

Research Article

Mental Health as Struggle: Understanding Depression, Stress, Anxiety Among University Students: A Cross-Sectional Study

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Abstract

Benefits of an enhanced comprehension of the mental health of young adults. They are constrained by numerous factors that specifically impact students' academic performance. The aims of this study to evaluate the levels of anxiety and depressive symptoms in annual and semester university students in Lahore, Pakistan. A cross-sectional study spanning seven months was conducted with a sample of 467 students of two private universities and two public universities in Lahore, Pakistan. The primary factors encompassed frequency distribution by age ($p = 0.380$), gender ($p = 0.001$), area of residence ($p = 0.283$), marital status ($p = 0.243$), and multiple reasons ($p = 0.166$). Students who are enrolled in the annual and semester systems. Students with anxiety had a higher likelihood of enrolling in an annual system compared to those in a semester system. Univariate analysis in the comprehensive assessment of university students, along with multiple regression analysis, revealed a statistically significant relationship involving male students. The quantity of students, age under 22 years, and residential status. Similarly, regarding anxiety, only male students exhibited a heightened likelihood of anxiety. As expected, multiple factors affecting students were able to restrict their exploration of the world. Mental health exhibits a significant correlation with all three factors: stress, anxiety, and depression. The amalgamation of this data suggests a rise in anxiety cases among annual students within the system, predominantly attributed to academic pressures. Furthermore, in a comprehensive assessment, it is evident that not only do male students benefit, but the significance of male students is also noteworthy. Students in the early stages of university life are more prone to anxiety and depression, likely attributable to various factors affecting their mental well-being.

Keywords: Mental Health, Depression, Stress, Anxiety, Martial status, Univariate model

1. Introduction

Mental illnesses are defined as substantial clinical impairments in a person's ability to think and control their emotions, or behavior. Approximately 970 million individuals globally are grappling with mental health issues [1]. Depression is a global phenomenon impacting approximately 350 million individuals across all age demographics [2]. The incidence of depression and anxiety among young adults and adolescents globally ranges from 5% to 70%. Research indicates that 18% of young adults exhibit depressive symptoms, with this prevalence steadily rising in both genders as they age [3]. Depression is more prevalent in females than in males [4]. Moreover, the frequency of symptoms of depression will vary across distinct racial groups. In the USA, 29% of Indian American youth experience depression, followed by 22% of Hispanics, 18% of whites, 17% of Asian Americans, and 15%

of African Americans [5]. Nonetheless, when comparing both sexes, the prevalence is greater among females. Nonetheless, if young people are suffering from anxiety and sadness, it is alarming and requires immediate attention, not only because it deprives society of latent and potential leadership but also because it jeopardize their future.

Depression and anxiety within the student population are analyzed as prevalent disorders impacting various attributes such as motivation, attention, self-esteem, and mood [6]. Most lifetime mental disorders typically commence with depression, with their initial onset occurring during university years, affecting approximately 85% to as low as 8% of university students [7]. University students, as they prepare to enter their professional lives, are constantly reshaping and imitating various psychological influences [8]. Nonethe-

less, the revelation and duration may vary between different study areas. Numerous studies have indicated that medical students experience heightened mental health issues due to persistent exposure to stressful conditions, including an extensive curriculum, parental pressure regarding academic performance, anxiety over failure, fluctuations in the job market, and significant emotional challenges [9]. Fields such as medicine and pharmacy are regarded as arduous due to the numerous academic and practical demands, which frequently have a significant impact on students' physical and mental well-being [10]. Numerous literary sources indicate that factors contributing to depression and anxiety among students include societal pressure, workload intensity, intimidation from faculty, exposure to personal issues and hardships, and financial difficulties [11].

Depression and anxiety influence students' personal and professional attributes. Professional concern encompasses academic performance, integrity, a reduction in empathy and decorum, and an increased incidence of medical errors [12]. Conversely, personal impact encompasses limited relationships, psychological abuse, and health deterioration. Various studies indicate that pharmacy students experience higher levels of mental stress, anxiety, and depression compared to their peers in other medical disciplines [13].

