

Cognitive Failures in Higher Education: Exploring the Roles of Anxiety, Depression and Stress in Adult Learners

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ABSTRACT Mental health significantly impacts cognitive performance among adult learners in higher education. This study examines the roles of anxiety, depression, and stress in predicting cognitive failures, such as memory lapses and reduced attention, across various demographic groups. A cross-sectional design was used to survey 217 students from Jadavpur University using validated self-report tools. Analysis revealed strong links between psychological distress and cognitive inefficiencies, with stress emerging as the most influential factor. Differences in mental health indicators were evident across income levels, academic stages, and family structures, while gender and habitat showed minimal effect. These findings highlight the need for targeted mental health interventions, particularly for postgraduate and low-income students.

INTRODUCTION

Cognitive failure refers to temporary lapses in attention, memory and action execution that can have a significant impact on academic performance, particularly among adult learners who are responsible for multiple responsibilities or tasks (Broadbent et al. 1982; Mahoney et al. 1998). Within the context of higher education, students face increasing emotional demands, with anxiety, depression, and stress emerging as key psychological concerns (Pedrelli et al. 2014). These conditions have been shown to impair cognitive functioning, resulting in reduced concentration, mental fatigue, and task overload (Abbasi et al. 2021).

Recent studies have highlighted the prevalence of psychological distress among university students, linking it to socioeconomic background, academic pressure, and family dynamics (Mboya et al. 2020). Despite growing awareness, adult learners remain underrepresented in psychological research, often assumed to be emotionally resilient due to age and experience (Hoult 2013). However, the compounded stressors of academic rigour, financial constraints, and domestic obligations may make them particularly vulnerable to cognitive inefficiencies (Wang 2021).

The present study aims to explore the relationship between psychological distress and

cognitive failure among adult students in Indian higher education. It further investigates how demographic factors, such as academic level, income group, and family structure moderate this relationship, with an emphasis on identifying high-risk groups in need of targeted support (Singh et al. 2024).

According to the World Health Organisation (2020), mental health problems among higher education students significantly impair cognitive functioning, academic engagement, and overall well-being. A comprehensive understanding of the role stress, anxiety and depression play in cognitive lapses is essential for effective support and interventions. The existence of research gaps has been demonstrated to impede educators' efforts to enhance student mental well-being and academic performance. This study aims to bridge that gap by exploring mental health's role in cognitive efficiency in higher education.

Objectives

The objective of this study is to examine the impact of psychological distress, specifically anxiety, depression, and stress on cognitive failure among adult learners in higher education. It focuses on differences across academic levels, income groups, and family structures. The specific aims are:

1. To assess variations in cognitive failure across academic levels, income groups, and family types, and examine the prevalence of anxiety, depression, and stress.
2. To determine whether these mental health factors predict cognitive failure individually and collectively.

Research Hypothesis

Based on the premise that psychological distress (depression, anxiety and stress) significantly impacts cognitive failure across demographic and socio-economic variables, the null hypotheses are as follows:

H01: There is no significant difference in cognitive failure, depression, anxiety, stress, or overall mental health across gender, habitat (urban or rural), or family type.

H02: There is no significant difference in cognitive failure, depression, anxiety, stress, or overall mental health across academic levels or income groups.

H03: There is no significant association between demographic variables (gender, habitat, family type, academic level, income) and mental health levels (depression, anxiety and stress).

H04: There is no significant relationship between cognitive failures and mental health problems (depression, anxiety, stress, overall mental health).

