the total number because it provides a normalized value that accounts for the varying sizes of categories being compared. Overall, the use of bar graphs enhances the clarity and impact of data visualizations.

In Graph A, we see that the average anxiety score amongst males remains stagnant, regardless of relationship status. However, females tend to have marginally lower anxiety scores as the severity of their relationship status increases. When looking at different factors that could affect the anxiety of students in relationships, we decided to graph multiple different factors such as sleep quality, extracurricular activity, diet, residence type, etc. There were four factors that seemed to significantly affect the average anxiety scores of single people versus those in a relationship. In Graphs B-D, we compared these four different factors to see what could affect anxiety levels, while remaining to consider relationship status. The four factors used are residence type, physical activity, and social support.

In Graph B, females who are in a relationship, including those who are married, have lower anxiety scores if they live with family than if they don't. Men who are in a relationship, including those who are married, have lower anxiety scores when they do not live with family, which is the

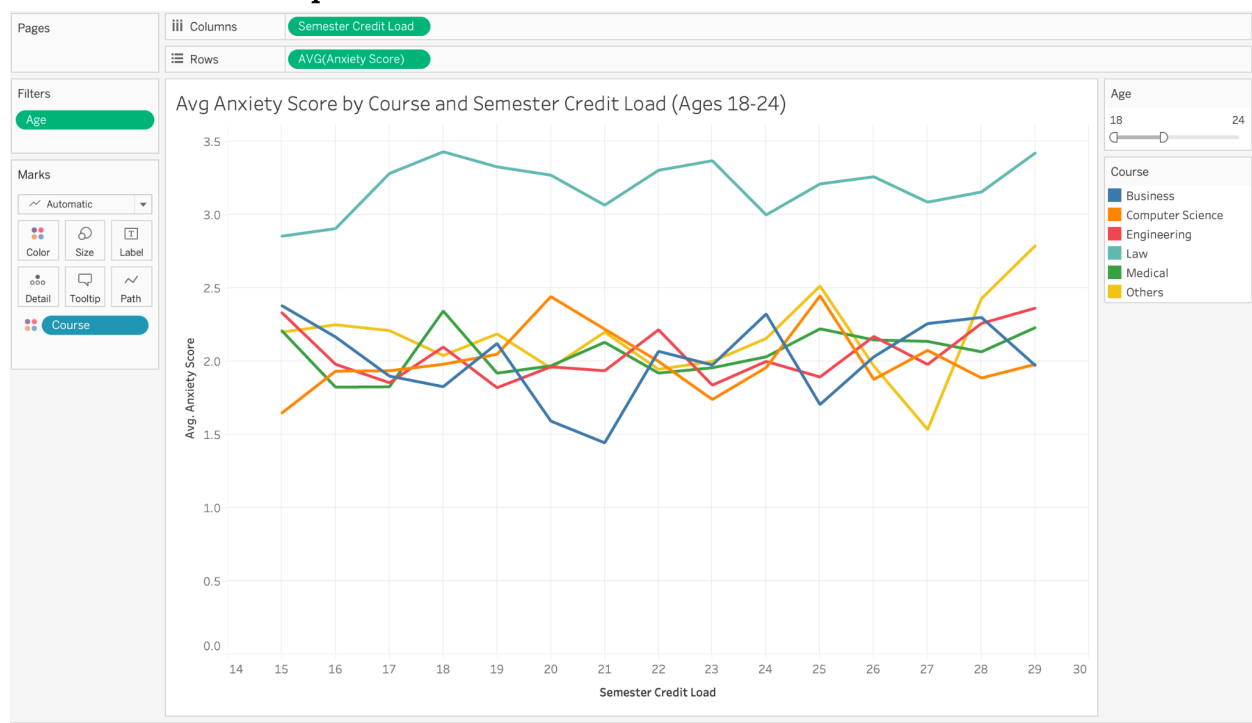
opposite of what was analyzed for females in relationships. This suggests there might be a potential correlation between relationship status and residence type when in a relationship.

In Graph C, the amount of physical activity for those in relationships can have some effect on their anxiety levels. For those who are in relationships, low physical activity is related to low anxiety scores, as they have higher anxiety scores with higher amounts of physical activity. However, those who are single tend to have higher anxiety when they have low amounts of physical activity, and a lower anxiety score when they have moderate to high amounts of physical activity. This suggests there might be a potential correlation between these two variables.

In Graph D, the level of social support does not affect a woman's average anxiety score significantly if they are in a relationship, and similar for men in relationships. Moreover, a notable analysis based on the data is that single women have low levels of average anxiety scores when they have a low social support system. This suggests there might be a potential, but weak correlation between social support levels when in a relationship and anxiety scores.

