
DYNAMICS OF THE STUDENTS' BEHAVIOR AND ITS VARIABILITY: IMPACT OF STRESS, ANXIETY AND DEPRESSION ON ACADEMIC ACHIEVEMENT OF UNIVERSITY STUDENTS

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ABSTRACT

This research examines- consequences of stress, anxiety and depression- on academic achievement of graduation level students. "Stress" is an innovation which stimulates physical, emotional and psychological burden on them. It brings frustration, anger and nervousness in a student's daily routine. However, "anxiety" is an impression of apprehension that an unpleasant happening is beginning to take place. Most of the students experience it at the time of presentation or exams. This matter as usual does not receive proper attention which damages students' capabilities which leads to a poor CGPA. On the other hand, "depression" is a persistent problem and difficult to deal with. The individual who is affected goes through emotions of sadness and a diminished interest in different aspects of their daily life. This diminishes their inherent qualities, disrupts their sleep and wake cycle entirely, and spreads demotivation throughout their life. They withdraw from social activities and may pose a risk to themselves. The academic achievement of female students is not satisfactory as compare to male students due to lack of social support. Social support may help in reducing degree of stress, anxiety and depression as well as enhancing their academic performance. An equation has been modeled which shows the variables (stress, anxiety and depression) are independent to each other.

KEYWORDS

Stress, Anxiety, Depression, Social Support, Academic Achievement

INTRODUCTION

University life is an exciting and transformative period, offering numerous opportunities for personal growth and intellectual development. However, the university experience is not without its share of pressure and difficulties, which often result in students facing high levels of stress, anxiety, and depression. These mental health conditions have a profound impact on the academic achievement of university students. The prevalence of stress, anxiety, and depression among students has been steadily increasing. The transition to higher education, along with academic demands, social adjustments, and personal struggles, creates an environment that is conducive to the development of these mental health issues. According to research, approximately (Ahmed et al., 2020) one in three university students experiences significant levels of stress (Spitzer et al., 1990), while anxiety and depression affect around 20% and 15% of the student population, respectively (Zhai & Du, 2020). Stress is a mental pressure condition which a person feels due to any type of an event that makes him/her feel agitated, raged, or nervous (Chen & Yuan, 2020). Stress is usually a reaction of one's body to any kind of challenge which they have to face in difficult circumstances. Stress can be described as the psychological burden or concern that arises from demanding situations. It is a natural response that motivates us to confront and overcome challenges and potential risks. Stress is a common experience that is universally encountered to some degree. University life can be very stressful for many students. Insufficient sleep, an unhealthy diet, and even excessive free time can also contribute to stress among students (Islam et al., 2020). There are a few factors which lead towards it, for example health problems, financial issues, relatives' pressure (especially parents), competition in the marks, and most importantly fear of failure in academics. All these factors lead towards failure of students in academic achievements. Anxiety is a reason of scare or dread that a terrible happening is going to take place. It may be prevailing or ordinary anywhere (Salari et al., 2020). Additionally, anxiety or depression can deplete one's mental capacity as a substantial portion of their cognitive resources becomes occupied by distressing thoughts. This can make it challenging for students to focus on positive thoughts and can be mentally exhausting, detracting from their ability to learn. Students have to face it specially, at the time of representation of assignments or examinations. Generally, this problem does not receive proper attention, which leads damage of affected one's actual abilities resulting with poor CGPA.

However, a common problem is depression whose forecast is difficult (Spritzer et al., 1990). It brings enormous grief and lack of interestedness in curricular or extra-curricular activities. Students' learning abilities reduce, demotivation prevails and they get ready to harm themselves, if depression increases. Social meet-up must be considered besides studies. Otherwise, learning achievements damage drastically. Having friends, family, and others to rely on during times of need or crisis is

considered social support. Social support encompasses various forms of aid, such as physical assistance, sharing of resources, and emotional encouragement. Some researches indicate that higher levels of social support have a positive impact on the academic performance of students. This improvement may be attributed to increased dispositional optimism, which positively influences academic achievement.