METHODOLOGY

This cross-sectional study was conducted among regular students of Jadavpur University in the South 24 Parganas district of West Bengal, India. A sample of 217 students was selected through stratified random sampling. The tools used were the Cognitive Failures Questionnaire (CFQ) (Broadbent et al. 1982; Goodhew and Edwards 2024b) and the Depression, Anxiety and Stress Scale-21 (DASS-21) (Lovibond and Lovibond 1995). Recent meta-analytic findings further confirm the association between subjective cognitive failures and execu-

tive dysfunction under psychological distress (Goodhew and Edwards 2024a). The CFQ 2.0, as described by Goodhew and Edwards (2024b), provides a refined assessment of memory lapses, distractibility, and action slips, ensuring relevance for contemporary student populations. Before use, the reliability and validity of the tools were verified. Cronbach's alpha for CFQ was found to be 0.84, and for DASS-21, it ranged from 0.86 to 0.90, indicating high internal consistency.

Participants provided self-reported data on demographic variables (age, gender, income, education level, family structure) and mental health metrics. Statistical analyses included descriptive statistics, t-tests, ANOVA, Pearson correlations, and chi-square tests were conducted using IBM SPSS Statistics software version 20. These methods facilitated the identification of patterns and associations between cognitive failure and psychological distress within higher education contexts.

RESULTS

The study examined cognitive failure and mental health concerns of stress, anxiety, and depression, among 217 adult learners in higher education, focusing on demographic influences. The findings highlight variations in psychological distress across academic levels, family structures, and income groups, offering insights into targeted interventions for students facing cognitive failure. Table 1 presents the distribution of stress, anxiety, and depression levels among higher education students.

The prevalence of mental health concerns among students was assessed, revealing that 46.5 percent were at-risk for stress, 59.4 percent faced high-risk anxiety, and 47.5 percent were at-risk for depression. Anxiety emerged as the most severe concern, with over half of the students falling into the high-risk category. Depression and stress levels were also substantial, highlighting the ur-

Table 1: Distribution of stress, anxiety and depression levels among students

Levels	Stress	Anxiety	Depression
Normal	72 (33.2%)	31 (14.3%)	60 (27.6%)
At-risk	101 (46.5%)	57 (26.3%)	103 (47.5%)
High-risk	44 (20.3%)	129 (59.4%)	54 (24.9%)

gent need for psychological support interventions in higher education. Table 2 summarises the t-test and ANOVA results examining cognitive failure and mental health across demographic variables.

Gender-based Differences

Gender differences in cognitive failures were found to have no statistical significance ($t = 0.249$, $p = 0.803$). Similarly, mental health dimensions of depression, anxiety, and stress, also showed no significant differences across gender. Mental health scores were comparable between males and females ($t = 0.412$, $p = 0.681$). These results indicate that cognitive inefficiencies and psychological distress are not significantly influenced by gender.

Habitat-based Differences

No significant difference was found in cognitive failure scores between rural and urban students ($t = -1.43$, $p = 0.154$). Additionally, mental health variables of depression, anxiety, and stress, showed no habitat-based variance, suggesting that location does not impact psychological distress.

Family Structure Differences

A significant difference was identified in cognitive failure scores based on family type ($t = 2.18$, $p = 0.030$). Students from joint families exhibited higher cognitive failure levels compared to nuclear families, possibly due to shared responsibilities and distractions in a collective household environment. However, mental health differences across family structures were statistically insignificant, as depression, anxiety, and stress showed no variance. This suggests that while cognitive inefficiencies may be influenced by family dynamics, overall mental health scores remain stable regardless of family type.

Differences by Academic Level

Significant differences in anxiety ($F = 7.080$, $p < .001$), depression ($F = 5.022$, $p < .001$), and stress ($F = 7.068$, $p < .001$) were found across undergraduate (UG), postgraduate (PG), and research scholar (RS) groups. Post-hoc analysis revealed

that UG and PG students experience higher distress levels compared to research scholars. However, cognitive failure scores did not significantly vary among academic levels, indicating that study level influences mental health but does not necessarily impact cognitive inefficiencies.

Differences by Income Level

Income-based differences were observed for anxiety ($F = 7.937$, $p < .001$), stress ($F = 4.227$, $p < .001$), and overall mental health ($F = 5.382$, $p < .001$). Lower-income students reported significantly higher distress levels, reinforcing prior research suggesting financial hardship exacerbates psychological strain. Depression and cognitive failure scores did not significantly vary across income groups. Table 3 illustrates the chi-square associations between levels of mental health and selected demographic variables.

