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Assessment and Analysis of Factors Impacting Stress in Students in Higher Educational Institutes in Delhi-NCR

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Abstract: Well-being is essential to lead a fulfilling and enjoyable life. Today's fast-paced world causes stress and strain, affecting physical and mental health. The study focuses on stress among students who are anxious owing to competition and performance-oriented objectives. The study describes academic stress, deliberates its causes, and discusses its impacts and manifestations. Factors affecting the perception of stress for a sample of 633 college students in Delhi-NCR are examined. Learner assessment of stress perception is measured using twenty-five items with responses collected on a 5-point Likert Scale. Additionally, the perceived impact of stress on the health and productivity of learners is also examined using six items. The ordered logistic regression model is employed to empirically examine the impact of demographic factors, home and college environments, as well as anxiety about the future on perceived stress amongst the respondents. More than 65 percent of respondents reported facing medium or high levels of stress perception. The study finds no difference in the average stress perception based on gender, but academic pressure, family income and teachers, peer and parental pressure emerge as stress-contributing factors. Examination, curriculum, and time pressures appear to be the most significant factors affecting stress perception. An increase in perception regarding examination, curriculum and time pressures significantly increases the ordered log-odds of moving to the higher stress perception category by 1.19 units. The study makes a compelling case for shifting the focus of education from purely academic to students' holistic development. Given the increase in stress perception, coping strategies for stress management are desperately needed. Recreational activities and the provision of appropriate counselling services by higher education institutions are imperative in this respect. Additionally, parents, teachers, and policymakers working together may do a lot to help youngsters manage their stress.

Introduction

Well-being is crucial for leading a happy and good-quality life (Diener, 2000). To live a gratifying life, one must prioritise well-being, where happiness and fulfilment are integral to one's mental, emotional, and physical health. People in today's fast-paced world are under a lot of stress and pressure, which impacts their well-being. This stress emerges from a variety of sources, including economic anxieties, societal demands, technological evolutions, and the constant need to be updated. Increased competitiveness, productivity, and flow of information necessitating adjustment and adaptation are also common causes of this heightened stress. The inevitability of stress in everyday life is causing various health hazards. In India alone, 56 million people suffer from some form of serious mental disorder (WHO, 2017) and the National Health Survey 2016 reports the prevalence of depression in India to be 5 percent.

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The present study is focused on stress among students. The education sector lies at the root of a strong pillar of current and future economic and social infrastructure. According to all macroeconomic models, the growth rate of an economy is a function of technological development and high labour and capital investment in research, which in turn depends on the quality of education and future human resource development. However, with the increasing pressure of competition and performance-oriented results or targets, there are increasing cases of rising stress, anxiety, and even severe depression among students (Madhu et al., 2018, 2022; Kaur and Kaur, 2022; Saha et al., 2024).

Based on a 2020 study published in the Times of India (Kumar, 2020), data from the National Crimes Register Bureau reveals that India has a daily average of one student suicide. Furthermore, between 1995 and 2019, India witnessed the tragic loss of almost 170,000 students to suicide. This alarming statistic appears to be becoming more critical every year, portraying a grim picture of India's education system. Targeting the underlying source of academic pressure could be the most effective approach to decrease stress. Nevertheless, it is crucial to prioritise the empowerment of students and consider their perspectives when it comes to creating more inclusive and conducive learning environments.

As per the literature, college students are under an alarming amount of stress, which has detrimental effects, including psychological hardship, poor self-esteem, diminished optimism, and a lack of self-efficacy. This study examines the factors impacting perceived stress amongst learners in higher education institutions in Delhi-NCR. The study's primary objective is to define academic stress and its causes, including socio-economic aspects of stress: finance, caste and gender and the impacts of this stress, which has been attempted in the next section. Secondly, the study assesses the extent of stress among learners in higher education institutions. Furthermore, the study also examines the various factors impacting perceived stress among learners in higher education institutions. Identifying the more significant factors that augment perceived stress amongst students is important to suggest and help design appropriate policies and guidelines for changes in the education sector and enhancing overall well-being. This is the final objective of the study. After summarising the existing literature on the topic, the empirical methodology we adopted is elaborated, followed by a discussion of the empirical results. The last section gives policy implications and concludes from a broad policy perspective.

Academic Stress: Definition, Cause and Impacts

Academic stress is often defined as a crucial stress-inducing factor for students, but it is a frequently disregarded aspect of many students' lives. According to the 2016 Mental Health Survey, more than one in three Indians between the ages of 18 and 29 experience depression. NCERT report on 'Mental Health and Well-being of School Students' states that 81 percent of school students find studies, examinations, and results to be a major cause of anxiety (PTI, 2022).

The manifestations of academic stress are not only psychological such as depression and anxiety, but also run the risk of developing into physical ailments like stomach aches, nausea, and insomnia. The most drastic impact of stress induced by a rigorous and competitive academic environment is perhaps suicide, a shocking outcome that students resort to when institutional support and interventions fail to provide relief. It was also found that while academic stress arises from high expectations to perform well, it may reduce overall academic performance due to impacts of anxiety and depression i.e., there is a vicious cycle of heightened stress and reduced performance. Due to the umpteen implications that academic stress entails, it is imperative to understand the nature and scope of this better and propose preventative measures.

Among all academic levels, teenagers are particularly susceptible to academic stress since they are going through a lot of psychological and social transformations. Given the crowded lecture halls, inadequate facilities, massive syllabus, excessive concept cramming, etc., the educational system is also somewhat to blame. Monetary issues, parental anxiety, and unreasonable expectations further exacerbate this. These factors are examined in detail in the following section.

