E-ISSN 2250-0944
ISSN 2250-1150
doi: 10.31838/ijprt/15.01.15

Research Article

ENGINEERING DREAMS, ENDURING STRESS: THE HEAVY TOLL OF STRESS ON ENGINEERING STUDENTS: A CROSS-SECTIONAL STUDIES

Janhavi Sarva[1], Kanika Gupta[1], Keshav Aggarwal[1], Ruchita Dixit[2], Amol R. Patil[3]

1. MBBS students, Shri Shankaracharya Institute of Medical Sciences, Bhilai, Chhattisgarh
2. Professor, Department of Community Medicine, Shri Shankaracharya Institute of Medical Sciences, Bhilai, Chhattisgarh
3. Assistant Professor (statistician), Department of Community Medicine, Government Medical College, Nashik, Maharashtra.

Corresponding author:

Dr. Ruchita Dixit, Shri Shankaracharya Institute of Medical Sciences, Junwani road, Bhilai, Chhattisgarh, India

ABSTRACT

Background: The pressure of professional courses like engineering and medicine often takes a toll on students, leading to stress, anxiety, and health issues. Heavy workloads and packed schedules disrupt sleep and eating habits, worsening stress over time. This study analyses stress factors among engineering students through a survey-based quantitative approach. **Methods:** A cross-sectional study was conducted among undergraduate students at a private engineering college in central India to assess stress levels using the Perceived Stress Scale. Data was gathered from 130 third-year Computer Science students over two months, then systematically tabulated and analysed using Excel and R 4.2 software. The findings were presented through well-structured tables and graphical representations. **Result:** This study analysed student stress levels across various factors. The results indicated that high stress was reported by 15.38% of females and 10% of males. Accommodation type also influenced stress levels, with 30% of hostellers and 23.08% of day scholars experiencing high stress. Relationship status showed a trend, with 24.10% of single students and 33.30% of students in relationships reporting elevated stress. Academically, significant stress levels were observed in 25% of students who scored ≤50% and 30% of those who scored >50% in the previous examination. **Conclusion:** The study highlights significant stress among engineering students, influenced by academics, relationships, and living conditions. Addressing this issue through counselling, mentorship, and stress management programs is crucial. A supportive academic environment and regular well-being initiatives can help students develop healthy coping mechanisms, ensuring both academic success and mental well-being.

Keywords: Engineering Students, Academic Stress, Mental Health, Perceived Stress Scale

INTRODUCTION

Engineering students face intense pressure, juggling tough coursework, competition, and tight deadlines. In India, careers in engineering and medicine are highly valued, and many students pursue them after 10+2.[1] However, the heavy

academic load, long study hours, and high expectations from society and family often lead to stress and burnout. Starting college brings its own set of challenges—adjusting to a new environment, living away from home, and making independent decisions can feel overwhelming. With unfamiliar teaching methods and the absence of familiar support systems, this transition becomes even more stressful for students.[2] Stress is a state of worry or mental tension that arises in response to challenging situations. It is a natural human reaction that helps us recognize and respond to difficulties and threats in our lives.[3] Stress is a mix of external pressures and how we react to them. Academic workload, relationship struggles, and big life changes can feel overwhelming, while overthinking, anxiety, and self-doubt make things even harder. When outside challenges fuel inner insecurities, stress becomes even heavier to carry. Students face stress from various factors, like studying a course they don't enjoy, struggling with unclear concepts, or lacking passion for their studies. Heavy coursework, poor time management, and balancing school, social life, and family add to the pressure. For those with part-time jobs, juggling everything can feel overwhelming. [4] Financial conflicts with family members can add another layer of pressure, especially when there are disagreements about educational expenses or future career choices. A lack of leisure time can also leave students feeling burnt out, as they struggle to balance academic responsibilities with personal well-being. Some students may find their studies particularly challenging, especially if they feel like they are falling behind or can't grasp the material as easily as others.[5]

