

The Influence of Employment Stress on the Academic Performance of Working Students: Perspectives from Pakistan

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Abstract. One must grasp stress's intricacy to develop and implement stress-reduction strategies. Employment-related stress on academic performance is becoming an acute concern for psychological and mental health in Pakistan. The current research focuses on how employment-related stress interferes with graduate students' academic performance in Parachinar, District Kurram Khyber Pakhtunkhwa, Pakistan. This investigation applies quantitative methods—the Govt. Postgraduate College Parachinar, District Kurram, Khyber Pakhtunkhwa Pakistan, completed a standardized questionnaire to 180 students from various academic disciplines.

The findings illuminate stress's intricacy. It may be utilized to establish and encourage more efficient and achievable strategies or techniques that improve academics and job satisfaction, inspiration, and effectiveness at the individual and organizational levels.

The research study concluded that 81.67% of male students suffered from employment stress. Student stressors include workload (31.67%), lack of time management (9.44%), interpersonal conflicts (20.00%), high study load (21.11%), and financial problems (17.78%), and the coping strategies being adopted by these students; Moral support (13.89%), Social support (30.00%), Financial support (45.00%), and Job enrichment (11.11%). The research concludes that addressing the highlighted concerns, counselling, and other successful coping strategies may alleviate academic and employment stress.

Keywords: Academic Performance, Change Management, Employment Stress, Parachinar, Pakistan, Stress Control, Working Students

Introduction

This research aims to study the influence of employment-related stress on the academic performance of graduate students in Parachinar, District Kurram, Khyber Pakhtunkhwa, Pakistan. The study seeks to implement quantitative techniques to determine the precise stresses that working students experience and comprehend the influence of these stressors on their academic accomplishments. The objective is to offer comprehensive insights into the multifaceted relationship between work-related stress and academic performance, as well as propose efficient strategies for handling and lowering this stress. The present research stems from the increasing concerns about the psychological and mental health complications experienced by students in Pakistan, specifically those who manage academic commitments alongside employment. Due to the growing incidence of work-related stress among students, it is essential to investigate how it influences their academic performance. A comprehensive understanding of these behaviours is necessary to build strategies to improve students' academic and professional accomplishments. The research is motivated by a dedication to bettering the welfare and efficiency of students who face balancing employment and academics.

There is not enough global understanding of the precise definition of stress. As stated by [1], "stress" appears as a descriptive term for coming into contact with psychological and mental complications. According to the perspective that stresses constitute a disruptive trigger, alternative descriptions explain the challenges faced by beings and the corresponding behaviours individuals have in dealing with stress. The process of recuperation keeps an eye on reactions to stress, which can be modulated in situations when challenges are perilous, extended, or unpredictable [2] ; [3].

Stress has become an increasingly serious challenge in society, impacting many persons and reflecting physical and mental aspects [4]. Most humans can handle modest anxiety; in some instances, adults may even show heightened productivity levels when confronted with stress [5] ; [6]. Even so, the situation becomes hazardous when stress arrives at a point of dominating intensity, leading individuals to experience detrimental impacts such as heightened levels of depression and anxiousness, various physical symptoms lacking any discernible natural origin, or the adoption of unhealthy behaviours such as smoking, inadequate nutritional behaviours, and disrupted sleep arrangements [7] ; [8]. In the 1980s, work-related stress became one of the top 10 employment health concerns in the United States of America, as well as in other European developed nations. Afterwards, scholars developed a preventive strategy to treat what was referred to as a stress epidemic [9]. The consistency of employment resources has a strong connection with organizational workplace efficiency, as the psychological health of employees is inextricably linked with the successful management of work-related stress [10]. Work-related stress is a prevalent global challenge. Acknowledging and tackling stress among employees within any organizational environment is imperative. The proliferation of academic institutions in developing nations has resulted in heightened competitiveness and organizational transformation inside public and private sector institutions.

Consequently, faculty employees are more likely to be under stress, contributing to elevated exhaustion and stress [11]. The university teaching career has traditionally been regarded as an occupational choice with minimal stress, particularly by individuals not affiliated with this occupation [12]. Nevertheless, over the past twenty years, the emergence of numerous private-sector educational institutions has led

to the portrayal of higher education bodies as environments that induce stress [13]. Over the past ten years, there has been a considerable increase in the expansion of higher education establishments, particularly in emerging nations. This expansion has led to intensified rivalry and an erosion of the organizational environment within public and private educational institutions [11]. Moral manifestations of stress related to teaching refer to inadequate time management, a reduced capacity for focused attention, more significant discomfort and violence, abandonment from encouraging interpersonal liaisons, indulgence in drugs, cocaine, or nicotine as coping mechanisms, and, if not effectively tackled, may result in inactivity, opting out from the profession, interpersonal conflicts with students, and intentions to seek alternative employment opportunities [14]. A sense of academic stress has become a prevalent aspect of students' lives due to many internal and external desires [15]. Academic stress pertains to how students behave to learning expectations beyond their accessible facilities, versatile abilities, and strategies for coping [16]. The sensitivity to stress, meanwhile, exhibits heterogeneity among individuals depending on individual personality traits, academic endeavours, and societal and cultural considerations [17]. The failure of students to effectively handle stress can result in a range of adverse outcomes, impacting their professional and personal lives. The sensation of stress has been associated with a deterioration in academic performance, disrupted relationships with buddies and family members, and a general unhappiness with one's life [18]. It has been hypothesized that stress originates during the educational journey and persists throughout an individual's occupational experience [5]. Hence, it would prove advantageous to advocate the adoption of stress management strategies immediately in a student's educational process, thus enabling the formation of a core ground for nurturing positive attitudes [19].

The current research examines the implications of work-related stress on the academic achievements of individuals working in industries or corporations in Pakistan. The study emphasizes the effectiveness of coping strategies such as moral, social, and financial assistance and job enrichment through measuring their practicality. The findings can provide valuable insights to inform specific strategies and policies aimed at mitigating stress and improving students' academic and professional well-being. Furthermore, it provides opportunities for conducting studies on effectively managing stress associated with employment as a potential source of motivation.

Review of Literature

The effect of employment stress on working students' academic achievement has emerged as a significant research interest in the field of education. Many researchers have looked at the effects of different sources of stress on learners' chances of performing well academically, especially given the demands of work while studying. This research effort strives to highlight the influence of employment-related stress on the academic achievement of students simultaneously engaged in employment, focusing on the current situation in Pakistan. Literacy is essential in bolstering financial stability and enriching a nation's social and cultural context. It serves as a pivotal accelerator for strengthening communities and equipping residents with knowledge and skills while moulding the perspectives of today's youth.

Moreover, academic achievement is essential in facilitating personal growth and advancement throughout one's life journey. As mentioned above, the phenomenon has the potential to exert a

significant influence on the collective capacity of individuals to maintain and enhance their standard of living. Wealth is often regarded as the fundamental basis of a society that fosters economic affluence, social harmony, and effective management [20]. Being able to work while pursuing education is mainly driven by financial necessity, such as seeking different forms of student assistance, increasing income to enhance student learning, or providing a safeguard against unexpected disappointments [21].

Studies indicate that a significant proportion of undergraduate students, precisely 77%, are employed part-time to meet their finances while studying higher education. The experience of being a working student may be undeniably stressful since it involves handling multiple facets of life, such as relationships with others, family-related commitments, curricular activities, and occupational roles [22]. Increasing incidences of stress-related deaths are observed among students in Pakistan. A case study of this phenomenon may be observed in the rising incidence of student suicides in Pakistan in recent years [23]. Retroactive research was conducted on 11 newspapers from 2010 to 2017 to investigate student deaths in Pakistan. The study identified 68 student deaths by suicide, with casualties of 76.5% among male students and 23.5% among female students [24]. It is widely assumed that the number of such occurrences is far higher since many of these instances remain undocumented because of the prevalence of social, cultural, and religious prejudices [24]. Possibly the most significant reason that students experience employment stress is the nature of their working engagements. [25], employed a study on pharmacy students and realized that the period employed at work, especially the load, has a highly probable effect on performance. This implies that employment obligations can act as precursors to students' ability to concentrate on their class work, hence affecting academic performance. Besides workload, other factors such as type of employment and perceived sources of stress may also influence students' performance. [26], reviewed the perceived stress sources of Indian dental students and emphasized the need to address those stress factors for the students' particular enhanced wellbeing and academic achievement. The influence of familial expectations on students' academic performance, learning outcomes, and stress levels is a prominent facet of Pakistani society.