According to the students' claims, when faced with stress, anxiety, and depression, it becomes increasingly difficult for them to cope with academic challenges and the accompanying pressure. Unfortunately, their learning abilities damage badly. It is necessary to find out the main reason of these problems. Then the affected students would be facilitated to overcome this situation. In our usual views, stress, anxiety and depression have similar effects but differentiation among them is necessary to take proper actions against these problems accordingly. However, there are many students who are not affected luckily but their safety is essential before it gets more dangerous for them too (Zimet, 2016). Stress, anxiety, and depression can have detrimental effects on the academic performance of university students. These mental health conditions can disrupt students' ability to concentrate, impair their memory and decision-making skills, and negatively affect their motivation and overall well-being. Students may find it challenging to meet deadlines, engage in class discussions, or perform well on exams, ultimately leading to a decline in their academic achievements. Multiple factors contribute to the onset of stress, anxiety, and depression among university students. These include academic workload, financial constraints, social isolation, relationship difficulties, lack of sleep, and the pressure to meet high expectations. Moreover, the competitive nature of university environments and the fear of failure can intensify these mental health challenges.

The relationship between stress, anxiety, depression, and academic achievement, shedding light on the challenges faced by students and highlighting the importance of addressing these issues has been explored. Long-term benefits of good academic performance- students are expected to invest a significant amount of time in their education, and graduating with good academic results can have several long-term benefits. These factors encompass enhanced employment opportunities, greater income potential, boosted self-esteem and self-confidence, decreased levels of anxiety and depression, and a reduced likelihood of substance abuse. Building on the gaps identified in the literature review, this section provides specific recommendations for future research in this field. It suggests conducting longitudinal studies to better understand the causal relationships between mental health issues and academic achievement. Moreover, exploring the role of protective factors and coping mechanisms, particularly those that are culturally sensitive, can help in designing more effective interventions.

LITERATURE REVIEW

This section provides a comprehensive exploration of studies investigating stress, anxiety, and depression among university students. It discusses various factors contributing to mental health issues, such as academic pressure, social and financial challenges, and the adjustment to university life. In recent times, students face several problems like inadequate electricity supply, internet issues, health-related concerns, and financial difficulties, which lead to stress, anxiety, and depression. Previous studies (Beran & Violato, 2010) have demonstrated that these mental health issues have a greater impact on female students compared to their male counterparts. Research has also identified a connection between emotional disturbances, as indicated by heart rate variability and vagal tone. A neurophysiological model proposes integrating yogic breathing practices, polyvagal theory, vagus nerve stimulation, hyperventilation, and clinical observations. Yoga breathing techniques offer a unique approach to balancing the autonomic nervous system and addressing psychological and stress-related disorders. While numerous studies have reported the effects of yoga breathing techniques on brain function and physiological parameters, the underlying mechanisms remain unclear.

Sudarshan Kriya Yoga (SKY), which involves specific breathing techniques like Ujjayi, Bhastrika, and Sudarshan Kriya, has shown promise in reducing anxiety, depression, everyday stress, post-traumatic stress, and stress-related conditions. Its effectiveness stems from facilitating the parasympathetic system, suppressing the stress response system, releasing neuroendocrine hormones, and activating thalamic generators. This model has practical implications for further research and clinical applications. Anxiety disorders, including generalized anxiety disorder, panic disorder/agoraphobia, and social anxiety disorder, are prevalent psychiatric conditions associated with significant disease burden. However, they often go unnoticed and untreated in primary care settings. Treatment is necessary when patients experience significant symptoms or complications due to the condition. Psychotherapy, medication, or a combination of both should be considered for treating anxiety disorders. Cognitive-behavioral therapy has strong evidence as an effective psychotherapeutic approach. First-line medications include selective serotonin reuptake inhibitors and serotonin-norepinephrine reuptake inhibitors. Benzodiazepines are not recommended for daily use. Other treatment options comprise pregabalin, tricyclic antidepressants, buspirone, moclobemide, among others. Generally, medication should be continued for 6 to 12 months after symptom remission. Treatment planning should consider efficacy, side effects, drug interactions, cost, and patient preferences.

In a study comparing stress levels (Rusli et al., 2008), availability of social support, and burnout experiences among Israeli managers, 357 women (mean age 32 years)

and 273 men (mean age 39 years) completed self-reported questionnaires administered to individuals and HR professionals. The analysis revealed that female managers experienced burnout and stress more frequently than their male counterparts. However, no significant difference was found between men and women regarding work-related stress. Burnout was positively correlated with stress and negatively correlated with social support (Garson, 2016) in both personal and professional life. Further analysis indicated gender differences in the mitigating effects of social support on the relationship between stress and burnout. Additionally, students between the ages of 18 and 24 experienced more implications in terms of stress, anxiety, depression, and suicidal attempts compared to students older than 25 years.