Chi-square analysis indicates varied associations across study levels, family type, habitat, gender, and financial income. Anxiety ($\chi^2 = 18.487$, $p < .01$) and stress ($\chi^2 = 18.634$, $p < .01$) significantly differ across study levels, with undergraduate students experiencing higher distress, while research scholars report lower levels. Depression ($\chi^2 = 8.206$, $p > .05$) does not significantly vary across study levels.

Family type has a marginal influence on depression ($\chi^2 = 5.990$, $p = .050$) but does not significantly affect anxiety ($\chi^2 = 1.536$, $p > .05$) or stress ($\chi^2 = .323$, $p > .05$). Similarly, gender does not show significant differences in depression ($\chi^2 = .691$, $p > .05$), anxiety ($\chi^2 = .821$, $p > .05$), or stress ($\chi^2 = 1.051$, $p > .05$). Habitat also lacks a notable effect, as depression ($\chi^2 = .310$, $p > .05$), anxiety ($\chi^2 = .197$, $p > .05$), and stress ($\chi^2 = 1.070$, $p > .05$) remain consistent across urban and rural environments.

Financial income, however, exhibits strong associations with mental health outcomes. Depression ($\chi^2 = 10.885$, $p = .028$), stress ($\chi^2 = 15.329$, $p = .004$), and anxiety ($\chi^2 = 22.861$, $p < .001$) vary significantly across income groups, with individuals earning below INR 20,000 reporting higher psychological distress, while those earning more than INR 40,000 experience lower levels of anxiety and stress. This finding underscores the role of economic stability in mental well-being. Table 4 shows the Pearson correlation coefficients

Table 2: T-Test and ANOVA analysis of cognitive failure and mental health problems with demographic variables

Dimension variable	CF			DEP			ANX			STR			MHP		
	M	SD	TR	M	SD	TR	M	SD	TR	M	SD	TR	M	SD	TR
G	M(111) 37.96	14.43	$t_{215} = -.249$	7.639	4.14	$t_{215} = .909$	8.63	4.14	$t_{215} = .068$	8.97	4.17	$t_{215} = .427$	25.24	25.24	$t_{215} = .412$
H	F(106) 37.47	14.67		7.122	4.23		8.49	4.82		8.99	4.46		24.60	24.60	
	R(161) 36.89	13.95	$t_{215} = -1.43$	7.36	4.15	$t_{215} = -.160$	8.38	4.34	$t_{215} = -.988$	8.79	4.19	$t_{215} = 1.08$	24.54	11.15	$t_{215} = -.854$
FT	U(56) 40.11	15.91		7.46	4.29		9.07	4.85		9.51	4.62		26.05	12.16	
	J(61) 41.13	13.56	$t_{215} = 2.18^*$	7.67	3.11	$t_{215} = .735$	8.85	4.20	$t_{215} = .596$	8.95	3.90	$t_{215} = .066$	25.47	9.29	$t_{215} = .493$
L	N(156) 36.39	14.70		7.27	4.54		8.44	4.59		8.99	4.47		24.72	12.16	
	UG(48) 40.90	11.37	$F(2,214) = 7.080^*$	8.00	3.52	$F(2,214) = 5.022^*$	4.00		$F(2,214) = 7.068^*$	3.36		$F(2,214) = 8.067^*$	9.12		$F(2,214) = 1.499$
	PG(114) 36.67	13.44		7.86	4.24		10.00			9.69			27.69		
	RS(55) 37.14	18.46		5.87	4.30		8.79	4.45		9.57	4.27		26.22	11.20	
FI	$\leq 20(147)$ 37.64	12.79	$F(2,214) = .006$	7.71	3.69	$F(2,214) = 1.513$	6.84	4.46	$F(2,214) = 7.937^*$	7.14	4.66	$F(2,214) = 4.227^*$	19.85	12.20	$F(2,214) = 5.382^*$
	20-40(27) 38.14	15.78		7.00	5.34		7.33	3.89		9.52	3.59		26.58	9.56	
	$\geq 40(43)$ 37.77	18.99		6.51	4.87		6.60	5.36		8.63	5.54		22.96	13.31	
										7.40	5.30		20.51	14.50	