Numerous analyses in Pakistan indicate that multiple factors are contributing to the rising incidence of stress, depression, and anxiety among medical students [14]. The emphasized factors are sociolect-demographic elements encompassing age, gender, assessment criteria, disillusionment, and perpetual examinations [15]. Nonetheless, various factors including academic and psychological discernment, future pressures, hostel life, university regulations, and the commencement of semesters significantly contribute to the prevalence of depression and anxiety among university students in Pakistan, particularly medical students [16]. Various studies have investigated depression, stress, and anxiety; however, these psychological factors have yet to be examined and analyzed among diverse university students. The primary objective of this study is to examine the prevalence of anxiety, depression, and stress among university students enrolled in either an annual or semester system [11].

1.1. Ethical Approval

The University of Central Punjab's Research Ethical Committee granted ethical permission for the project. All enrolled students gave their full approval, both in writing and verbally.

2. Research methodology

Data were gathered over the course of eight months, from December 2024 to June 6, 2025, as part of a cross-sectional study. Two reputable public and private universities in Lahore, Pakistan, provided the data. Both semester and annual exam methods are used by the chosen institutions. Data collecting forms were distributed to eligible students by field management and medical students, mostly from the pharmacy department. The subsequent step involved data segregation, with the data divided into (n=251) annual system

and (n=217) semester system. The survey was split into two parts: the Depression, Anxiety, and Stress Scale (DAAS-42) and a portion on basic demographics (age, gender, place of residence, educational system, and field of study [17]). The purpose of this 42-item self-report measure is to evaluate the negative emotional states of stress, anxiety, and sadness. The questionnaire includes a condensed version known as DAAS-21, comprising 21 items within the same domains [18]. However, this study favored the DAAS-42 version.

2.1. Data collection

Students from a variety of areas, including computer sciences, pharmacy, biological sciences, and food sciences, were given a questionnaire. Incorporating the relevant universities' yearly and semester systems. Field management personnel also assist with filling out the questionnaire and ensure their attendance at one-on-one interviews as necessary. The DAAS-42 is a self-administered test designed to assess stress, anxiety, and depression three interrelated emotional states. It also encompasses the effects on skeletal muscle, situational anxiety, subjective experiences of anxiety, and autonomic responses. The DAAS-42 questionnaire rating index is employed to classify the intensity and severity of symptoms. The intensity rating index categorizes levels of depression (normal 0-9, mild 10-13, moderate 14-20, severe 21-27, and extreme severe 28+), stress (normal 0-14, mild 15-18, moderate 19-25, severe 26-33, and extreme severe 34+), and anxiety (normal 0-7, mild 8-9, moderate 10-14, severe 15-21, and extreme severe 22+) [19]. Students gave their informed consent before any data was collected.

2.2. Study Population

Based on inclusion and exclusion criteria, a sample of 467 students from two public and private institutions in Lahore, Pakistan, from both the annual and semester systems was judged suitable.

2.3. Criteria for Inclusion

Regardless of age, gender, minor health conditions, cognitive functions, ethnicity, financial status, or place of residence, all students enrolled in semester and annual examination systems are unaffected.

2.4. Exclusion Criteria

Numerous students exhibit mental health disorders, including depression and anxiety, and are unable to provide documented consent. Consequently, they are omitted from the study.

In conjunction with documented consent, questionnaires were distributed to students. Of the 607 students, 33 failed to provide documented consent, 47 were absent during data collection, and 58 submitted incomplete questionnaires despite providing documented consent. Consequently, data was gathered exclusively from 467 students, comprising 247 males enrolled in various degree programs, with (n= 250) from the annual system and (n= 217) from the semester system, which was subsequently scrutinized and analyzed.

