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“Study on stress levels of university students using the Perceived Stress Scale”



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B.Sc (Statistics hons.)

A STUDY ON
“STRESS LEVELS OF UNIVERSITY STUDENTS USING THE
PERCIEVED STRESS SCALE”



A PROJECT REPORT
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UNDER THE SUPERVISION OF:

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DECLARATION

I, **Bithal Baibhav Nayak** hereby declare that the project titled *"A study on stress levels of university students using the perceived stress scale"* is submitted by me, under the guidance and supervision of **Prof. S K Upadhyay**. I also declare that it has not been submitted previously in part or in full to this university or any university or institution for the award of any degree or diploma.

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CERTIFICATE

This is to certify that the project report titled *"A study on stress levels of university students using the perceived stress scale"* has been completed in its original form by **Bithal Baibhav Nayak**, BSc (Statistics hons.) student, Department of Statistics, Institute of Science, Banaras Hindu University.

This project has been successfully completed under my supervision and is recommended for evaluation.

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Last but not the least, I thank the Department of Statistics and Banaras Hindu University for giving me the opportunity and all the facilities required to complete this project "A study on stress levels of university students using the perceived stress scale".

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ABSTRACT

Owing to the academically competitive scenario in today's education forums, university students experience mental stress on a regular basis. The demographic background and lifestyle behaviors of a student play a key role in how he/she copes up with stressful situations. This project aims to study stress levels of university students using the perceived stress scale (PSS). Demographic data like age, gender, family income, residence locality and lifestyle data like academic workload, physical exercise, social media use, daily food and sleep habits, etc. were collected through a self-developed online questionnaire. Based on the PSS scale, mental stress scores of the 228 surveyed students were calculated and they were categorized into low, moderate or high stress levels. The results revealed that majority of the students were 'moderately' stressed. Studying increasing and decreasing trends of extreme stress levels (low stress and high stress) in graphs and through the chi-square test of independence, it was interpreted that regular, active lifestyle is associated with balanced mental health. The stereotype around mental health existing in society must be addressed to ensure free communication and mental well-being of university students and people in general.

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INTRODUCTION

According to the World Health Organization, “Stress can be defined as a state of worry or mental tension caused by a difficult situation.” Stress is a natural human response that prompts us to address challenges and threats in our lives. Everyone, especially students and working individuals experience stress to some degree. The way we respond to stress, however, makes a big difference to our overall well-being.

Stress affects both the mind and the body. A little bit of stress or pressure is good and can help us perform daily activities more efficiently. Too much stress can cause physical and mental health problems. Everyone reacts differently to stressful situations. Coping styles and symptoms of stress vary from person to person. Learning how to cope with stress can help us feel less overwhelmed and support our mental and physical well-being.

Stress and related health concerns

Stress makes it hard for us to relax and can come with a range of emotions, including anxiety and irritability. When stressed, we may find it difficult to concentrate academically or professionally. We may experience headaches or an upset stomach resulting in a loss of appetite and troubled sleep schedule. Chronic stress can worsen pre-existing health problems and may result in increased use of alcohol, tobacco and other substances.

Stressful situations can also cause or aggravate mental health conditions, most commonly anxiety and depression, which require proper diagnosis and health care. A chronic mental health condition may be because of persistent stress symptoms that have started affecting one’s daily functioning, including at work or school.

On your body	On your mood	On your behaviour
Headache	Anxiety	Overeating or undereating
Muscle tension or pain	Restlessness	Angry outbursts

On your body	On your mood	On your behaviour
Chest pain	Lack of motivation or focus	Drug or alcohol misuse
Fatigue	Feeling overwhelmed	Tobacco use
Sleep problems	Irritability or anger	Social withdrawal
Stomach upset	Sadness or depression	Exercising less often

Need for the study

In today's education scenario, college students report dealing with varying levels of stress for a number of different reasons. Common ones include increased responsibilities, lack of good time management, changes in eating and sleeping habits, excess exposure to social media, etc.

Some predictable stressful situations include studying for competitive examinations, competing for an internship, preparing for a job interview, etc.

This project aims to study the stress levels of university students of different backgrounds and lifestyle behaviours. The mental stress score is calculated using the "Perceived Stress Scale" also popularly known as the PSS Scale.

Perceived Stress Scale

The **Perceived Stress Scale** was first developed by Sheldon Cohen and his colleagues. The PSS scale was developed to measure the degree to which situations in one's life are appraised as stressful. Psychological stress has been defined as the extent to which persons perceive (appraise) that their demands exceed their ability to cope.

The PSS was published in 1983, and has become one of the most widely used psychological instruments for measuring nonspecific perceived stress among students. It has been used in studies assessing the stressfulness of situations, the effectiveness of stress-reducing

interventions, and the extent to which there are associations between psychological stress and psychiatric and physical disorders.

The questions in the PSS scale ask about the respondent's feelings and emotions during the last one month. In each case, the respondents must reply how often they feel a certain way. The various degrees of agreement are:

- Never
- Sometimes
- Fairly often
- Very often

A "Never" response carries 1 point.

A "Sometimes" response carries 2 points.

A "Fairly often" response carries 3 points.

A "Very often" response carries 4 points.

In this scale, based on the responses of the patient, a mental stress score is calculated roughly categorising the patient into any of the below three stress categories:

- Mild Stress
- Moderate Stress
- High Stress

A higher PSS score implies comparatively higher stress levels in an individual.

Literature Review

Kechter (2019) observed that the PSS scale can be used for children aged 12 and above. The measure has been validated in both adolescent and adult populations.

Initial evidence suggests that the PSS scale may allow for meaningful comparisons across different racial, ethnic or linguistic groups. **Makhubela (2020)** found that the measure was invariant across gender and race (Black African and White) in South-African university students. In addition, **Baik (2019)** reported that the tool allowed for meaningful comparison between English and Spanish-speaking Hispanic Americans. However, more research is needed to explore the measurement invariance of the tool in different contexts.

Lee (2012) conducted a review of the psychometric properties of all three versions of the PSS and found that the psychometric properties of the PSS-10 are superior to those of the PSS-14 and PSS-4.

The criterion validity of PSS scale was evaluated and it was strongly correlated with the mental component of health status as measured by the Medical Outcomes Study – Short Form 36 (**Ware, Snow, Kosinski, & Grandek, 1993**).

The PSS was either moderately or strongly correlated with the hypothesized emotional variables, such as depression or anxiety, as measured using the Center for Epidemiologic Studies Depression Scale (**Radloff, 1977**), Inventory to Diagnose Depression (**Zimmerman & Coryell, 1987**), Beck Depression Inventory (**Beck, Steer, & Garbin, 1988**), Hospital Anxiety and Depression Scale (**Zigmond & Snaith, 1983**), State-Trait Anxiety Inventory (**Spielberger, 1983**), General Health Questionnaire (**Goldberg & Williams, 1991**), Edinburgh Postnatal Depression Scale (**Cox, Holden, & Sagovsky, 1987**), Thai Depression Inventory (**Lotrakul & Sukanich, 1999**), and Depression Anxiety Stress Scale – 21 (**Lyrakos, Arvaniti, Smyrnioti, & Kostopanahiotou, 2011**).

Methodology of the survey

In any type of survey or experiment, a pre-planned systematic approach is required for the successful completion of the project in minimum time and cost. Managing all the available resources and time available, the survey was conducted under the following methodology.

Planning of the survey:

Planning included selection of topic, preparation of the questionnaire, a scale to measure stress levels and selection of the sample covering the required objective.

The Perceived Stress Scale (PSS) scale was used to calculate the mental stress score of the respondent. The number of questions from the PSS-10 scale were reduced and simplified in order to get free and proper responses. The appropriate scaling was done while calculating the corresponding stress score. The questions were formed in a manner to allow relevant data analysis in context of the topic. The questions also aimed to cover various demographic features of the respondent in order to check how mental stress levels are distributed across different lifestyles and backgrounds.

Objectives of the survey:

The main aim of the project was

- To study mental stress levels of university students of different demographic backgrounds, and
- To check for any association between the respondent's lifestyle and their corresponding mental stress level.

Area of the survey:

The student population of Banaras Hindu University was selected for the survey. The respondents were majorly of science (Bachelor of Science BSc., Masters of Science MSc.) and humanities (Bachelor of Arts BA.) majors.

Sampling method:

Simple Random Sampling (SRS) method was used for the survey. The total number of responses for the survey on mental stress levels of university students was 228.

Collection of data:

The methods used to collect quantitative data are through observation, interview method, questionnaire method. The online questionnaire method was used data collection in this survey.

Data was collected using an online questionnaire (Google Form) which was circulated to students through personal and mutual contacts, social media groups, surveying in public

spots such as libraries and canteens, etc. to obtain a representative sample for further analysis.

Duration of the survey:

The survey was conducted in the month of March, 2023. The data analysis and compilation of the project report was completed in April, 2023.

Data analysis and interpretation:

The several demographic characteristics of the data collected include:

- A. Age (in years)
- B. Gender
- C. Family income
- D. Residential locality (rural/urban)

The questionnaire also covered other probable causes of mental stress such as:

- A. Workload
- B. Physical activity (sports, exercise, etc.)
- C. Social media use
- D. Sense of comparison to the perfect life portrayed on social media.
- E. Upcoming examination or job interview
- F. Sleep Schedule
- G. Diet behavior
- H. Smoking, drinking or substance use

The distribution of stress levels of university students was calculated using the PSS scale. In the questionnaire, there were five subjective questions on how often the respondent felt different symptoms of mental stress in the past 1 month. The levels of agreement were:

1. "Never" response carries 1 point.
2. "Sometimes" response carries 2 points.
3. "Fairly often" response carries 3 points.
4. "Very often" response carries 4 points.

The stress scores of the respondents were calculated based on the above notations falling into any of the below three stress level categories.

PSS score	Stress level
5.0 – 8.0	Mild Stress
9.0 – 14.0	Moderate Stress
15.0 – 20.0	High Stress

The distribution of stress scores across the demographic attributes were studied using **graphical representation**.

The association few variables with the respondent's PSS score were studied by the **Chi-Square test** analysis.

The **coefficient of correlation** of few variables with the PSS score were also calculated.

Chi-Square test

calculated

$$\chi^2 = \sum_i \frac{(O_i - E_i)^2}{E_i}$$

where;

O_i = Observed frequency

E_i = Expected frequency

df (Degree of freedom) = (no of rows – 1)*(no of columns – 1)

If the calculated chi square value is found to be greater than the tabulated chi square value, the null hypothesis is rejected implying a significant relationship between the nominal and ordinal variables.