Furthermore, it is crucial to acknowledge the unique challenges faced by university students, especially those aged 18 to 24. This age group appears to be particularly vulnerable to stress, anxiety, depression, and even suicidal attempts. As a result, educational institutions and support services must proactively address the mental health needs of their students, offering appropriate counseling, mental health resources, and awareness programs. In recent years, there has been growing interest in non-pharmacological approaches to managing mental health issues. Yoga and specific breathing techniques, like Sudarshan Kriya Yoga (SKY), have shown promising results in reducing anxiety, depression, and stress-related conditions. These techniques are believed to influence the autonomic nervous system and positively impact psychological well-being. Further research on the underlying mechanisms and long-term effects of these practices can help establish their role as complementary interventions for mental health treatment.

When addressing anxiety disorders, it is essential for primary care providers to recognize the signs and symptoms early on. Due to the significant burden these disorders can impose on individuals and society, prompt and appropriate treatment becomes paramount. Cognitive-behavioral therapy has consistently proven effective and should be considered as a primary psychotherapeutic approach. Additionally, medication options, such as selective serotonin reuptake inhibitors and serotonin-norepinephrine reuptake inhibitors, have demonstrated efficacy, but careful consideration of potential side effects and individual preferences is necessary during the treatment planning process.

While pharmacological interventions have their place in managing anxiety disorders, it is crucial to adopt a holistic and individualized approach to mental health care. Combining psychotherapy with lifestyle modifications, social support, and other non-pharmacological techniques, such as yoga and meditation, may offer a comprehensive and personalized treatment plan.

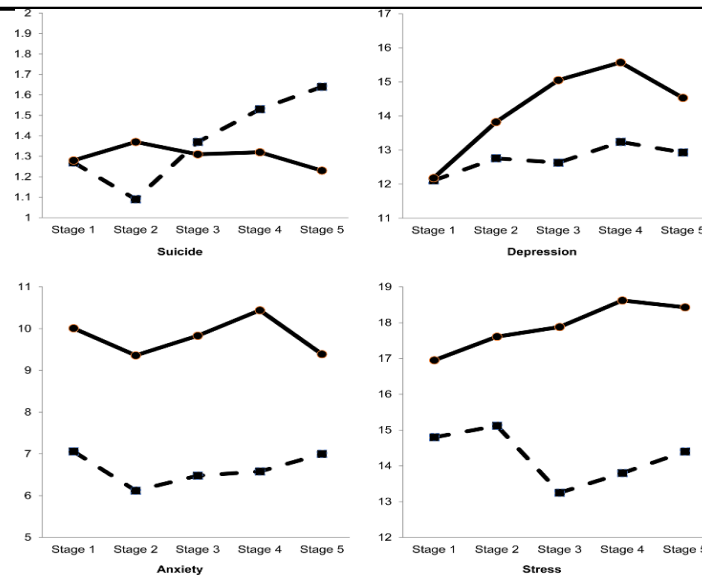


Figure 1: Five different study stages of each gender using ANOVA results. (Solid line = female students; dashed line = male students) (Debowska et al., 2020).

A survey conducted in the United State [20] discovered 80.57% (1607) respondents reported a level of depression from total 1994, mild = 32.45% (647), moderate = 24.87% (496), moderately severe = 15.85% (316) and severe = 7.42% (148). Females were at higher, with 1.76 points as mean = 10.61 than males mean = 8.84. Higher classification’s participants were with lower PHQ-9 scores. The following figure shows:

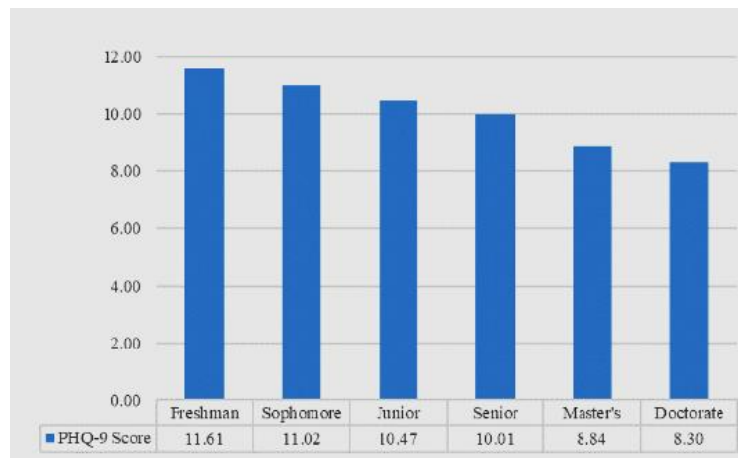


Figure 2: Mean PHQ-9 score by classification (Kroenke & Spitzer., 2002)