2.5. Data Analysis

SPSS (IBM, version 21) was used to analyze the data. To calculate the frequencies of each sociodemographic characteristic, a variety of descriptive statistics were used. Despite this, chi-square was used to assess and examine the relationship between pharmacy and non-pharmacy departments across a range of sociodemographic traits. In medical research, univariate and multivariate regression models are essential tools for determining risk variables, predicting outcomes, and clarifying variable interactions. The odds ratios for stress, anxiety, and depression were estimated and calculated using both regression models for each sociodemographic model. Students' sociodemographic predictors of anxiety, stress, and depression are estimated using the linear regression model, which is used to examine the relationship between a continuous dependent variable and an independent variable. Statistical significance was defined as an alpha value less than 0.05.

2.6. Outcomes

2.7. Fundamental Demographics of the Sample Population

Table 1 provides a summary of the sample population's overall demographics, including both annual and semester data. The frequency distribution of several demographic characteristics, such as age ($p = 0.380$), gender ($p = 0.001$), living status ($p = 0.217$), and area of residence ($p = 0.283$), showed

a statistically significant difference between the annual and semester systems (Table 1). With a p -value of 0.004, there was a significant difference in the frequency distribution of anxiety levels between students in the semester and annual systems (Table 1). Additionally, there was no difference between pupils from the two educational systems in the remaining characteristics that were examined.

2.8. Correlation of Students' Sociodemographic Factors Associated with Depression, Anxiety, and Stress

To compare different variables to the reference category of normal scoring, a category was created to look at the relationships between different levels of stress, anxiety, and depression.

2.9. Stress

An analysis was conducted on students' demographic variables, including living status, reasons for mental health imbalance, and field of study, in relation to potential correlations with stress levels (Table 2). Substantial correlations were examined in specific variables including age, gender, marital status, and residential area, utilizing a univariate regression model for calculation. Nonetheless, numerous students possess diverse factors that contribute to stress (p -value = 0.030). Variables exhibited significant associations as determined by univariate analysis, subsequently analyzed through multivariate analysis.

Characteristics	Annual system (n = 250)	Semester system (n = 217)	p value
Age			
≤ 22	120 (48.0%)	113 (49.9%)	0.380*
> 22	130 (52.6%)	104 (50.1%)	
Gender			0.001
Male	96 (38.4%)	121 (55.8%)	
Female	154 (61.6%)	96 (44.2%)	
Marital status			0.243
Married	65 (26.0%)	67 (30.9%)	
Singal	185 (74%)	150 (69.1%)	
Living status			0.217
Day scholar	141 (56.4%)	110 (50.7%)	
Hostelite	131 (43.6%)	107 (49.3%)	
Area of residence			0.283
Urban	173 (69.2%)	140 (64.5%)	
Rural	77 (30.8%)	77 (35.5%)	
Depression			0.502
Normal	72(28.8%)	60 (27.6%)	
Mild	44 (17.6%)	47 (21.7%)	
Moderate	66 (26.4%)	44 (20.3%)	
Severe	39 (15.6%)	39 (18.0%)	
Extremely severe	29 (11.6%)	27 (12.4%)	
Anxiety			0.004*
Normal	65 (26.0%)	65 (30%)	
Mild	41 (16.4%)	45 (20.7%)	

Moderate	61 (24.4%)	33 (15.2%)	
Severe	44 (17.6%)	37 (17.1%)	
Extremely severe	39 (15.6%)	37 (17.1%)	
Stress			0.175
Normal	46 (18.4%)	51 (23.5%)	
Mild	67 (26.8%)	38 (17.5%)	
Moderate	52 (20.8%)	50(23.0%)	
Severe	46 (18.4%)	41 (18.9%)	
Extremely severe	39 (15.6%)	37(17.1%)	
Types of reasons			0.166
Family	28 (11.2%)	19 (8.8%)	
Finances	37 (14.8%)	27 (12.4%)	
Health	18 (7.2%)	26 (12.0%)	
Relationship	31 (12.4%)	20 (9.2%)	
Hostel life	18 (7.2%)	28 (12.9%)	
Studies	43 (17.2%)	43 (19.8%)	
2	28 (11.2%)	20 (9.2%)	
> 3	47 (18.8%)	34(7.3%)	

Table 1: Basic Demographics of University Students of Lahore

Keeping in view there are so many that interlinked with stress as (OR 0.011, *p value* = 0.030) among university students in contrast to one or two reasons worrying them.