Note: * = significant, G = Gender, H = Habitat, FT = Family Type, L = Level of Study, FI = Family Income, M = Male, F = Female, R = Rural, U = Urban, J = Joint Family, N = Nuclear Family, UG = Undergraduate, PG = Postgraduate, RS = Research Scholar, Income in Thousand INR ($\leq 20, 20-40, \geq 40$), M = Mean, SD = Standard Deviation, Tr = Test Result F = Value of ANOVA, CF = Cognitive Failure, DEP = Depression, ANX = Anxiety, STR = Stress, MHP = Mental Health Problem

Table 3: Chi-square analysis among levels of mental health and demographic variables

Dimension Variable	Depression			Anxiety			TR		Stress			TR
	N	R	HR	N	R	HR	χ^2		N	R	HR	
G	28	54	29	14	28	69	$\chi^2 = 691$	$df=2, p>.05$	36	55	20	$\chi^2 = 1.051$
	46.7	52.4	53.7	45.2	49.1	53.5			50	54.5	45.5	$df=2, p>.05$
F	32	49	26	17	29	60			36	46	24	
	53.3	47.6	46.3	54.8	50.9	46.5			50	45.5	54.5	
H	46	76	39	24	42	95	$\chi^2 = 197$	$df=2, p>.05$	55	76	30	$\chi^2 = 1.070$
	76.7	73.8	72.2	77.4	73.7	73.6			76.4	75.2	68.2	$df=2, p>.05$
U	14	27	15	7	15	34			17	25	14	
	23.3	26.2	27.8	22.6	26.3	26.4			23.6	24.8	31.8	
FT	12	37	12	6	18	37	$\chi^2 = 1.536$	$df=2, p>.05$	22	27	12	$\chi^2 = 323$
	20	35.9	22.2	19.4	31.6	28.7			30.6	26.7	27.3	$df=2, p>.05$
N	48	66	42	25	39	92			50	74	32	
	80	64.1	77.8	80.6	68.4	71.3			69.4	73.3	72.7	
L	9	26	13	2	9	37	$\chi^2 = 18.487$	$df=4, p<.01^*$	10	30	8	$\chi^2 = 18.634$
	15	25.2	24.1	6.5	15.8	28.7			13.9	29.7	22.1	$df=4, p>.01^*$
PG	28	55	31	15	28	71			32	56	26	
	46.7	53.4	57.4	48.4	49.1	55			44.4	55.4	59.5	
RS	23	22	10	14	20	21			30	15	10	
	38.3	21.4	18.5	45.2	35.1	16.3			41.7	14.9	22.7	
≤ 20	32	80	35	11	38	98	$\chi^2 = 22.861$	$df=4, p>.01^*$	38	81	28	$\chi^2 = 15.329$
	53.3	77.7	64.8	35.5	66.7	76			52.8	80.2	63.6	$df=4, p>.05^*$
20-40	10	10	7	5	7	15			12	8	7	
	16.7	9.7	13	16.1	12.3	11.6			16.7	7.9	15.9	
≥ 40	18	13	12	15	12	16			22	12	9	
	30	12.6	22.2	48.4	21.1	12.4			30.6	11.9	20.5	

Note: C= Count, %= Percentage, TR=Test Result, N= Normal, R=Risk, HR= High Risk, G= Gender, H= Habitat, FT= Family Type, L= Level of Study, FI= Family Income, M=Male, F= Female, R= Rural, U= Urban, J= Joint Family, N= Nuclear Family, UG= Undergraduate, PG= Postgraduate, RS= Research Scholar, Income in Thousand INR ($\leq 20, 20-40, \geq 40$)
 $\div 2$ = Value of Chi-square Test, * = Significant, df=Degree of Freedom

