"Examining University Student's Mental Health Issues"

Submitted by:
Basmala Yasser (22-101098)
Abeer Sherif (22-101136)
Shahd Ayman (22-101045)
Badr Mohamed(22-101178)

Supervised by:
 Dr. Mohamed Taher ElRefaei
 Eng. Nadine ElSaeed

Introduction

Mental health issues like anxiety, depression, and appetite issues are increasingly prevalent among university students. External factors, such as academic pressures and life changes, significantly impact their mental well-being. Given that students spend over 17 years in education, the demands of academic life can exacerbate these issues as they age. Understanding these influences is vital for developing strategies to support student mental health and ensure their educational and personal success.

Research Question

Do gender differences contribute to varying levels of anxiety, and how do specific appetite issues, such as poor appetite or overeating, impact the severity of depression among university students?

Hypothesis

First Hypothesis

- Null Hypothesis (H0): There is no significant difference in anxiety levels between male and female university students.
- Alternative Hypothesis (H1): There is a significant difference in anxiety levels between male and female university students.

Second Hypothesis

- Null Hypothesis (H0): The frequency of appetite issues (poor appetite or overeating) does not have a significant impact on depression levels among students.
- Alternative Hypothesis (H1): The frequency of appetite issues (poor appetite or overeating) has a significant impact on depression levels among students.

Population of Interest:

This dataset comprises mental health data from 1977 university students across 15 top universities.

Sampling Method:

We chose random sampling because it ensures that every respondent has an equal chance of being selected, reducing selection bias and increasing the representativeness and generalizability of the results.

Bias Identification:

We recognized potential biases in using an existing dataset for our study on university students and their mental health. Our confidence in the dataset's accuracy may influence our analysis, and using data from an external website could introduce further bias. To address this, we ensured a diverse sample, conducted through data cleaning. Through cleaning our data and making visualizations we've discovered that there is a predominance of males over females, Due to the percentage of males in
the sample being more than females.

Survey Questions/Collected Data/Dataset:

The dataset contains information on 1,977 university students and includes 39 columns of data. It covers basic details like age and gender, academic information such as university and department, and extensive measurements of mental health, including anxiety, stress, and depression levels. This setup provides a comprehensive look at the mental health landscape among these students.
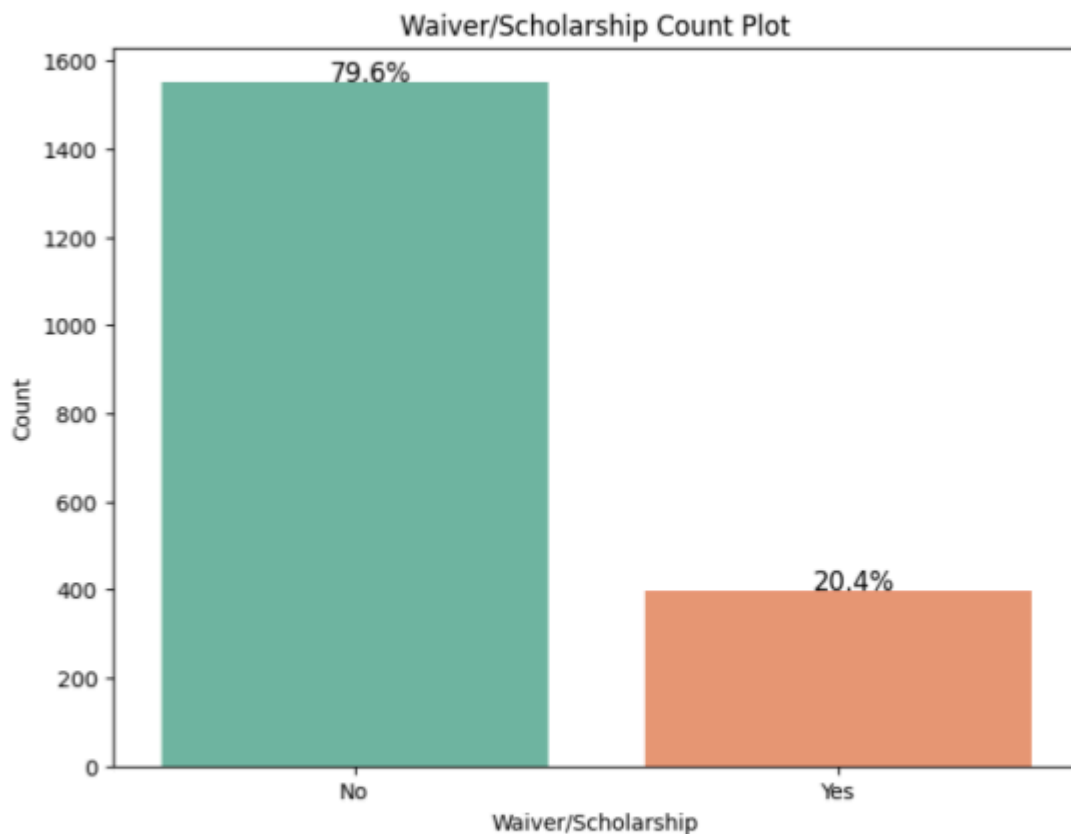
Analysis:

Distribution of Depression Levels Across CGPA Categories
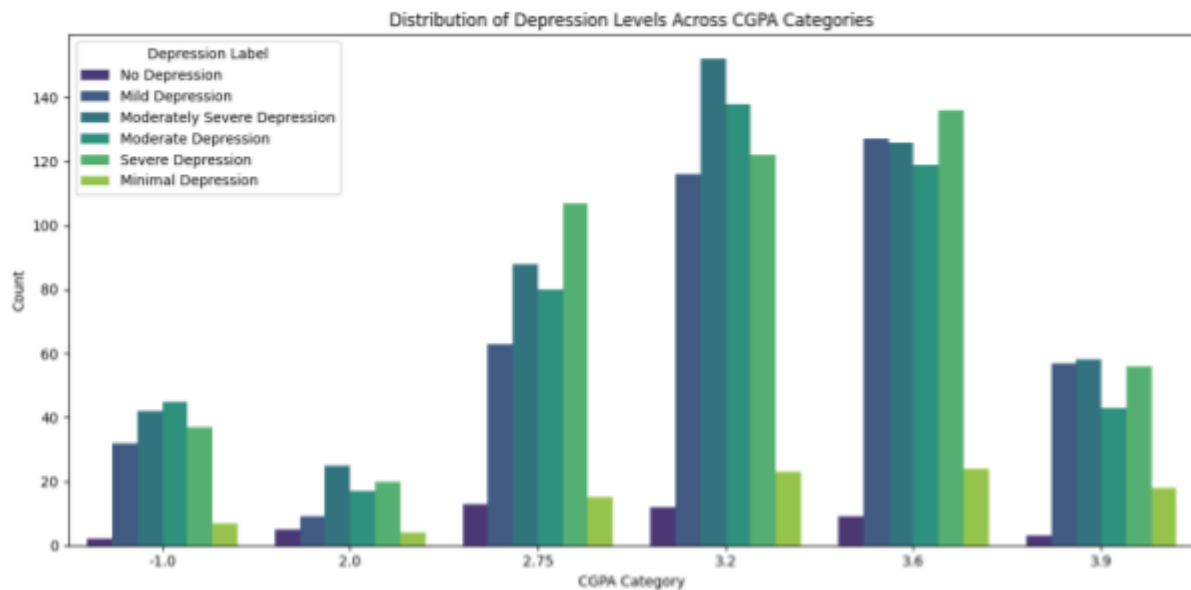
The graph shows how depression levels vary among different groups of people based on their academic performance (CGPA). It reveals that higher GPAs tend to be associated with lower levels of depression, with most students experiencing mild depression regardless of their GPA