2.10. Anxiety

In addition to this, by applying univariate and multivariate logistic regression (Table 3) were used to examine the associations between anxiety and students’ demographic variables.

Characteristics	Stress Yes (score 15–34+) No (score 0–14)	Univariate logistic regression OR (95% CI)	p value	Multiple logistic regression OR (95% CI)	p value
Age ≤22 (233)	192 (82.4%) 41 (17.6%)	1.17 (0.74–1.87)	0.492	–	–
>22 (234)	187 (79.9%) 47 (20.1%)				
Gender Male (217)	174 (80.2%) 43 (19.8%)	0.88 (0.55–1.41)	0.61	–	–
Female (250)	205 (82.0%) 45 (18.0%)				
Marital status Unmarried (335)	262 (78.2%) 73 (21.8%)	2.17 (1.19–3.94)	0.011	1.95 (1.06–3.580)	0.030
Married (132)	117 (88.6%) 15 (11.4%)				
Living Status Day scholar (251)	197 54	0.68 (0.42–1.09)	0.113	–	–
Hostelite (216)	182 34				
Area of residence Urban (313)	242 (77.3%) 71 (22.7%)	0.423 (0.23–0.74)	0.003	0.459 (0.258–0.816)	0.008
Rural (154)	137 (89.0%) 17 (11.0%)				
Examination system Annual (250)	209 (83.6%) 41 (46.6%)	1.409 (0.885–2.24)	0.148	–	–

Semester (217)	170 (78.3%) 47 (53.4%)				
Reasons Single (338)	275 (81.4%) 63 (18.6%)	1.049 (0.62-1.75)	0.855		
Multiple (129)	104 (80.6%) 25 (19.4%)				

Table 2: Association of Stress with Student’s Demographic Variables

Univariate analysis shows that in comparison to females or nonpharmacy students, males (OR 0.634 $p = 0.093$) show greater anxiety levels. However, through a multiple regression model, it was analyzed that only gender, pharmacy students have multiple reasons for anxiety.

2.11. Depression

The next anxious step was to examine the association of different socio-demographic variables with depression. Signif-

icant variables that were used to examine stress and anxiety were used to analyze relevant associations between depression and different variables. Univariate analysis shows the occurrence of depression in commonly of students having an age (OR 1.084 $p = 0.735$). males (OR 0.093 $p = 0.093$), day scholar (OR 0.202 $p = 0.156$) below or equal to 22. The analysis also shows that students have numerous reasons for depression. Exact variables show defined associations, after applying multiple regression model (Table 4).

Characteristics	Yes (score 8-20+) No (score 0-7)	Univariate logistic regression OR (95% CI)	p value	Multiple logistic regression OR (95% CI)	p value
Age ≤22 (233)	202 (86.7%) 31 (13.3%)	1.070 (0.631-1.813)	0.802	1.137(0.659-1.962)	0.644
>22 (234)	201 (85.9%) 33 (14.6%)				
Gender Male (217)	181(83.4%) 36 (16.6%)	0.634(0.373-1.079)	0.093	0.521(0.294-0.922)	0.025
Female (250)	222 (88.8%) 28 (11.2%)				
Marital status Unmarried (335)	280(83.6%) 55 (16.4%)	2.685 (1.286-5.60)	0.009	2.865(1.345-6.104)	0.006
Married (132)	123 (93.2%) 9 (6.8%)				
Living Status Day scholar (251)	210 41	0.610 (0.353-1.054)	0.077	0.544(0.305-0.971)	0.039
Hostelite (216)	193 23				
Area of residence Urban (313)	264 (84.3%) 49 (15.7%)	0.581 (0.315-1.074)	0.083	0.648(0.341-1.230)	0.185
Rural (154)	139 (89.0%) 15 (11.0%)				
Examination system Annual (250)	218(87.2%) 32 (12.8%)	1.178 (0.695-1.997)	0.542	0.452(0.224-0.910)	0.026
Semester (217)	185 (85.3%) 32 (14.7%)				
Reasons Single (338)	285 (84.3%) 53 (15.7%)	0.501 (0.253-0.993)	0.048	1.150(0.660-2.003)	0.621
Multiple (129)	118 (91.5%) 11 (8.5%)				