A depression measurement tool PHQ-9 (Patient Health Questionnaire) that is used and validated widely, containing on 9 items whose base is depression ailments. According to report of respondents, prevalence of complaints found within previous 2 weeks (Kroenke & Spitzer., 2002).

The responses are categorized using a scale where values of 0, 1, 2, and 3 are assigned to represent "not at all", "several days", "more than half the days" and "nearly every day", respectively. The PHQ-9 total score, consisting of nine elements, ranges from 0 to 27 (Kroenke & Spitzer., 2002). Severity levels are classified as minimal (0-4), mild (Wanf et al., 2020), moderate (10-14), moderately severe (15-19), and severe (20-27).

The GAD-7 (General Anxiety Disorder-7) is employed to assess the level of anxiety. Based on this tool, out of the 2014 responses, 28.25% of the participants reported minimal anxiety, 33.27% reported mild severity, 23.68% reported moderate severity and 14.80% reported extreme severity (Kroenke & Spitzer., 2002). On average, females had a mean score of 9.12, while males had a mean score of 6.89, indicating that females scored 2.23 points higher than males.

There was a lower GAD-7 score of higher classification participants. Degree of stress and anxiety of majority respondents 71.26% (1443) risen, 5.48% (111) declined however 23.26% (471) continued as similar as before. The Main reason of expansion in stress was academics (i.e. online classes' schedule, increased target over grades, late graduations). Second cause was health problems of family, friends and personal. The third greatest concern established that 20.51% (183) finance problems, fear of unemployment and vulnerability (Kroenke & Spitzer., 2002).

The follow figure showing Academics related problems:

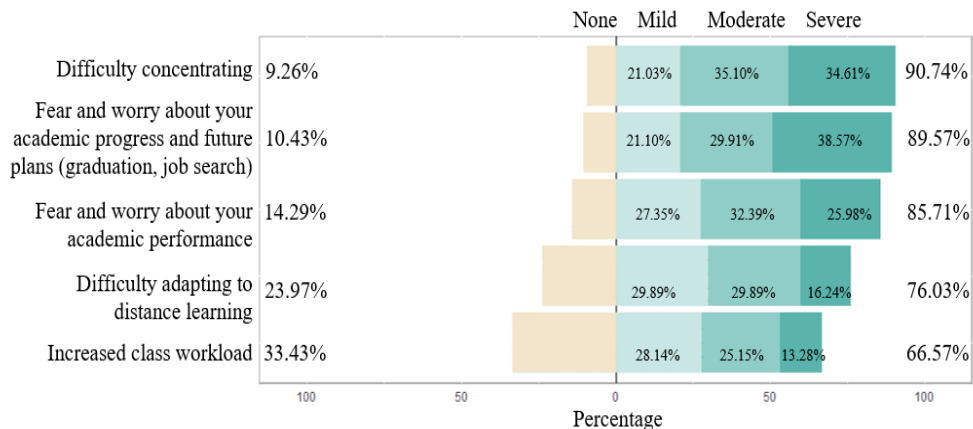


Figure 3: Academics related problems (Muhammad et al., 2020).

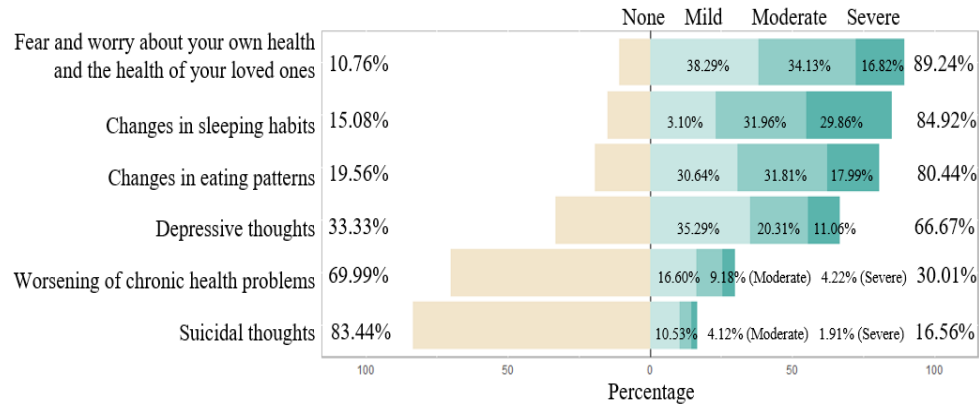


Figure 4: Health related issues (Muhammad et al., 2020).

