

# An Empirical Study of Mental Stress Among Engineering Students in Gujarat

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## ABSTRACT

There is a mental health crisis, as evidenced by the rising number of suicide cases in India's leading colleges for engineers. Social scientists, legislators, educators, and parents have all expressed serious worry about the declining mental health of engineering students. However, this problem has not been the subject of much scholarly investigation. In India, mental stress among engineering students has become a serious problem, especially in areas with high academic standards like Gujarat. With a primary focus on academic expectations, this study investigates the degree and effects of stress among engineering students under a hypothetical theoretical performance-pressure model. Peer pressure, a lack of institutional resources, and external socioeconomic issues are among the major stresses identified by the study using a questionnaire-based empirical technique. The purpose of the current study is to investigate risk variables for mental health crises in engineering students. The sequential exploratory mixed-method design is used in this investigation.

Keywords: Mental stress, health, pressure, engineering students, emotions, peer pressure, awareness

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## INTRODUCTION

There is a mental health crisis, as evidenced by the rising number of suicide cases in India's leading colleges for engineers. Social scientists, legislators, educators, and parents have all expressed serious worry about the declining mental health of engineering students. However, this problem has not been the subject of much scholarly investigation. In India, mental stress among engineering students has become a serious problem, especially in areas with high academic standards like Gujarat. With a primary focus on academic expectations, this study investigates the degree and effects of stress among engineering students under a hypothetical theoretical performance-pressure model. Peer pressure, a lack of institutional resources, and external socioeconomic issues are among the major stresses identified by the study using a questionnaire-based empirical technique. The purpose of the current study is to investigate risk variables for mental health crises in engineering students. The sequential exploratory mixed-method design is used in this investigation.

A condition of mental health is one in which each person feels confident in his or her capacity to manage everyday stressors, work efficiently, and contribute to the community [1]. Drug use problems and mental illnesses have increased by 13% during the past ten years. About 20% of kids and teenagers worldwide experience psychological disorders. About one in five people suffer from a mental illness. Among young adults aged 15 to 29, suicide is now the second most common cause of death [2]. Gujarat has a very competitive engineering education system, with thousands of students enrolling in different technical schools each year. It exposes students to demanding academic workloads, performance expectations, and social pressure even while it offers excellent job options. People with psychological problems who are unable to cope with their environment and circumstances are frequently observed these days. They occasionally go so far as to commit suicide as a result of this unhealthy mental state. As they graduate from high school, students are starting a whole new chapter in their lives. After growing up in a safe haven at home, they are abruptly thrust into the grind of adulthood. These young minds are under a lot of stress and worry as a result, which increases their susceptibility to depression and suicidal thoughts [3]. A significant percentage of

students experience stress as a result of personal factors, job uncertainties, and academic pressure, according to a cross-sectional survey-based approach. A student's life will inevitably involve stress [4].

Engineering college students experience mental stress due to a number of causes, including peer pressure, financial reliance, relationship problems, and academic and social hurdles [5]. Furthermore, the recent COVID-19 pandemic, which has persisted for the past two years, has intensified these unpleasant emotions, resulting in an exponential increase in the general population's cases of anxiety, despair, and insomnia [6]. Engineering students experience irritation and mental stress due to a variety of factors, including project deadlines, assignment submissions, difficult exams, intimidating professors, family expectations, and financial problems [7]. Nearly half of engineering students in India, including those in Gujarat, have moderate to high levels of stress, which are frequently accompanied by symptoms including sleep difficulties, difficulty concentrating, and a loss of interest in everyday tasks, according to earlier research [8].

Academic strain is one of the main causes of mental health problems in technical education, according to research utilizing standardized instruments like stress assessment measures. Additionally, research has shown that psychological suffering is greatly influenced by outside variables such as potential job instability, financial worries, and family expectations. These results provide a solid basis for stress analysis under a hypothetical, simplified model that focuses mostly on performance demand. Students' academic stress has been studied for a long time, and researchers have found that stressors include an excessive number of assignments, peer competition, failures, a lack of pocket money, strained relationships with lecturers or other students, family issues, or troubles at home.