Table 3: Association of Anixety with Student’s Demographic Variables

2.12. Sociodemographic Perspective on Student Stress, Anxiety, and Depression

Additionally, the variables like (multiple reasons) that were the sole envision among students having anxiety and stress were consequently related to stress, anxiety p-values that

were unadjusted. Besides the variables like gender, age, marital status, only two predicted variables were found to contribute remarkably to anxiety were Area of residence, and examination system (annual or semester).

Characteristics	Yes (score 10-28+) No (score 0-9)	Univariate logistic regression OR (95% CI)	p value	Multiple logistic regression OR (95% CI)	p value
Age ≤22 (233)	192 (82.4%) 41 (17.3%)	1.084 (0.678-1.736)	0.735	1.115(0.682-1.825)	0.663
>22 (234)	190 (81.2%) 44 (18.8%)				
Gender Male (217)	173(79.7%) 44 (20.3%)	0.771(0.482-1.235)	0.093	0.722(0.433-1.205)	0.213
Female (250)	209(83.6%) 41 (16.4%)				
Marital status Unmarried (335)	261(77.9%) 74(22.1%)	3.119 (1.597-6.089)	<0.001	3.104(1.561-6.173)	0.001
Married (132)	121(91.7%) 11(12.9%)				
Living Status Day scholar (251)	200 51	0.733 (0.454-1.182)	0.202	0.690(0.413-1.152)	0.156
Hostelite (216)	182 34				
Area of residence Urban (313)	244 (78.0%) 69 (22.0%)	0.410 (0.229-0.734)	0.003	0.443(0.242-0.812)	0.008
Rural (154)	138 (89.6%) 16 (10.4%)				
Examination system Annual (250)	216(86.4%) 34 (13.6%)	1.952 (1.209-3.150)	0.006	2.099(1.268-3.477)	0.004
Semester (217)	166 (76.5%) 51 (23.5%)				
Reasons Single (338)	273 (80.8%) 65 (19.2%)	0.771 (0.445-1.333)	0.352	0.241(0.401-1.259)	0.241
Multiple (129)	109 (84.5%) 20 (15.5%)				

Table 4: Association of Depression with Student's Demographic Variables

3. Discussion

Nowadays, anxiety and depression are considered major health problems in young adults and are highlighted as major large suffering. However, the scenario becomes more dangerous and unstable when students are the main perpetrators of these sufferings, since it affects nearly every aspect of daily life, including motivation, perception, self-worth, and mood [15]. Analyzing stress, anxiety, and depression among students enrolled in various degree programs is the goal of the current study. Students who took exams under annual and semester systems from a range of public and private universities in Lahore were selected from the sample collection [20]. According to our statistics, students who participate in the annual system have a higher chance of experiencing mild to severe anxiety without exhibiting signs of stress or despair. Nonetheless, university students showed a strong correlation between mental health and academic discipline [21]. Negative impacts on mental health lead to a variety of problems, including stress, anxiety, and depression. Anxiety and depression among students may be linked to several factors that contribute to these mixed depression- anxiety disorders [22]. Items such as age, gender, living conditions, strained relationships, and adverse life events. Problems in the family, social and educational issues, and the expect-

tations of parents are high psychological financial warriors and financial concerns [23].

These factors can not only impact the academic performance but also a student. In addition to their academic, social, and professional life, it affects their quality of life and career development poor [9]. Our data indicated that most of the students in annual and semester system degree programs were < 22 years of age, unmarried, and day scholars. The findings have been reported previously, and they show the augmentation of anxiety among medical students is between 8 to 22 years of old pharmaceutical old pharmaceutical students registered in the annual system degree. Furthermore, our sample analysis showed a 7.8 prevalence of health conditions of interest. [24]. In terms of 21.6 and 5.2 percent, respectively, it was found to be comparable to semester students. But in industrialized nations like the US and Europe, the depression rate was 17.3% in the US, 34% in Poland, 37% in Bulgaria, 52% in Greece, and 23% in Germany [25].