Socio-Economic Aspects of Stress: Finance, Caste, and Gender:

In addition to the pressure to succeed, academic stress can also be caused by external factors such as family, culture, and religion. Studies show that low-income students usually experience higher levels of stress. Students from different cultures could feel more pressure to adhere to societal standards, such as gender roles or traditional values, which can increase academic stress.

For outstation students who move to metropolitan cities like Delhi to pursue their higher education, additional expenses of accommodation, food, and travel are stressors, along with added cultural insecurity in a new city. Similar experiences are shared by students who, in their schooling years, move to intense preparation centres like Kota in Rajasthan to completely focus on

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cracking entrance examinations and securing admissions into India's best technical universities. With horrifying incidents of student suicides, caste discrimination and safety threats experienced by young students away from their native homes, anxiety and depression need to be carefully examined for such populations.

According to studies, females have higher levels of anxiety and depression than their male counterparts. This is due to perfectionism, self-doubt, failure anxiety, and the need to manage academic and personal obligations. In a resource-strapped family, with a strong prevalence of gender norms, the male child is likely to acquire more education at the behest of the female child's education. Hence, female students are under extreme stress in coordinating their familial expectations with professional goals.

According to a 2018 poll conducted on the IIT campus, caste discrimination against SC/STs is unquestionably the worst. The survey also highlighted the education disparity in the caste system. Agarwal (2023) states that according to the data presented in Parliament, the highest count of suicides has been reported by premier institutes like the IITs, the NITs and the IIMs. Figure 1, sourced from her article, shows the number of suicide cases in technical institutes over the period 2018 to 2023. A clear fall in the numbers is apparent in the lockdown period due to the pandemic in 2020-21.

Following the suicide of a first-year reserved category student in IIT-Bombay, the institute suggested the students refrain from disclosing their GATE or JEE Advanced scores or any other information reflecting their caste (Handa, 2023).

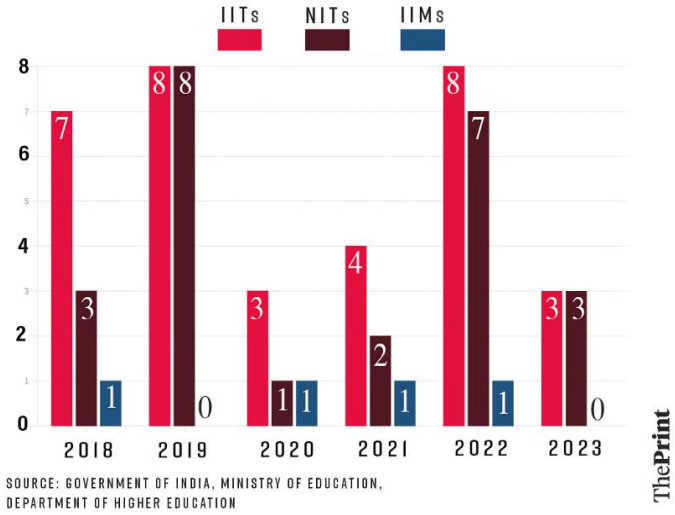

Figure 1. Number of Suicides in Technical Institutes (Source: Reproduced from Handa, 2023).

With the entry of deregulated private coaching institutions, which charge exorbitant fees of approximately 3-4 lakhs for entrance exams such as IIT-JEE/NEET preparation programmes, competition has become fiercer as the culture of learning with self-study is gradually being eradicated. This levies greater stress on relatively economically weaker students, who are to fulfil their parents' expectations. Largely, it worsens the academic and digital divide that already exists between rich and poor students. It further burdens the latter, who must already bridge greater foundational and technical gaps in order to compete in classrooms.

Hence, there is a worrying trend in academic institutions of greatly ascribing value to students' grades while neglecting the significant mental health challenges they face. Dimitrov (2017) corroborated that the educational system places greater emphasis on academic achievement than on the holistic development of students. Furthermore, there are not many available employment-centric courses.

Based on a 2021 UNICEF report, the employment rates of college students have risen, but they remain below 50 percent. Specifically, the employment rates for arts and commerce graduates can be as low as 30 percent. Around half of the undergraduate students, which accounts for 80 percent of the total student population, are enrolled in fields with lower job prospects. A significant number of college graduates opt to pursue more degrees, take positions with lower salaries, or face unemployment while awaiting better job prospects. All of these contribute to their heightened levels of stress and anxiety.

Academic stress can have wide-ranging impacts, including emotional symptoms like worry and despair, as well as physical symptoms such as headaches, stomach aches, and insomnia.

Academic problems, interpersonal problems (family and peer pressure), low self-esteem, ideological disagreements, communication difficulties with parents, and overly critical body image all contribute to students' declining mental health. All these factors have the potential to lead to severe mental illnesses, including sadness and feelings of failure and loneliness. The same leads to issues like disturbed sleep patterns, increased blood pressure, weight gain, weight loss etc. Concerns about excessive internet use have also been identified as the main stress contributing to children's short attention spans, poor self-control, and impaired executive functions. All of this has significantly decreased the nation's productivity as more millennials choose higher leisure time over employment.

Review of Literature

University life is often seen as an exciting chapter of personal growth and academic exploration. However, it

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also brings with it significant challenges and pressures that can lead to stress among students. The combination of academic responsibilities, social expectations, financial constraints, and future uncertainties can create an overwhelming environment. A review of the literature has been done to find the main causes, its redressal, and suggestions to deal with the rising stress among university students.

The literature offers multiple sources of stress among students in universities. Studies, examinations, gender differences, lack of personal and/or family time, financial problems, parental pressure, and competition, among many others. These reasons are discussed in detail in various studies quoted in this section below.