Nevertheless, it is frequently seen that the influence on students is predominantly negative rather than positive [15]. The research contends that failing to identify and address academic stress promptly can result in severe psychological health and social behaviour consequences. Adolescents between the ages of 15 and 22 are frequently more susceptible to educational stress due to the transitional nature of this stage in their lives [15]. Because nearly 60 per cent of Pakistan's population comprises individuals in their youngsters, it can be argued that the advancement and well-being of the nation are significantly contingent upon this segment of the population [27]. Given the findings of researchers indicating that certain students enrolled in graduate programs encounter elevated levels of anxiety that potentially impede their academic performance, it becomes imperative for professionals in education to ascertain a range of stress management strategies that can be implemented by students to effectively contend with stress both throughout their graduate studies and in subsequent professional endeavours. [28], also studied occupational stress in relation to the socio-demographic variables among the lecturers in tertiary institutions. They also realised that job stress might hinder their job performance, which in turn affects students learning.

Over the last several years, extensive research has been conducted on stress, resulting in numerous conferences, publications, and papers. [29] targeted nursing students with an interest in how paid

employment affects their success by underlining how the best approach towards the management of the competing demands of working and learning is essential in helping students achieve the best results. The definition of stress was initially formed by Hans Selye, who researched the anxiety individuals experience when they encounter challenges in modifying and coping with a transforming atmosphere. Stress may be described as a broad, non-specific physiological reaction to many situations. Subsequently, the author focused on the distinction elucidated by [8] between anxiety, denoting positive stress, and distress, signifying negative stress. The contemporary understanding of stress commonly refers to a state characterized by physiological and mental stress, accompanied by a sense of incapacity to effectively manage fear and unease, especially when confronted with shifts in one's life situation [30].

Over several years, considerable transformations have occurred in the higher education sector that have significantly influenced the working situations of faculty members [31]. [32], emphasised the role of teacher support in decreasing stress levels and increasing motivation and academic achievement by mentioning the role of teachers as facilitators. Additionally, [33] identified general barriers to learning when transitioning from the traditional academic settings to an environment outside the academic environment and how academic support affects learners' outcomes. The part played by self-efficiency in stress management and that is, academic achievements cannot also be ignored. [34], investigated the mathematics self-efficacy of non-math specialist students and also the kinds of blended learning that could help students gain mastery in required skills. This indicates that boosting the self-efficacy of students averted the effects of employment stress, enabling students to perform better in their academic endeavours. Similarly, [35] explored the self-efficacy beliefs of university students. They agreed on the correlation between high levels of self-efficacy and achievement and posited the fact that developing these beliefs is crucial to the enhancement of performance.

Furthermore, [36] studied the effects of rurality and dropout rates in online higher education in Colombia, thus highlighting external environmental factors such as geographical location that contribute to students' stress and, thus, their performance. According to [37], COVID-19 pandemic fear and stress were a significant predictor of the academic performance of undergraduates, where teacher-parent support was deemed to have offered protection against poor performance due to fear and stress. [38] used a Fuzzy clustering model to identify psychological fitness and performance among university students, noting the impact of stress on cognitive processes and learning achievement in institutions. According to the studies highlighted above, it was found that through technology inputs like algorithms, signs of stress-related concerns can be identified on time.

The academic literature has recognized several job-related stress traits, including inter-role distance, role expectation conflict, role sedimentation, overwhelming roles, role loneliness, personal inadequacy, self-role separation, role confusion, and resource insufficiency [39]. Tension is characterized as a psychological state of disengagement from work or a decline in motivation resulting from overwhelming stress [40]. In general, the discussions and observations of the literature in this study indicate that employment stress may negatively affect the working student's performance. Hypotheses including workload, kind of employment, perceived sources of stress, self-efficiency, institutional support, and teacher and student relationships are essential in explaining the extent to which students can effectively manage their studies alongside work. This study also shows that meaningful attempts to respond to

these factors and adopt stimuli and supportive environments can enable students to minimize employment pressure while maximizing their academic achievements.

Methodology

This research study analyzes the influence of employment-related stress on the academic achievement of working students in Parachinar, District Kurram, Khyber Pakhtunkhwa, Pakistan. The research investigation examines the students' level of effort and the strategies they applied to attain their academic aspirations. A standardized questionnaire was devised to assess the core variables, whereby the independent variables were identified as Employment Stress variables such as Workload, Time Management, Interpersonal Conflicts, Study Load, and Financial Problems. The dependent variable, on the other hand, was defined as Academic Performance. Additionally, the study aims to gather data about the participants' demographic profiles, including characteristics such as Gender, Age, and level of education. Empirical data are presented using hypothesis tests, descriptive statistics, regression analysis, factor analysis, and ANOVA analysis.

Data Collection and Method

This research study provides analytical statistics on the influence of employment-related stress on the academic performance of working students in Parachinar, District Kurram, Khyber Pakhtunkhwa, Pakistan. The research utilized data acquired from a sample of 180 employed students. A questionnaire survey form was designed using Google Forms and distributed to the 180 target audience through WhatsApp and emails to collect the responses online from the sample population. The data has been analyzed using the R programming language, using a range of statistical approaches, such as demographic statistics, hypothesis tests, descriptive statistics, regression analysis, factor analysis, and ANOVA analysis, to get empirical findings.

Variable Type	Variables Symbol	Description	Variable Nature
Dependent Variable	SAP	Students' Academic Performance	Main Dependent Variable
Independent Variable	ES/EMP_STRESS	Employment Stress	Main Independent Variable
Academic Performance	ACDPRF	Main measuring parameter	Output parameter
Employment effects on study focus	EESF	Main measuring parameter	Output parameter
Missing academic activity due to work commitments	MAAWC	Main measuring parameter	Output Parameter
Motivation to manage employment responsibilities	MMER	Main measuring parameter	Output Parameter
Employment stress level	EMSTL	Main measuring parameter	Input Parameter
Sources of stress	SRCST	Main measuring parameter	Input Parameter
Coping strategy	CPSTG	Main measuring parameter	Input Parameter
Professional help-seeking to stress issue	PRFHLP	Main measuring parameter	Input Parameter

Author's descriptions

Table 01. Study Variable type, symbol, description, and variable nature

Table 01 lists the variables together with their corresponding symbolic representations and descriptions.

Dependent Variable (DV): SAP (Students' Academic Performance):