As we check the research done before, we find that not only are male students experiencing high stress levels, but also female students [26]. However, in practice, we did not find any considerable sex-based differences- a finding that can

be attributed to cultural expectations in Pakistan. In their behavior towards female students, providing them with additional emotional support [27]. In their turn, females tend to express concerns related to competence, pressure, and grades. Such a trend appears to increase the stress among women students [28]. What struck even more was the fact that a rise in anxiety was noted in male students, and this can further be seen as a general cultural assumption about masculinity: Pakistani society assumes that men are self-reliant and struggle to solve problems by themselves [29]. Due to such norms, male population may be less willing to use external support in situations where they feel overwhelmed. Combined, these factors make it hard to determine a single factor that can lead to stress, anxiety, or depression; coursework is the most reported factor [30].

This conclusion has been repeatedly replicated abroad, and our findings reflect the previously reported results. Academic demands are increased by finances, interpersonal relationships, and physical health when a student is not with his or her family [31]. These variables combine to emphasize that stress, anxiety, and depression are the results of a combination of forces other than a single force. In this bigger picture, the data depict a very consistent relationship between depression or anxiety and age [32]. Improved concern was observed in older students in line with the other studies.

The trend is almost similar when we review the body of literature in Pakistan, where medical students have high rates of anxiety and depression, with female learners having the highest rates [33]. Recent statistics in Lahore suggest that 62 % of the students are plagued with moderate-to-severe anxiety, and 58 % engage in moderate-to-severe depression, and despite women and men being even, the females continue to be more massively affected [34]. This could be because of the high academic demands of the cohort, along with life issues. The scales of stress, anxiety, and depression typically distinguish mild, moderate, and serious [35].

Our current study uses this model, which enables us to take a more fine-grained approach than that previously taken in studies that have simply been to aggregated the responses into two broad categories of yes or no. Our results, therefore, affirm the two concepts that stress, anxiety, and depression are not independent but rather interdependent issues that can spoil the academic output. As much as coursework forms the hub of these issues, other problems, particularly financial neediness and relationship conflicts, are a great trigger. Our study presents an integrative picture of mental well-being within campus life by emphasizing these complementary aspects. Pakistani universities ought to use such evidence to develop support structures that will enable present and future students to emerge in the best position when the pressure keeps mounting [36].

3.1. Study Limitations

The results in the study of the present case must be treated with apparently with caution due to a number of methodological and resource limitations. The first is the cross-sectional design, which precludes drawing any conclusions

regarding a connection between explanatory factors and outcomes related to mental health, including stress, anxiety, and depression. Second, only students from four universities were included in the sample; two of these were public, and the other two were privately owned. As a result, the sample could not be applied to all students in Lahore; however, an effort was made to include both types of universities, with the assistance of one public and one privately owned. Third, the research design did not consider the effect of study year and residence length at the university on the psychological status, the effect of transition to university life and adjustment to a new environment, as well as the influence of parents, including one-parent family, parental education level and the number of family members. Lastly, due to a lack of scales and questionnaires used in the covered studies, it is not easy to make a direct comparison between studies, even within a single country [37].

4. Conclusion

The statistical tests revealed the fact that students who attended the annual systems had a higher rate of anxiety compared to students who were in semester systems. In the overall sample population, the relationship between the depressed condition and males and individuals aged 22 years and below was significant. Gender also determined anxiety, whereby males were at a higher risk of having this condition. Studies, strained relationships, being away from home, and financial concerns were only the multiple determinants that significantly contributed towards the severity of the three mental states, namely stress, anxiety, as well as depression. Therefore, on both departmental and university levels, training and education programmes should be offered and organised together with systematic mental health counselling. More emphasis should be given to the academic departments whose curriculum requires intense and long hours of study because these conditions may increase stress, anxiety, and depressive symptoms.

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Conflict of Interest: The authors declare that they have no conflict of interest.

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