Stress can make it incredibly difficult to relax, often bringing along a variety of uncomfortable emotions, such as anxiety, frustration, and irritability. Hectic schedules filled with classes, assignments, and extracurricular activities can be exhausting, often leaving students drained both physically and mentally. Without proper sleep and nutrition, the stress only builds, making it even harder to stay focused and feel their best.[6] When one is under stress, focusing or concentrating on tasks becomes a struggle. It may also manifest physically, causing symptoms like persistent headaches, muscle tension, stomach problems, or trouble falling asleep. Ones eating habits may be affected as well, leading to either a loss of appetite or overeating in response to emotional distress. If stress persists over time, it can exacerbate existing health conditions, making them more difficult to manage. Additionally, chronic stress can lead some people to rely more heavily on substances like alcohol, tobacco, or other coping mechanisms. [3]Stressful situations can also take a significant toll on our mental health, often contributing to or worsening conditions like anxiety and depression, which may require professional help and treatment. When stress symptoms become persistent, they can begin to impact ability to function in daily life—whether at work, school, or in relationships. Over time, this can lead to a diminished quality of life, making it crucial to address and manage stress before it begins to deeply affect our well-being.

Stress is a natural part of life, but it shouldn't take over. When it lingers too long, it doesn't just affect the mind—it drains the body, strains relationships, and impacts overall well-being. If ignored, it can slowly lead to serious health problems, turning temporary pressure into a long-term struggle..[7] Long-term stress takes a serious toll on both the mind and body, slowly disrupting the body's natural balance. It doesn't just cause mental exhaustion but also affects overall health by interfering with metabolism. Studies have shown that chronic stress can increase the risk of obesity, type 2 diabetes, heart disease, and other metabolic disorders. The body's constant struggle to cope with stress

leads to long-term strain, making it harder to stay healthy and maintain well-being. [8]

Aims and Objectives

1. To measure the Burden of Stress on Engineering Students.

2. To study the association between socio-demographic profile of engineering stress.

3. To suggest recommendations based on the study findings.

MATERIALS & METHODOLOGY

MATERIALS

Sample design – Cross sectional study

Sample area- A Private Engineering college of central India

Study period- 2 months (October-November)

Study subject- Engineer UG students

Sampling method- Convenient sampling method

Sampling size - 130

This study set out to understand that burden, to give shape to the pressures that shape their daily lives. To do so, the Perceived Stress Scale (PSS) by Sheldon Cohen—a trusted tool in psychological research—was employed to measure their stress levels. Before participating, students were informed about the study's purpose, and their consent was obtained, ensuring ethical research practices. The questionnaire found its way into the hands of students at a private engineering college in Central India, where 130 voices came forward, each response a window into their struggles.

Beyond the numbers, a mental health talk on stress management was held, transforming insights into action. Here, students were guided through the art of meditation, deep breathing, mindfulness, and yoga—not as abstract concepts but as lifelines in their chaotic schedules. The conversation extended beyond the mind to the body, highlighting the power of adequate sleep, a balanced diet, and regular exercise in restoring equilibrium. The students were enthusiastic and the session was interactive. In that moment, stress was no longer just a statistic—it was something that could be understood, managed, and overcome.

Statistical Analysis: Statistical analysis was conducted using Fisher's Exact Test and Chi-square tests to examine associations between categorical variables. Descriptive statistics, including frequencies and percentages, were used to summarize demographic characteristics and stress levels. Fisher's Exact Test was applied to assess the relationship between gender and stress levels, while Chi-square tests were used to evaluate associations between stress levels and residence type, relationship status, and academic performance. A significance level of 0.05 was considered for all statistical tests. Data analysis was performed using R 4.2 software.

RESULT

Table 1: Characteristics of Students

Variable		Frequency	Percentage
Gender	Female	48	36.92
	Male	82	63.08
Residence	Day Scholar	91	70.00
	Hosteller	39	30.00
Relationship Status	Single (S)	112	86.15
	In a Relationship (R)	18	13.85

Academic Grade	A [more than 50%]	120	92.31
	B [less than 50%]	10	7.69

Table 1 presents the demographic characteristics of 130 students, categorized by gender, residence, relationship status, and grade. Regarding gender, 48 students (36.92%) are female, and 82 students (63.08%) are male. In terms of residence, the majority of students are day scholars, with 91 students (70.00%), while 39 students (30.00%) are hostellers. As for relationship status, most students are single, with 112 students (86.15%) reporting being single, while 18 students (13.85%) are in a relationship. In terms of academic performance, 120 students (92.31%) are in academic Grade A, and 10 students (7.69%) are in academic Grade B.

