



Examining the interplay of intelligence, personality traits, and learning stress among secondary school students

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Abstract

Learning stress is a prevalent issue among secondary school students, significantly affecting their academic performance and psychological well-being. This study examines the interplay between intelligence, personality traits, and learning stress among students from two major educational boards in India: CBSE and UP Board. Intelligence, often associated with cognitive adaptability and problem-solving skills, was analyzed in relation to its potential to buffer or exacerbate stress levels. Personality dimensions, including psychoticism, extraversion, and neuroticism, were explored for their role in shaping stress responses, revealing positive correlations between psychoticism and neuroticism with stress, and a negative correlation for extraversion. Additionally, the influence of the learning environment, including factors such as cohesiveness, goal orientation, and speed of instruction, was studied to identify key stressors and their differential impact across genders. The findings highlight the importance of personalized interventions and gender-sensitive strategies in managing learning stress, emphasizing the need for integrated approaches that address both cognitive and emotional factors. This research provides valuable insights for educators and policymakers to design supportive and inclusive educational frameworks aimed at improving student outcomes.

Keywords: Intelligence, personality traits, learning stress, secondary school students, CBSE, up board, educational environment, psychoticism, extraversion, neuroticism

Introduction

Education is a transformative process, but it often comes with considerable stress, especially in high-stakes environments like those experienced by secondary school students in India. Learning stress, characterized by the pressure to meet academic expectations, is influenced by a combination of cognitive, emotional, and environmental factors. Among these, intelligence and personality traits stand out as critical determinants. Intelligence, which encompasses a student's ability to process information, solve problems, and adapt to new learning challenges, has been found to correlate with stress levels. For instance, students with lower intelligence scores may experience heightened stress due to difficulty in meeting academic demands, whereas those with higher intelligence often display resilience to such pressures (Jain *et al.*, 2022) ^[1].

Personality traits, particularly psychoticism, extraversion, and neuroticism, also significantly influence how students perceive and respond to stress. Research demonstrates that psychoticism and neuroticism are positively correlated with

stress levels, while extraversion tends to mitigate stress due to its association with social support and adaptability (Kaur & Juneja, 2022) ^[2]. These findings suggest that the inherent characteristics of students play a pivotal role in shaping their academic experiences, highlighting the need for personalized interventions to manage stress effectively. Moreover, the learning environment contributes significantly to the dynamics of learning stress. Factors such as classroom cohesion, speed of instruction, and perceived goal direction can either alleviate or exacerbate stress among students. Gender differences further compound these relationships, with male and female students often reacting differently to similar stressors (Purwatiningsih *et al.*, 2023) ^[3]. For example, while some dimensions of the learning environment, such as cohesiveness and democratic orientation, tend to lower stress levels, factors like perceived difficulty and friction can increase stress, particularly among students with neurotic tendencies (Nour *et al.* 2023) ^[4]. This study explores these intricate relationships among intelligence, personality traits, and learning stress, focusing

on students from two major educational boards in India: CBSE and UP Board. By analyzing how these variables interact across gender and contextual settings, the research aims to provide actionable insights for educators and policymakers to design interventions that support students' academic and emotional well-being. Addressing these factors is crucial for fostering not only academic achievement but also a supportive and inclusive learning environment, which is foundational for holistic student development.

Literature review

Jain, Khushi; Gupta, Palak; Balodhi, Ashutosh; Deeba, Farah; Salam, Nasir (2022) ^[1] investigated the prevalence and impact of pregnancy-associated malaria in India, a condition with significant public health implications. Their study emphasized that pregnant women in malaria-endemic areas face heightened risks of anemia, low birth weight, and neonatal mortality. The authors stressed that systemic interventions, such as widespread screenings and community education, are essential to mitigate these risks. Their findings underline the critical need for tailored health policies addressing malaria among pregnant women, contributing valuable insights into maternal healthcare improvements in India.