For students, the study-related stress, which especially includes examination, its preparation or the time of exams is extremely high and has been extensively studied in literature (Pandey et al., 2023; Fernández-Castillo for University of Spain, 2021; Ahmad et al., 2021; Al Qahtani and Alsubaie, 2020; Pullokaran, 2018; Yikealo et al. 2018; Reddy et al., 2018; Rahim et al., 2015; Gbettor et al., 2015; Deb et al., 2014; Bataineh, 2013; Nandamuri and Gowthami's, 2011; Yumba, 2008; and Abouserie, 1994).

Literature also quotes academic performance and vast curriculum as strong factors triggering anxiety and stress (Guzmán et al., 2023; Wang et al., 2023; Zhan et al., 2021; Bashir et al., 2019; Pullokaran, 2018; Sebastian, 2018; Sharma et al., 2016; Rahim et al., 2015; Gbettor et al., 2015; Bataineh, 2013; Jaekul et al., 2013; Elias et al., 2011; Nandamuri & Gowthami, 2011; Benette, 2010; Yumba, 2010; and Dimitrov, 2017; Abouserie, 1994).

The stress is further aggravated due to family and financial responsibilities (McCloud and Bann, 2019; Pullokaran, 2018; Bhat et al., 2018; Sharma et al., 2016; Pariat et al., 2014; Jaekul et al.,2013; Benette, 2010; Kai-Wen, 2010; and Bayram and Bilgel, 2008; Darling et al., 2007and Abouserie, 1994).

Pandey et al. (2023) in an interesting study on assessing stress among students living in border areas of Jammu and Kashmir use the perceived stress scale among students with educational status below graduation level and find them to be more anxious and depressed.

Pullokaran (2018) in his study of the Indian state of Kerela found academic stress causes certain psychological problems like feelings of isolation, hopelessness, and finally depression. Stress also creates physiological problems like changes in sleeping patterns, increased blood pressure, weight gain or weight loss, etc. Students mentioned that social media involvement is one of their stress relief factors.

The literature also strongly agrees with stress based on gender differences, where most of the studies agree with female students being more stressed (Johnson et al., 2023; Graves et al., 2021; Tessema et al., 2019 based on students of Southern Ethiopia; Sharma et al., 2016; Karaman et al., 2016; Amin et al., 2013; Yumba, 2010) for King Faisal University, Saudi Arabia; Mahmoud et al., 2012 for a large public university in the USA; Dixon and Kurpius, 2008; Yumba, 2008; Darling et al., 2007; and Abouserie, 1994). The literature also quotes cases of higher stress among male students (Ahsan-ul-Haq et al., 2018 for students of Lahore; and Kai-Wen, 2010). Some papers also find no significant differences in stress based on gender differences (Ahmad et al., 2021; Yikealo et al., 2018; Reddy et al., 2018; Ganesan et al., 2018 for students at a public university in Malaysia; Al-Sunni and Latif, 2014).

Other significant sources of stress include over-expectations by parents or teachers (Hoferichter et al., 2024; Zimmer-Gembeck et al., 2023; Deng et al., 2022; Pascoe et al., 2019; Pullokaran, 2018; Bataineh, 2013), heavy competition among students (Jain and Singhal, 2018; Sharma et al., 2016), as well as lack of motivation (Bataineh, 2013; Benette, 2010). Sharma et al. (2016) mention changes in the environment as one comes far from home to study at university, which is also a cause of stress.

A significant amount of literature has been on stress among students in professional fields such as medical or other sciences (Reddy et al., 2018; Rahim et al., 2016; Abdulghani et al., 2011; Elias et al., 2011; Bayram and Bilgel, 2008; and Sreeramareddy et al., 2007) and management studies (Nandamuri and Gowthami's, 2011; Bhat et al., 2018). Rahim et al. (2016) and Elias et al. (2011) found that the stress level is highest among final-year students in different Universities in Malaysia. On the contrary, Abdulghani et al. (2011) and Bayram and Bilgel (2008) found that stress levels decreased with the latter years of study in medical students at the University of Turkey and King Saudi University, respectively.

Finally, many studies have quoted the outbreak of COVID-19 as a severe cause of stress due to multiple reasons of online teaching, lack of active social life, recreational activities, etc. (Fernández-Castillo, 2021; Zhan et al., 2021 for China; Clabaugh et al., 2021 for the US; Ma et al., 2020 for China).

The literature highlights the need for psychological counselling centres within the university regularly or organizing informational workshops as important strategies to reduce stress (Cerolini et al., 2023; Broglia et al., 2021; Zhan et al., 2021; Tessema et al., 2019;

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Reddy et al., 2018; Rehman, 2016; Karaman et al., 2016; Lee and Jang, 2015; Jaekul et al., 2013; Kumaraswamy, 2013; Mahmoud et al., 2012; Hamaideh et al., 2011; Darling et al., 2007; Sreeramareddy et al., 2007).

Table 1. Characteristics of Student Respondents.

Gender	
Males	298
Females	335
Stream of Study	
Commerce	171
Humanities	234
Management & Other Professional Courses	238
Monthly Family Income	
Less than ₹50,000	106
Between ₹50,000 to ₹100,000	187
Between ₹100,000 to ₹300,000	206
More than ₹300,000	134
Year of Study	
First Year	**227**
Second Year	253
Third Year & Higher	153
Class XII Percentage (Proxy for Past Academic Performance)	
Less than 85 percent	**127**
Higher than 85 but lower than 95 percent	267
More than 95 percent	239
Source: Estimates based on survey data collected	

Research also suggests enhancing sports/yoga/meditation and other outdoor or recreational activities to counter stress levels (Yikealo, 2019; Jain and Singhai, 2018; Sharma et al., 2016; Pariat et al., 2014). Kumaraswamy (2013) emphasized, that a warm and effective learning environment for students should be encouraged, and support and mentorship should be provided.