Distribution of Anxiety Levels Across Academic Years
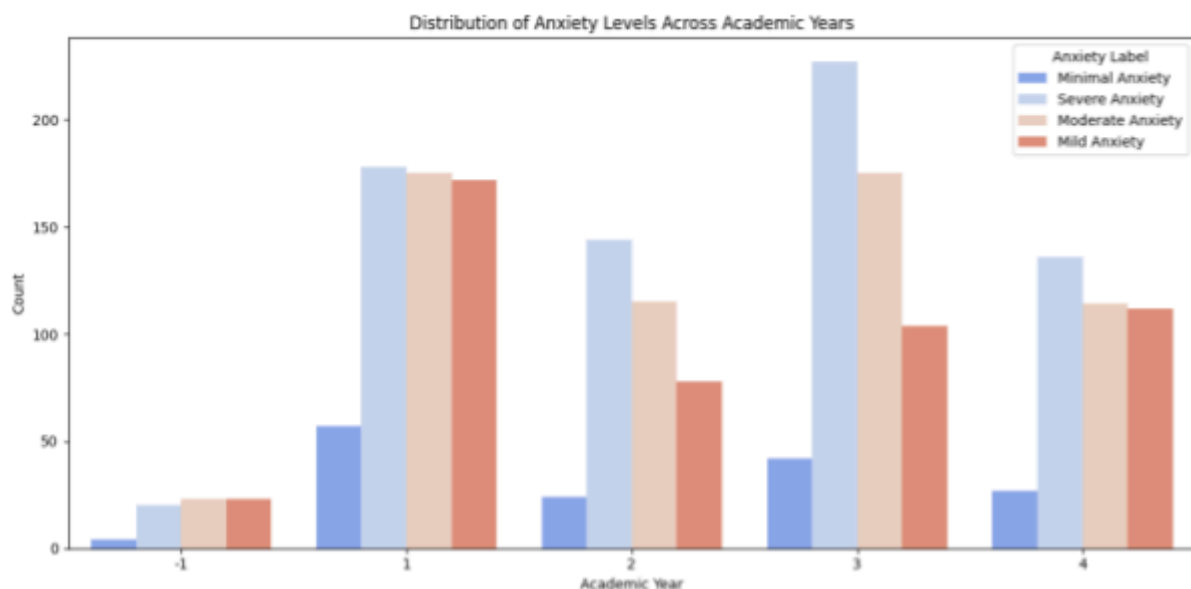
The graph shows that as students move through their academic years, their anxiety levels tend to increase. Most students start with low anxiety in their first year, but this decreases as they continue their studies. At the same time, more students begin to experience moderate and severe anxiety as they progress. This suggests that the growing academic pressure may be causing higher anxiety levels.

Gender Count Plot
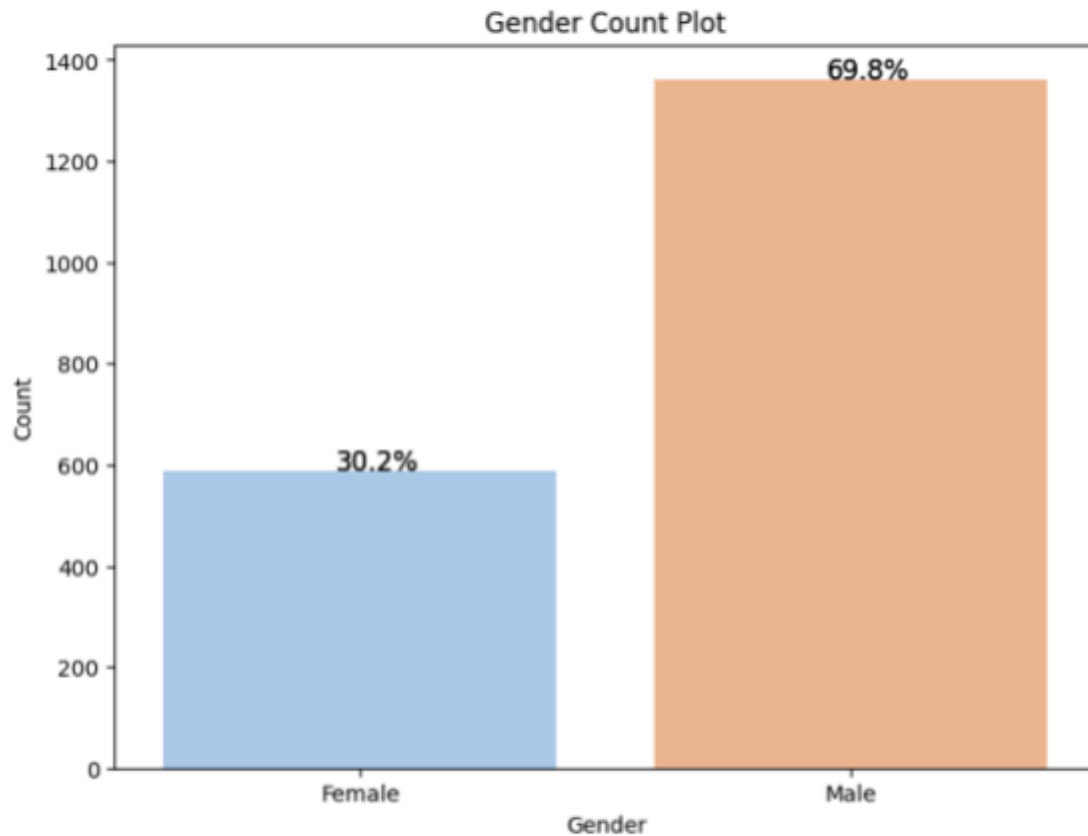
The graph illustrates the gender distribution in the dataset, showing a clear predominance of males over females, with males making up 69.9% and females 30.1%.