Table 2: Gender-wise Distribution of Stress Levels

Gender	**High Stress**		**Moderate Stress**		**Low Stress**		**Total**
	n	**%**	**n**	**%**	**n**	**%**	
Female	20	15.38%	28	21.54%	0	0.00%	48
Male	13	10.00%	62	47.69%	7	5.38%	82
Total	**33**	**25.38%**	**90**	**69.23%**	**7**	**5.38%**	**130**
The P value by Fisher Exact Test 0.0012							

Table 2 presents the gender-wise distribution of stress levels among 130 individuals, categorizing them into high stress, moderate stress, and low stress groups. Among females, 20 (15.38%) individuals experienced high stress, while 28 (21.54%) had moderate stress, and none reported low stress. In contrast, males exhibited a higher percentage of moderate stress, with 62 (47.69%) experiencing it, 13 (10.00%) reporting high stress, and 7 (5.38%) having low stress. Overall, the total number of individuals with high stress was 33 (25.38%), with 90 (69.23%) experiencing moderate stress and 7 (5.38%) reporting low stress. The Fisher's Exact Test p-value of 0.0012 indicates a statistically significant association between gender and stress levels, suggesting that the distribution of stress levels differs significantly between females and males in this sample.

Table 3: Residence-wise Distribution of Stress Levels

Residence	**High Stress**		**Moderate Stress**		**Low Stress**		**Total**
	n	**%**	**n**	**%**	**n**	**%**	
Day Scholar	21	23.08%	66	72.53%	4	4.40%	91
Hosteller	12	30.77%	24	61.54%	3	7.69%	39
Total	33	25.38%	90	69.23%	7	5.38%	130
X-squared = 1.6636, df = 2, p-value = 0.4353							

Table 3 shows the residence-wise distribution of stress levels among 130 individuals, categorized into high stress, moderate stress, and low stress groups. Among day scholars, 21 (23.08%) reported high stress, 66 (72.53%) experienced moderate stress, and 4 (4.40%) had low stress. In contrast, hostellers showed a higher percentage of high stress, with 12 (30.77%) reporting it, while 24 (61.54%) experienced moderate stress, and 3 (7.69%) had low stress. Overall, the total number of

individuals with high stress was 33 (25.38%), with 90 (69.23%) reporting moderate stress and 7 (5.38%) experiencing low stress. The chi-square test results, with a p-value of 0.4353, indicate that there is no statistically significant association between residence type and stress levels in this sample.