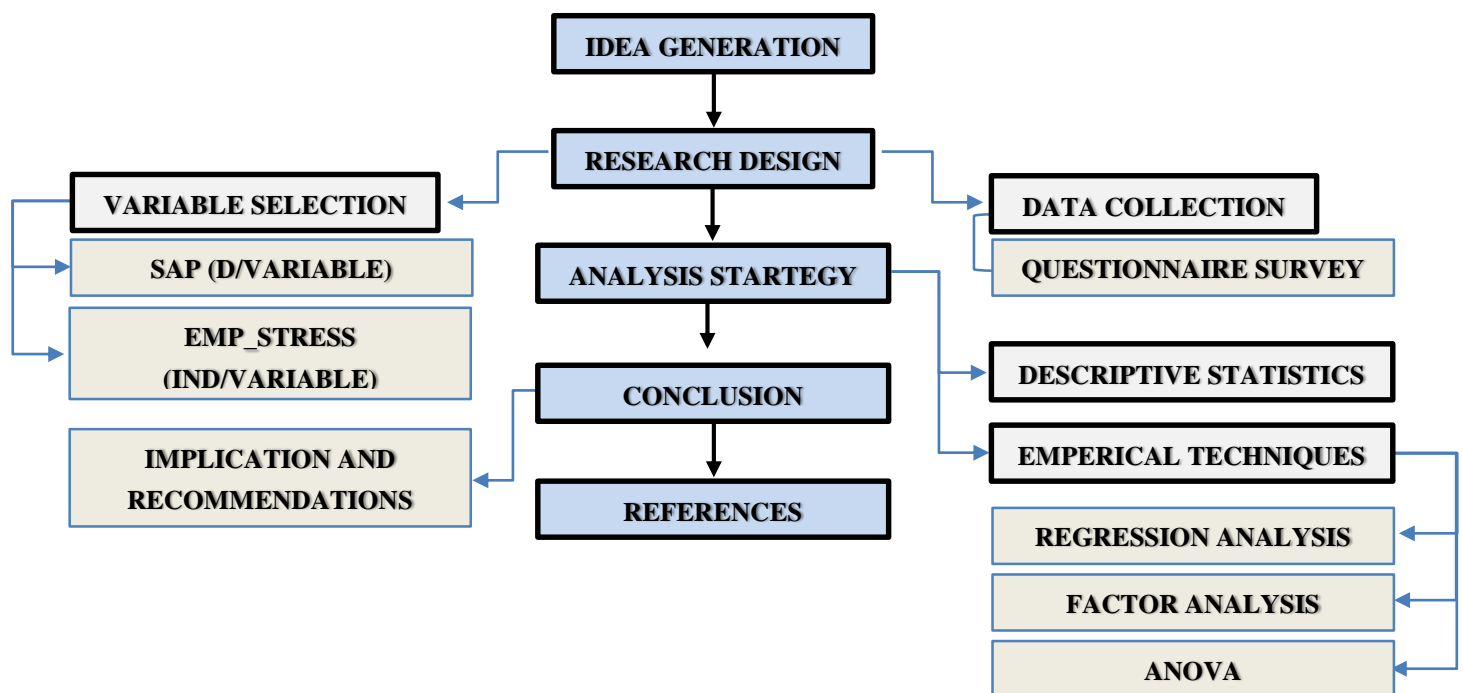
The variable of interest in this research is "Students' Academic Performance" (SAP), the dependent variable. This implies that the researchers are avidly curious to investigate or assess students' academic performance. The variable denoted as SAP acts as the dependent variable, capturing students' academic performance. This variable is particularly relevant since it reflects the outcomes or measures being investigated.

Independent Variable (IV): E.S. (Employment Stress):

The variable under investigation in this research is denoted as "Employment Stress" (E.S.) and is considered the independent variable. This statement indicates that the researchers are examining the influence of job-related stress on students' academic achievement. The variable denoted as the independent variable (E.S.) pertains to employment stress, which is the component or variable hypothesized by researchers to affect students' academic performance potentially.

The table presents a concise overview of the variables and their corresponding symbols, elucidating their respective functions within the research.

Methodological workflow of the study:



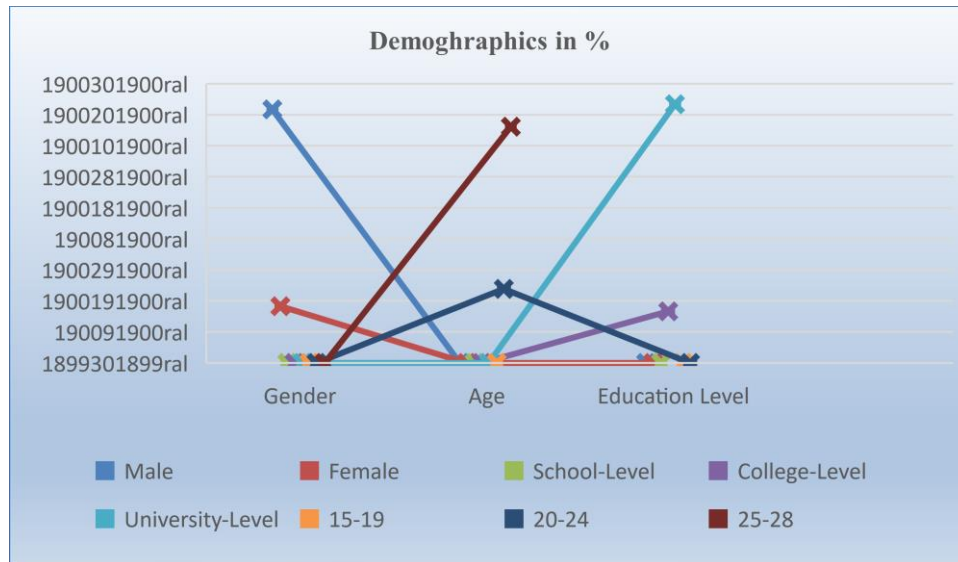


Figure 01. Demographics in Percentage

The discussion of the student population involved in the research study enables an analysis of students pursuing different academic disciplines, striving to meet their educational goals, and being employed in various companies or organizations in Pakistan with a positive outlook. Figure 01 illustrates the distribution of Gender among students, with 81.67% being male and 18.33% being female. Additionally, it highlights the age distribution, with 76.11% of students falling within the 25-28-year range and 23.89% becoming within the 20-24-year range. Furthermore, 83.33% of students are enrolled in university-level study programs, while 16.67% pursue college studies. This study examines the influence of employment-related stress on the academic performance and accomplishments of students of various backgrounds while they seek career opportunities to satisfy their aspirations. The number shown emphasizes students' dedication towards achieving tremendous success in the future and their prominent role in the worldwide shift towards more prosperous and economically responsible career opportunities.

Empirical results and discussion

After collecting the required data, proper tools and techniques were used for classification and analysis. The study was examined through demographic statistics, descriptive statistics, regression analysis, factor analysis, and ANOVA test. The (R programming language) was used for the analysis processes to this effect.

Results:

GEN	Frequencies	Percent	Cumulative Percent
1.00	147	81.67	81.67
2.00	33	18.33	100.00

1.00= Male, 2.00 = Female

Table 02. Frequency and Percentage of Gender

Table 04 clarifies that "1.00" corresponds to males, while "2.00" corresponds to females.

The table below delivers a brief overview of the gender distribution within the dataset, illustrating the number of respondents from the targeted demographics that participated in the research questionnaire. The participants include males and females, with the table further showing the respective percentages they represent about the entire dataset. The dataset exhibits a disparity in gender representation, with a higher number of males (147) than females (33). males constitute a more vital percentage (81.67%) of the overall population, while females comprise a lower proportion (18.33%).

AGE	Frequencies	Percent	Cumulative Percent
1.00	-	-	-
2.00	43	23.89	23.89
3.00	137	76.11	100.00

1.00= 15-19, 2.00 = 20-24, 3= 25-28

Table 03. Frequency and Percentage of Age

Table 03 briefly describes the distribution of age groups (AGE) within the dataset. The provided table facilitates a rapid comprehension of the age distribution among the individuals surveyed or sampled, as the percentages indicate the relative representation of each age cohort within the dataset.

The table illustrates that more university students under the age of 25-28 years (137) are actively involved in work across diverse companies/organizations, unlike college students between 20-24years (43). Notably, no students enrolled in school are permitted to participate in any employment. University students represent the majority (76.11%) of the total population, but college students form a minority (23.89%).

EDU_LEV	Frequencies	Percent	Cumulative Percent
1.00	-	-	-
2.00	30	16.67	16.67
3.00	150	83.33	100.00

1.00= School Level, 2.00 = College Level, 3= University Level

Table 04. Frequency and percentage of Education Level

Table 06 reveals the level of education among the individuals corresponding to this particular group. The data indicates that a significant majority of the participants within the population have a higher education background, namely at the university level, comprising 83.33% of the whole group. The remaining 16.67% includes college-level students concurrently employed while pursuing their studies.