Waiver/Scholarship Count Plot

The graph shows that most people (79.6%) do not have a waiver or scholarship for school. Only a small number of people (20.4%) have some kind of financial help for school.

First Hypothesis Analysis:

There is a statistically significant difference in anxiety levels between females and males.
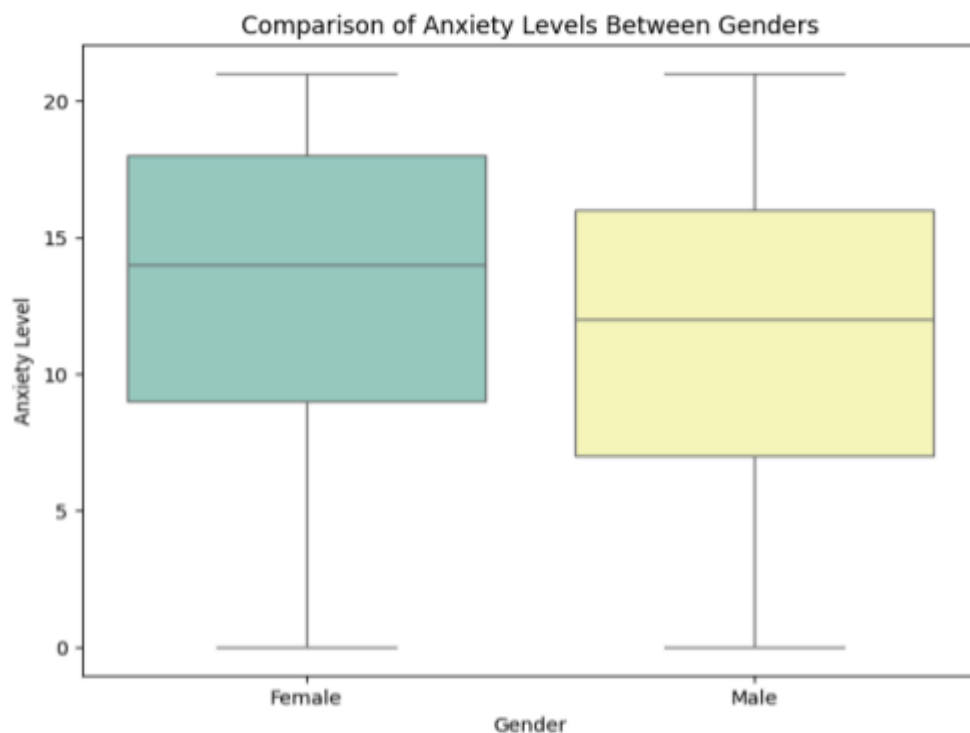
```
Z-statistic: -5.6299
P-value: 1.8034e-08
The p-value is less than the alpha level (0.05).
We reject the null hypothesis (H₀).
This suggests that there is a statistically significant difference in
anxiety levels between male and female students.
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Comparison of Anxiety Levels Between Genders

This box plot compares anxiety levels between females and males. Females appear to have higher anxiety levels overall, with more variability in scores compared to males. However, there is some overlap between the groups, indicating that individual differences exist.

Overall Conclusion

We can conclude that there is a strong relationship between gender and anxiety levels. Female students tend to have higher anxiety levels compared to male students, and this difference is statistically significant.

Second Hypothesis Analysis:

There is a significant positive correlation between the frequency of appetite issues (poor appetite or overeating) and depression value among students.

F-value: 287.52409589449763, P-value: 2.052332594264456e-294
The p-value is less than the alpha level so, We reject the null
hypothesis.
This suggests that there is a statistically significant effect of
Gender, Appetite Issues, and their interaction on Depression values.
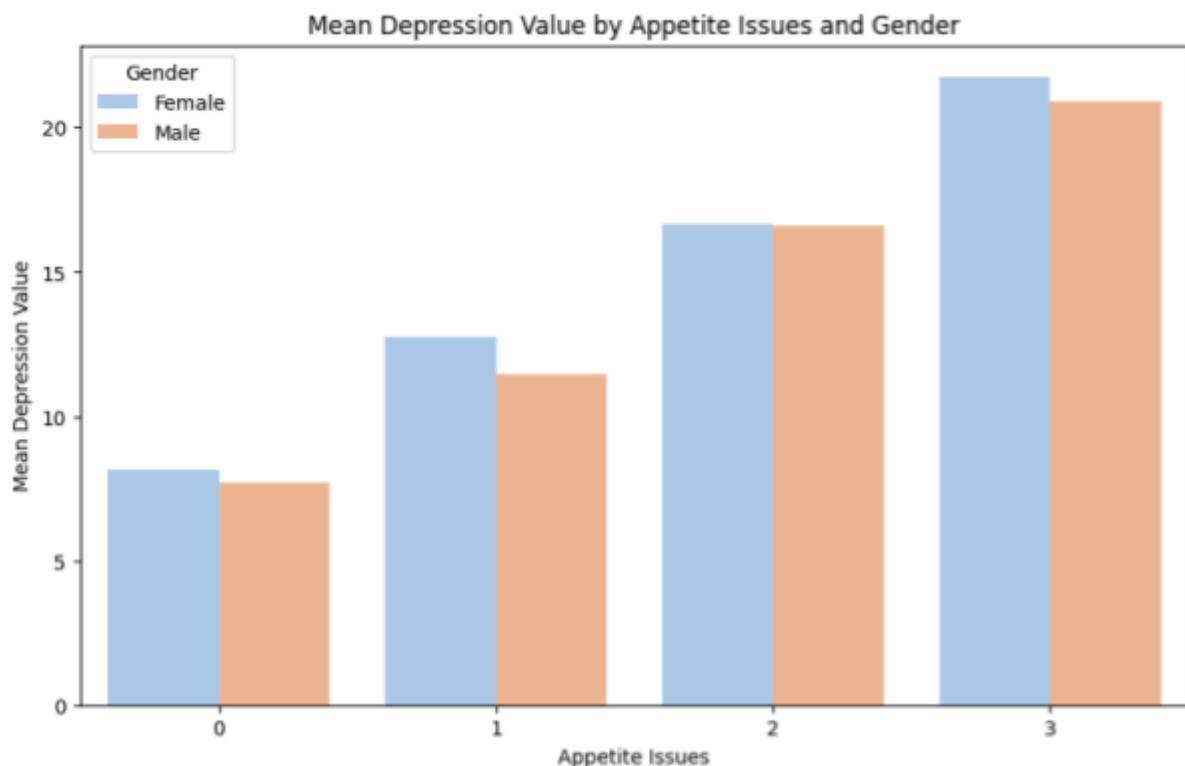
The bar chart shows a clear relationship between appetite issues and depression
levels for both males and females. As appetite issues increase, so does the mean
depression value. Additionally, the chart hints at potential gender differences in this
relationship, especially at lower appetite issues.

Overall Conclusion

We can conclude that there is a strong relationship between appetite issues and depression levels. The severity of appetite issues is associated with higher levels of depression, and this relationship appears to be consistent across both males and females