Overall, in Graph A, we see that females in a relationship or if they are married have lower levels of anxiety compared to males. For men, being in a relationship does not affect their anxiety scores as much and their average anxiety scores stay consistent, despite their relationship status. Additionally, when we consider different factors that could affect anxiety levels when a female is in a relationship, she is still, on average, going to have a lower anxiety score. Factors that have the biggest impact on a female's and male's anxiety level while being in a relationship are residence types and physical activity, according to the data above. Other factors, like social support, have consistent scores of anxiety when females or males are in a relationship.

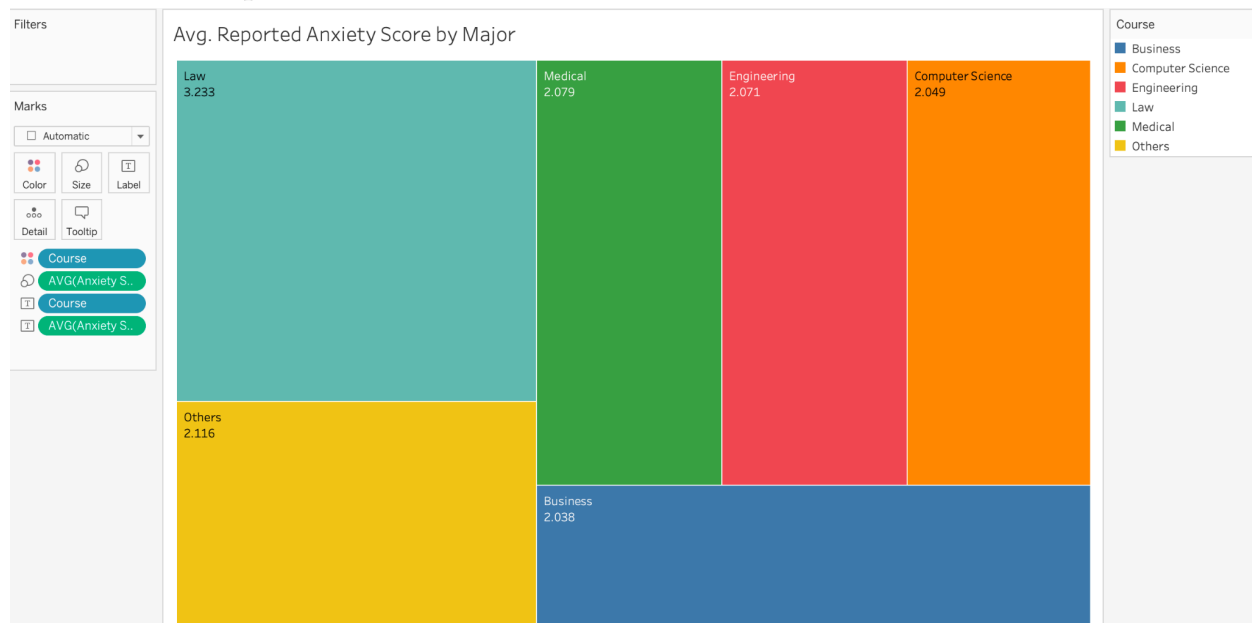
Visualization 2: Line Graph



Insights: (Answering Question 2)

This visualization shows there seems to be an upward trend in average anxiety scores reported as semester credit load increases across all courses. This suggests there might be a potential correlation between these two variables. As a result, institutions may need to investigate their credit requirements as a factor in reducing student anxiety. We chose a line graph to investigate this because trends and patterns between anxiety scores and credit load can easily be observed and interpreted. This visualization narrows the focus to the 18-24 age range to limit variability within the dataset, thereby attempting to restrict the analysis exclusively to undergraduate students. In addition, because the relationship between credit load and anxiety might vary across different majors, we colored the lines for a more nuanced analysis. The Law course line is significantly above all others which suggests students in the Law field may experience higher average anxiety levels, even when controlling for credit load.

Visualization 3: Proportional Boxes



Insights: (Answering Question 3)

The visualizations reveal that average reported anxiety levels are relatively consistent across various majors, with the exception of Law, which exhibits marginally higher reported average anxiety scores. This is consistent with our insights made from visualization 2 and suggests that educational institutions may need to direct additional mental health support toward students in law programs. The proportional boxes graph was chosen to represent the data for question 1, as it enables viewers to quickly discern the relative differences in reported average anxiety scores among the majors, through the use of box size and color variation. It is important to recognize that the dataset encompasses a broad age range (18-32), which includes both undergraduate and graduate populations such as law, medical, and doctoral students. The heightened reported anxiety levels among law students may reflect the rigorous demands of graduate-level education compared to undergraduate studies. To ensure fairness in comparison, average reported anxiety scores were analyzed instead of total scores,

as the dataset may not be proportionally representative of all majors, potentially leading to biased outcomes.