In conclusion to the study of our vast literature, it is apparent that stress management techniques are quintessential and should be appropriately framed for students at the university level. The study empirically uses the reasons for stress stated by the literature to analyse stress perception amongst college students in Delhi-NCR in the next section.

Methods

To help students with their educational obligations and reduce their anxiety, it is important to understand the underlying reasons giving rise to their perceived stress. Existing studies have examined the predictors of perceived stress among university students as discussed in the previous section.

Primary data was collected from students of higher education institutions in Delhi-NCR to analyse the various concerns. The questionnaire survey contained different parts. The first part asked demographic questions about gender, stream of education, monthly family incomes, years of higher education, and past academic performance. The second part gathered information about the academic expectations of students, their perceptions regarding workload and examinations, and their academic self-perceptions. Learner assessment of stress perception was based on their current situation and feelings about prospects. 25 items with responses on a 5-point Likert Scale showing different degrees of responses from ‘strongly agree’ to ‘strongly disagree’ were used. Additionally, to measure the apparent impact of stress on the health and productivity of learners, 6 items were considered with responses on five-point Likert Scale Demographic questions.

Data was collected from 633 students using an online questionnaire circulated through mail and disseminated with the help of faculty. The study uses Cross Tabulations and Ordered Logit Regressions to assess the factors impacting perceived stress amongst students.

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Table 2. Items Used to Measure Student Stress Perception.

v1	Competition with my peers for grades is quite intense.
v2	My parents are critical of my academic performance.
v3	Over-expectations of my teachers stress me out.
v4	The biased/critical nature of my teachers stresses me out.
v5	My family has huge expectations of me.
v6	The size of the curriculum is excessive.
v7	I can manage extracurricular activities with my coursework.
v8	I cannot afford to miss classes.
v9	The examination questions are too lengthy.
v10	The examination questions are usually difficult.
v11	I am worried about failing in my final exams.
v12	I do not get sufficient personal/family time.
v13	I do not get sufficient recreational breaks.
v14	There are too many assignments to be submitted.
v15	Feel frustrated due to limited choices in the course curriculum.
v16	Feel stressed out due to social media addiction.
v17	The financial cost of studies is a cause of stress.
v18	I face gender discrimination at home/college.
v19	Feel stressed due to fear of not being selected for higher studies.
p1	I will be a successful student.
p2	I will be successful in my career.
p3	I fear not being able to get into a Higher Education programme of my choice.
p4	I am worried about getting a job that meets my expectations.
p5	I will have to do an additional course to increase my employability prospects.
p6	Experiencing Mental health issues (anxiety or depressive thoughts)
	Source: Authors based on Literature Review

Demographic Profile of Respondents

The respondents primarily comprised students from the University of Delhi and other Universities located in Delhi-NCR.

Table 1 gives an outline of the demographic profile of our 633 student respondents. Females comprised 53 percent of the sample and the male respondents were 298 in number. The largest number of respondents – 238, belonged to Management & Other Professional Courses, followed by a marginally smaller number from Humanities. 171 respondents were from the field of Commerce. 32 percent of the student respondents were from families with monthly family incomes of between ₹100,000 to ₹300,000, 30 percent from families with monthly family incomes of between ₹50,000 to ₹100,000, 21 percent from families with monthly family incomes of more than ₹300,000 and about 17 percent of the student respondents were from families with the lowest monthly family income category of less than ₹50,000 per month. Nearly 40 percent of the student respondents belonged to the second year of study. 36 percent belonged to the first year and the remaining 24 percent were in their third year or at a higher level in their respective course of study. Information on Class XII percentage (as a proxy for past academic performance) was also collected. Forty-two (42) percent of the respondents scored more than 85 but lower than 95 percent in their Class XII exams. 239 or 38 percent of the student respondents had scored more than 95 percent in their class XII exams and about 20 percent of the student respondents had class XII scores of less than 85 percent.

Results and Discussion

The study centred on creating and evaluating a scale to quantify the perceived aetiology of stress among undergraduate university students. Stress perception was measured based on the following twenty-five items (Table 2).

The responses were collected on a 5-point Likert scale and the respondents were asked to mark their responses as “Strongly agree”, “Agree”, “Neutral”, “Disagree”, or “Strongly disagree”, measuring the extent to which they agreed with the given statements. The respective responses were then correspondingly accorded values of 5, 4, 3, 2 and 1, which were added correspondingly. The cumulative values were then considered as indicators of

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stress perception with lower values mirroring lower levels of stress perception and vice versa.

Table 3. Reliability and Sampling Adequacy Tests.

Cronbach's Alpha Index	0.873	
Kaiser-Meyer-Olkin Measure of Sampling Adequacy	0.865	
Barlett's Test of Sphericity	Approx. Chi^2	5450.76^{***}
	DF	300
Source: Calculations based on data collected		

The present study focused on the development and the psychometric assessment of a scale to measure the perceived sources of stress among undergraduate university students. Stress perception was measured based on the twenty-five items listed in Table 2.