Hypothesis Testing Steps

1st Hypothesis

- **Step 1:** The null and alternative hypotheses were defined as mentioned earlier.

- **Step 2:** The Z-test was selected to analyze the data.

- **Step 3:** The Z-statistic calculated was -5.6299, and the p-value was 1.8034e-08.

- **Step 4:**
    - Since the p-value is less than the significance level (α=0.05), we reject the null hypothesis (H_0).
    - This indicates a statistically significant difference in anxiety levels between male and female students.

2nd Hypothesis

- **Step 1:** The null and alternative hypotheses were defined as mentioned earlier.

- **Step 2:** The ANOVA test was selected to analyze the data.

- **Step 3:** The F-value calculated was 207.345019954879, and the p-value was 1.05233239524645e-294.

- **Step 4:**

    - Since the p-value is less than the significance level (α=0.05), we reject the null hypothesis (H0).
    - This indicates a statistically significant effect of gender, appetite issues, and their interaction on depression values.

Conclusion

The analysis shows that gender has a big impact on the mental health of university students. Female students report higher levels of anxiety and depression, especially when they also have appetite issues. This difference between males and females means that mental health support should be tailored to meet the specific needs of female students. The connection between gender, anxiety, and depression suggests that these issues are closely related, with appetite problems making things even harder for females. To better support all students, mental health services should consider both gender and appetite-related challenges, helping to ensure students' well-being and success in an increasingly demanding academic environment.

Any potential issues

1. Data Privacy: The dataset contains potentially sensitive information, such as details about personal mental health states. Ensure that data handling complies with relevant data protection laws and ethical guidelines.

2. Column Renaming: Simplify column names, originally in the form of questions, to one-word names for easier reference and analysis.