Coefficient of correlation

$$r = \frac{\sum (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum (x_i - \bar{x})^2 \sum (y_i - \bar{y})^2}}$$

Where,

r = Pearson Correlation Coefficient

x_i = x variable samples y_i = y variable sample

\bar{x} = mean of values in x variable \bar{y} = mean of values in y variable

Graphical Representation

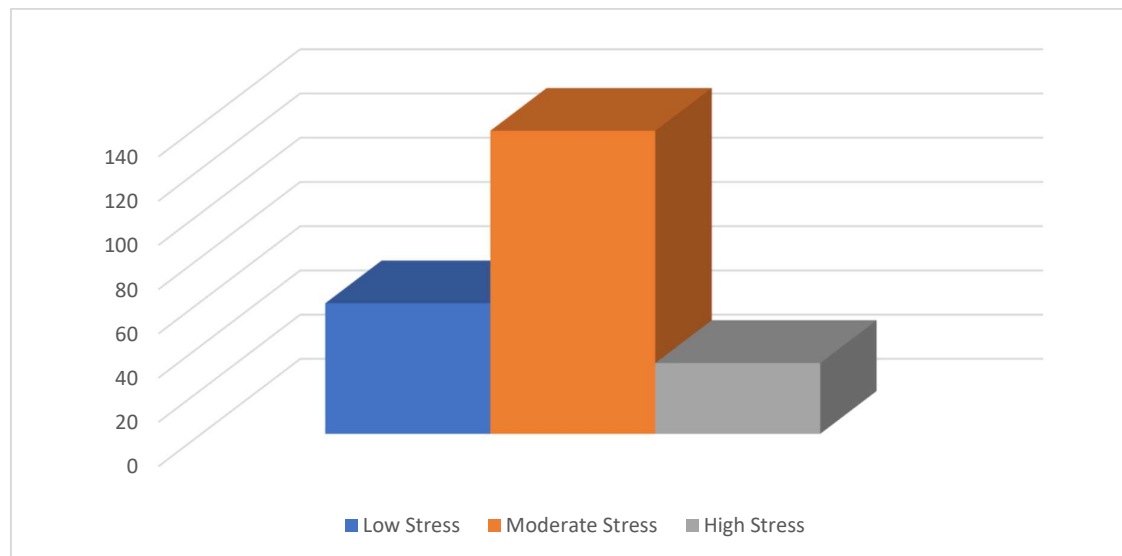
The distribution of stress levels (low, moderate, high) according to other concerned variables were calculated in the form of pivot tables in **Microsoft- EXCEL** and the essential analysis was conducted. The observed data was then represented in bar graphs and pie charts.

Tabulation and graphical representation

Based on the responses to five subjective questions on how often the respondent felt different symptoms of mental stress in the past 1 month, the stress levels of the respondents were calculated using the perceived stress scale (PSS).

The overall frequency-distribution of student respondents into stress level categories of low, moderate and high are as tabulated below.

Stress Level	Number of respondents
Low	59
Moderate	137
High	32



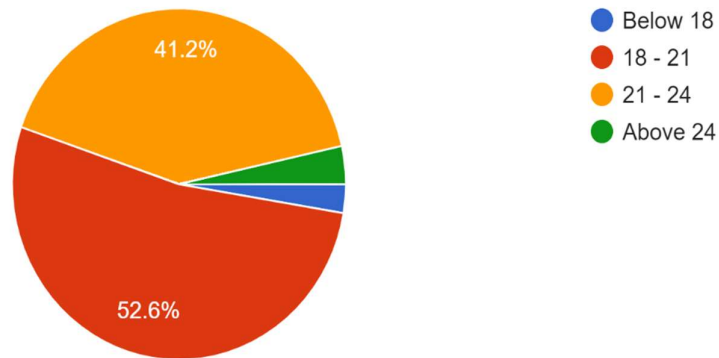
This section of the project involved tabulation and graphical representation (pie-charts) of the data received through the questionnaire responses. The responses were then divided into different stress-level categories and were represented in tables of percentages and bar-graphs were plotted for the same.

Based on the observations of increasing and decreasing trends in stress levels from the bar graphs, several valid interpretations were made.

Age:

Age (in years)

228 responses



The age-wise responses received are as tabulated below.

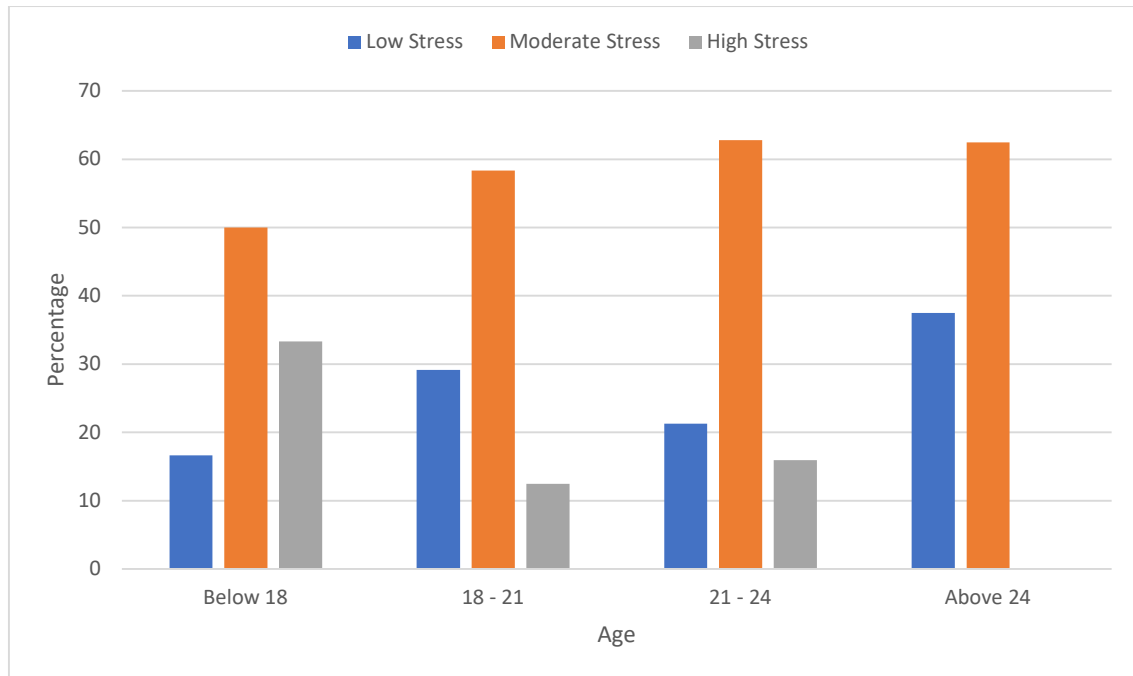
Age (in years)	Frequency	Percentage
Below 18	6	2.6 %
18 – 21	120	52.6 %
21 – 24	94	41.2 %
Above 24	8	3.5 %

The distribution (in percentages) of the respondents into the different stress level categories based on their age (in years) is tabulated below.

Age	Low Stress	Moderate Stress	High Stress
<u>Below 18</u>	16.66%	50.00%	33.33%
<u>18 – 21</u>	29.16%	58.33%	12.50%

<u>21 – 24</u>	21.27%	62.76%	15.96%
<u>Above 24</u>	37.50%	62.50%	-----

The bar graph of the above tabulated data is:

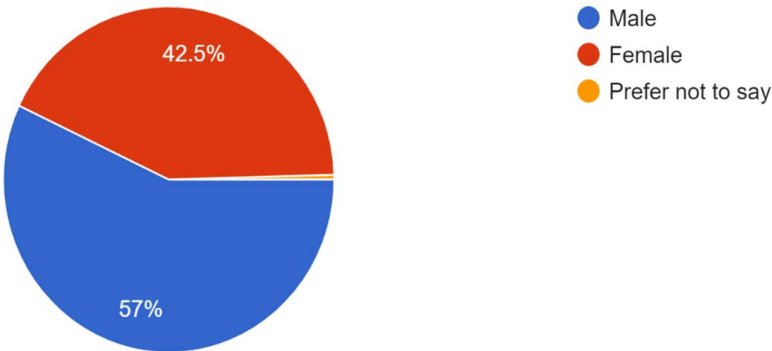


Interpretations:

- The concerned population being university students, majority of the respondents belong to either 18 – 21 years or 21 – 24 years age groups.
- The percentage constituent of moderately stressed students is higher in the older age groups than the younger ones.

Gender:

Gender
228 responses



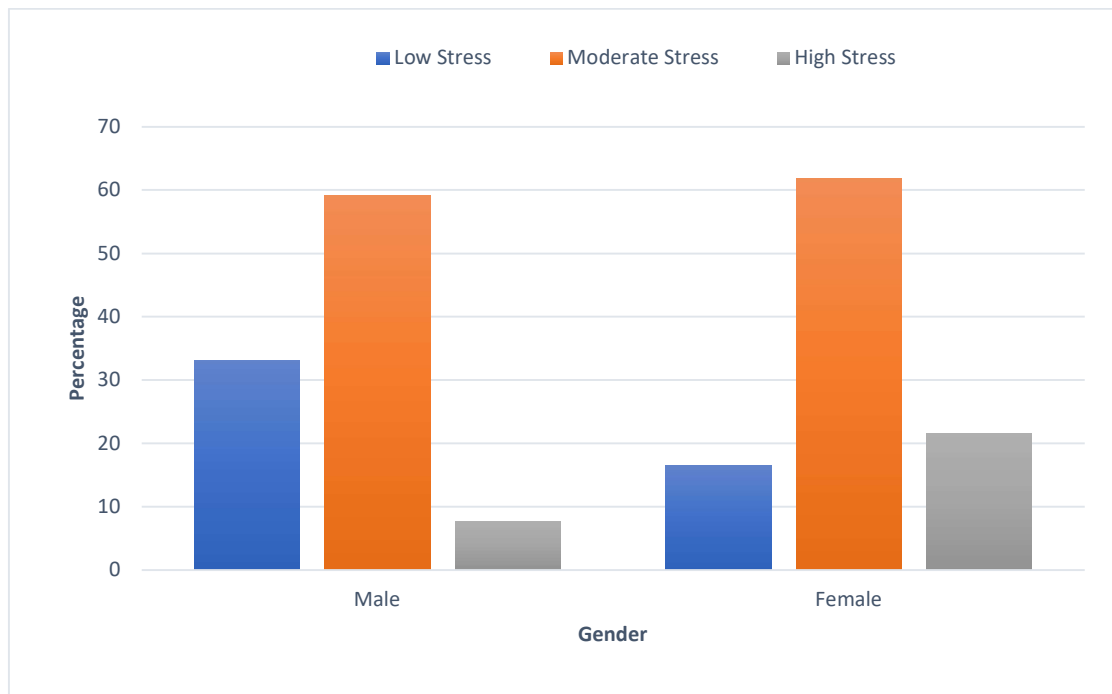
The gender-wise responses received are as tabulated below.