Numerous research conducted worldwide have shown that the academic schedule of medical, dentistry, and engineering courses causes students to feel more stressed [9]. They must regularly read for many hours in order to comprehend a wide range of subjects, and their families and society have very high expectations for them.[10] On the other hand, not much research has been done in this field of comparative analysis in India. In order to determine whether there are any variations in the elements influencing stresses between the two groups, students from various professions were chosen. Students may find it easier to cope with these elements in order to achieve better. The study also became relevant because it is being conducted to find out how students feel about the challenges and issues that engineering faces.

## **1. RESEARCH METHODOLOGY**

This study's main goal is to empirically investigate the degree and contributing factors of mental stress among Gujarati engineering students, with a focus on stress resulting from pressure to perform well academically within a theoretical framework. The study intends to determine how common stress is among students, pinpoint important contributing factors like peer pressure, external socioeconomic influences, and institutional constraints, and assess the impact of inadequate study materials and academic resources on students' psychological health. Through a systematic questionnaire, the study also aims to investigate students' perspectives and understanding of their own stress levels and to offer workable solutions, such as the role of family encouragement in stress reduction and institutional support systems.

While acknowledging the indirect influence of other factors, the research aims to isolate and examine the direct impact of performance-related stress. The study uses a descriptive and empirical research design, which is suitable for examining behavioural and psychological phenomena like mental stress, in order to accomplish these goals. The study's empirical design makes it possible to gather primary data directly from engineering students, guaranteeing that the results accurately represent experiences and viewpoints from the real world. The study is based on a cross-sectional approach, in which information is gathered all at once from a chosen sample of students from different Gujarati engineering colleges. Without needing long-term monitoring, this method is helpful for finding patterns, trends, and connections between stress levels and contributing factors.

This study's empirical and descriptive research approach is based on a fictitious questionnaire-based survey given to engineering students. Using random sampling procedures, a sample size of about 200 pupils is taken into consideration for analysis. A systematic questionnaire intended to measure stress levels and pinpoint contributing factors serves as the data gathering method. Academic pressure, peer pressure, outside influences, institutional resources, and emotional well-being are all included in the questionnaire. The questions are designed to assess if

students compare their performance to that of their classmates, how often they feel stressed out by tests and deadlines, and whether the facilities provided by the school, such as study guides and lab equipment, are sufficient. Other inquiries evaluate emotional symptoms that are important markers of mental stress, such as worry, insomnia, and difficulty concentrating.

## **2. RESEARCH PROBLEM**

Adjustment is a part of the transition from school to university. Students encounter circumstances that are very different from those they encountered in school [11]. For someone who is on a learning binge when it comes to university life, difficulties like housing, scholarships, health problems, social relationships, and homesickness cause a great deal of stress [12]. [13] determined the significant pressures experienced by engineering graduates. These include the demanding curriculum, competition, a severe workload, and sleep deprivation. [14] highlighted the significance of additional apparent determinants for the emergence of stress; gender, academic characteristics, environmental factors, and social factors are a few examples.

Students in Gujarat are expected to regularly achieve at high levels in a highly competitive academic environment due to the rapid expansion of engineering education. Although this system encourages technical brilliance, it has also contributed to the rising but sometimes unacknowledged problem of mental stress among engineering students. The study's research topic is the rising incidence of psychological stress, which is mostly brought on by pressure to perform well academically and is exacerbated by peer pressure, outside expectations, and institutional constraints. Engineering students often face ongoing assessments, demanding coursework, and the pressure to live up to social and personal standards, all of which add to mental stress. Despite the gravity of this problem, there is a dearth of targeted research that identifies performance pressure as the primary factor, especially when considering Gujarat's engineering education system.

Stress levels are further exacerbated by elements like inadequate study materials, inadequate academic infrastructure and equipment, and restricted access to mental health support services. Students frequently suffer from anxiety, poor focus, sleep issues, and emotional instability, all of which have an impact on both their general wellbeing and academic achievement. Understanding how academic performance pressure affects engineering students' mental stress under a hypothetical theoretical framework and determining the related contributing factors and their effects constitute the main study challenge. The study tackles students' lack of knowledge and organized methods for recognizing and handling stress in addition to the main issue. Many students lack the tools necessary to deal with stress or are unable to identify its symptoms.