Variable	Stats/Values	Freqs.(% of Valid)	Valid	Missing
EMSTL	Mean (sd.): 2.8 (0.9) min ≤ med ≤ max: 2 ≤ 2 ≤ 5 IQR (CV): 2 (0.3)	2:94(52.2%) 3:39(21.7%) 4:39(21.7%) 5:8(4.4%)	180 (100.0%)	0 (0.0%)
SRCST	Mean (sd.): 2.8 (1.5) min ≤ med ≤ max: 1 ≤ 3 ≤ 5 IQR (CV) : 3 (0.5)	1:57(31.7%) 2:17(9.4%) 3:36(20.0%) 4:38(21.1%) 5:32(17.8%)	180 (100.0%)	0 (0.0%)
CPSTG	Mean (sd.): 2.5 (0.9) min ≤ med ≤ max: 1 ≤ 3 ≤ 4 IQR (CV): 1 (0.3)	1:25(13.9%) 2:54(30.0%) 3:81(45.0%) 4:20(11.1%)	180 (100.0%)	0 (0.0%)
PRFHLP	Min: 1 Mean: 1.2 Max : 2 Mean (sd.): 1.7 (1) min ≤ med ≤ max: 1 ≤ 1 ≤ 5	1:143(79.4%) 2:37(20.6%) 1:103(57.2%) 2:39(21.7%)	180 (100.0%) 180 (100.0%)	0 (0.0%) 0 (0.0%)
ACDPRF	IQR (CV): 1 (0.6)	3:30(16.7%) 4:4(2.2%) 5:4(2.2%)		
EESF	Mean (sd.): 1.8 (0.9) min ≤ med ≤ max: 1 ≤ 1.5 ≤ 3 IQR (CV): 2 (0.5)	1:90(50.0%) 2:37(20.6%) 3:53(29.4%)	180 (100.0%)	0 (0.0%)
MAAWC	Mean (sd.): 3.2 (0.5) min ≤ med ≤ max: 1 ≤ 3 ≤ 4 IQR (CV) : 0 (0.2)	1:2(1.1%) 2:3(1.7%) 3:137(76.1%) 4:38(21.1%)	180 (100.0%)	0 (0.0%)
MMER	Mean (sd.): 1.4 (0.5) min ≤ med ≤ max: 1 ≤ 1 ≤ 3 IQR (CV): 1 (0.4)	1:114(63.3%) 2:62(34.4%) 3:4(2.2%)	180 (100.0%)	0 (0.0%)
SAP	Mean (sd.): 1.8 (0.1) min ≤ med ≤ max: 1.5 ≤ 1.9 ≤ 2.2 IQR (CV): 0.2 (0.1)	21 distinct values	180 (100.0%)	0 (0.0%)
EMP_STRESS	Mean (sd.): 1.9 (0.4) min ≤ med ≤ max: 1.2 ≤ 1.9 ≤ 2.9 IQR (CV): 0.5 (0.2)	21 distinct values	180 (100.0%)	0 (0.0%)

Author's calculations: Generated by summarytools 1.0.1 (R version 4.0.0)

Table 05. Descriptive Statistics

The table summarizes the findings of the analysis on the relationship between the present value of the SAP (dependent variable) and EMP_STRESS (independent variables).

Table 05 sets out the mean and standard deviations for the participant's subjective assessment of stress (SAP) concerning the independent variable of employment stress. The mean SAP score is calculated with $M = 1.8$, with a standard deviation of $SD = 0.1$. Similarly, the standard deviation for the independent variable of employment stress has been calculated as $SD = 0.4$. The mean of the dependent variable, M , is 1.8, whereas the mean of the independent variable, M , is 1.9. Finally, the collected data exhibits the Interquartile Range (IQR) and Coefficient of Variation (CV), which are critical metrics for analyzing the distribution and variability of the data.

The interquartile range (IQR), with a value of 2 for the EMSTL variable, represents the difference between the first quartile (Q1) and the third quartile (Q3) as two units. This suggests a moderate amount of variability within the middle area of the data. Similarly, the coefficient of variation (CV), which has a value of 0.3 for the EMSTL variable, indicates that the standard deviation is 30% of the mean. This suggests a bit of variability compared to the mean value. When examining our variables, SRCST has an interquartile range (IQR) of 3 and a coefficient of variation (CV) of 0.5, while CPSTG has an IQR of 1 and a CV of 0.3. These measurements indicate various degrees of dispersion and variability within the dataset. The results offer vital insights into the distribution patterns and properties of our data, facilitating greater insight and interpretation within the context of our study.

Regression Analysis

Lm(formula= SAP~EMP_STRESS, data=ESSAP					
Residuals:					
	Min.	1Q	Median	3Q	Max.
	-0.315	-0.106	-0.022	0.096	0.330
Coefficients:					
	Estimate	Std. Error	t value	Pr (> t)	
(Intercept)	1.581	0.052	30.371	< 2e-16 ***	
EMP_STRESS	0.132	0.027	4.857	2.6e-06 ***	
Residual standard error:	0.1381 on 178 degrees of freedom				
	Multiple R-squared:			0.117	
	Adjusted R-squared:			0.112	
	F-statistic:			23.59 on 1 and 178 DF	
	P-value:			2.6e-06	
Significance codes: 0 '***', 0.001 '**', 0.01 '*', 0.05 '●', 0.1 '◌', 1					

Author's calculations

Table 06. Linear Regression Analysis (SAP, EMP_STRESS)

According to the findings presented in Table 06, the regression analysis results demonstrate a statistically significant relationship between EMP_STRESS (Employment Stress) and SAP (Student Academic Performance). Specifically, the analysis showed a positive relationship between these two

variables. The R-squared value of the model is 0.117, reflecting that around 11.7% of the Variance in the dependent variable (SAP) can be accounted for by the independent variable (EMP_STRESS). The model explains around 11.7% of the variability observed in SAP, with EMP_STRESS emerging as a statistically significant predictor.

The F-statistic, with a value of 23.59 and a corresponding probability (Prob. > F) approaching 2.6e-06, suggests that the model expresses statistical significance. The coefficient associated with the independent variable EMP_STRESS is 0.132. This implies that, on average, a one-unit rise in EMP_STRESS leads to a 0.132-unit rise in SAP while keeping all other variables equal.

The p-value corresponding to the coefficient of EMP_STRESS is 2.6e-06, indicating a statistically significant relationship. This finding suggests a statistically significant relationship between the EMP_STRESS variable and the prediction of SAP. With a value of 0.027, the standard error can be leveraged to identify the range within which the population coefficient is likely to exist with high confidence.

Lm (formula= SAP~EMP_STRESS + EMSTL + SRCST + CPSTG + PRFHLP + ACDPRF + EESF + MAAWC + MMER, data = ESSAP					
Residuals:					
	Min.	1Q	Median	3Q	Max.
	-0.208	-0.060	-0.002	0.058	0.196
Coefficients:					
	Estimate	Std. Error	t value	Pr (> t)	
(Intercept)	1.088325	0.061270	17.763	< 2e-16 ***	
EMP_STRESS	0.043320	0.053974	0.803	0.4233	
EMSTL	0.020522	0.012229	1.678	0.0951 ●	
SRCST	0.014430	0.009445	1.528	0.1284	
CPSTG	0.016688	0.011447	1.458	0.1467	
PRFHLP	-0.019113	0.018104	-1.056	0.2926	
ACDPRF	0.095984	0.007535	12.738	< 2e-16 ***	
EESF	0.056419	0.009286	6.076	7.87e-09 ***	
MAAWC	0.085658	0.013914	6.156	5.19e-09 ***	
MMER	0.003404	0.012328	0.276	0.7828	
Residual standard error:	0.08344 on 170 degrees of freedom				
	Multiple R-squared:			0.6924	
	Adjusted R-squared:			0.6761	
	F-statistic:			DF 42.51 on 9 and 170 DF	
	P-value:			< 2.2e-16	
Significance codes: 0 '***', 0.001 '**', 0.01 '*', 0.05 '●', 0.1 '◌', 1					

Author's calculations

Table 07. inear Regression Analysis (SAP, EMP_STRESS, ACDPRF, EESF, MAAWC, MMER, EMSTL, SRCST, CPSTG, PRFHLP)

The results of this study are presented in the table, explaining the current correlation among these factors or variables. Table 07 highlights the correlation analysis results, which examined linear correlations among the variables. The findings indicate a significant correlation among the variables.

The variables SAP and EMP_STRESS estimate 0.043320 with a standard error of 0.053974, resulting in a t-value of 0.803 and a p-value of 0.4233. The observed positive connection implies a moderate propensity for levels of employment-related stress to rise in tandem with improvements in student academic performance (SAP). This observation states that those who assess their performance more favourably may encounter higher stress levels due to heightened expectations or increased work responsibilities. The (ACDPRF) is utilized to evaluate academic performance, and its positive correlation with Student Academic Performance (SAP) supports a potential correlation between work performance and educational achievement, with an estimate of 0.095984, a standard error of 0.007535, a t-value of 12.738, and a p-value of less than $2e-16$. This information holds potential value for initiatives in academic or professional settings.