Gender	Frequency	Percentage
Male	130	57 %
Female	98	43 %

The distribution (in percentages) of the respondents into the different stress level categories based on their gender is tabulated below.

Gender	Low Stress	Moderate Stress	High Stress
Male	33.07%	59.23%	7.70%
Female	16.50%	61.85%	21.65%

The bar-graph for the above tabulated data is:



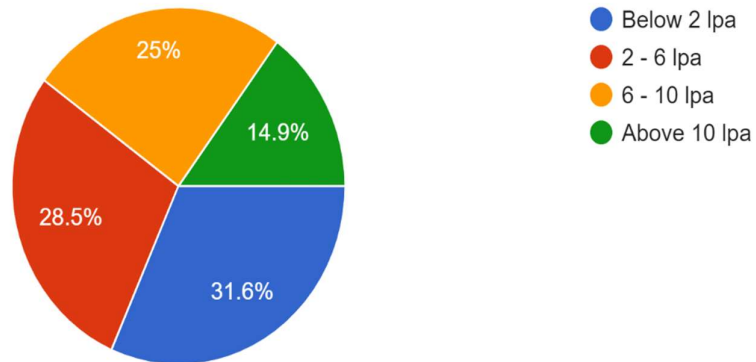
Interpretations:

- Based on gender, 57% were male respondents and 43% were female respondents.
- A larger percentage of male respondents were observed to be experiencing low stress as compared to the female respondents.
- Whereas, a larger percentage of female respondents were observed to be highly stressed compared to the male respondents.
- The moderate stress level is almost equally experienced by both males and females.
- **Therefore, it can be interpreted that the female respondents experience higher stress levels compared to male respondents.**

Family Income:

Family income (lakhs per annum)

228 responses

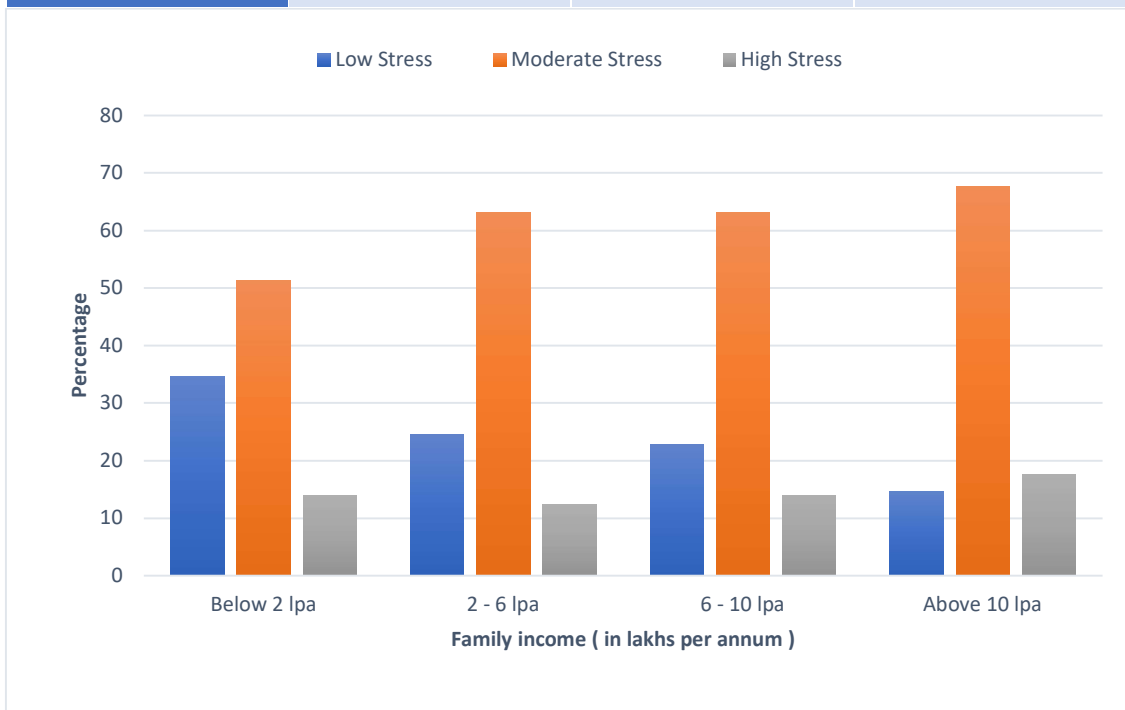


The family-income wise responses received are as tabulated below.

Family Income (in lakhs per annum)	Frequency	Percentage
Below 2 lpa	72	31.6 %
2 – 6 lpa	65	28.5 %
6 – 10 lpa	57	25 %
Above 10 lpa	34	14.9 %

The distribution (in percentages) of the respondents into the different stress level categories based on their family income is tabulated below.

<u>Family income</u>	<u>Low Stress</u>	<u>Moderate Stress</u>	<u>High Stress</u>
<u>Below 2 lpa</u>	34.72%	51.38%	13.88%
<u>2 – 6 lpa</u>	24.61%	63.07%	12.31%
<u>6 – 10 lpa</u>	22.80%	63.15%	14.03%
<u>Above 10 lpa</u>	14.70%	67.64%	17.65%



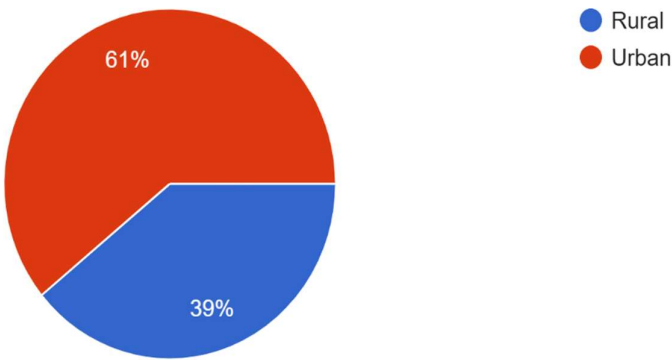
Interpretations:

- 31.6% of the respondents belonged to the 'Below 2 lpa' income slab, 28.5% of the respondents belonged to the '2 – 6 lpa' income slab, 25% of the respondents belonged to the '6 – 10 lpa' income slab and 14.9% of the respondents belonged to the 'Above 10 lpa' income slab
- The respondents are almost evenly distributed across all the income categories except the higher income category (10 lakhs per annum or above).
- If observed closely, the number of respondents decrease as the family income levels rise.
- **There is a larger percentage of low-stressed individuals among the higher income groups than in the lower income groups.**

Residential (home) Locality:

Residential locality (home)

228 responses



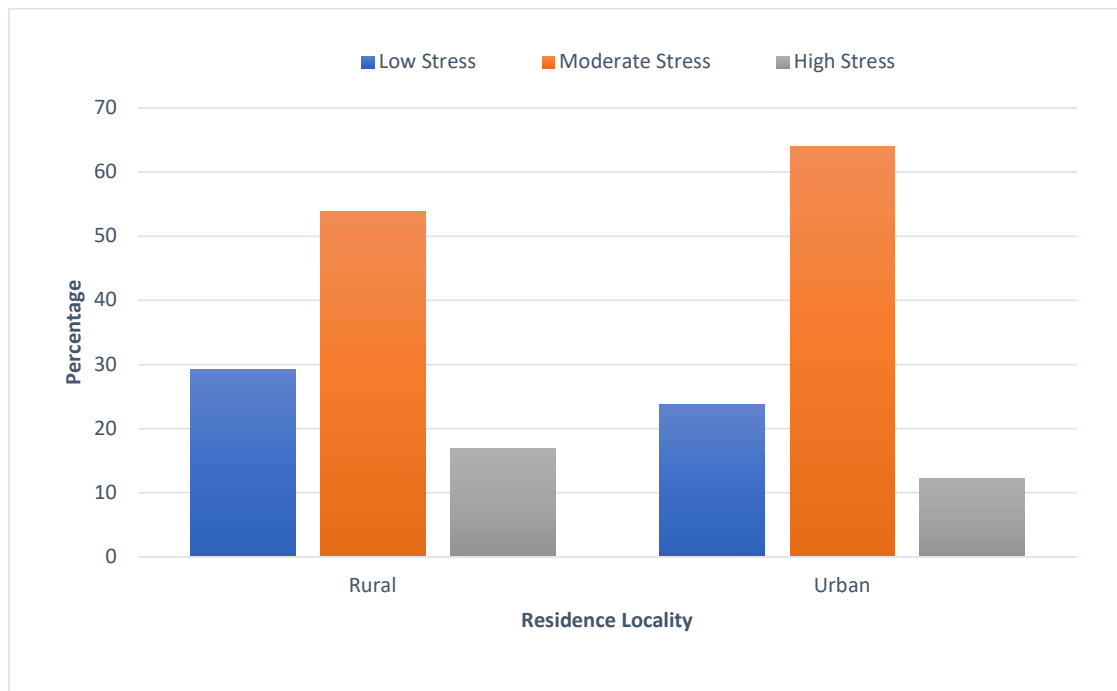
The residential-locality-wise responses received are as tabulated below.

Residence locality	Frequency	Percentage
Urban	139	61 %
Rural	89	39 %

The distribution (in percentages) of the respondents into the different stress level categories based on their residential locality is tabulated below.