Constant comparison and self-doubt are caused by peer pressure in a competitive academic environment, and extra psychological pressures are brought on by outside variables including parental expectations, financial worries, and job insecurity. Students' performance is further hampered by institutional issues, such as outdated lab equipment, poor study materials, and inadequate academic support, which raises stress levels. These interrelated problems emphasize the necessity for a thorough empirical study that looks at underlying causes and potential remedies in addition to measuring stress levels.

- **Objective of Study**

The study's goals are to methodically approach the research issue and offer significant insights on mental stress among Gujarati engineering students. The main goal is to evaluate pupils' levels of mental stress, especially in connection to pressure to perform well academically.

The study also seeks to pinpoint and examine the main causes of stress, such as peer pressure, outside socioeconomic forces, and institutional constraints such inadequate study resources and equipment. Assessing how stress affects students' academic performance and psychological health, including elements like motivation, focus, and emotional stability, is another crucial goal. In order to better understand how students perceive and react to stress in their academic setting, the study also looks at how students perceive and are aware of their own stress levels using a structured questionnaire.

The study also intends to look into the efficiency of students' current coping strategies as well as the function that social environments and family support have in reducing stress. Proposing workable fixes and corrective actions,

such as institutional reforms like better academic resources, counselling services, and stress management programs, is a major goal. The study also attempts to evaluate the premise that performance pressure significantly contributes to mental stress among engineering students by concentrating on a hypothetical framework where academic performance pressure is handled as the key variable.

**3. HYPOTHESIS OF RESEARCH**

[15] described how coping skills affect students' ability to achieve a work/study/life balance. The current study evaluated students' general discomfort and coping skills in light of the aforementioned. A hypothesis-based strategy is used to lead the research in order to comprehend the connection between mental stress and academic strain. The alternative hypothesis (H<sub>1</sub>) suggests that academic performance pressure considerably raises mental stress levels among engineering students, while the null hypothesis (H<sub>0</sub>) asserts that academic performance pressure has no discernible impact on mental stress. By taking into account secondary contributing factors including peer pressure, institutional constraints, and external socioeconomic situations, this hypothesis enables the study to concentrate on the direct effects of performance-related stress. This study's descriptive and empirical research design uses a cross-sectional survey approach to record engineering students' experiences at a particular moment in time.

To ensure diversity and minimize bias, a representative sample of roughly 200–300 students from different engineering colleges in Gujarat was chosen using random selection procedures. A standardized questionnaire with several questions covering academic pressure, peer pressure, external variables, institutional resources, and emotional well-being is used to gather data. Exam anxiety, social competition, the availability of study materials, and emotional symptoms including sleep disruptions and lack of focus are all included in the questionnaire, which use a Likert scale to gauge students' levels of stress. To find trends and derive significant conclusions, the gathered data is examined utilizing statistical techniques including mean score evaluation and percentage analysis.

The sample size is determined using a standard statistical formula:

$$n = Z^2 * p (1-p) / e^2$$

where p is the estimated percentage of students under stress (assumed to be 0.5 for maximum variability), e is the margin of error (usually 0.05), Z is the Z-value corresponding to the confidence level (usually 1.96 for 95% confidence), and n is the sample size. When these values are substituted, we get:

$$n = (1.96)^2 \times 0.5 \times 0.5 / (0.05)^2 \approx 384$$

A standardized questionnaire with several parts on academic pressure, peer pressure, institutional facilities, and emotional well-being is used to collect data. A Likert scale (1 to 5) is used to quantify responses; higher scores correspond to higher levels of stress. Mean score computations and percentage analysis are used to examine the gathered data.

A hypothetical distribution of stress levels among students is shown in the table below:

<b>Stress Level</b>	<b>Number of Students</b>	<b>Percentage (%)</b>
Low Stress	60	30%
Moderate Stress	110	55%
High Stress	30	15%
<b>Total</b>	<b>200</b>	<b>100%</b>

**Table:1 Distribution of stress level among students**

This table shows that while 15% of students have high levels of stress, the majority of students (55%) have moderate levels.