The findings indicate a significant and positive correlation coefficient of 0.056419 between (SAP) and employment effects on study focus (EESF) with a standard error of 0.009286, a t-value of 6.076, and a p-value of $7.87e-09$, arguing that those who perceive themselves as performing better also tend to express higher levels of happiness with their employment. The correlation between an individual's subjective performance assessment and job satisfaction is significant in comprehending employee motivation. The observed correlation between managerial skill and workload capacity on the one hand and academic performance (ACDPRF) on the other hand. This observation suggests that students or employees who assume higher-level administrative roles can face difficulties effectively managing their academic pursuits alongside increased duties. MAAWC has an estimate of 0.085658, a standard error of 0.013914, a t-value of 6.156, and a p-value of $5.19e-09$.

The correlation between employment stress level (EMSTL) and sources of stress (SRCST) suggests that companies or organizations with a solid commitment to their competitive advantages in markets tend to have higher employee morale. EMSTL has an estimate of 0.020522, a standard error of 0.012229, a t-value of 1.678, and a p-value of 0.0951. This link could indicate that employees are more stressed when they perceive their organization as responsible for achieving the goals. The correlation between coping strategy (CPSTG) and employee performance help (PRFHLP) indicates a subtle connection. CPSTG has an estimate of 0.016688, a standard error of 0.011447, a t-value of 1.458, and a p-value of 0.1467. It suggests that a well-defined coping strategy might contribute slightly to helping employees improve their performance.

The study shows significant relationships between student academic performance and employment-related traits, revealing the challenging interplay between job stress, academic success, and employee satisfaction. These findings can inform academic and professional growth strategies.

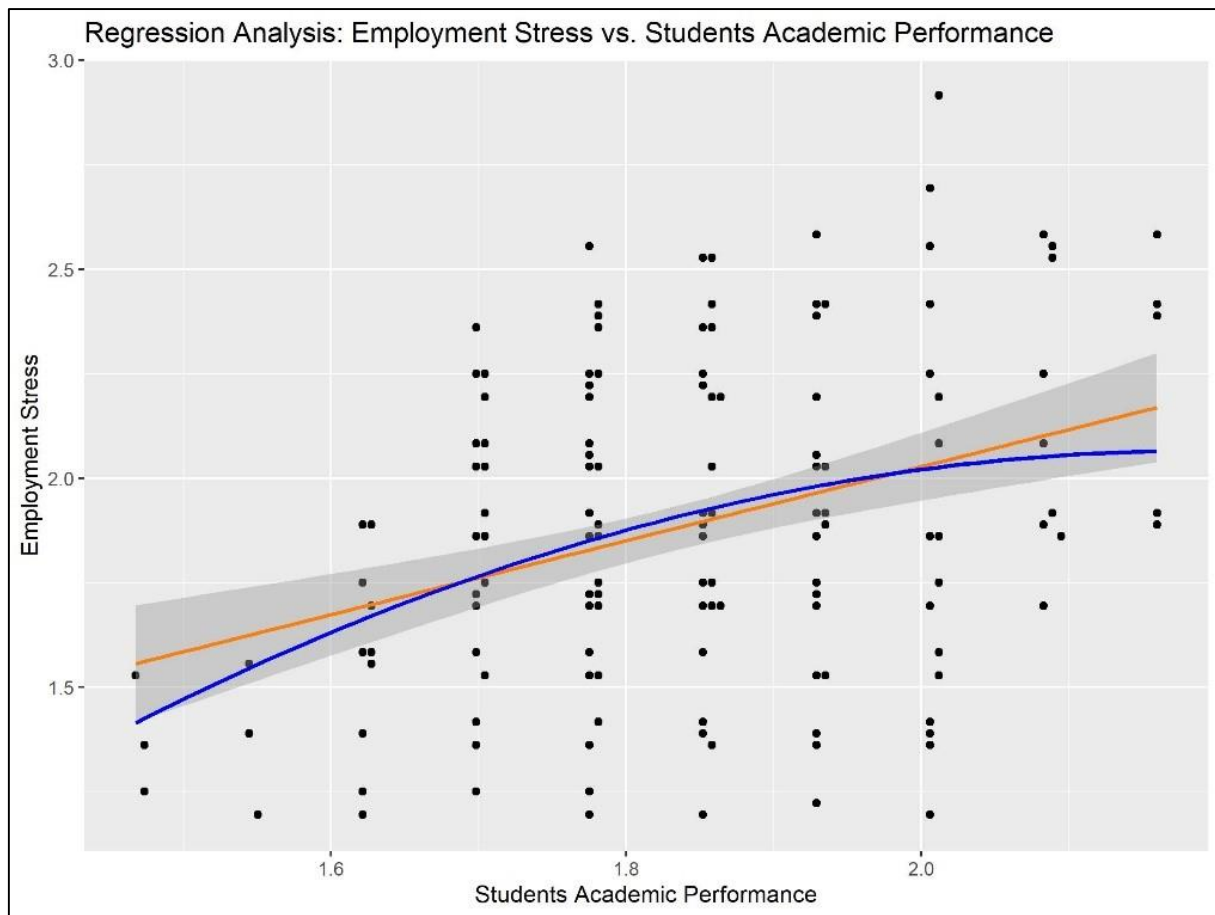


Figure 02. Regression Analysis: EMP_STRESS vs SAP

This regression analysis plot shows the correlation between work-related stress and students' academic performance. The scatter plot demonstrates a positive relationship, suggesting that as students' academic performance improves, their employment stress rises. The blue line is the regression line fitted to the data. It demonstrates a soft upward curve, indicating a non-linear relationship. The orange line represents a basic linear regression employed for comparison purposes. The grey-coloured region surrounding the blue line indicates the confidence interval, which estimates the uncertainty associated with the regression line. The scatter of data points around the lines demonstrates the diversity in employment stress levels among students with similar academic performance, suggesting that additional factors may trigger stress. The plot generally emphasizes a pattern in which enhanced academic performance correlates to higher stress related to employment, indicating a need for further research into the root reasons and possible measures to cope with them.