Residence	Low Stress	Moderate Stress	High Stress
Rural	29.21%	53.93%	16.85%
Urban	23.74%	64.03%	12.23%

The bar graph for the above tabulated data is:



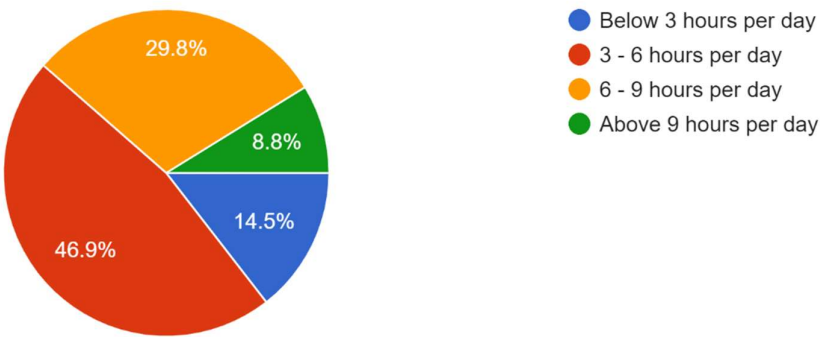
Interpretations:

- A larger portion of the respondents (61%) hailed from urban areas whereas only 39% of the respondents hailed from rural areas.
- A larger percentage of students (29.21%) hailing from rural areas experienced low stress as compared to 23.74% of students hailing from urban areas.
- A larger percentage of students (16.85%) hailing from rural areas experienced high stress as compared to 12.23% of students hailing from urban areas.
- A larger percentage of students (64.03%) hailing from urban areas experienced moderate stress levels as compared to 53.93% of students hailing from rural areas.

Academic Workload:

How many hours of workload do you have on an average?

228 responses



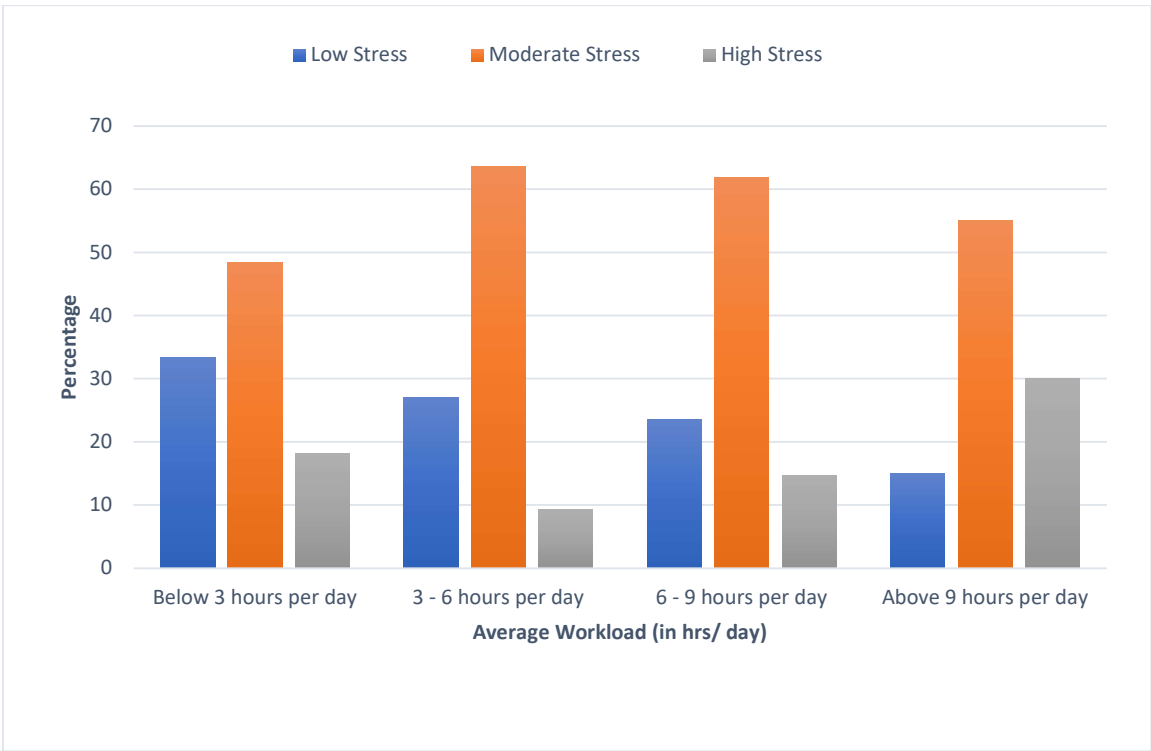
The daily workload-wise responses received are as tabulated below

Daily Workload (In hours per day)	Frequency	Percentage
Below 3 hours per day	33	14.50%
3 – 6 hours per day	107	46.90%
6 – 9 hours per day	68	29.80%
Above 9 hours per day	20	8.80%

The distribution (in percentages) of the respondents into the different stress level categories based on their daily academic workload is tabulated below.

<u>Academic workload</u>	<u>Low Stress</u>	<u>Moderate Stress</u>	<u>High Stress</u>
<u>Below 3 hours per day</u>	33.33%	48.48%	18.19%
<u>3 – 6 hours per day</u>	27.10%	63.55%	9.35%
<u>6 – 9 hours per day</u>	23.52%	61.76%	14.72%
<u>Above 9 hours per day</u>	15.00%	55.00%	30.00%

The bar-graph for the above tabulated data is:



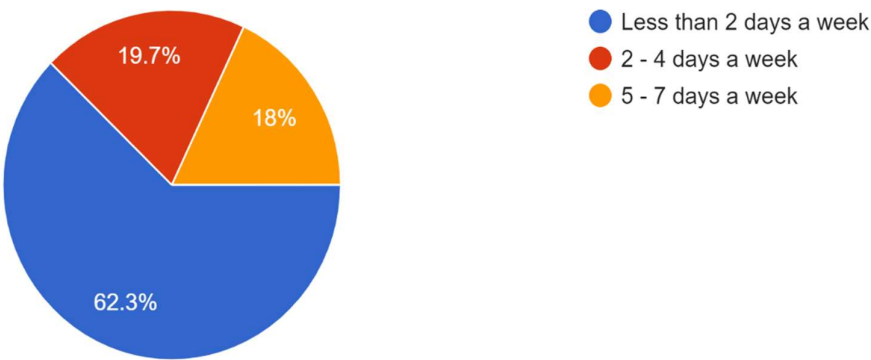
Interpretations:

- 14.50% of the respondents have less than 3 hours of academic workload per day. 46.90% of the respondents have 3 – 6 hours of academic workload per day. 29.80% of the respondents have 6 – 9 hours of academic workload per day. 8.80% of the respondents have more than 9 hours of academic workload per day.
- Majority of the students who responded were either from '3 – 6 hours per day' or '6 – 9 hours per day' academic workload categories.
- From the bar-graph, it can be clearly observed that with increase in daily academic workload, the percentage of low-stressed students decrease.
From the bar-graph, it can be clearly observed that with increase in daily academic workload, the percentage of high-stressed students increase.
- In the 'Above 9 hours per day' workload category, 30% (almost one-third) of the respondents are highly stressed.
In the 'Below 3 hours per day' workload category, 33.33% (one-third) of the respondents experience low stress levels.
- **Therefore, it can be interpreted that with increasing academic workload, the individuals with high stress levels increase and with decreasing academic workload, a larger percentage of low-stressed individuals are recorded.**

Physical Activity (sports, exercise, etc.):

How many days in a week do you engage in physical activity? (sports, exercise, etc.)

228 responses



The responses on physical activity (sports, exercise, etc.) in a week are as tabulated below.

Physical exercise	Frequency	Percentage
Less than 2 days a week	142	62.30%
2 – 4 days a week	45	19.70%
5 – 7 days a week	41	18.00%

The distribution (in percentages) of the respondents into the different stress level categories based on their weekly physical exercise is tabulated below.

Physical exercise	Low Stress	Moderate Stress	High Stress
Less than 2 days a week	22.53%	58.45%	19.02%
2 – 4 days a week	33.33%	57.78%	8.89%
5 – 7 days a week	29.27%	68.29%	2.44%

The bar-graph of the above tabulated data is:



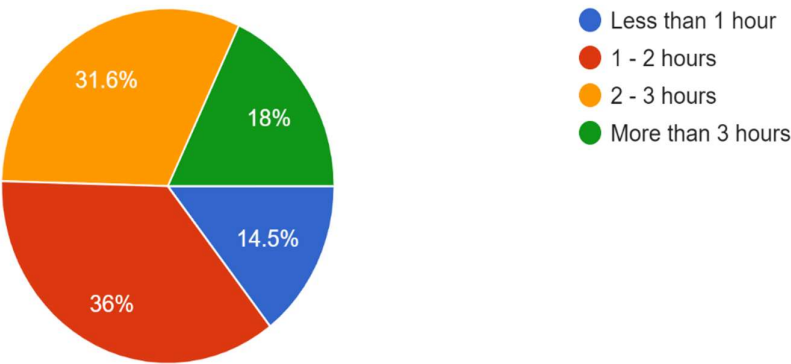
Interpretations:

- 62.30% of the respondents exercised less than 2 days a week. 19.70% of the respondents exercised 2-4 days a week. 18% Of the respondents exercised 5-7 days a week.
- Majority of the students (62.30%) do not involve frequently in physical activities like sports, exercise, etc.
- As it can be clearly observed from the bar-graphs, the students exercising less frequently experience higher stress levels.
- 19.02% of the respondents who exercise less than 2 days a week fall into the highly-stressed category, 8.89% of the respondents who exercise 2-4 days a week are highly-stressed but only 2.44% of the respondents who exercise 5-7 days a week experience high stress.
- **Therefore, it can be interpreted that the individuals who exercise on a regular basis experience lower stress level.**

Social media use:

How much time do you spend on a daily basis on social media?