In a few previous years, Bangladeshi students were found in a study with increased anxiety and depression (Figure 5). Out of 476 responses, 82.4% (392) students were affected with mild to severe depression, 81.7% (389) students were affected with mild to severe anxiety and 35.1% students belonged to rural areas. Mostly 76.78% students said that they had been under-developing academically, however more than 30% were noted with continuous exercise domestically (Muhammad et al., 2020).

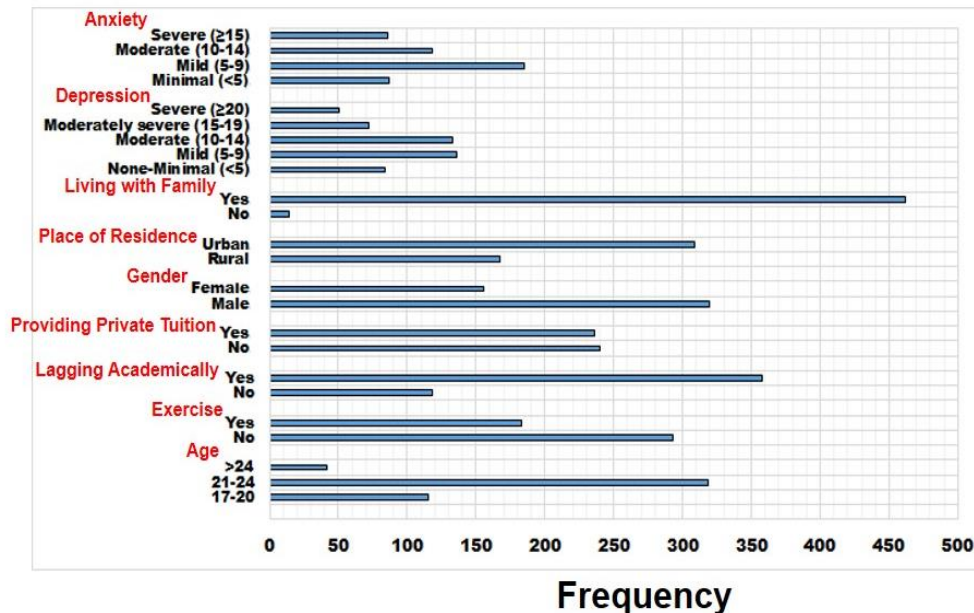


Figure 5: PHQ-9 and GAD-7 reports of 476 respondents (Muhammad et al., 2020).

Male learners were highly indicated of depression than female students as well as junior students had lower indications of depression than senior students. There was an increased level of depression in those students who belonged to urban areas with joint family systems. That was reported 96.93% in male students and 65.05% in female students. Female students were found with lower indications of anxiety as compare to male students.

Degree of anxiety in female students recorded 33.67 and male students recorded 66.33. Degree of anxiety in junior students was lower than senior students. Indications of increased anxiety were found in those students who belonged to urban areas with joint family systems. Those students were highly indicated with anxiety indications who were residing with their relatives in urban regions.

The table below presents findings indicating that students who are academically under-developed have a 1.8 times higher likelihood (95% CI: 1.098, 2.935) of experiencing depression. Furthermore, students who reside with their relatives and family tend to have a higher level of depression. Specifically, their depression level is reported to be 2.6 times higher (95% CI: 1.418, 4.751) compared to those who live separately. Additionally, learners living with relatives are 2.6 times more likely (95% CI: 1.418, 4.751) to experience depression compared to those who reside separately. Moreover, students who have taken supplementary classes in the past few years show a 1.4 times higher indication level (95% CI: 0.856, 2.227) of mild to severe anxiety compared to those who have not been involved in such classes.