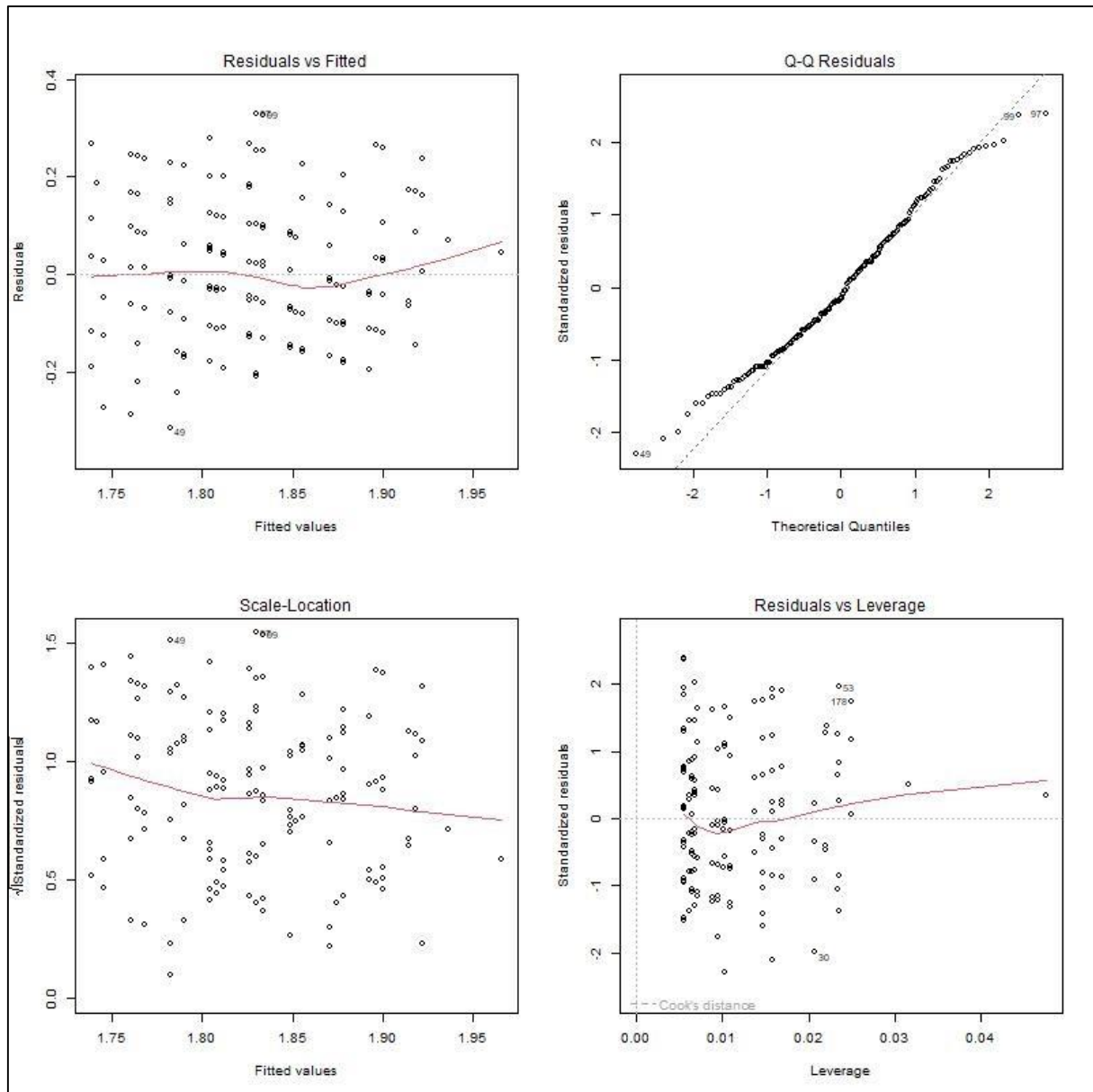


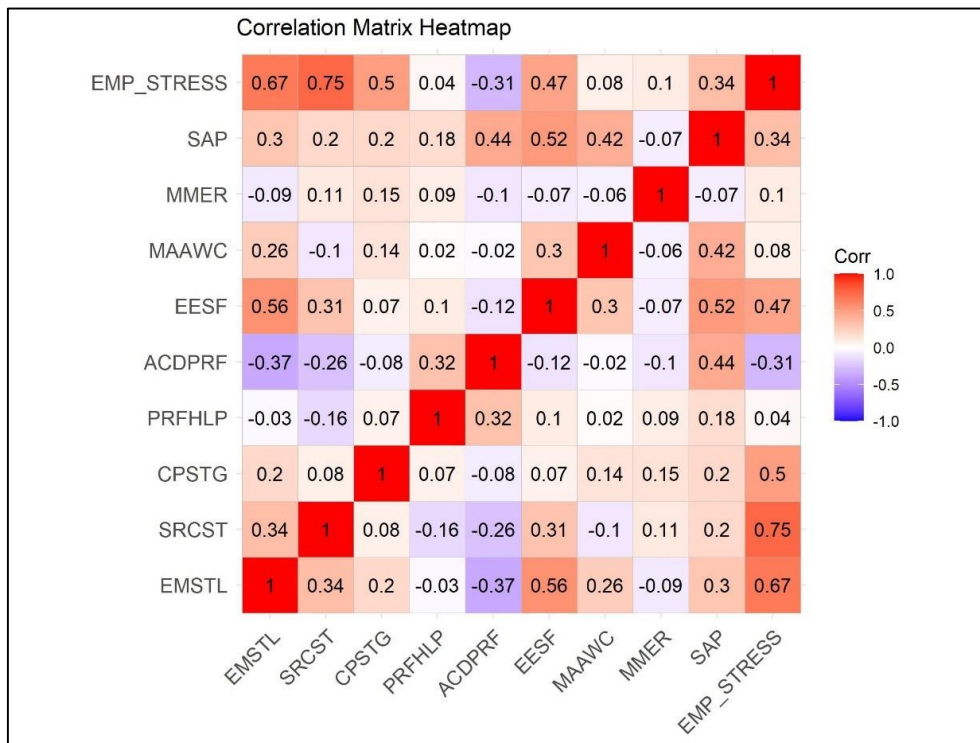
Figure 03. Diagnostic Analysis of Regression Model Assumptions

The diagnostic plots suggest that the regression model generally satisfies the main assumptions with minimal variations. The plot of residuals vs fitted values shows a random dispersion about the horizontal line, indicating that the assumption of linearity is met. However, a delicate curve exists, indicating the presence of slight non-linearity. The Q-Q Plot suggests that the residuals follow a normal distribution, providing evidence for the model's validity. The Scale-Location Plot shows a consistent variation of residuals without any discernible pattern suggesting homoscedasticity, but there is little downward tendency. The residual vs Leverage Plot highlights no evidence of any excessively influential points, as most data points are tightly clustered within a narrow range of leverage values, and none of the points have a high Cook's distance. In general, the model's assumptions are adequately fulfilled. Although slight variations, the results confirm the model's accuracy and strength, confirming the dependability of the model's predictions.

	EMSTL	SRCST	CPSTG	PRFHLP	ACDPRF	EESF	MAAWC	MMER	SAP	EMP_STRESS
EMSTL	1.0000	0.3438	0.1982	-0.0292	-0.3714	0.5631	0.2626	-0.0878	0.3046	0.6680
SRCST	0.3438	1.0000	0.0789	-0.1559	-0.2612	0.3113	-0.0976	0.1063	0.2049	0.7545
CPSTG	0.1982	0.0789	1.0000	0.0677	-0.0776	0.0720	0.1364	0.1531	0.2043	0.4956
PRFHLP	-0.0292	-0.1559	0.0677	1.0000	0.3244	0.1047	0.0175	0.0934	0.1795	0.0418
ACDPRF	-0.3714	-0.2612	-0.0776	0.3244	1.0000	-0.1247	-0.0217	-0.1012	0.4409	-0.3079
EESF	0.5631	0.3113	0.0720	0.1047	-0.1247	1.0000	0.3039	-0.0676	0.5157	0.4650
MAAWC	0.2626	-0.0976	0.1364	0.0175	-0.0217	0.3039	1.0000	-0.0648	0.4170	0.0799
MMER	-0.0878	0.1063	0.1531	0.0934	-0.1012	-0.0676	-0.0648	1.0000	-0.0680	0.0975
SAP	0.3046	0.2049	0.2043	0.1795	0.4409	0.5157	0.4170	-0.0680	1.0000	0.3420
EMP_STRESS	0.6680	0.7545	0.4956	0.0418	-0.3079	0.4650	0.0799	0.0975	0.3420	1.0000

Author's calculations*Table 08. Correlation Matrix (SAP, EMP_STRESS, ACDPRF, EESF, MAAWC, MMER, EMSTL, SRCST, CPSTG, PRFHLP)*

Table 08 demonstrates significant results regarding the relationship between EMP_STRESS and SRCST ($r = 0.7545$) and EMSTL ($r = 0.6680$). These correlations suggest that more employment stress corresponds to higher division scores. The correlation coefficients indicate that SAP has a positive relationship with EESF ($r = 0.5157$), ACDPRF ($r = 0.4409$), and EMP_STRESS ($r = 0.3420$). This suggests improved academic performance correlates to increased emotional and educational support, academic proficiency, and employment stress. Incredibly, there exists a negative association between ACDPRF and both EMSTL ($r = -0.3714$) and SRCST ($r = -0.2612$), suggesting that higher levels of academic competence may be tied to reduced emotional stress and lower scores in stress situations connected to students.

*Figure. 04. Correlation matrix heat map*

The heat map in Figure 01 depicts the correlation matrix among numerous factors, including EMP_STRESS (Employment Stress), SAP (Student Academic Performance), and other variables such as

EMSTL, SRCST, CPSTG, PRFHLP, ACDPRF, EESF, MAAWC, and MMER. The heat map displays multiple significant correlations.