228 responses



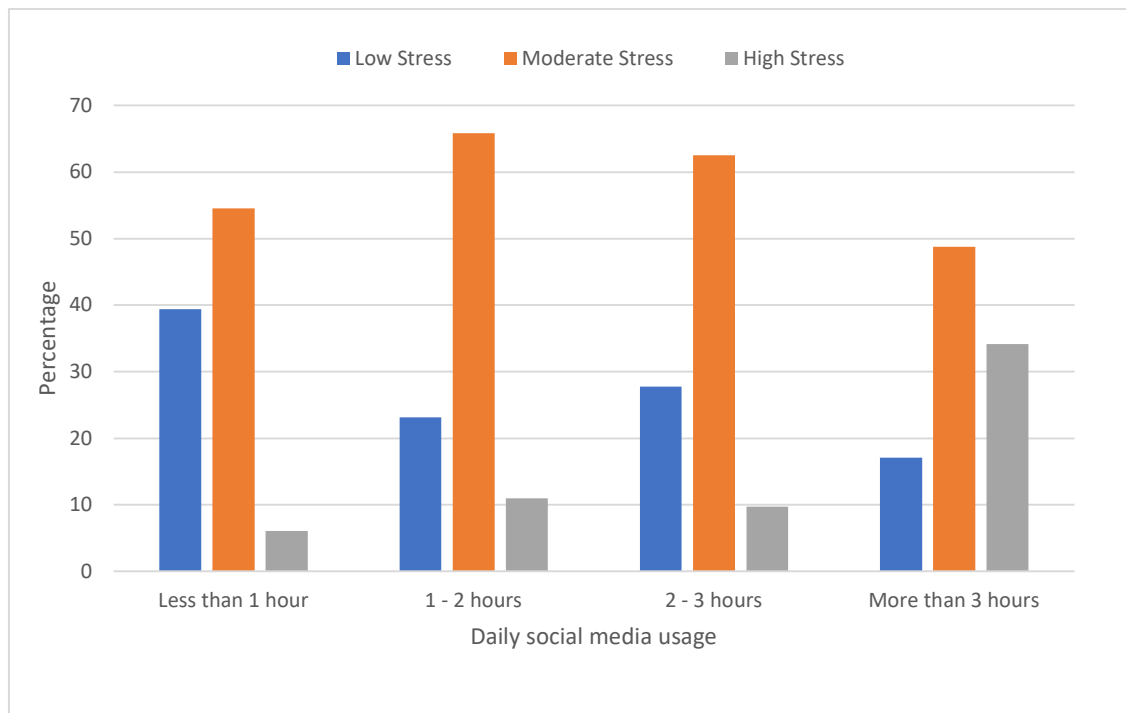
The students’ responses on their daily activity on social media platforms are as tabulated below.

Daily social media use	Frequency	Percentage
Less than 1 hour	33	14.50%
1 – 2 hours	82	36.00%
2 – 3 hours	72	31.60%
More than 3 hours	41	18.00%

The distribution (in percentages) of the respondents into different stress level categories based on their daily social media use is tabulated below.

Social media usage	Low Stress	Moderate Stress	High Stress
Less than 1 hour	39.39%	54.54%	6.07%
1 – 2 hours	23.17%	65.85%	10.98%
2 – 3 hours	27.77%	62.50%	9.73%
More than 3 hours	17.07%	48.78%	34.15%

The bar-graph for the above tabulated data is:



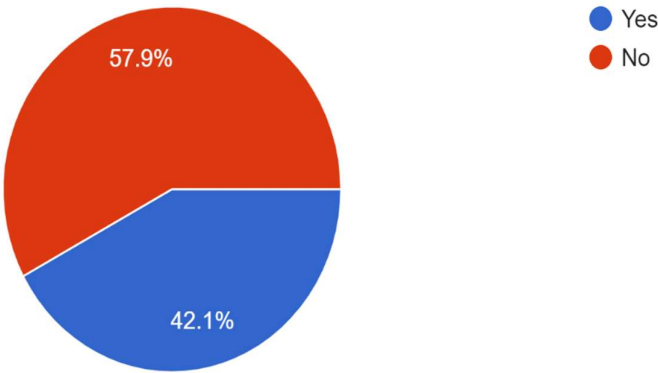
Interpretations:

- 14.50% of the respondents' daily usage of social media was less than 1 hour. 36% of the respondents used various social media platforms for 1 – 2 hours a day. 31.60% of the respondents spent 2 – 3 hours daily on different social media platforms. 18% of the respondents participated in extensive use of social media for more than 3 hours daily.
- Most of the students who responded to the questionnaire spent either 1 – 2 hours or 2 – 3 hours daily on social media platforms.
- As can be clearly observed from the bar-graph, the constituent percentages of highly-stressed individuals rise among the respondents who are more active on social media. In contrast, the constituent percentages of low-stressed individuals rise among the respondents who are less active on social media platforms.
- 6.07% of the respondents who used social media for less than 1 hour in a day were high stressed but 34.15% of the respondents who extensively used social media were highly-stressed.
17.07% of the respondents who used social media for more than 3 hours daily were low stressed but 39.39% of the respondents with minimal social media use experienced low stress levels.
- Therefore, it can be interpreted that individuals with frequent activity on social media platforms are comparatively higher stressed and respondents with minimal social media use experienced low stress levels.**

Sense of comparison with what is shown on social media:

Do you feel a sense of comparison with the "perfect" life portrayed on social media?

228 responses



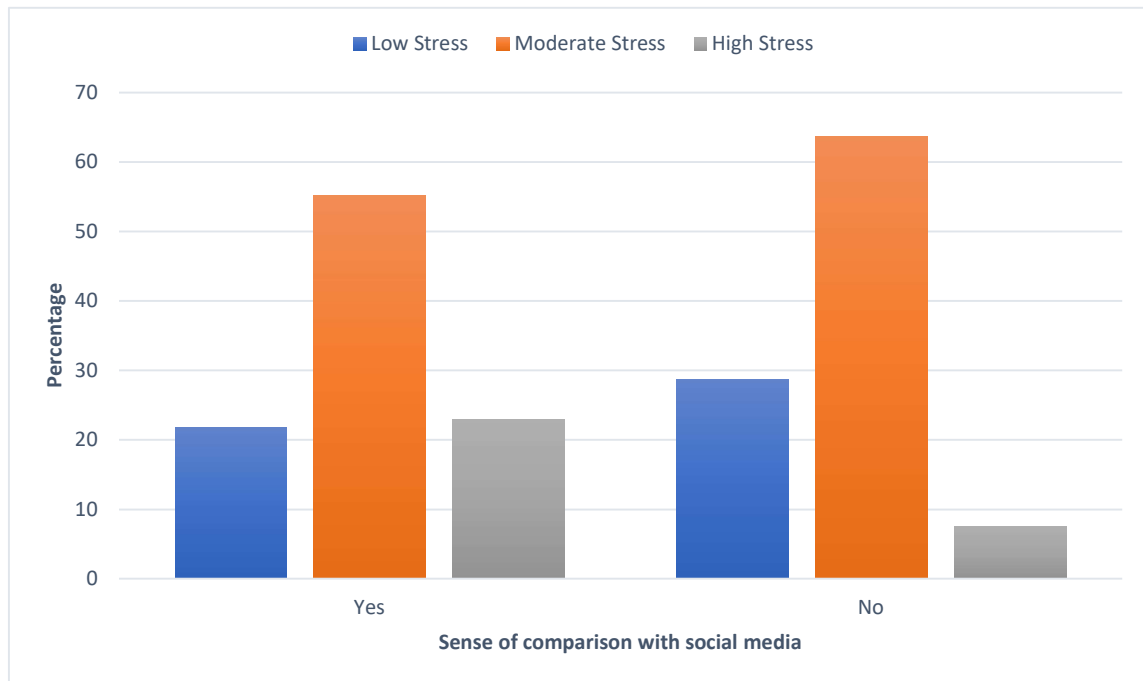
The responses received on this subjective question are as tabulated below.

Do you feel a sense of comparison with the "perfect" life portrayed on social media?	Frequency	Percentage
Yes	96	42.10%
No	132	57.90%

The distribution (in percentages) of the respondents into different stress levels based on whether they feel a sense of comparison with the “perfect life” shown on social media or not, is tabulated below.

<u>Sense of comparison</u>	<u>Low Stress</u>	<u>Moderate Stress</u>	<u>High Stress</u>
<u>Yes</u>	21.87%	55.21%	22.92%
<u>No</u>	28.79%	63.63%	7.57%

The bar-graph for the above tabulated data is:



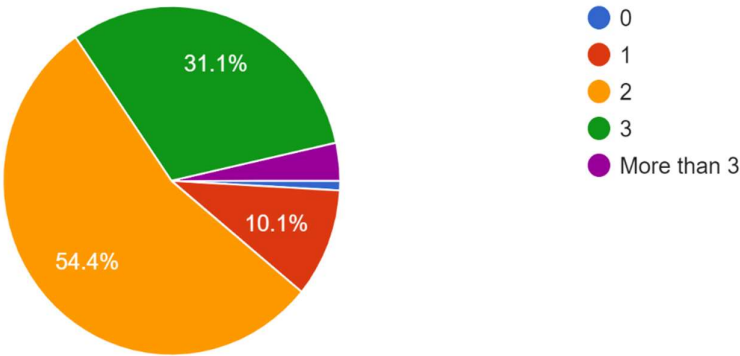
Interpretations:

- Even though 57.90% of the respondents do not feel a sense of comparison with what is shown on social media platforms, a substantial 42.10% of the respondents feel a sense of comparison with the “perfect life” portrayed on social media.
- There are considerably more highly-stressed people (22.92%) among the respondents who compare their present lifestyles with social media representations, in contrast to just 7.57% of the respondents who don’t feel a sense of comparison. Whereas, there are considerably more low-stressed people (28.79%) among the respondents who do not compare their present lifestyles with social media representations, in contrast to 21.87% of the respondents who feel a sense of comparison.
- **Therefore, it can be interpreted that individuals who compare their present lifestyle with what is portrayed on social media comparatively experience higher stress levels.**

Diet factor:

How many whole meals do you eat daily on an average?

228 responses



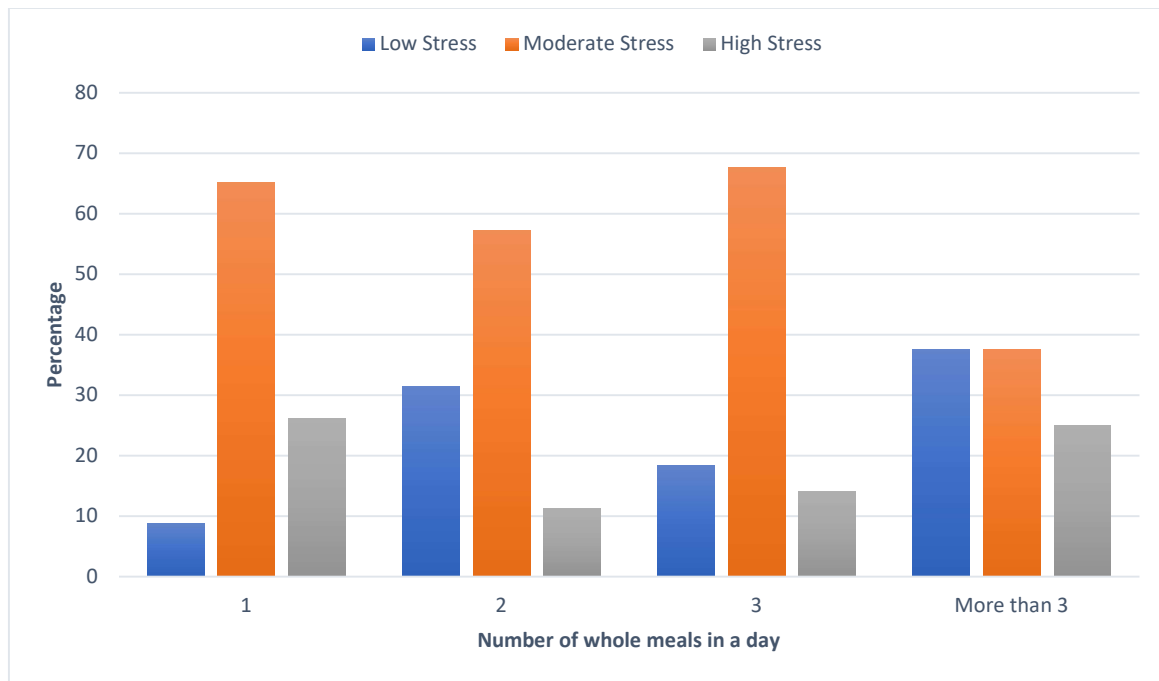
The responses on the average intake of whole meals in a day are tabulated below

Daily intake of whole meals	Frequency	Percentage
1	23	10.10%
2	124	54.40%
3	71	31.10%
More than 3	9	4.40%

The distribution (in percentages) of the respondents into different stress level categories based on their daily intake of whole meals is tabulated below.