Table 4: Pearson correlation analysis among cognitive failure, mental health, stress, anxiety and depression

Variables	Depression	Anxiety	Stress	M.H. P	C.F
Depression					
Anxiety	0.584**				
Stress	0.719**	0.677**			
M.H. P	0.868**	0.863**	0.908**		
C.F	0.379**	0.381**	0.398**	0.439**	

** Correlation is significant at the 0.01 level (2-tailed)

Note: CF= Cognitive Failure, MHP= Mental Health Problem

among cognitive failure, depression, anxiety, stress, and overall mental health.

Cognitive Failures and Mental Health

A strong correlation was found between cognitive failures and mental health variables, including depression ($r = .379$, $p < .001$), anxiety ($r = .381$, $p < .001$), stress ($r = .398$, $p < .001$), and overall mental health problems ($r = .439$, $p < .001$). Higher levels of psychological distress contributed to increased cognitive inefficiencies. Stress exhibited the highest correlation with overall mental health issues ($r = .908$, $p < .001$), making it the most significant predictor of psychological impairment. Depression ($r = .868$) and anxiety ($r = .863$) also showed strong associations with mental health decline.

Interpretation and Implications

These findings underscore the multifaceted relationship between cognitive failures and mental health, highlighting the influence of socio-economic and academic pressures. While gender and habitat do not significantly impact cognitive functioning, academic levels and income exert a considerable influence on anxiety, depression, and stress. Postgraduate and lower-income students exhibit greater distress, suggesting a need for tailored mental health interventions.

Family structure appears to shape cognitive performance, with joint family students reporting higher cognitive failures. This aligns with existing research on environmental distractions in collective households. Given the strong correlations between cognitive inefficiencies and psychological distress, early intervention strategies focused on stress management could enhance cognitive performance and overall well-being.

DISCUSSION

The present study demonstrates a robust association between psychological distress, particularly stress, anxiety, and depression, and cognitive failure among adult learners in higher education. Stress emerged as the strongest predictor of cognitive inefficiencies, reinforcing earlier evidence that chronic psychological strain disrupts attentional control and working memory processes (Broadbent et al. 1982; Mahoney et al. 1998; Goodhew and Edwards 2024a). These findings align with intervention-based evidence indicating that stress reduction leads to sustained improvements in cognitive performance and academic functioning among university students (Winzer et al. 2018).

The high prevalence of anxiety and depression observed in this study reflects patterns reported in recent international research. Mo (2025), in a study of adult students in Hong Kong, demonstrated that academic stress indirectly impairs academic performance through elevated depressive symptoms. This mediating pathway is consistent with the present findings, where students reporting higher stress also exhibited increased memory-related cognitive failures. Similarly, Nørby (2024) emphasised that depression interferes with learning by impairing cognitive flexibility, sustained attention, and memory consolidation, offering a theoretical explanation for the elevated cognitive failures observed among psychologically distressed students in this sample. Recent 2025 research further supports this view, indicating that sustained academic stress, combined with environmental demands, undermines attentional regulation in adult learners (Rahman and Chatterjee 2025).

Notably, the present study found no significant influence of gender or habitat on cognitive failure or psychological distress. This result is

consistent with recent findings by Duraku and Hoxha (2024), who reported that psychosocial variables such as sleep quality, perceived health, and emotional regulation exert stronger effects on cognitive functioning than demographic characteristics. Wong (2022) further demonstrated that non-cognitive attributes, including emotional resilience and motivation, are more predictive of academic persistence than demographic factors alone. Together, these findings suggest that interventions should prioritise strengthening psychological coping capacities rather than focusing solely on demographic risk profiling.

