



# An In-Depth Examination of Student Stress Levels: A Comprehensive Analysis

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**Abstract.** This study presents a detailed analysis of student stress levels based on a comprehensive dataset gathered from undergraduate and graduate students across diverse disciplines. The dataset includes self-reported stress levels, demographic information, academic performance metrics, and factors contributing to stress. Utilizing statistical analysis techniques, including correlation analysis, regression modelling, and clustering algorithms, we uncover patterns and relationships within the dataset. Our analysis explores the impact of various factors such as academic workload, time management skills, social support networks, and coping mechanisms on student stress levels. Additionally, we investigate demographic differences in stress experiences, considering factors such as academic year. Preliminary findings reveal a complex interplay of factors influencing student stress levels. Academic workload emerges as a significant predictor of stress, with students reporting higher stress levels during peak academic periods. However, the relationship between workload and stress is moderated by factors such as time management skills and social support, highlighting the importance of individual coping strategies.

**Index Terms:** Acute stress and chronic stress.

## I Introduction

Stress is a big problem for students. That's why I decided to analyse this dataset with about 20 different things that can make students stressed. Understanding and addressing student stress is crucial for creating a healthier and more effective educational environment.

The insights gained from this analysis can be instrumental in enhancing the wellbeing and academic success of students. To conduct this analysis, we will employ Python, the most used programming language in data analysis. We will apply various statistical techniques to extract meaningful patterns and insights from the student stress data, providing a data-driven foundation for informed decision-making.

### Objectives

- To check which physiological factor has the most impact on student stress.
- To check which physiological factor has the most impact on student stress.
- To examine what percentage of students have reported experiencing depression.
- To check the relation between anxiety level and academic performance.

## II Research Methodology

In this project we have analysed the Student Stress analysis. The student stress analysis dataset was used to perform the data study is taken from Kaggle. There were 11001 rows and 20 columns in this dataset. The physiological factors, headaches exhibit the strongest correlation with stress levels, indicating that students experiencing more

frequent headaches are more likely to report higher stress levels. Following headaches, breathing problems and blood pressure also display positive correlations with stress, suggesting that these physiological factors can also contribute to elevated stress levels in students.

### III Graphical Representation

1. Which physiological factor has the most impact on student stress?

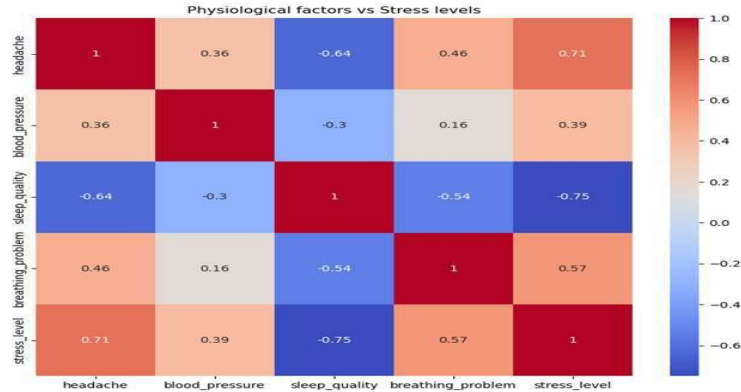


Figure 1: Physiological factors Vs. Stress levels

#### Interpretation

From above the Heat map, among the physiological factors, headaches exhibit the strongest correlation with stress levels, indicating that students experiencing more frequent headaches are more likely to report higher stress levels. Following headaches, breathing problems and blood pressure also display positive correlations with stress, suggesting that these physiological factors can also contribute to elevated stress levels in students.

On the other side, the data reveals a potentially reassuring trend students who report experiencing good sleep quality tend to exhibit lower stress levels. This association implies that ensuring students have better sleep quality may contribute to reducing their overall stress levels.