<u>Number of whole meals per day.</u>	<u>Low Stress</u>	<u>Moderate Stress</u>	<u>High Stress</u>
<u>1</u>	8.69%	65.22%	26.09%
<u>2</u>	31.45%	57.26%	11.29%
<u>3</u>	18.32%	67.60%	14.08%
<u>More than 3</u>	37.50%	37.50%	25.00%

The bar-graphs for the above tabulated data are:



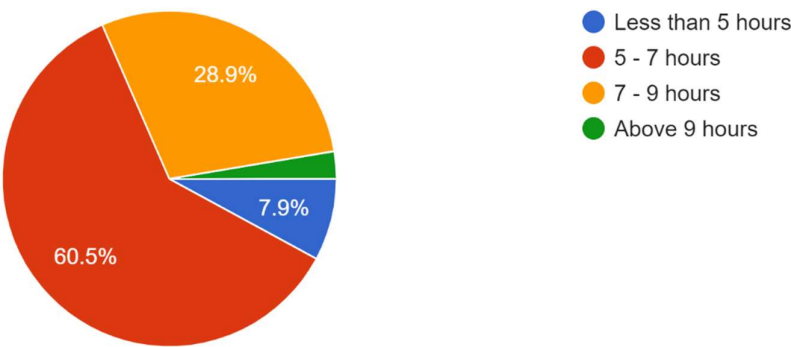
Interpretations:

- 10.10% of the respondents eat only one whole meal on an average daily. 54.40% of the respondents eat 2 whole meals daily. 31.10% of the respondents eat 3 whole meals daily. Only 4.40% of the respondents eat more than 3 whole meals on a daily basis.
- Majority of the students who responded to the questionnaire eat either 2 or 3 whole meals on an average daily.
- As it can be clearly observed from the bar graphs, the percentage of highly-stressed individuals are mostly of either low diet (1 whole meal per day) or excess diet (more than 3 whole meals per day).
26.09% of the respondents who have low diet (1 whole meal per day) and 25% of the respondents who have excess diet (more than 3 whole meals per day) fall into the highly-stressed category.
- Whereas among the respondents having regular diet (2 or 3 whole meals per day) the percentage of highly-stressed individuals is comparatively lower, ie. 11.29% and 14.08% respectively.
- **Therefore, it can be interpreted that the individuals with irregular diet behavior (either low or excess) experience higher stress levels.**

Sleep schedule:

What is your recent sleep schedule?

228 responses

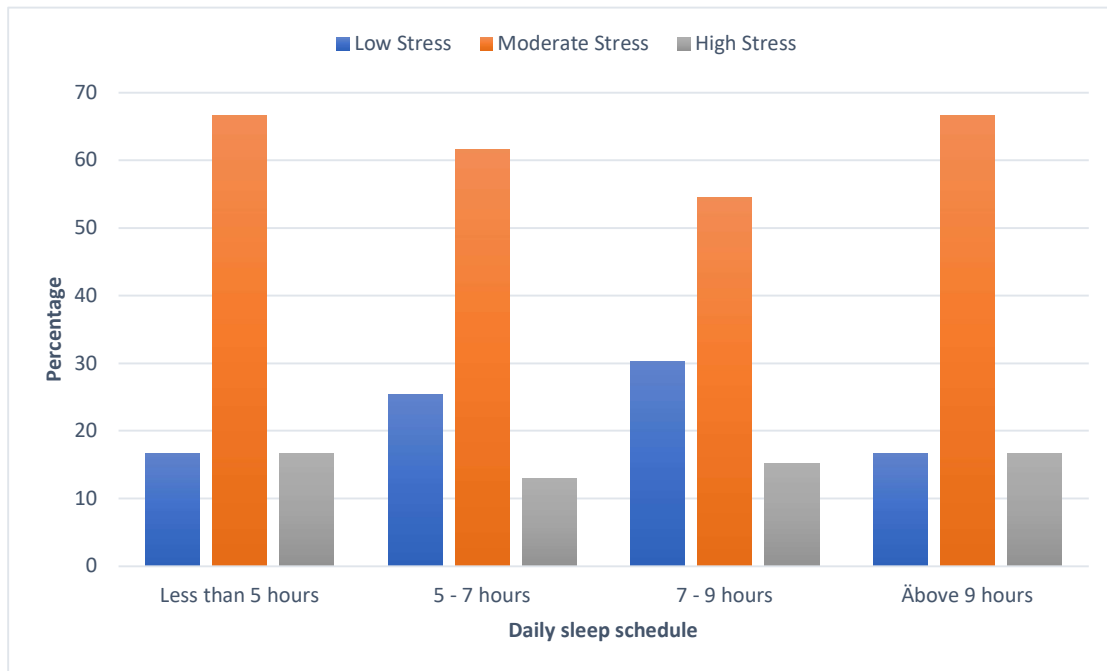


Recent sleep schedule	Frequency	Percentage
Less than 5 hours	18	7.90%
5 – 7 hours	138	60.50%
7 – 9 hours	66	28.90%
Above 9 hours	6	2.70%

The distribution (in percentages) of the respondents into different stress level categories based on their recent sleep schedules (over the past month) is tabulated below.

<u>Recent sleep schedule</u>	<u>Low Stress</u>	<u>Moderate Stress</u>	<u>High Stress</u>
<u>Less than 5 hours</u>	16.66%	66.67%	16.67%
<u>5 – 7 hours</u>	25.37%	61.59%	13.04%
<u>7 – 9 hours</u>	30.31%	54.54%	15.15%
<u>Above 9 hours</u>	16.66%	66.67%	16.67%

The bar-graphs for the above tabulated data are:

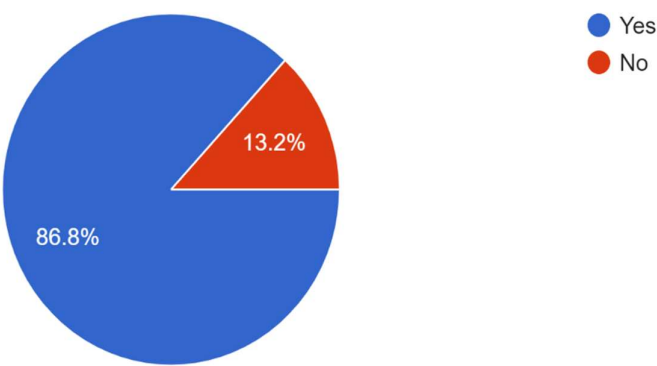


Interpretations:

- 7.90% of the respondents sleep less than 5 hours per day. 60.50% of the respondents sleep 5-7 hours per day. 28.90% of the respondents sleep 7-9 hours per day. 2.70% of the respondents sleep more than 9 hours per day.
- Majority of the students who responded to the questionnaire have a decent sleep schedule (5 – 7 hours of sleep daily or 7 – 9 hours of sleep daily).
- As it can be clearly observed from the bar graphs, the percentage of low stress individuals are higher in the 5-7 hours of sleep daily and 7-9 hours daily categories. 25.37% of the respondents who sleep 5-7 hours a day and 30.31% of the respondents who sleep 7-9 hours a day experience low stress level. Whereas, only 16.66% of respondents who sleep less than 5 hours a day or more than 9 hours a day experience low stress level.
- **Therefore, it can be interpreted that a larger proportion of individuals with a regular and moderate sleep schedule (neither lack of sleep nor excess sleep) are low-stressed.**

Upcoming examination/ job interview:

Do you have any upcoming examination/ job interview in the near future?
228 responses



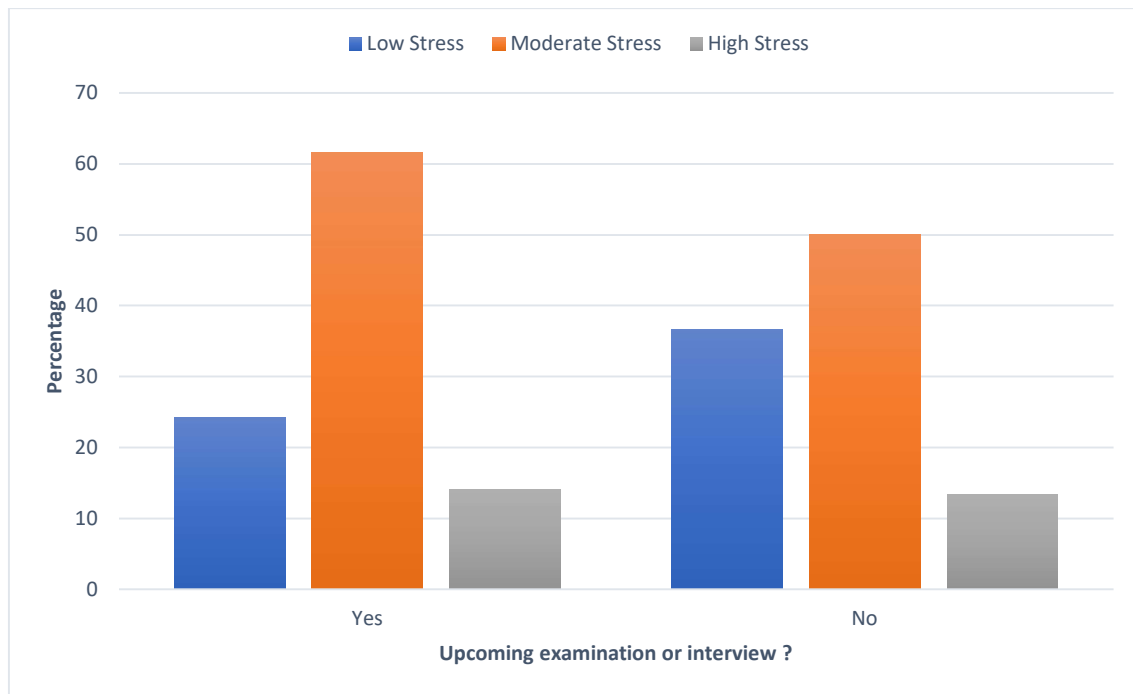
The response data on whether the respondent has an upcoming examination, job interview, etc. or not is tabulated below.