The reliability of any given measurement refers to the extent to which it is a consistent measure of a concept and Cronbach's alpha is one way of measuring the strength of that consistency. Cronbach's alpha is a measure used to assess the reliability, or internal consistency, of a set of scale or test items. It is based on the number of variables in a questionnaire as well as on the correlations between the variables. As per Nunnally (1978), Cronbach's α is the most important measure to account for reliability. Our study's Cronbach's Alpha Index is 0.873 and is statistically acceptable (Table 3).

Kaiser–Meyer–Olkin (KMO) and Bartlett's test of sphericity is a measure to check sampling adequacy, which is recommended to check the data to the variable ratio for the analysis being conducted. In most studies, KMO and Bartlett's test play an important role in accepting sample adequacy. Bartlett's test of sphericity assesses the hypothesis that the correlation matrix is an identity matrix. Therefore, this test needs to be significant. For this dataset, KMO analysis has revealed that the KMO measure of sampling adequacy value is 0.873 (Table 3) and has also been estimated to be highly significant ($p < 0.001$), therefore, factor analysis is found to be suitable.

Several exploratory principal component analyses were conducted on the 25-item scale. Based on the Kaiser rule (eigenvalues>1.0), the percentage of variance accounted for, and the cohesiveness of the factors (i.e., patterns of loadings), a five-factor solution appeared optimum. The five factors that were constructed are- Examination, Curriculum & Time Pressures (Factor 1), Future Uncertainties (Factor 2), Hostile Home & Institution Environment (Factor 3), Parental, Peer & Teacher Pressures (Factor 4) and Self Perception (Factor 5).

Table 4. Distribution of Student Respondents Concerning Stress Perception.

Low Levels of Perceived Stress	Medium Levels of Perceived Stress	High Levels of Perceived Stress
218	255	160
Source: Estimates based on survey data collected		

The stress perception scores were divided into three categories *levels of perceived stress* (respondents with cumulative 25 item scores for stress perception less than or equal to 75), *medium levels of perceived stress* (respondents with cumulative 25 item scores for stress perception more than 75 but less than 90), and *high levels of perceived stress* (respondents with the cumulative 25 item scores for stress perception more than 90). The distribution of the 633 student respondents as per their respective stress perceptions is given in Table 4. Forty (40) percent of the student respondents reported having *medium levels of perceived stress*, 34 percent reported having low levels, and 26 percent reported having *high levels of perceived stress.*

Table 5. Items Used to Measure Perceived Student-Stressed Behaviour.

1	Lack of Sleep
2	Irritating behaviour
3	Lack of concentration, understanding and retaining power
4	Rude behaviour with parents/siblings/peers
5	Experiencing diminishing work efficiency/productivity
6	Lack of sports activities affects my productivity.
Source: Based on Literature Review	

In addition to stress perception, the study also measured the perceived stressed behaviour of students based on 6 items given in the subsequent Table 5.

To examine if there exist any gender differences in stress perception, a paired (or "dependent") t-test was employed. The results are reported in Table 6. The t-statistic is -0.2595 with 631 degrees of freedom and the

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corresponding two-tailed p-value is 0.7953, which is greater than 0.05. The results imply no statistically significant difference between the average stress perception for males and females.

Table 6. Difference in Stress Perception Based on Gender.

Group	Observations	Mean	Standard Error	*t*-value	*p*-value
Male	298	80.342	0.829	-0.2595	0.7953
Female	335	80.627	0.724		
Source: Estimates Source (based on survey data collected)					

To examine any difference in stress perception based on different courses of study of the student respondents, a one-way analysis of variance (ANOVA) was used as there are three groups in this case. The ANOVA results are reported in Table 7. As is evident, the mean of perceived stress scores differs significantly among the courses of study.

Table 7. Difference in Stress Perception Based on Course of Study.

Course of Study	Mean	Std. Dev.	Freq.
Commerce	82.96491	13.90256	171
Humanities	80.73077	13.4726	234
Professional & Other Courses	78.39474	13.6789	228

Table 8. ANOVA Table for Factors Impacting Stress in Students in Higher Educational Institutes in Delhi-NCR.

Source	SS	DF	MS	F	Prob > F
Between groups	2061.916	2	1030.958	5.52	0.0042
Within groups	117624.3	630	186.7052		
Total	119686.2	632	189.3769		
Source: Estimates based on survey data collected					

There appears to be a significant difference in stress perception between students pursuing professional and other courses vs commerce.

Next, the study also examined any difference in stress perception depending on the monthly family income of the student respondents. As exhibited in Figure 2, the stress perception of the least income category is the highest, while that of the highest monthly income category is the lowest. The stress perception score falls for higher income slabs.

Ordinal Regression Analysis

To analyse whether there exists some degree of association between stress perception and several independent variables, such as gender, stream of education, monthly family incomes, year of higher education, and past academic performance, the present study employs the ordered logit model.

Stress perception is the dependent variable in the regression analysis. The variable was constructed based on the 6 items given in Table 4. The variable was constructed as a categorical ordered variable. The dependent variable stress perception has three categories- low, medium and high. The stress behaviour scores were divided into three categories- *low levels of perceived stressed behaviour* (respondents with cumulative 6-item scores for stressed behaviour less than or equal to 17), medium levels of perceived stressed behaviour (respondents with cumulative 6-item scores for stressed behaviour greater than 17 and less than or equal to 24), and high levels of perceived stressed behaviour (respondents with the cumulative 6 item scores for stressed behaviour more than 24).