2. Which physiological factor has the most impact on student stress?

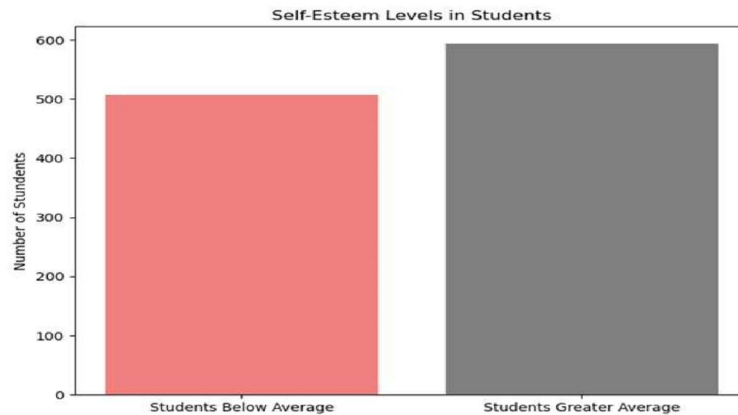


Figure 2: Self-Esteem levels in Students

**Interpretation**

- The average of self-esteem in the dataset is: 17.78
- Number of students that have less than the average level of self-esteem is: 507

3. What percentage of students have reported experiencing depression.

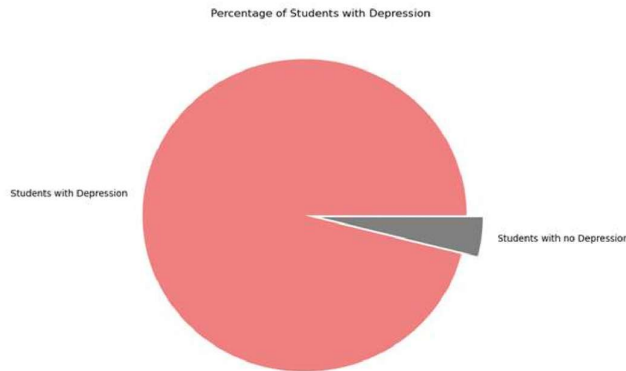


Figure 3: Percentage of Student with Depression

**43 Interpretation**

From the above pie-diagram we conclude that approximately 96% of the students, totalling 1,056 individuals, have encountered depression at some point in their lives. This statistic underscores the significant issue that many students face with on a daily basis.

**IV Pearson Correlation Coefficient**

To check correlation between Anxiety level and academic performance

**Hypothesis**

- **H0:** There is no significant relationship between anxiety level and academic performance
- **H1:** There is a significant relationship between anxiety level and academic performance

Table 1: Pearson Correlation Coefficient

Pearson Correlation coefficient	p-value
0.8728	0.0533

**V Result**

Since  $\alpha=0.05 > p\text{-value}=0.0533$   
 Therefore, Reject H0

**Conclusion**

We conclude that, there is a significant relationship between anxiety level and academic performance.

□ One-Way Anova:

To check significant difference in depression level and two group



### Hypothesis

- **H0:** There is no significant difference in depression level between the groups.
- **H1:** There is a significant difference in depression level between the groups.

Table 2: F-Statistics

F-Statistics	p-value
24.4981	0.0002284

Since  $\alpha=0.05 < P\text{-value} = 0.00004802$   
Therefore, we reject H0

## VI Conclusion

We conclude that, there is significant difference in depression level between the groups.

### Major Finding

- To physiological factors, headaches exhibit the strongest correlation with stress levels, indicating that students experiencing more frequent headaches are more likely to report higher stress levels. Following headaches, breathing problems and blood pressure also display positive correlations with stress, suggesting that these physiological factors can also contribute to elevated stress levels in students.
- The data reveals a potentially reassuring trend students who report experiencing good sleep quality tend to exhibit lower stress levels. This association implies that ensuring students have better sleep quality may contribute to reducing their overall stress levels.
- The average of self-esteem in the dataset is: 17.78 Number of students that have less than the average level of self-esteem is: 507
- We conclude that approximately 96% of the students, totalling 1,056 individuals, have encountered depression at some point in their lives. This statistic underscores the significant issue that many students face with on a daily basis

### Future Scope

- Encouraging interdisciplinary collaboration among educators, psychologists, healthcare professionals, and technology experts can yield innovative solutions to address student stress comprehensively.
- Understanding how stress evolves throughout the academic journey can inform targeted interventions at different stages.
- Schools and colleges can make rules that focus on making students feel less stressed.
- We can use gadgets like phones and smart watches to see how stressed students are and give those help when they need it.

### References

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