The role of distractibility and memory lapses as core mechanisms linking psychological distress and cognitive failure is well established. Classic models of cognitive failure emphasise that stress compromises attentional resources, increasing susceptibility to everyday cognitive errors (Broadbent et al. 1982; Mahoney et al. 1998). Recent meta-analytic evidence supports this framework, showing consistent associations between subjective cognitive failures and executive dysfunction under stress (Goodhew and Edwards 2024a). The present findings extend this literature by demonstrating that such mechanisms are particularly salient among adult learners managing multiple academic and social responsibilities.

Socioeconomic status emerged as a critical moderator in this study, with students from lower-income backgrounds exhibiting significantly higher anxiety and stress. This finding aligns with evidence from developing contexts showing that economic insecurity exacerbates psychological strain and cognitive vulnerability (Larño et al. 2022). Mo (2025) similarly reported that financial pressure intensifies depressive symptoms among adult learners, thereby impairing academic engagement. These converging findings highlight the importance of institutional support structures, including financial aid and mental health services, in mitigating the cognitive consequences of economic stress (Zhang et al. 2025). More recent international evidence suggests that financial insecurity exacerbates stress-related cognitive decline by limiting access to mental health resources and adaptive coping strategies among university students (Martin et al. 2025). These findings underscore the importance of institutional financial support and inclusive academic policies as

protective factors for cognitive and psychological well-being.

Emerging methodological approaches further support the present findings. Khan (2024), using an artificial neural network model, demonstrated that psychological variables such as stress and anxiety significantly predict cognitive performance outcomes among university students. This computational evidence strengthens the argument that psychological distress is not merely correlated with, but functionally predictive of, cognitive inefficiencies.

Finally, the results align with the growing post-pandemic literature documenting persistent mental health challenges in higher education. Abrams (2022) demonstrated that chronic academic pressure and social isolation contribute to long-term cognitive vulnerabilities. Recent longitudinal evidence further suggests that post-pandemic stress interacts with digital overload to intensify attentional fatigue and memory disruption among adult learners (Chen et al. 2025). In the absence of sustained institutional mental health support, such cognitive difficulties may persist and undermine academic success.

In summary, the present study contributes to a growing body of contemporary research demonstrating that psychological distress is both prevalent and cognitively consequential in higher education. By integrating classic cognitive theory with recent empirical and computational studies, the findings underscore the necessity of multidimensional interventions that combine stress management, emotional resilience training, and institutional support to enhance cognitive functioning and academic well-being among adult learners.

CONCLUSION

The study establishes a clear link between psychological distress, particularly stress, anxiety, and depression, and cognitive failure among adult learners in higher education. The investigation revealed that stress emerged as the most dominant factor influencing cognitive inefficiencies. The findings revealed that differences were observed across academic levels, income groups, and family structures, while gender and habitat had minimal impact. These findings highlight the importance of integrated mental health support within

academic institutions to enhance cognitive function and student well-being.

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RECOMMENDATIONS

Higher education institutions should implement mental health initiatives focused on emotional resilience and stress management. Interventions must prioritise postgraduate and low-income students who exhibit greater vulnerability. Counselling services, academic workload modifications, and financial aid programs are essential for improving cognitive outcomes and fostering an inclusive learning environment.

LIMITATIONS

This study's cross-sectional design restricts causal conclusions, limiting interpretations to associations rather than cause-and-effect relationships. Reliance on self-report measures introduces potential biases, including social desirability effects. Additionally, the sample is limited to Jadavpur University, affecting broader generalisability. Future studies should adopt longitudinal methodologies, include objective cognitive assessments, and consider additional factors such as sleep quality and academic workload to enhance reliability and applicability.

DATA AVAILABILITY

Dataset can be accessed upon reasonable request to the authors.

CONFLICT OF INTEREST

There is no financial or institutional bond that may be seen as a potential conflict of interest.

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AUTHOR'S CONTRIBUTION

SS and BKP conceptualised the study. Design and implementation were done by SS and BKP. Analyses were conducted by SS and FA.

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