The dependent variable in the present analysis is the different categories of 'perceived stressed behaviour'. That is, the value of the dependent variable is 1 if the respondent reports 'Low Levels of Perceived Stressed Behaviour'. Similarly, the value will be 2 if the respondent reports 'Medium Levels of Perceived Stressed Behaviour' and 3 if the respondent reports 'High Levels of Perceived Stressed Behaviour'. In this case with Y_i being stress perception the ordered logistic regression model is given by:

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$$P(Y_i > j) = \frac{exp\,(X_i\beta - \theta_j)}{1+[exp\,(expexp\,(X_i\beta - \theta_j)\,]}, j = 1,2,3 \text{ (1)}$$

Here β 's shows the log odds change with a corresponding unitary increase in the values of $\boldsymbol{X}_k$ variables.

The results of ordered logistic regression indicate that several factors used in the regression model are significantly associated with the perception of stress reported by the students.

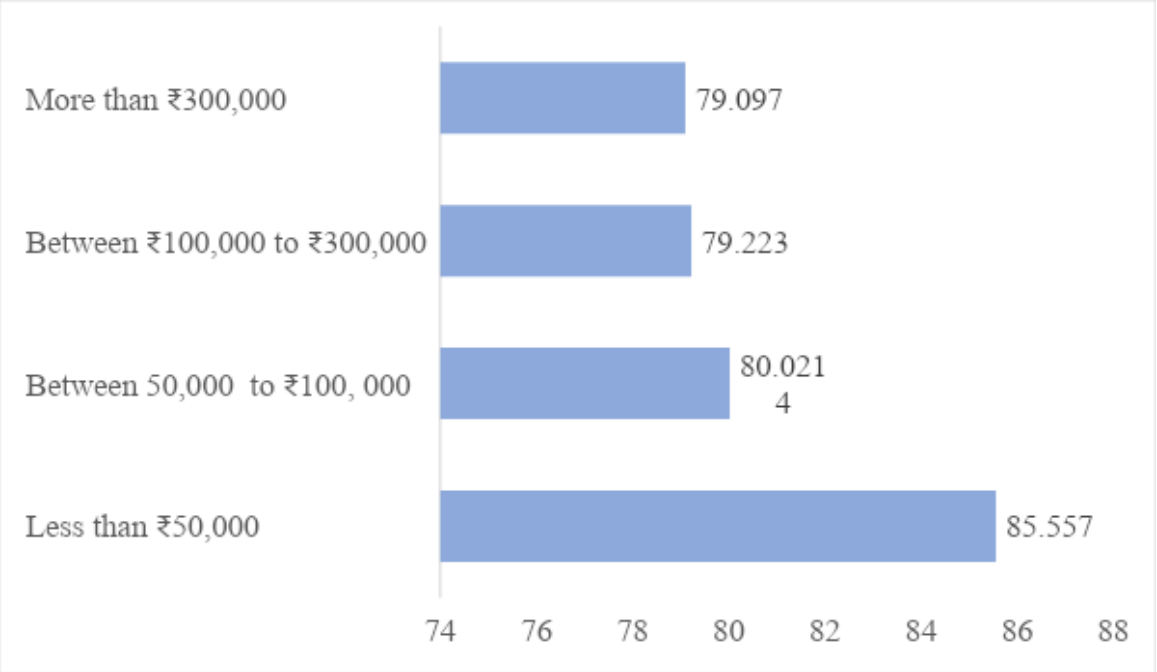

Figure 2. Difference in Stress Perception Based on Course of Study-Groups Comparison
(Source: Estimates based on survey data collected).

The dependent variable in the present analysis is the different categories of 'perceived stressed behaviour'. That is, the value of the dependent variable is 1 if the respondent reports 'Low Levels of Perceived Stressed Behaviour'. Similarly, the value will be 2 if the respondent reports 'Medium Levels of Perceived Stressed Behaviour' and 3 if the respondent reports 'High Levels of Perceived Stressed Behaviour'. In this case with Y_i being stress perception the ordered logistic regression model is given by:

$$P(Y_i > j) = \frac{exp\,(X_i\beta - \theta_j)}{1+[exp\,(expexp\,(X_i\beta - \theta_j)\,]}, j = 1,2,3$$

(1)

Here β 's shows the log odds change with a corresponding unitary increase in the values of $\boldsymbol{X}_k$ variables.

To examine whether there exists some degree of association between perception towards stress and demographic variables such as gender, nature, of course, being pursued, household income, the score achieved in class XII examination and factors such as examination, curriculum and time pressures, future uncertainties, hostile home and institution environment and parental, peer & teacher pressures, the Ordered Logit Model has been employed. The results of our Ordinal Regression Analysis based on analysis of student responses are given in Tables 9 and 10.

- *Males vs. Females*: For females, the ordered log odds of being in a higher stress perception category are larger compared to males but these are non-significant. In general, gender appears to be a non-significant factor for our Delhi-NCR sample of students in terms of impact on stress perception.
- *Commerce vs. Humanities vs. Professional & Other Streams:* Compared to the base category of commerce students, students pursuing other streams are less likely to have a higher stress perception as reflected by a lower ordered log odds ratio. The ordered log odds are even smaller for students pursuing professional and other streams compared to those pursuing humanities. The ordered log odds for professional and other stream categories students in a higher stress perception category is 0.9642 less than students in the base commerce category.
- *Household Income:* Compared to the base category of monthly family income of less than ₹50,000, students belonging to higher monthly family income categories have significantly lower stress perception as reflected by lower and significant (at 1 percent in the model (1) in all cases) ordered log odds ratio. The highest monthly family income students have the lowest stress perception.

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Table 9. Ordered Logit Regression (Log-Odds)- Student Responses.