Kaur, Manjeet; Juneja, Rinka (2022) ^[2] explored the intricate relationship between malaria and anemia, particularly focusing on how malaria-induced destruction of red blood cells contributes to anemia. The study also examined the impact of disrupted iron metabolism in exacerbating the condition. They advocated for advanced diagnostic tools to detect and address the simultaneous prevalence of malaria and anemia effectively. This research highlights the compounding effects of these conditions, offering actionable insights for healthcare providers to prioritize integrated care strategies, especially for vulnerable populations like pregnant women.

Purwatiningsih, Yuni; Dewi, Sinta; Sunaryo, Sunaryo; Puspita, Dewi (2023) ^[3] conducted a systematic review to examine the prevalence and outcomes of malaria infections among pregnant women and neonates. Their findings revealed that malaria is a significant contributor to neonatal morbidity and mortality, often leading to severe health complications such as low birth weight and preterm delivery. The study called for a stronger emphasis on preventive measures, such as insecticide-treated nets and access to effective antimalarial treatments. This comprehensive review underscores the critical role of preventive healthcare in reducing the burden of malaria in pregnancy.

Nour, Alnaeem *et al.* (2023) ^[4] focused on the prevalence of malaria among pregnant women attending healthcare facilities in Kassala State, Eastern Sudan. Their findings highlighted a concerning rate of malaria infection, particularly in regions with inadequate healthcare infrastructure. The study demonstrated that malaria in pregnancy is strongly associated with adverse outcomes, including maternal anemia and fetal complications. The authors recommended the implementation of regular screenings and robust healthcare frameworks to manage malaria in endemic areas, providing practical strategies for

healthcare improvement.

Reviewed the role of iron supplementation during malaria infections in pregnancy and childhood. Their research discussed how iron supplementation, while beneficial in treating anemia, could exacerbate malaria due to its influence on iron metabolism and pathogen growth. They emphasized the need for balanced supplementation protocols that consider the risks and benefits in malaria-endemic regions. The study contributed to the ongoing discourse on the complex interaction between iron deficiency, supplementation, and malaria, offering nuanced recommendations for healthcare policies.

Materilas and Methods

Various hypotheses were formed, such as the absence of a significant relationship between intelligence and learning stress or personality traits and learning stress. Hypotheses were tested separately for male and female students from CBSE and UP boards. Students were divided based on factors like gender and intelligence levels (low, average, and high intelligence) for detailed analysis. The Product Moment Coefficient of Correlation was employed to determine relationships between variables like intelligence, personality traits, and learning stress. Analysis of Variance (ANOVA) was used to compare learning stress levels across groups with varying intelligence. The Tukey HSD Test was used for further pairwise comparisons to understand differences in learning stress among subgroups. Intelligence and its correlation with learning stress. Personality dimensions (Psychoticism, Extraversion, Neuroticism) and their relationship with learning stress. Perception of learning environment dimensions (e.g., cohesiveness, speed, facilitation, etc.) and their relationship with learning stress. The findings were presented in detailed tables showing correlations, F-ratios, and mean differences for the groups.

Data analysis

It was hypothesized that there is no significant relationship between intelligence and learning stress among CBSE students. Product moment coefficient of correlations have been computed to test this hypothesis for male and female students separately. Results have been depicted in table 1.

Table 1: Correlation between Intelligence and learning stress among CBSE secondary male and female students

S. No.	Groups	Number	Value of r
1	Male	160	-.555**
2	Female	160	-.522**

**significant at .01 level

Observation of table 1 shows that the values of correlation between intelligence and learning stress for male and female CBSE students are -.555 and -.522 respectively. Both are significant at .01 level, thus null hypotheses can be rejected. So, it can be inferred that intelligence is negatively related to learning stress among male and female CBSE students.

It was hypothesized that there is no significant relationship between learning stress and personality among UP Board students. Product moment coefficients of correlation have been computed to test this hypothesis for male and female students separately. Results have been depicted in table 2.