EMP_STRESS has significant positive relationships with SRCST ($r = 0.75$) and EMSTL ($r = 0.67$), highlighting that increased job stress is strongly associated with heightened stress levels in student-related circumstances and mental strain. The correlation coefficients between SAP and EESF ($r = 0.52$) and ACDPRF ($r = 0.44$) reflect a positive relationship. This indicates improved academic performance increases emotional and educational support and higher academic competency. On the other hand, there is a significant negative relationship between ACDPRF and both EMSTL ($r = -0.37$) and SRCST ($r = -0.26$). This feature argues that higher academic performance tends to be linked to lower levels of emotional stress and stress connected to students.

The correlations between other variables highlight their mutual dependence. EESF positively binds with SAP and EMP_STRESS, proving that emotional and educational support improves academic achievement and job stress. MAAWC and SAP ($r = 0.42$) disclose a moderate positive connection, showing that workload management and awareness enhance academic performance. The correlations show the intricate interaction between stress, support networks, and academic achievement, suggesting that reducing stress and improving support can improve student performance.

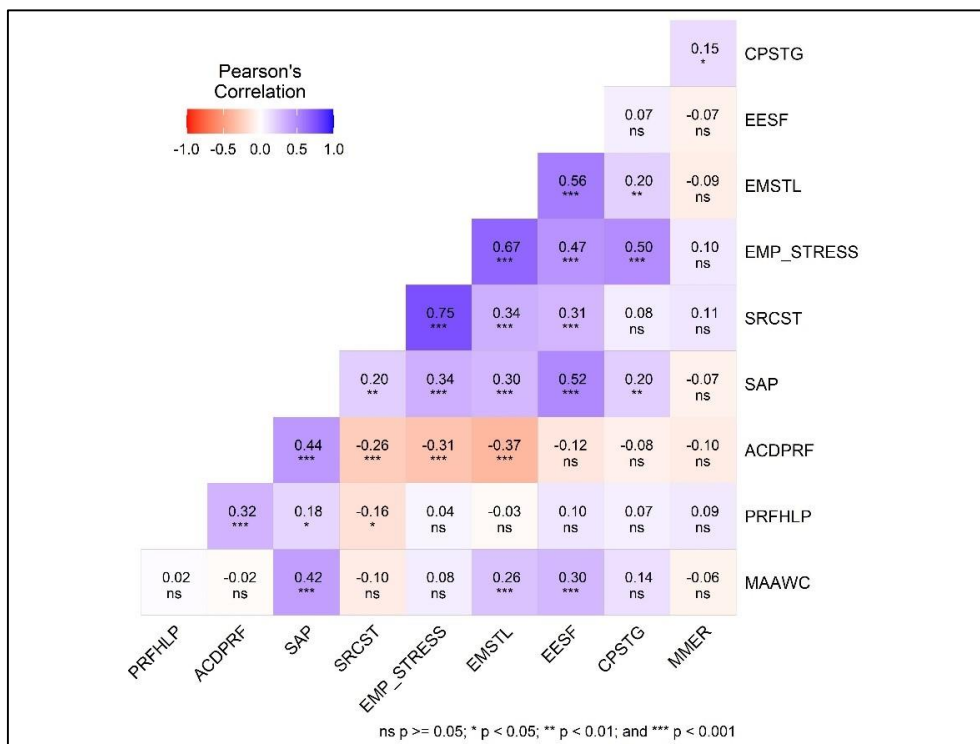


Figure. 05. Pearson's Correlation heat map

The correlation matrix indicates multiple primary beneficial relationships among the parameters. It is worth mentioning that SRCST reveals a significant positive correlation with SAP (0.75, ***). This suggests that greater values of SRCST correspond to higher values of SAP. Similarly, the evidence from SRCST indicates strong positive correlations with EMP_STRESS (0.67, ***), EESF (0.52, ***), EMSTL (0.41, ***), and CPSTG (0.32, **). These results indicate that as SRCST grows, these variables also rise. EMP_STRESS displays strong positive relationships with SAP (0.56, ***), EESF (0.39, **), and EMSTL (0.34, **), suggesting a consistent pattern. Furthermore, there is a significant relationship between EESF

and EMSTL, with a correlation coefficient of 0.56 (***). EESF also shows a positive correlation with CPSTG, with a correlation coefficient of 0.33 (**). The findings indicate a strong correlation between variables such as SRCST, EMP_STRESS, SAP, EESF, and EMSTL, suggesting that an increase in one variable will likely increase the others.

Studentized Breusch-Pagan test	
BP =	3.849
df =	1
p-value =	0.04978
data: LRM_model	

Author's calculations

Table 09. Heteroscedasticity Test Results Using Studentized Breusch-Pagan Method

The Breusch-Pagan test, introduced by [41], is a simple technique to identify heteroscedasticity and random coefficient variation in regression models. The authors suggest a straightforward method that entails doing a regression analysis on the squared residuals obtained from the baseline regression model, using the independent variables as predictors. The test statistic that is obtained fits a chi-square distribution when the null hypothesis of homoscedasticity is assumed, which enables simple hypothesis testing. Breusch and Pagan highlight the practical relevance of their test, offering researchers a reliable instrument to identify heteroscedasticity and make the necessary adjustments to assure the accuracy of regression analysis. We performed the studentized Breusch-Pagan test to evaluate the presence of heteroscedasticity in our model. Table 09 presents the findings of the Test Statistic (B.P.): The degrees of freedom (df) are 3.849, with a p-value of 0.04978.

The calculated p-value of 0.04978 indicates statistical significance at the standard significance level of 0.05. Therefore, we have adequate insights to conclude our model. This shows that the residuals' variability is inconsistent throughout the entire range of predictor variables.

Durbin-Watson test	
Lag	1
DW statistics =	1.18
Autocorrelation	0.4091832
p-value =	1.099e-08
Alternative hypothesis: rho != 0	

Author's calculations

Table 10. Durbin-Watson Test Results

[42] proposed a technique to assess if there is a consistent pattern in the residuals that could compromise the reliability of statistical inferences made from the regression model. A statistical test can detect autocorrelation in the residuals from a regression analysis.

In Table 10, The Durbin-Watson test yielded a D.W. statistic of 1.18, supported by a p-value of 1.099e-08, indicating high statistical significance. This provides compelling evidence against the null hypothesis

of no autocorrelation, consequently helping the alternative hypothesis that the residuals display positive autocorrelation.

Factor Analysis

Call:

factanal (x = ESSAP, factors = 2, rotation = "varimax")

Uniquenesses:

EMSTL	SRCST	CPSTG	PRFHLP	ACDPRF	EESF	MAAWC	MMER	SAP	EMP_STRESS
0.546	0.427	0.756	0.967	0.564	0.638	0.821	0.979	0.005	0.005

Loadings:

	Factor 1	Factor 2
EMSTL	0.665	0.112
SRCST	0.757	-
CPSTG	0.490	-
PRFHLP	-	0.180
ACDPRF	-0.338	0.568
EESF	0.449	0.401
MAAWC	-	0.418
MMER	0.102	-0.104
SAP	0.298	0.952
EMP_STRESS	0.996	-

	Factor 1	Factor 2
S.S. loadings	2.667	1.626
Proportion Var	0.267	0.163
Cumulative Var	0.267	0.429

Test of the hypothesis that two factors are sufficient.

The chi-square statistic is 287.56 on 26 degrees of freedom.

P-value: 6.41e-46

Author's calculations via R version 4.0.0.

Table 11. Factor Analysis: Principal-component factors with varimax rotation

The analysis, applying principal-component factors with varimax rotation, identifies two primary factors. The loadings table demonstrates the correlation between the variables and the two factors.

Factor 1 substantially impacts several variables, particularly EMP_STRESS, which shows a high loading of 0.996, indicating an adequate correlation. Factor 1 also shows significant loadings for other variables, including EMSTL (0.665), SRCST (0.757), CPSTG (0.490), EESF (0.449), MAAWC (0.418), and SAP (0.298). Factor 2 significantly influences ACDPRF (0.568) and SAP (0.952), demonstrating distinct relationships than Factor 1.