Upcoming examination/ Job interview?	Frequency	Percentage
Yes	198	86.80%
No	30	13.20%

The distribution (in percentages) of the respondents into different stress level categories based on whether they have an examination, job interview, etc. or not in the near future, is tabulated below.

<u>Upcoming examination/ job interview?</u>	<u>Low Stress</u>	<u>Moderate Stress</u>	<u>High Stress</u>
<u>Yes</u>	24.24%	61.61%	14.15%
<u>No</u>	36.67%	50.00%	13.33%

The bar graphs for the above tabulated data are:



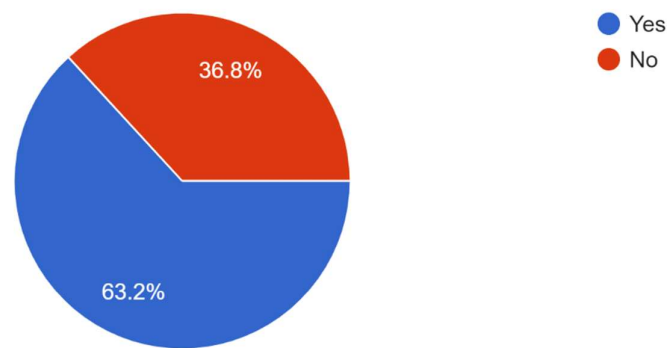
Interpretations:

- The population under study being university students, a large majority of the respondents (86.80%) had an upcoming examination, job interview, etc.
- Only 13.20% of the respondents stated that they don't have any examination, job interview, etc. in the near future.
- As observed from the bar graphs, there is comparatively a larger portion of low stress level individuals among those who do not have any upcoming examination/ job interview compared to those who do.
In contrast, there is comparatively a larger portion of moderate and high stress level individuals among those who have an upcoming examination/ job interview compared to those who do not.
- 36.67% of the respondents who do not have any upcoming examination/ job interview are low stressed whereas only 24.24% of the students who have an upcoming examination/ job interview are low stressed.
14.15% of the respondents who have an upcoming examination/ job interview are moderately stressed whereas only 13.33% of the students who do not have any upcoming examination/ job interview are moderately stressed.
- **Therefore, it can be interpreted that the respondents who do not have any upcoming examination/ job interview experience comparatively lower stress levels.**

Perception on stereotype around mental stress issues:

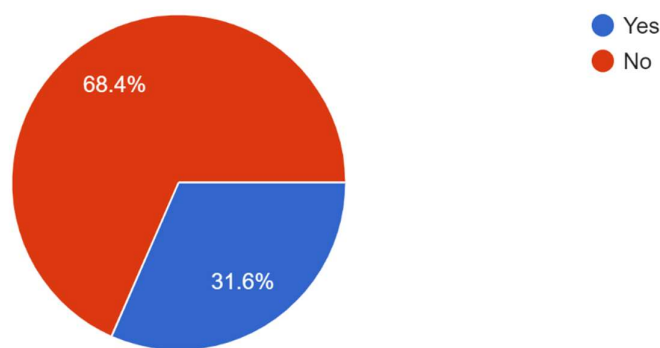
Do you have a person to talk about your mental stress issues (if any)?

228 responses



Are you afraid of the social stigma (stereotype) associated with mental stress issues?

228 responses



The response data on whether the respondent has a person to talk about his/her mental stress issues is tabulated below.

Do you have a person to talk about your mental stress issues?	Frequency	Percentage
Yes	144	63.20%
No	84	36.80%

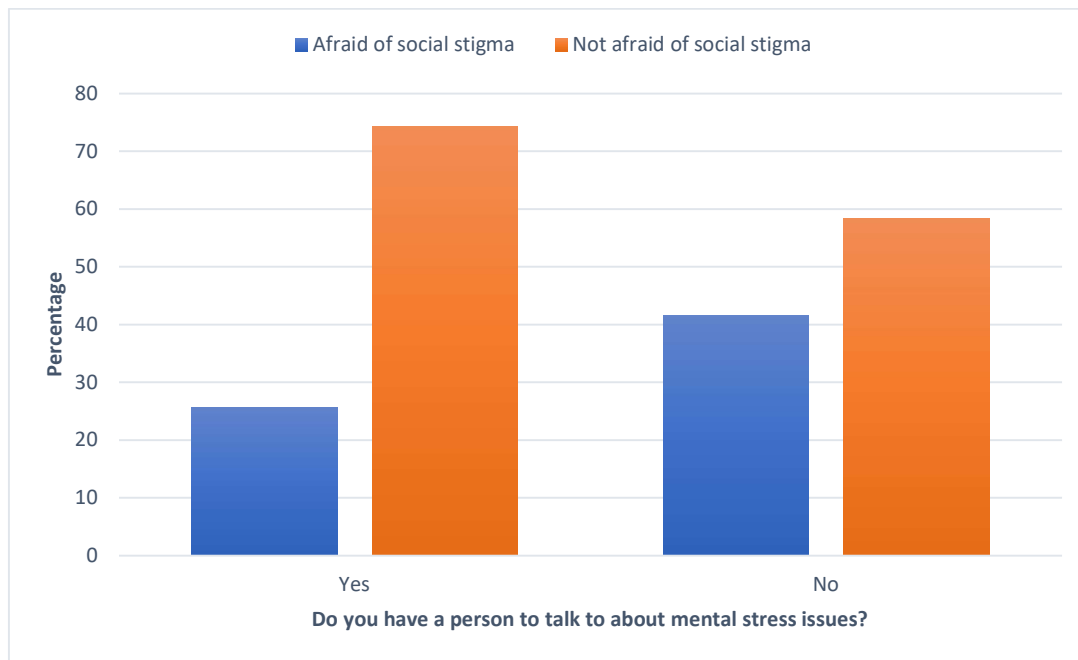
The response data on whether the respondent is afraid of the social stigma (stereotype) around mental stress issues is tabulated below.

Are you afraid of the stereotype around mental stress issues?	Frequency	Percentage
Yes	72	31.60%
No	156	68.40%

Both of the above data sets were crossed over and the results obtained are presented in the below table.

<u>Do you have a person to talk about your mental stress issues?</u>	<u>Afraid of social stigma</u>	<u>Not afraid of social stigma</u>
<u>Yes</u>	25.69%	74.31%
<u>No</u>	41.67%	58.33%

The bar graphs for the above tabulated data are:



Interpretations:

- 63.20% of the respondents stated that they have a person to talk about their mental stress issues and 36.80% of the respondents did not.
- 31.60% of the respondents stated that they are afraid of the social stigma around mental stress issues and the remaining 68.40% of the respondents are not.
- As can be clearly observed from the bar graphs, a larger percentage of individuals who do not have someone to talk to about their mental stress issues are afraid of the stereotype around mental stress.
In contrast, a larger percentage of individuals who have someone to talk to about their mental stress issues are not afraid of the stereotype around mental stress.
- 41.67% of the respondents who lack a person to talk to about their stress are afraid of the stereotype around mental stress whereas only 25.69% of the respondents who have someone to talk about their stress are afraid of the stereotype.
74.31% of the respondents who have a person to talk to about their stress are not afraid of the stereotype around mental stress whereas only 58.33% of the respondents who lack someone to talk about their stress are not afraid of the stereotype.
- **Therefore, it can be interpreted that individuals who have someone to talk to about their mental stress issues are usually not afraid of the social stigma (stereotype) around mental stress issues.**

Data Analysis

In this section of the project, we apply the chi-square test for independence of attributes to check for association between the stress level of a respondent and his/her demographic and lifestyle factors such as:

1. Gender
2. Residence locality
3. Physical activity (sports, exercise, etc.)
4. Social media use
5. Diet factor
6. Perception on stereotype around mental stress issues

The observed and expected values were tabulated in the form of a 'contingency table' in order to find the calculated chi-square value.

The calculated chi-square value was then compared to the tabulated chi-square value of corresponding degree of freedom and 95% confidence level.

The correlation coefficients were also calculated for the following.

1. Between the respondent's stress level and his/her weekly physical activity (sports, exercise, etc.)
2. Between the respondent's stress level and his/her daily social media usage.

To check for association between gender and stress level:

The null and alternate hypotheses for the test are:

H_0 : There is no significant association between gender and stress level.

H_1 : There is significant association between gender and stress level.

Contingency table:

Stress Level		Male	Female
Low Stress	Observed	43	16
	Expected	33.78855	25.21145
Moderate Stress	Observed	77	60
	Expected	78.45815	58.54185
High Stress	Observed	10	21
	Expected	17.7533	13.2467

Degree of freedom = $(3-1)*(2-1) = 2$

Level of significance = 0.05

Tabulated Chi-Square value	5.991465
Calculated Chi-Square value	13.86429

Results:

- Since the Calculated chi-square value > Tabulated chi-square value, the null hypothesis is rejected.
- **Therefore at 95% confidence level, we can conclude that there is a significant association between gender of the respondent and his/her stress levels.**

To check for association between residence locality and stress level:

The null and alternate hypotheses for the test are:

H₀: There is no significant association between residence locality and stress level.

H₁: There is significant association between residence locality and stress level.