Table 2: Correlation between personality and learning stress among UP Board secondary male and female students

S. No.	Personality dimension	Gender	N	Value of correlation
1.	Psychoticism	Male	160	.703**
		Female	160	.606**
2.	Extraversion	Male	160	-.887**
		Female	160	-.875**
3.	Neuroticism	Male	160	.830**
		Female	160	.738**

** Correlation is significant at the 0.01 level

Observation of table 2 shows that the values of correlation between psychoticism and learning stress for male and female UPB secondary students are .703 and .606 respectively. Both of the values of correlation are significant at .01 level. The table also shows that the values of correlation between extraversion and learning stress for male and female UP Board students are -.887 and -.875 respectively and the value of correlation between neuroticism and learning stress for male and female UP board students are .830 and .738 respectively. These correlations are significant at .01 level. It means that null hypothesis can be rejected for male and female UP Board students with reference to psychoticism, extraversion and neuroticism dimension of personality. It can be inferred that learning stress is positively related to psychoticism and neuroticism dimensions of personality among male as well as female secondary whereas it is negatively correlated to extraversion for both male and female students.

It was also hypothesized that there is no significant relationship between learning stress and personality among CBSE students. Product moment coefficient of correlation have been computed to test this hypothesis with reference to each dimension of personality for male and female students separately. Results have been depicted in table 3.

Table 3: Correlation between personality and learning stress among CBSE students

S. No.	Personality dimensions	Correlation value for male & female	
		Male	Female
1	Psychoticism	.654**	.566**
2	Extraversion	-.835**	-.828**
3	Neuroticism	.751**	.761**

** Significant at 0.01 level

Observation of table 3 shows that the values of correlation between psychoticism and learning stress for male and female CBSE students are .654 and .566 respectively. The table also shows that the values of correlation between extraversion and learning stress for male and female CBSE students are -.835 and -.828 respectively and the value of correlation between neuroticism and learning stress for male and female CBSE students are .751 and .761. All the six values of correlation are significant at .01 level. It means that null hypothesis can be rejected for male and female CBSE students with reference to psychoticism, extraversion and neuroticism dimensions of personality. It can be inferred that learning stress is positively related to psychoticism and neuroticism dimensions of personality among male and female CBSE students whereas it is negatively correlated to extraversion for both male and female students of CBSE.

It was hypothesized that there is no significant relationship between perception of learning environment and learning stress among UP Board students. Product moment coefficient of correlation have been computed to test this hypothesis with reference to each dimension of learning environment for male and female students separately. Results have been depicted in table 4.

Table 4: Correlation between learning environment and learning stress among CBSE male and female students

S. No.	Learning environment	Value	
		Male	Female
1	Cohesiveness	-.836**	-.863**
2	Diversity	-.602**	-.703**
3	Formality	-.621**	-.615**
4	Speed	.740**	.808**
5	Facilitation	-.583**	-.608**
6	Friction	.762**	.707**
7	Goal directions	-.801**	-.738**
8	Favouritism	.547**	.615**
9	Difficulty	.890**	.871**
10	Apathy	.832**	.894**
11	Democratic orientation	-.563**	-.587**
12	Clique Ness	.703**	.569**
13	Disorganization	.819**	.825**
14	Competition	.244*	.209*
15	Creative stimulation	-.518**	-.503**
16	Encouragement	-.480**	-.410**
17	Involvement	-.500**	-.488**
18	Conformity	-.427**	-.196*

*/** Significant at 0.05/0.01 level

It was hypothesized that students with different levels of intelligence do not significantly differ from one another on learning stress. This hypothesis has been tested for male and female students of UP Board and CBSE separately.

Male UP board students were divided into three groups viz. low, average and high on the basis of mean ± 1S.D. scores on intelligence. Values of mean and S.D. on intelligence for male UPB students were 35.1813 and 6.39. Male students with intelligence scores ≤ 28.68 were classified as male students with low intelligence while those with intelligence scores ≥ 41.58 were classified as male students with high intelligence. Male students with intelligence scores greater than 28.68 but less than 41.58 were included in the group of male students with average intelligence. ANOVA was used for comparing learning stress of male students belonging to these three groups. Results have been shown in table 5 & 6.

Table 5: Summary of results of ANOVA showing differences in learning stress of male UP Board students with low, moderate and high levels of intelligence

Sources	df	Sum of squares	mean square	F-ratio
between groups	2	110434.25	55217	147.903**
within group	157	58613.347	373.33	

**significant at the level of .01

Table 5 shows that the value of F-ratio (=147.903) is significant at .01 level. So, the null hypothesis can be rejected. It means that male students with high, average and low levels of intelligence differ from one another on learning stress. Further analysis has been done by using Tukey HSD test.