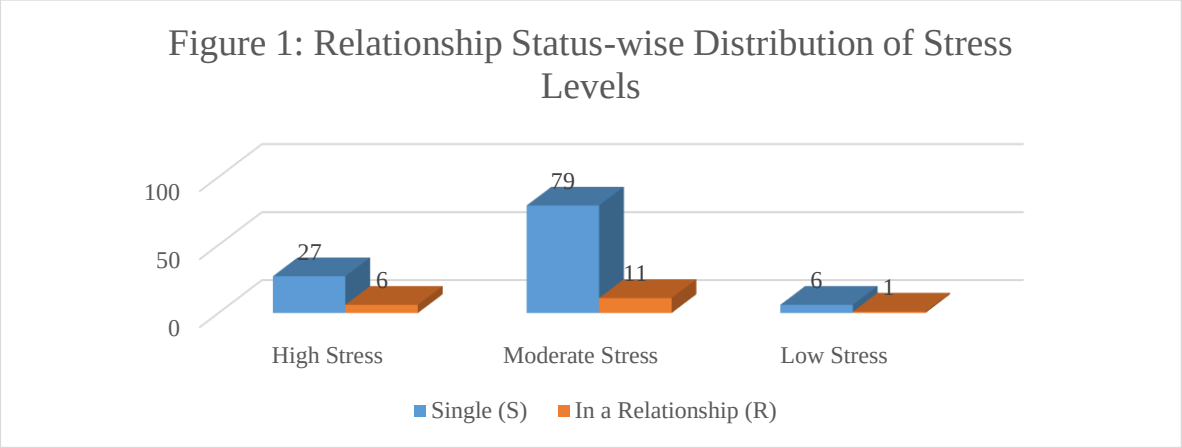

Figure 1 presents the distribution of stress levels based on relationship status among 130 individuals, categorizing them into high stress, moderate stress, and low stress groups. Among those who are single (112 individuals), 27 (24.10%) reported high stress, 79 (70.50%) experienced moderate stress, and 6 (5.40%) had low stress. In contrast, 6 (33.30%) individuals in a relationship (18 individuals total) reported high stress, 11 (61.10%) had moderate stress, and 1 (5.60%) had low stress. Overall, the total number of individuals with high stress was 33 (25.40%), with 90 (69.20%) experiencing moderate stress and 7 (5.40%) having low stress. The chi-square test results, with a p-value of 0.6976, indicate that there is no statistically significant association between relationship status and stress levels in this sample.

Table 4: Grade-wise Distribution of Stress Levels

Academic Grade	High Stress		Moderate Stress		Low Stress		Total
	N	%	n	%	n	%	
A [more than 50%]	30	25.00%	85	70.80%	5	4.20%	120
B [less than 50%]	3	30.00%	5	50.00%	2	20.00%	10
Total	33	25.40%	90	69.20%	7	5.40%	130
X-squared = 4.9672, df = 2, p-value = 0.08344							

The table 4 presents the grade-wise distribution of stress levels among 130 individuals, categorized into high stress, moderate stress, and low stress groups. In academic Grade A (120 individuals), 30 (25.00%) reported high stress, 85 (70.80%) experienced moderate stress, and 5 (4.20%) had low stress. In academic grade B (10 individuals), 3 (30.00%) reported high stress, 5 (50.00%) had moderate stress, and 2 (20.00%) experienced low stress. Overall, the total number of individuals with high stress was 33 (25.40%), with 90 (69.20%) reporting moderate stress and 7 (5.40%) experiencing low stress. The chi-square test results, with a p-value of 0.08344, suggest that there is no statistically significant association between grade and stress levels in this sample, as the p-value is greater than the typical significance level of 0.05.

DISCUSSION

Our study encompassed a total of 130 students, comprising 48 females and 82 males. These students were further categorized based on their residential status, with 91 identifying as day scholars who commuted from home, while 39 resided in hostels on campus. In terms of relationship status, a significant majority of 112 students reported being single, whereas 18 students indicated that they were in a relationship. Academic performance was another key factor in our study. Based on their most recent examination results, students were classified into two groups. Group A consisted of 120 students who achieved a score greater than 50%, reflecting commendable academic performance. Meanwhile, Group B included 10 students whose scores were below 50%, indicating areas for potential academic improvement.

Based on the data collected through the questionnaire and analysed using the Perceived Stress Scale (PSS) scoring system [18], students were categorized into three distinct groups according to their stress levels: high, moderate, and low. The Perceived Stress Scale is a widely recognized psychological tool used to measure the degree of stress individuals experience in their daily lives. By evaluating students' responses to various stress-related questions, their stress levels were quantified and classified accordingly. Students falling into the high-stress category exhibited elevated stress levels, indicating a greater degree of academic, social, or personal pressure. Those in the moderate-stress category experienced a balanced level of stress, suggesting they faced challenges but managed them within a tolerable range. Meanwhile, students in the low-stress category reported minimal stress, implying effective coping mechanisms and a relatively lower impact of stressors on their daily lives. This classification provides valuable insights into students' well-being, helping to identify those who may require additional support in managing stress and maintaining mental health.