Contingency table:

Stress Level		Rural	Urban
Low Stress	Observed	26	33
	Expected	23.0307	35.9693
Moderate Stress	Observed	48	89
	Expected	53.47807	83.52193
High Stress	Observed	15	17
	Expected	12.49123	19.50877

Degree of freedom = $(3-1)*(2-1) = 2$

Level of significance = 0.05

Tabulated Chi-Square value	5.991465
Calculated Chi-Square value	2.374881

Results:

- Since the Calculated chi-square value < Tabulated chi-square value, the null hypothesis is not rejected.
- **Therefore at 95% confidence level, we can conclude that there is no significant association between residence locality of the respondent and his/her stress levels.**

To check for association between weekly physical activity (sports, exercise, etc.) and stress level:

The null and alternate hypotheses for the test are:

H_0 : There is no significant association between physical exercise and stress level.

H_1 : There is significant association between physical exercise and stress level.

Contingency table:

Stress Level		Less than 2 days a week	2 - 4 days a week	5 - 7 days a week
Low Stress	Observed	32	15	12
	Expected	36.74561404	11.64473684	10.60964912
Moderate Stress	Observed	83	26	28
	Expected	85.3245614	27.03947368	24.63596491
High Stress	Observed	27	4	1
	Expected	19.92982456	6.315789474	5.754385965

Degree of freedom = $(3-1)*(3-1) = 4$

Level of significance = 0.05

Tabulated Chi-Square value	9.487729
Calculated Chi-Square value	9.609963

Karl Pearson's coefficient of correlation = -0.19101

Results:

- Since the Calculated chi-square value > Tabulated chi-square value, the null hypothesis is rejected.
- Therefore at 95% confidence level, we can conclude that there is a significant association between weekly physical activity (sports, exercise, etc.) of the respondent and his/her stress levels.
- Since there is negative correlation between physical exercise and the mental stress score of a respondent, it can be interpreted that with an increase in frequency of weekly physical activity, stress levels of the respondents reduce.

To check for association between social media use and stress level:

The null and alternate hypotheses for the test are:

H_0 : There is no significant association between social media use and stress level.

H_1 : There is significant association between social media use and stress level.

Contingency table:

Stress Level		Less than 1 hour	1 - 2 hours	2 - 3 hours	More than 3 hours
Low Stress	Observed	13	19	20	7
	Expected	8.539473684	21.21929825	18.63157895	10.60964912
Moderate Stress	Observed	18	54	45	20
	Expected	19.82894737	49.27192982	43.26315789	24.63596491
High Stress	Observed	2	9	7	14
	Expected	4.631578947	11.50877193	10.10526316	5.754385965

Degree of freedom = $(3-1)*(4-1) = 6$

Level of significance = 0.05

Tabulated Chi-Square value	12.59159
Calculated Chi-Square value	20.26682

Karl Pearson's coefficient of correlation = 0.213553

Results:

- Since the Calculated chi-square value > Tabulated chi-square value, the null hypothesis is rejected.
- **Therefore at 95% confidence level, we can conclude that there is a significant association between the respondent's daily social media use and his/her stress levels.**
- **Since there is positive correlation between social media use and mental stress score of a respondent, it can be interpreted that respondents who frequently use social media tend to have higher stress levels.**

To check for association between diet of respondents and their stress levels:

The null and alternate hypotheses for the test are:

H₀: There is no significant association between diet of the respondent and his/her stress level.

H₁: There is significant association between diet of the respondent and his/her stress level.

Contingency table:

Stress Level		1 whole meal per day	2 whole meals per day	3 whole meals per day	More than 3 whole meals per day
Low Stress	Observed	2	39	13	3
	Expected	5.800884956	31.27433628	17.90707965	2.017699115
Moderate Stress	Observed	15	71	48	3
	Expected	13.94247788	75.16814159	43.03982301	4.849557522
High Stress	Observed	6	14	10	2
	Expected	3.256637168	17.55752212	10.05309735	1.132743363

Degree of freedom = $(3-1)*(4-1) = 6$

Level of significance = 0.05

Tabulated Chi-Square value	12.59159
Calculated Chi-Square value	11.50628

Results:

- Since the Calculated chi-square value < Tabulated chi-square value, the null hypothesis is not rejected.
- **Therefore at 95% confidence level, we can conclude that there is no significant association between daily food intake of the respondent and his/her stress levels.**

To analyze the perception of stereotype around mental stress issues:

The null and alternate hypotheses for the test are:

H_0 : There is no significant association between whether the respondent has someone to talk about his/her stress issues and his/her fear of social stigma on mental stress.

H_1 : There is significant association between whether the respondent has someone to talk about his/her stress issues and his/her fear of social stigma on mental stress.

Contingency table:

Do you have a person to talk to about your stress issues?		Afraid of social stigma	Not afraid of social stigma
Yes	Observed	37	107
	Expected	45.47368421	98.52631579
No	Observed	35	49
	Expected	26.52631579	57.47368421

Degree of freedom = $(2-1)*(2-1) = 1$

Level of significance = 0.05

Tabulated Chi-Square value	3.841459
Calculated Chi-Square value	6.263978

Results:

- Since the Calculated chi-square value > Tabulated chi-square value, the null hypothesis is rejected.
- **Therefore at 95% confidence level, we can conclude that there is a significant association between whether an individual has a person to talk to about his/her stress issues and their fear of social stigma (stereotype) on mental stress.**

Conclusions

The following key conclusions were drawn from the analysis of the entire data collected by the survey on “Stress levels of university students”.

1. A significant association was found between gender and stress level. Female respondents experienced higher stress levels compared to the male respondents.
2. With increase in academic workload and with upcoming examination/ job interview, the respondents were observed to experience higher stress levels.
3. The respondents who exercised or played a sport regularly experienced lower stress levels compared to those who did not. Thus, students must indulge in physical activities (sports, exercise, etc.) to cope up with mental stress.
4. The individuals who frequently used social media and felt a sense of comparison to what they saw on social media platforms experienced higher stress levels compared to others. Hence, students must avoid extensive use of social media and must build actual connections with friends and family in order to maintain a good mental state.
5. The students who followed a regular, moderate diet and sleep behavior (neither minimal nor excess) were largely found to be in the low stress category. Therefore, regular and moderate food and sleep habits play a major role in the mental well-being of university students.
6. Last but not the least, young adults must be aware that a balanced mental health is essential and should not be afraid of any prevalent stereotypes.

Limitations and Difficulties

There were few limitations faced during the collection of data for the project work and also during data analysis and interpretation.

1. The topic of the project “Study on stress levels of university students” is not a straight-forward topic. Some students were hesitant to be a part of the survey.
2. The survey data did not give perfectly equal representation among the genders, field of study of the respondent, etc. There were comparatively more male respondents than female respondents. Most of the respondents were either from science or humanities background.
3. The survey required some information that is typically difficult to collect from people. The respondents hesitated to share information on their drinking and smoking behaviors.
4. The major challenge faced during the survey was getting sufficient responses to the circulated questionnaire. In the limited time, I could collect a total of 228 student responses. Larger data would have proven more representative and would have given better results.
5. Owing to the usual lifestyle of university students, majority of them were observed to be moderately stressed while the study was conducted by only observing increasing and decreasing trends of the low and high stress students in different demographic and lifestyle behaviors.

References

1. S.C. Gupta and V.K. Kapoor: Fundamental of mathematical statistics
2. S.C. Gupta and V.K. Kapoor: Fundamental of applied statistics
3. [mayoclinic: Symptoms and effects of mental stress](#)
4. [WIKIPEDIA: Perceived Stress Scale.](#)
5. [uk.net: Previously researched measurements of the PSS scale on different ethnicities.](#)
6. [novopsych.com: Psychometric properties of the Percieved Stress Scale and its correlation with mental and emotional health variables](#)
7. [Chi-Square test to analyze independence of attributes.](#)

Questionnaire



Survey on stress levels of university students

*Required

1. Email id

2. Name *

3. Age (in years) *

Mark only one oval.

☐ Below 18

☐ 18 - 21

☐ 21 - 24

☐ Above 24

4. Gender *

Mark only one oval.

☐ Male

☐ Female

☐ Prefer not to say

5. Family income (lakhs per annum) *

Mark only one oval.

- ☐ Below 6 lpa
- ☐ 6 - 9 lpa
- ☐ 9 - 12 lpa
- ☐ Above 12 lpa

6. Residential locality (home) *

Mark only one oval.

- ☐ Rural
- ☐ Urban

7. Stream *

Mark only one oval.

- ☐ Science
- ☐ Engineering
- ☐ Medical
- ☐ Commerce
- ☐ Humanities
- ☐ Other

8. How many hours of workload do you have on an average? *

Mark only one oval.

- ☐ Below 3 hours per day
- ☐ 3 - 6 hours per day
- ☐ 6 - 9 hours per day
- ☐ Above 9 hours per day

9. How many days in a week do you engage in physical activity? (sports, exercise, etc.) *

Mark only one oval.

- ☐ Less than 2 days a week
☐ 2 - 4 days a week
☐ 5 - 7 days a week

10. Do you have any upcoming examination/ job interview in the near future? *

Mark only one oval.

- ☐ Yes
☐ No

11. Which is the best stress-releasing activity? (in your opinion) *

Mark only one oval.

- ☐ Yoga / Meditation
☐ Music
☐ Reading
☐ Other: _____

12. How much time do you spend on a daily basis on social media? *

Mark only one oval.

- ☐ Less than 1 hour
☐ 1 - 2 hours
☐ 2 - 3 hours
☐ More than 3 hours

13. Do you feel a sense of comparison with the "perfect" life portrayed on social media? *

Mark only one oval.

- ☐ Yes
☐ No

14. How many whole meals do you eat daily on an average? *

Mark only one oval.

- ☐ 0
☐ 1
☐ 2
☐ 3
☐ More than 3

15. Do you involve in smoking/drinking? *

Mark only one oval.

- ☐ Never
☐ Socially
☐ Often

16. What is your recent sleep schedule? *

Mark only one oval.

- ☐ Less than 5 hours
☐ 5 - 7 hours
☐ 7 - 9 hours
☐ Above 9 hours

Perceived Stress Scale

Please read each statement and mark the appropriate option which indicates how much the statement applied to you OVER THE PAST MONTH. There is no right or wrong answer. Do not spend too much time on any statement. HOW OFTEN HAVE YOU-

17. *

Mark only one oval per row.

	Never	Sometimes	Fairly often	Very often
felt "nervous"?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
felt that you were unable to control the important things in your life?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
felt "irritated"?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
been angered by things that were outside your control?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
felt that difficulties were piling up so high that you could not overcome them?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

18. Do you have a person to talk about your mental stress issues (if any)? *

Mark only one oval.

☐ Yes

☐ No

19. Are you afraid of the social stigma (stereotype) associated with mental stress issues? *

Mark only one oval.

☐ Yes

☐ No

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