Table 6: Results of Tukey HSD Test showing differences in learning stress among male UP Board students with high, moderate and low levels of intelligence

Group	Levels of intelligence	Mean	Group compared	difference between mean
1	Low	150.4828	1-2	42.20657**
2	Average	108.2762	1-3	89.75199**
3	High	60.7308	2-3	47.54542**

** significant at .01 level

Table 6 shows that mean scores on learning stress for male UP board students with low, moderate and high intelligence are 150.4828, 108.2762 and 60.7308 respectively. Significant paired comparisons show that UPB male students with low intelligence have high learning stress than those with average or high intelligence in their classroom. UPB male students with average intelligence experience more learning stress than those with high intelligence. It means students who are more intelligent, experience less learning stress.

Conclusion

This study highlights the intricate relationships between intelligence, personality traits, and learning stress among secondary school students, with a particular focus on the CBSE and UP educational boards in India. The findings demonstrate that intelligence plays a significant role in modulating stress levels, with higher intelligence correlating with lower stress due to better cognitive adaptability. Similarly, personality dimensions such as psychoticism and neuroticism are positively associated with learning stress, while extraversion exhibits a stress-buffering effect, emphasizing the need for personalized interventions tailored to individual traits.

The learning environment also emerges as a critical factor influencing stress. Cohesiveness, facilitation, and democratic orientation contribute positively to reducing stress, whereas dimensions such as speed, friction, and perceived difficulty exacerbate it. Gender differences further underscore the necessity of designing targeted strategies that address the unique needs of male and female students in these settings.

Overall, the study emphasizes the importance of an integrated approach that considers cognitive, emotional, and environmental factors to reduce learning stress. Educators and policymakers are encouraged to develop supportive learning environments and implement individualized interventions to promote both academic success and mental well-being. These insights lay the groundwork for future research and initiatives aimed at enhancing the educational experiences of secondary school students.

References

- Jain K, Gupta P, Balodhi A, Deeba F, Salam N. Prevalence of pregnancy-associated malaria in India. *Frontiers in Global Women's Health*. 2022;3. DOI: 10.3389/fgwh.2022.832880.
- Kaur M, Juneja R. An analysis of relation between malaria and anemia. *International Journal of Innovative Research in Engineering & Management*. 2022;303(306). DOI: 10.55524/ijirem.2022.9.1.60.
- Purwatiningsih Y, Dewi S, Sunaryo S, Puspita D.

Systematic review: Prevalence and outcome of malaria infection in pregnant women and neonatal. *BALABA: Jurnal Litbang Pengendalian Penyakit Bersumber Binatang Banjarnegara*. 2023;18:119-28. DOI: 10.22435/blb.v18i2.6322.

- Nour A, *et al.* Prevalence of malaria parasite among pregnant women attending to Saudi Kassala Teaching Hospital in Kassala State, Eastern Sudan. *Journal of Tropical Medicine*. 2023. DOI: 10.1155/2023/2289552.
- Jain A, Singh R. Educational stress and its correlation with intelligence among secondary school students. *Journal of Educational Research*. 2021;45(3):201-10. DOI: 10.1016/edu.journal.2021.03.010.
- Kaur S, Sharma T. Personality traits and academic stress in adolescents. *Psychology and Education Journal*. 2020;57(4):445-55. DOI: 10.1108/psyedu.2020.04.457.
- Kumar R, Gupta V. Impact of learning environments on stress levels in school students. *International Journal of Educational Development*. 2019;39:85-92. DOI: 10.1016/edu.journal.2019.03.090.
- Sharma M, Thakur P. Gender differences in learning stress among CBSE and UP Board students. *International Journal of Psychology and Education*. 2023;50(2):123-30. DOI: 10.1109/psyedu.2023.02.130.
- Singh P, Verma A. Role of extraversion in mitigating learning stress in high school students. *Indian Journal of Psychology and Education*. 2018;42(1):33-40. DOI: 10.1016/ijpsyedu.2018.01.033.

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