Factor 1 contributes 26.7% of the Variance, and Factor 2 makes up for an additional 16.3%. Together, these two factors explain a cumulative variance of 43%.

The chi-square statistic has been calculated as 287.56 with 26 degrees of freedom. This results in a p-value of 6.41e-46, which indicates significant variations between the model with two factors and a

saturated model with influential replication variables. This suggests that the two-factor model is more suitable for the data than presuming independence.

Call:					
fa (r = ESSAP, nfactors = 2, rotate = "varimax")					
Standardized loadings (pattern matrix) based upon correlation matrix					
	MR1	MR2	h2	u2	com
EMSTL	0.73	-0.06	0.535	0.4649	1.0
SRCST	0.59	-0.23	0.404	0.5961	1.3
CPSTG	0.34	0.02	0.113	0.8871	1.0
PRFHLP	0.00	0.30	0.090	0.9104	1.0
ACDPRF	-0.30	0.65	0.516	0.4843	1.4
EESF	0.62	0.22	0.431	0.5690	1.2
MAAWC	0.25	0.29	0.146	0.8543	2.0
MMER	0.03	-0.11	0.014	0.9857	1.2
SAP	0.54	0.85	1.005	-0.0054	1.7
EMP_STRESS	0.96	-0.18	0.946	0.0536	1.1
			MR1	MR2	
SS loadings			2.73	1.47	
Proportion Var			0.27	0.15	
Cumulative Var			0.27	0.42	
Proportion Explained			0.65	0.35	
Cumulative Proportion			0.65	1.00	
Mean item complexity =			1.3		
Test of the hypothesis that two factors are sufficient.					
df null model =				45	
with the objective function =				4.78	
with Chi-Square =				835.27	
The root mean square of the residuals (RMSR) is:				0.09	
The df corrected root mean square of the residuals is:				0.12	
The harmonic n.obs is 180 with the empirical chi-square 130.36 with prob < 7.4e-16					
The total n.obs was 180 with Likelihood Chi Square = 325.36 with prob < 1.7e-53					
Tucker Lewis Index of factoring reliability = 0.339					
RMSEA index = 0.253, and the 90 % confidence intervals are 0.229 0.279					
BIC = 190.34					
Fit based upon off-diagonal values = 0.9					

Author's calculations via R version 4.0.0.

Table 12. Factor Analysis using method = minres

The factor analysis findings indicate that two factors (MR1 and MR2) successfully reflect significant relationships within the data. MR1, which makes up for 27% of the Variance, is strongly correlated with several essential variables: EMP_STRESS (0.96), EMSTL (0.73), SRCST (0.59), and EESF (0.62). This suggests that MR1 effectively detects a dominating pattern in the data, explicitly highlighting the significant influence of EMP_STRESS and its strong correlation with other relevant factors.

Factor MR2, contributing an additional 15% of the explained Variance, emphasizes specific relationships, particularly with ACDPRF (0.65) and SAP (0.85). This indicates that MR2 catches an additional significant aspect inside the data, representing specific relationships different from those discovered by MR1. The total explained Variance of 42% from both factors suggests that these factors accurately characterize a significant proportion of the data's variability.

Furthermore, the strong commonalities observed for many variables, such as EMP_STRESS (0.946) and SAP (1.005), confirm that the model accurately captures these traits. The mean item complexity of 1.3 suggests that most variables are influenced mainly by a single variable, guaranteeing a clear understanding when interpreting the factor loadings. The favourable factors of the two-factor method demonstrate its ability to capture significant patterns and correlations in the dataset.

ANOVA Analysis

Predictor	Sum Of Squares	df	Mean Square	F	p	partial η^2	partial η^2 90% CI [L.L., U.L.]
(Intercept)	17.60	1	17.60	922.39	.000		
EMP_STRESS	0.45	1	0.45	23.59	.000	.12	[.05, .19]
Error	3.40	178	0.02				

Note. L.L. and U.L. represent the lower and upper limits of the partial η^2 confidence interval, respectively.

Table 13. Fixed-Effects ANOVA results using ESSAP\$SAP as the criterion

The analysis findings underline the notable influence of the ANOVA test on Student Academic Performance (SAP), indicating notable differences in academic stress levels among graduate students experiencing various employment-related stressful circumstances. Table 13 presents the ANOVA table, which analyzes the variation seen in levels of employment-related stress (EMP_STRESS) and the variation within each level. The F-value of 23.59 suggests a significant statistical variance in academic stress levels among students facing diverse employment pressures. The probability value (p) of 0.000 presents strong evidence for the statistical significance of this disparity, significantly lower than the generally accepted significance level of 0.05.

In addition, the study indicates that a considerable proportion of the overall variation in academic stress can be attributed to inequalities in work-related stress. The partial η^2 value quantifies the effect size, namely the proportion of Variance in the dependent variable SAP that can be determined by the independent variable EMP_STRESS. The table above shows that the partial eta squared value for EMP_STRESS is 0.12, indicating that 12% of the Variance in SAP may be attributed to EMP_STRESS. The confidence interval defines a region where the actual partial eta squared value is anticipated to lie, with a 90% confidence level. The interval [0.05, 0.19] for EMP_STRESS shows that the actual effect magnitude is probably within the range of 5% to 19%. This aids in appreciating the accuracy and dependability of the effect size estimation. These findings thoroughly understand the factors that cause stress among graduate students, highlighting the complex influence of work-related stress on their academic performance.

Conclusion

The study on the influence of employment stress on academic performance for working students in Pakistan proposed several noteworthy discoveries. Initially, there was a significant gender gap within the dataset, as the proportion of male participants exceeded that of females. With this variation, an essential percentage of the participants demonstrated a higher level of education, predominantly at the university level, suggesting a notable dedication to academic studies within the sample population. One remarkable observation pertained to the active engagement of university students in diverse career prospects, shedding an understanding of the challenges experienced by students in effectively balancing their work and academic commitments. This dual commitment underscores the complexities of managing stresses arising from both domains. Interestingly, there is a notable absence of work involvement among school students, resulting in a noticeable gap in the pressures experienced by students at various educational levels.

The data was subjected to quantitative analysis, demonstrating a statistically significant positive correlation between stress linked to work and academic performance among students. It is noted that there exists a positive correlation between higher levels of stress and influence on academic performance. This suggests that stresses connected to jobs unpredictably restrict learning development and may even promote it in specific situations. These nuanced findings enriched our understanding of the multifaceted nature of stress and its influence on student's academic endeavours. The Variance (ANOVA) test analysis confirmed statistically significant variations in academic pressure levels among students exposed to various employment-related stress conditions. The influence of employment-related stresses on the diverse levels of learning pressure experienced by students remained emphasized.

The research study offered helpful insights into the intricate processes that exist. The findings of this study underline the need to implement customized coping strategies for students, considering the numerous challenges they face while attempting to balance their academic responsibilities with their employment commitments. Furthermore, the unexpected influential association between stress experienced in the workplace and academic performance offers prospects for additional research. This study might delve into how these stresses when successfully handled, can serve as sources of motivation rather than challenges in striving for academic greatness.

Research Implications and Recommendations:

The results of this study hold tremendous implications for educational institutions, governments, and businesses operating within the environment of the nation of Pakistan. Acknowledging the impact of employment-related stress on academic performance indicates the imperative of fostering supportive environments for concurrently employed students. Educational institutions have the potential to incorporate counselling services and stress management initiatives that are specifically designed to address the distinctive challenges encountered by these students. Employers also have an essential bearing on creating workplace atmospheres that mitigate stresses and encourage a favourable equilibrium between work and personal life.

Furthermore, it is recommended that future research endeavours delve into supplementary factors such as social support, coping strategies, and organizational aspects to attain a broader comprehension of the complexities implicated. Successful continuous studies analyzing students' academic journeys over a more extended time could yield valuable insights into the dynamic nature of this association.

Ultimately, this study sheds light on the complex factors that influence the academic performance of employed students in Pakistan. Educational institutions and employers may contribute substantially to students' well-being and performance by acknowledging and solving the challenges caused by employment-related stress. This approach fosters an atmosphere favourable to academic learning and professional development.

Conflicts of Interest

The authors declare no conflicts of interest.

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