Stress Perception/ Perception of Stressed Behaviour	**(1)**	**(2)**
Female (Base Category: Males)	0.0441 (0.28)	0.0894 (0.52)
Humanities	-0.108 (-0.55)	0.0331 (0.15)
Professional & Others (Base Category: Commerce)	-0.0358 (-0.16)	0.129 (0.51)
Between 50,000 to ₹100,000	**-0.605*** (-2.60)**	-0.177 (-0.68)
Between ₹100,000 to ₹300,000	**-0.828*** (-3.56)**	**-0.447* (-1.72)**
More than ₹300,000 (Base Category: Less than ₹50,000)	**-0.839*** (-3.27)**	-0.439 (-1.54)
Second Year	**0.793*** (4.10)**	0.196 (0.90)
Third Year or Higher (Base Category: First Year)	**0.615*** (2.90)**	**0.488** (2.05)**
Higher than 85 but lower than 95 percent	-0.273 (-1.27)	-0.278 (-1.15)
More than 95 percent (Base Category: Less than 85 percent)	0.188 (0.81)	0.174 (0.67)
Examination, Curriculum & Time Pressures		**1.196*** (11.05)**
Future Uncertainties		**0.871*** (9.13)**
Hostile Home & Institution Environment		**0.695*** (7.28)**
Parental, Peer & Teacher Pressures		**0.252*** (2.83)**
Low Self Perception		**0.457*** (5.12)**
cut1		
Constant	-1.327*** (-4.30)	-1.604*** (-4.48)
cut2		
Constant	0.951*** (3.11)	1.688*** (4.70)
N	633	630

Source: Calculations based on data collected

❖ *Year of Study:* Compared to the base category of commerce students, students pursuing other streams are less likely to have a higher stress perception as reflected by a lower ordered log odds ratio. Interestingly, the ordered log-odds are smaller for students in the third year or higher as compared to the second-year students.

❖ *Class XII Percentage:* Compared to the base category of less than 85 percent students having between 85 and 95 percent class XII marks have a lower perception of stress but students in the highest marks category of more than 95 percent marks have higher

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stress perception as reflected by positive ordered log odds ratio.

Table 10. Ordered Logit Regression (Odds Ratio)- Student Responses.

Stress Perception/ Perception of Stressed Behaviour	(1)	(2)
Female (Base Category: Males)	1.045 (0.28)	1.093 (0.52)
Humanities	0.898 (-0.55)	1.034 (0.15)
Professional & Others (Base Category: Commerce)	0.965 (-0.16)	1.138 (0.51)
Between 50,000 to ₹100,000	**0.546*** (-2.60)**	0.838 (-0.68)
Between ₹100,000 to ₹300,000	**0.437*** (-3.56)**	**-0.447* (-1.72)**
More than ₹300,000 (Base Category: Less than ₹50,000)	**0.432*** (-3.27)**	0.644 (-1.54)
Second Year	**2.209*** (4.10)**	1.216 (0.90)
Third Year or Higher (Base Category: First Year)	**1.849*** (2.90)**	**1.629** (2.05)**
Higher than 85 but lower than 95 percent	0.761 (-1.27)	0.757 (-1.15)
More than 95 percent (Base Category: Less than 85 percent)	1.207 (0.81)	1.190 (0.67)
Examination, Curriculum & Time Pressures		**3.307*** (11.05)**
Future Uncertainties		**2.388*** (9.13)**
Hostile Home & Institution Environment		**2.004*** (7.28)**
Parental, Peer & Teacher Pressures		**1.286*** (2.83)**
Low Self Perception		**1.580*** (5.12)**
cut1		
Constant	-1.327*** (-4.30)	-1.604*** (-4.48)
cut2		
Constant	0.951*** (3.11)	1.688*** (4.70)
N	633	630

Source: Calculations based on data collected

❖ *Examination, Curriculum & Time Pressures*: The said factor has a positive and significant (At 1 percent) impact on stress perception. With increased examination, curriculum and time pressures by a unit the ordered log-odds of moving to the higher stress perception category would go up by 1.19 units. Hence, examination, curriculum and time pressures significantly impact the stress perception of students.

This factor seems to have the largest impact on stress perception as reported by our sample.

❖ *Future Uncertainties; Hostile Home & Institution Environment; Parental, Peer & Teacher Pressures; and Low Self Perception:* With an increase in future uncertainties; hostile home and institution environment; parental, peer, and teacher pressures; and low self-perception the ordered log-odds of moving to higher stress perception category increase significantly (These ratios are significant at 1 percent). Future uncertainties seem to have the largest impact followed by hostile home and institution environments and low self-perception. A rise in parental, peer, and teacher pressures also significantly increases the ordered log odds of moving to a higher stress perception category, but the impact is relatively lower.

A similar analysis emerges when the odds ratios (Table 10) are analysed in place of the log of odds ratio.

The results drawn reinforce the findings of the research conducted both domestically and internationally in assessing stress among students in higher education. To summarize, the following results emerge from our empirical analysis: the monthly family income is a significant factor affecting the intensity of perceived stress perception. Literature has extensively quoted this, including recent studies (McCloud and Bann, 2019; Pullokaran, 2018; Bhat et al., 2018; Sharma et al., 2016).

The year of study also significantly affects the intensity of perceived stress perception as also found by Rahim et al. (2016) and Elias et al. (2011). Besides, other factors found to be relevant in past studies also find relevant weightage in the present research like Examination **(**Pandey et al., 2023; Fernández-Castillo for University of Spain, 2021; Ahmad et al., 2021; Al Qahtani and Alsubaie, 2020; Pullokaran, 2018; Yikealo et al., 2018; Reddy et al., 2018), Curriculum & Time constraints (Guzmán et al., 2023, Wang et al., 2023; Zhan et al., 2021; Bashir et al., 2019; Pullokaran, 2018; Sebastian, 2018; Sharma et al., 2016), Future Uncertainties, Parental, Peer & Teacher Pressures (Hoferichter et al., 2024; Zimmer-Gembeck et al., 2023; Deng et al., 2022) and Low Self Perception. However, Examination, Curriculum and Time Pressures are the strongest factors. According to the recent literature review, these factors have also been found crucial in the past.