When it comes to stress levels, men and women experience pressure in different ways. As per the gender wise distribution of stress levels, results show that 47.69% of males report moderate stress, which could be linked to societal expectations. Many men struggle with expressing their emotions, which can lead to bottled-up stress. They often feel the weight of being the primary breadwinner, a role that brings financial and social pressure. Additionally, some may turn to unhealthy coping mechanisms, such as substance use, which can further contribute to their stress levels. These findings align with previous studies [9]

On the other hand, 15.38% of females report experiencing high levels of stress. This could be attributed to the demands placed on them by both society and family, where they are often expected to balance multiple roles—academic, professional, and domestic—all while meeting societal standards. Additionally, biological factors, such as hormonal changes during menstruation, may amplify stress levels. These combined pressures create a challenging environment, making stress management particularly difficult for women. Similar finding were seen in other studies [10,11,12]

Stress levels among students can also vary based on their living arrangements. 30.77% of hostel students experience high levels of stress, which isn't surprising. Living away from home means dealing with homesickness, adjusting to a new environment, and managing daily responsibilities independently—whether it's academics, finances, or even basic tasks like laundry and meals. Without the immediate emotional and practical support of family, hostel students may struggle to cope, making their stress levels higher.

Similar finding were seen in other studies [13]

On the other hand, 72.53% of day scholars report moderate stress, which can stem from a different set of challenges. Many face constant parental pressure to excel academically, often with limited freedom to make their own choices. Their social interactions with classmates may also be restricted, making it harder to form strong peer connections. Long commutes to and from college add another layer of exhaustion, leaving them with less time to relax or engage in extracurricular activities. These factors combine to create a persistent, moderate level of stress for day scholars, even if they benefit from the comfort of living at home. Similar finding were reported in other studies [14].

Stress levels among students also vary based on their relationship status, with both singles and those in relationships facing unique challenges. Our findings reveal that 70.50% of single students experience moderate stress, which could be linked to feelings of loneliness and the pressure to find a partner. In a world where relationships are often glorified, singles may feel like they're missing out, leading to emotional distress. Additionally, without a partner, they might have fewer avenues for emotional support, making it harder to cope with academic and personal pressures. These patterns are consistent with findings from other studies [15] emphasizing the impact of social expectations on mental well-being.

Meanwhile, 33.30% of students in relationships report high levels of stress, but for entirely different reasons. While being in a relationship can offer emotional support, it also brings added responsibilities and emotional complexities. Young relationships often come with challenges such as managing expectations, handling conflicts, and dealing with the pressure of commitment. Balancing academics, personal goals, and a romantic relationship can feel overwhelming, leading to heightened stress levels. Similar trends have been observed in other studies [16,17] reinforcing the idea that relationships, while fulfilling, can also be a significant source of stress for students.

Academic performance plays a significant role in shaping students' stress levels, with both high and low achievers facing distinct pressures. Our findings reveal that 30% of students who scored below 50% in their previous exams experience high levels of stress. This is likely fueled by a fear of failure, self-doubt, and a drop in self-esteem. Many of these students also face intense parental pressure to improve, which can make them feel overwhelmed rather than motivated. The anxiety of falling behind academically, combined with the fear of disappointing others, creates a cycle of stress that can be difficult to break. Interestingly, stress doesn't disappear with higher grades—it just takes a different form. Our study shows that 70.8% of students who scored above 50% experience moderate stress, often due to self-imposed pressure to maintain their performance. The burden of meeting high expectations from family, friends, and even themselves can be mentally exhausting. Many high achievers grapple with perfectionism, fearing that even a slight dip in grades could be seen as failure. Additionally, the competitive academic environment pushes them to constantly prove themselves, leading to burnout over time.

CONCLUSION

The study highlights the serious issue of stress among engineering students, driven by academics, relationships, and societal expectations. While most experience moderate stress, a significant number struggle with high levels. Factors like gender, living conditions, and academic performance play a key role.

To tackle this, colleges should offer counselling, mentorship, and stress management workshops. Encouraging mindfulness, time management, and physical activity can help students cope better. Creating a supportive environment where students feel comfortable seeking help is crucial. As part of this study, a health talk was conducted to educate students on managing stress, reinforcing the need for regular well-being initiatives in academics.

Limitation of study: -

The study's findings are based on data from one engineering college in central India, which may limit the extent to which the results can be applied to other contexts.