Variable	Depression	P Value	95 % CI Lower- Upper	Anxiety	P Value	95% CL Lower- Upper
Age						
17-20	1			1		
21-24	0.057	0.082	0.632- 1.775	0.112	0.668.	0.672- 1.861.
>24	1.06	0.059	0.961- 8.669	0.486	0.29.	0.661- 3.998.
Providing Private tuition						
No	1			1		
Yes	0.181	0.046	0.736- 1.952	0.322	0.018.	0.856- 2.227.
Gender						
Male	1			1		
Female	0.012	0.902	0.616-	0.38	0.155.	0.866-

			1.732			2.468.
		Place of Residence				
Rural	1			1		
Urban	0.022	0.933	0.618-	0.168	0.512.	0.716-
			1.690			1.953.
		Lagging Academically				
No	1			1		
Yes	0.585	0.02	1.098-	0.577	0.019.	1.099-
			2.935			2.883.
		Exercise				
No	1			1		
Yes	-0.128	0.601	0.544-	-0.008	0.974.	0.617-
			1.442			1.594.
		Living with Family				
No	1			1		
Yes	0.954	0.002	1.418-	0.609.	0.042.	1.021-
			4.751			3.308.

Table 1: Forecasting of depression and anxiety indications by applying binary logistic regression model, based on PHQ-9 and GAD-7 scales (Muhammad et al., 2020).

Students who experience anxiety related to their academic activities were found to have a 1.8 times higher indication level of mild to severe anxiety (95% CI: 1.099, 2.883) compared to those who were not involved in such activities. Similarly, students who reside in joint family settings were found to have a 1.8 times higher indication level of mild to severe anxiety (95% CI: 1.021, 3.308) compared to those who live separately.

Structural Equation Modeling (SEM) including some algorithms, methods of statistics and models of mathematical which fit networks to data which was also applied for measuring and analyzing relations of latent and observed variables ((i) and (ii)).

$$y_i = \vartheta + \lambda \eta_i + \epsilon_i \tag{i}$$

$$\eta_i = \beta_0 + \beta_1 \eta_i + C_i \tag{ii}$$

Where $\vartheta = k \times 1$ intercept vector, $\lambda = k \times 1$ matrix of slopes, $\epsilon_i = k \times 1$ residual vector, β_0 is 1×1 vector of intercepts, β_1 is an 1×1 matrix of regression slopes with '0' diagonal elements, and C_i is an 1×1 vector of residuals, In equation (ii) β_0 is 1×1 vector of intercepts, β_1 is an 1×1 matrix of regression slopes with '0' diagonal elements, the determinant of $(I - B)$ is not equal to 0, and C is an 1×1 vector of residuals.

A specific case, when $v = 0$, $\epsilon_i = 0$ and $\lambda = I$, then

$$\text{Eq. (i)} \Rightarrow y_i = \eta_i \quad (\text{iii})$$

$$\text{Eq. (ii)} \Rightarrow \eta_i = \beta_0 + \beta_1 y_i + C_i \quad (\text{iv})$$

A regression equation is represented in equation (iv). For a particular case of β_0 and β_1 are zeros, a factor analysis model is obtained with factor loadings estimated in λ (Rusli et al., 2008).

SEM is employed to assess the direct and indirect impacts of one variable on another. Figure 6 shows the direct effects of anxiety (β_1) and depression (β_2) on academic productivity, as well as the direct effect of anxiety on curricular productivity (β_3). The indirect reaction of anxiety on academic productivity will be represented by $\beta_1 \times \beta_2$ and the total effect of anxiety on academic productivity will be represented by $\beta_3 + \beta_1 \times \beta_2$. Social support has a positive relationship with self-esteem. Higher self-esteem is associated with better academic achievement and lower emotional exhaustion. Self-esteem plays a mediating role between social support and academic achievement. In other words, self-esteem helps explain the relationship between social support and academic performance.

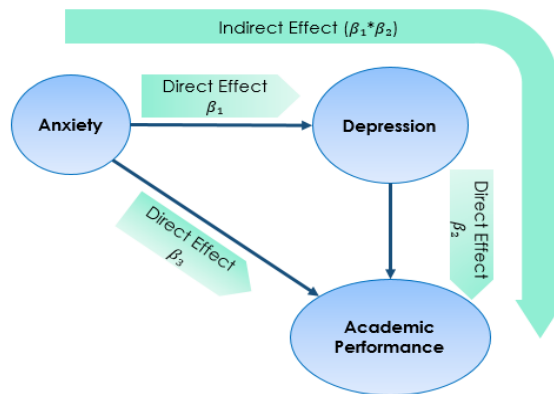


Figure 6: Direct and indirect effects of variables on one another

It underscores the urgent need for proactive interventions, support services, and policy changes to promote student mental health and optimize their educational outcomes. By synthesizing existing knowledge and identifying research gaps, this review contributes to the ongoing efforts to create healthier and more conducive learning environments for university students.