Further, as part of the coping strategies, the study finds regular counselling sessions by appointment of professional counsellors in the institutes will go a long way in managing stress. This has also been strongly put across in previous studies (Cerolini et al., 2023; Broglia et al., 2021; Zhan et al., 2021; Tessema et al., 2019; Reddy et al., 2018; Rehman, 2016; Karaman et al., 2016). Besides, incorporating any kind of physical activity routine helps physically release stress, as also emphasized by literature (Yikealo, 2019; Jain and Singhai, 2018; Sharma et al., 2016; Pariat et al., 2014; Rajasekar, 2013).

The study however does not find significant differences in stress based on gender in contrast to most of the literature (Johnson et al., 2023; Graves et al., 2021; Tessema et al., 2019 based on students of Southern Ethiopia; Sharma et al., 2016; Karaman et al., 2016; Amin et al., 2013; Yumba, 2010). Considering that the research has given significant weight to the above factors that contribute to stress, there is ample reason for the stakeholders to act promptly to mitigate stress.

Conclusion and Policy Recommendations

The empirical analysis in this study brings forth the significant factors that are the sources of stress among learners in higher education institutes in Delhi-NCR. Broadly, family income, examination, academic curricula, time constraints, future uncertainties, parental, peer and teacher expectations and low confidence are found to be the relevant reasons. However, examination, curriculum and time pressures are the most pertinent causes triggering stress. Most of these elements have also been mentioned extensively in literature as significant causes of stress, necessitating counteraction.

To effectively treat stress among university students, it is imperative to adopt a comprehensive approach that encompasses the promotion of academic and emotional well-being. This method aims to cultivate a positive and supportive environment that facilitates students' mental health. By understanding the underlying factors and subsequent outcomes of stress, educational establishments can design efficacious approaches to assist students in effectively managing and navigating these difficulties. By fostering an atmosphere that promotes open communication, prioritises a balanced approach between work and personal life, offers mental health resources, and provides academic support, an environment can be established that is conducive to the academic and emotional well-being of students. Educators can play a pivotal role in managing the stress of students. Moreover, maintaining open communication with parents ensures a supportive network for the student and allows for a coordinated approach to managing stress. Their actions, attitudes, and support systems can significantly influence their students' emotional and psychological well-being. By providing appropriate assistance counselling and implementing effective coping

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strategies, university students can successfully handle the various pressures associated with academic life. This process enables them to develop a sense of confidence and resilience, ultimately equipping them with the necessary skills to confront and overcome future problems.

It is recommended that both local and national governments consider ensuring the availability of mental health professionals within educational institutions nationwide. This measure would enhance the validity and applicability of research findings by aligning them with students' actual experiences and perspectives. Besides, easy financial loans/aid policies need to be devised for the marginalised sections. It is highly recommended that the habit of outdoor/sports/exercise be inculcated in any preferred form among students in their daily routine to manage stress.

While the government is working strongly towards reforming the Indian education system with the implementation of the National Education Policy (NEP), 2020, the system must adopt measures with an emphasis on reducing academic stress and focusing on practical learning. A holistic education that balances academics with extracurricular activities and vocational training, is the way ahead. The NEP has already introduced greater flexibility in subject choices, allowing students to select subjects based on their interests rather than being confined to rigid streams. This flexibility can lead to increased and sustained student engagement in community outreach programmes as well (Mittal and Jora, 2023) and reduced stress as students pursue areas, they are passionate about. Moreover, the policy of shifting the focus from marks and grades to a more comprehensive assessment of a student's abilities and potential. This change will help reduce the pressure to achieve high scores, fostering a more balanced approach to education and personal growth.

Further, the introduction of a "Happiness Curriculum" in schools, an initiative by the Delhi government since 2018, is working along similar lines of holistic and stress-free growth of the child. It focuses on self-directed and self-paced learning, ideation, problem-solving, fervour, and pragmatism, as well as evaluating execution and accomplishment are believed to reduce stress in students in higher educational institutions. This Curriculum should be further strengthened and introduced in the higher education system to create a more supportive and nurturing educational environment. Focusing on students' emotional and mental well-being would help equip them with the tools and skills necessary to handle stress and lead happier, healthier lives. Additionally, it is strongly recommended to implement a compulsory adoption of a mandatory two-day weekend off which will help ease stress levels with sufficient time to rest, complete assignments, family/personal time and outdoor/recreational activities. Creating a stress-free culture in educational institutions involves a collaborative effort among educators, parents, and policymakers. This will ensure that students excel academically and thrive emotionally, socially, and physically.

This study thoroughly evaluates the variables influencing stress in higher education, but its scope is still limited. It is restricted to the Delhi-NCR area and therefore lacks general application. Given the differences in India's geography, culture, and society, there is much room for further research in the area. Given the potential rural-urban disparity, there are good reasons to continue the investigation. To further strengthen the implications, it is also possible to compare states or countries to learn how policies differ from one another. Furthermore, this study does not go further in enhancing well-being; rather, it is limited to comprehending the variables influencing stress. This renders it insufficient and provides scope for additional study in the field.

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Conflict of Interests

The authors of this research declare that there is no conflict of interest regarding the publication of this paper.

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