#### 4. RESEARCH DESIGN

A structured questionnaire is the major instrument utilized in this study to obtain primary data. Academic pressure, peer pressure, institutional challenges, and emotional well-being are just a few of the many aspects of mental stress that are meticulously captured by the questionnaire. The study includes components of common psychological evaluation instruments in addition to the questionnaire, such as stress and depression indicators derived from popular scales like the Perceived Stress Scale (PSS) and related frameworks. By ensuring that the questions are in line with accepted psychological concepts, these references improve the instrument's validity and reliability even though the study uses a fictional model.

The following were the research's hypotheses:

1. When it comes to personality traits like openness, there won't be any notable differences between male and female engineering students.
2. In terms of personality traits like openness, there won't be much of a difference between engineering students in urban and rural areas.
3. When it comes to personality traits like openness, graduate and postgraduate engineering students won't differ significantly.
4. When it comes to personality traits like openness, there won't be a substantial interaction impact between engineering students' gender and area.
5. When it comes to personality traits like openness, there won't be a substantial interaction impact between the locality and educational degree of engineering students.

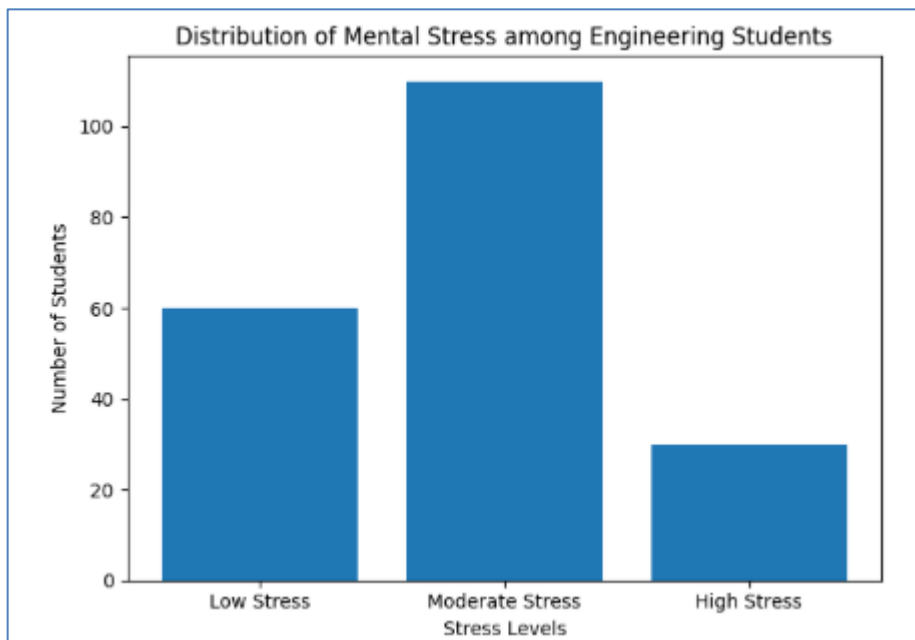


Fig.1 graphical presentation for research data

#### 5. FINDINGS OF RESEARCH

The results of this study show that the main cause of mental stress among Gujarati engineering students is pressure to perform well academically. Exams and grading schemes are a major source of stress for many students, and peer comparison exacerbates worry. Institutional constraints are particularly important since students who have less

access to study resources and equipment typically feel more stressed. The whole psychological strain is increased by outside variables like job instability and parental expectations. The alternative hypothesis is supported by the computed mean stress score of 3.6, which indicates that students typically experience moderate to high stress levels.

To further analyse stress intensity, the mean stress score is calculated using the formula:

$$\bar{X} = \frac{\sum X}{N}$$

## 6. CONCLUSION

In conclusion, this empirical study shows that pressure to perform well academically is the main cause of the complex problem of mental stress among Gujarati engineering students. The substantial effect of performance pressure on mental health is confirmed by the rejection of the null hypothesis and the acceptance of the alternative hypothesis. The study emphasizes the necessity of institutional enhancements, such as improved academic resources, counseling services, and stress-reduction initiatives. Positive social settings and family support are also crucial for assisting pupils in efficiently managing stress. Educational institutions can foster a healthier learning environment that supports students' academic achievement and well-being by addressing these aspects.

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