Conflict of Interest:

There is no conflict of interest

REFERENCES

1. Priyadarshini I, Ramteke V, Ansari R. Stress and Anxiety Among First Year and Final Year Engineering Students. International Journal of Advanced Research in Education & Technology (IJARET) [Internet]. 2016 [cited 2025 Mar 8];17(4). Available from: https://www.ijaret.com/wp-content/themes/felicity/issues/vol3issue4/priyadarshini.pdf

2. Nabanita Banerjee, Dr. Ishita Chatterjee. ACADEMIC STRESS, SUICIDAL IDEATION & MENTAL WELLBEING AMONG 1ST SEMESTER & 3RD SEMESTER MEDICAL, ENGINEERING & GENERAL STREAM STUDENTS. Researchers World : Journal of Arts, Science and Commerce. 2016 Jul 1;VII(3):73–80.

3. World Health Organization. Stress [Internet]. World Health Organization. 2023. Available from: https://www.who.int/news-room/questions-and-answers/item/stress

4. Bhargava D, Trivedi H. A Study of Causes of Stress and Stress Management among Youth. IRA-International Journal of Management & Social Sciences (ISSN 2455-2267). 2018 Jul 18;11(3):108.

5. Rizwan A, Alvi MS, Saeed MU. Analysis of factors affecting the stress level of engineering students. The International journal of engineering education. 2010 Jan 1;26(3):681-6.

6. Owusu P, Essel G. Causes of students' stress, its effects on their academic success, and stress management by students [Internet]. www.theseus.fi. 2017. Available from: https://www.theseus.fi/handle/10024/124792

7. Sindhu P. Impact of Anxiety on Academic Achievement among Engineering Students. The International Journal of Indian Psychology, Volume 4, Issue 1, No. 80. 2016 Dec 13:100.

8. Kyrou I, Tsigos C. Stress mechanisms and metabolic complications. Hormone and Metabolic Research. 2007 Jun;39(06):430-8.

9. Mishra P, Choudhuri R. A Study of Gender Difference in Academic Stress among Higher Secondary School Students of Varanasi. National Journal of Education [Internet]. 2024 [cited 2025 Mar

8];1. Available from: https://www.bhu.ac.in/Images/files/15(8).pdf

10. Graves BS, Hall ME, Dias-Karch C, Haischer MH, Apter C. Gender differences in perceived stress and coping among college students. Dalby AR, editor. PLOS ONE [Internet]. 2021 Aug 12;16(8). Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8360537/

11. C. A, Agines P. D, V.P. J, D. P, D. R. (PDF) Gender Differences in Perceived Stress levels and Coping Strategies among College Students. ResearchGate [Internet]. 2017 Sep 25 [cited 2021 Dec 4]; Available from: https://www.researchgate.net/publication/323995368_Gender_Differences_in_Perceived_Stress_levels_and_Coping_Strategies_among_College_Students

12. Infortuna C, Gratteri F, Benotakeia A, Patel S, Fleischman A, Muscatello MRA, et al. Exploring the Gender Difference and Predictors of Perceived Stress among Students Enrolled in Different Medical Programs: A Cross-Sectional Study. International Journal of Environmental Research and Public Health. 2020 Sep 11;17(18):6647.

13. Singh RS. Stress and Resilience: A comparative study between Hostellers and Day Scholars. Indian Journal of Applied Research. 2014;4(3):455-7.

14. Ravichandran H. Measuring stress in hostelites and day scholars. Research Journal of Pharmacy and Technology. 2015 Jun 1;8(6):710.

15. Adamczyk K, Segrin C. Perceived Social Support and Mental Health Among Single vs. Partnered Polish Young Adults. Current Psychology. 2014 Jun 29;34(1):82–96.

16. Ta VP, Gesselman AN, Perry BL, Fisher HE, Garcia JR. Stress of Singlehood: Marital Status, Domain-Specific Stress, and Anxiety in a National U.S. Sample. Journal of Social and Clinical Psychology. 2017 Jun;36(6):461–85.

17. Shah S, Mistry N. The effect of relationship status on emotional maturity and stress. The International Journal of Indian Psychology. 2020 Mar 3;8(1):2349–3429.

18. State of New Hampshire Employee Assistance Program. Perceived Stress Scale [Internet]. 1983. Available from: https://www.das.nh.gov/wellness/docs/percieved%20stress%20scale.pdf