RESEARCH OBJECTIVES

1. To examine the dynamics of the students' behavior and its variability.
2. To analyzed positive effect of social support to overcome negative effects of stress, anxiety and depression.

RESEARCH METHODOLOGY

This cross-sectional survey-based research-questionnaires can be used among students of different universities of Karachi in which Hamdard University, Institute of Business Management (IoBM), NEDUT, Iqra University and SSUET etc. are included, to investigate the students’ performances affected by stress, anxiety and depression. The GPA of students is considered for the evaluation of students’ performances. Logistic regression model can be applied by categorizing each of three independent variable i.e. stress, depression and anxiety into yes/ no.

$$\text{Logit}(p) = b_0 + b_1X_1 + b_2X_2 + \dots + b_kX_k \tag{v}$$

Where p is the P(presence of characteristic) and logit (p) can be defined as

$$\text{Logit}(p) = \log \left[\frac{p}{1-p} \right] \tag{vi}$$

DATA ANALYSIS

Distribution of GPA for this study is given below

GRADES	PERCENTAGE	GPA	CATEGORIES
A	88% - 100%	4.0	Excellent
B+	81% - 87%	3.5	Very Good
B	74% - 80%	3.0	Good
C+	67% - 73%	2.5	Average
C	60% - 66%	2.0	Below Average
F	Below 60%	0.0	Failure

Scores will be calculated for the independent variables i.e. stress, depression and anxiety. The score categories for the severity of stress, depression and anxiety are (0-4) for minimal, (5-9) for mild, (10-14) for moderate, (15-21) for severe. Data will be compiled and analyzed using statistical package for social sciences SPSS and Smart PLS. Correlation between variables, logistic regression, frequencies, bar charts (to show the frequency of students suffering from different stages of stress, depression and anxiety) and chi square test of independence will be used. Chi square test of independence will be used to test the following:

- H₀: GPA is independent of stress or there is no association between GPA and stress
- H₀: GPA is independent of depression or there is no association between GPA and depression
- H₀: GPA is independent of anxiety or there is no association between GPA and anxiety
- Where chi square test is

$$\chi^2 = \sum_{i=1}^n \frac{(oi-ei)^2}{ei} \tag{vii}$$

With $\vartheta = (r-1) \times (c-1)$ degrees of freedom and $e_i =$ Expected frequency and $o_i =$ observed frequency.

DISCUSSION

To overcome negative effects of Stress, Anxiety and Depression, we utilize social support to promote students' GPA and academic achievements.

Stress, anxiety, and depression can significantly impact the academic achievement of university students. Recognizing the prevalence of these mental health conditions and the negative consequences they can have on students' educational journeys is crucial. By addressing the underlying causes, providing adequate support services, and fostering a culture of well-being, universities can empower students to overcome these challenges and thrive academically. It is vital for both institutions and students to work together in creating an environment that promotes mental health and enables students to reach their full potential. These findings suggest that social support has a multifaceted impact on students' lives, influencing their academic performance, motivation to learn, cognitive development, and self-esteem. Educators, counselors, psychologists, and researchers can use these insights to develop strategies that foster social support and enhance students' academic achievement.

RECOMMENDATIONS

Our suggestions for enhancing the academic performance of university students include the following:

Since social support appears to play a crucial role in students' mental well-being and academic achievement, encourage the development of peer support groups, mentorship programs, and student organizations that promote a sense of belonging and connectedness.

Encourage students to maintain a healthy lifestyle by emphasizing the importance of regular physical activity, a balanced diet, and adequate sleep. These factors can positively impact mental health and academic performance.

For students with severe depression or anxiety, academic accommodations such as extended deadlines or reduced course loads may be necessary. These accommodations should be provided in a supportive and non-stigmatizing manner.

Encourage collaboration among researchers, institutions, and mental health professionals to further investigate the relationships between stress, anxiety, depression, and academic achievement. Sharing data and findings can lead to a better understanding of the issues and more effective interventions.

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