



Original Article



Depression, Anxiety, and Stress in Undergraduate Allied Health Students: A Cross-Sectional Study from Multan, Pakistan

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ARTICLE INFO

Keywords:

Depression, Anxiety, Stress, DASS-21, Undergraduate Students, Mental Health

How to Cite:

Ahmad, A., Sultan, M., Irfan, S., Mehboob, K., Sultan, A., Naeem, I., & Shehzad, S. (2025). Depression, Anxiety, and Stress in Undergraduate Allied Health Students: A Cross-Sectional Study from Multan, Pakistan: Depression, Anxiety, and Stress in Undergraduate Allied Health Students. *THE THERAPIST (Journal of Therapies & Rehabilitation Sciences)*, 6(3), 03-07. <https://doi.org/10.54393/tt.v6i3.274>

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Received Date: 11th August, 2025

Revised Date: 21st September, 2025

Acceptance Date: 28th September, 2025

Published Date: 30th September, 2025

ABSTRACT

Mental health problems like depression, anxiety, and stress become more widespread in university students all over the world. The involvement of academic pressure, social pressure, and transitional life stages is one of the factors that build psychological distress that may affect academic performance and general well-being. **Objectives:** To determine the prevalence and severity of depression, anxiety, and stress among undergraduate students of allied health sciences pursuing their undergraduate degrees at Laeeque Rafique Institute of Health Sciences, Multan, Pakistan. **Methods:** A cross-sectional study was conducted from January 15 to April 20, 2024, including all students of LRIHS. Participants completed a two-part questionnaire comprising socio-demographic details and the standardized DASS-21 scale. Data were analyzed using SPSS version 26.0 to calculate frequencies, percentages, means, and standard deviations. **Results:** Depression prevalence was 3.43% extremely severe, 8.57% severe, 22.57% moderate, 18.29% mild, and 47.14% normal. Anxiety levels were 15.43% extremely severe, 8.57% severe, 23.43% moderate, 7.71% mild, and 44.86% normal. Stress was reported as 2.57% extremely severe, 10.86% severe, 15.71% moderate, 19.71% mild, and 51.14% normal. Female students showed higher stress levels, while male students had relatively higher rates of depression and anxiety. **Conclusions:** The results suggest that undergraduate allied health sciences students experience considerable psychological distress. These findings point to the necessity to invest in specific mental health support, screening, and intervention in academic institutions.

INTRODUCTION

Mental health in undergraduate students is a major concern in terms of public health globally. Academic and family demands on university students put significant pressure on them, and thus, they experience psychological stress, which can later transform into more severe mental health problems, including depression and anxiety. As a result, their physical well-being, academic performance, and overall mental health may deteriorate over the course of their academic journey, often going unnoticed until an advanced stage. This assumption is supported by evidence showing that without timely support, students' mental health tends to worsen across academic years, with first-

and second-year students being particularly vulnerable [1, 2]. The WHO emphasizes that mental health is fundamental to overall health. Mental disorders are now the leading cause of disability worldwide, largely due to their chronic progression, therapeutic challenges, and rising prevalence [3]. The WHO reported that in 2001, approximately 450 million people globally suffered from a mental disorder, and that one in four individuals meets diagnostic criteria for a mental illness at some point in their life [4]. Depression is among the most common mental disorders that is characterized by persistent sadness, deficits of interest or pleasure, and other emotional and physical signs. The



incidence of depression is similar between boys and girls before puberty, but it becomes significantly more prevalent among females after puberty [5]. Anxiety refers to a group of emotional states characterized by excessive worry, tension, and physical changes such as increased heart rate. It can occur even in the absence of an identifiable trigger. In 2013, one in nine people globally was affected by an anxiety disorder [6]. Stress, as defined by the WHO (2023), is a state of mental strain resulting from challenging circumstances. It arises when the demands placed on an individual exceed their capacity to cope. When stress becomes chronic, it can contribute to the development and worsening of depression, anxiety, and burnout [7]. The vulnerability of university students to mental health problems is especially caused by one of the two shifts: a developmental shift between adolescence and adulthood, and a life shift between home or school and a new institutional setting [8]. The competitive nature of higher education further exacerbates academic stress, increasing the risk of mental health disorders. Literature indicates that students enrolled in health science programs are especially prone to psychological distress, including anxiety, depression, and suicidal ideation [9]. In Pakistan, multiple studies have highlighted rising rates of psychological distress among medical and health sciences students, with prevalence estimates ranging from 40–70%, underscoring the urgent need for localized evidence [10–12]. These mental health challenges can impair students' social relationships, vocational goals, and academic functioning. Those suffering from depression may experience difficulties concentrating, reduced academic motivation, and a general disinterest in studies. In the United States, nearly 10% of university students were diagnosed and treated for depression within 12 months [13]. This study was therefore designed to assess the prevalence and severity of depression, anxiety, and stress among BS students at Laeeque Rafiq Institute of Health Sciences (LRIHS), Multan, Pakistan. Specifically, the study aimed to explore gender and year-wise differences to identify high-risk subgroups. The Depression, Anxiety, and Stress Scale-21 (DASS-21), previously validated and applied in Pakistani student populations, was used in this study as it provides a reliable and culturally appropriate measure for assessing psychological distress [14, 15].

This study aimed to provide actionable evidence for the design of targeted mental health screening and intervention programs for Pakistani undergraduate students.

METHODS

An analytical cross-sectional study was conducted from January 15 to April 20, 2024, to assess the prevalence of depression, anxiety, and stress. And stress among BS

students at Laeeque Rafiq Institute of Health Sciences (LRIHS). A total of 350 students were recruited through convenience sampling. This represented a census of all available undergraduate allied health students at LRIHS during the study period, which justifies the sample size. The DASS-21 was used to measure psychological distress. This is a self-reported questionnaire that was administered in person during classroom sessions, under the supervision of the research team. The DASS-21 is widely validated across multiple populations, including South Asian contexts, with Cronbach's alpha values ranging from 0.82 to 0.90 for its subscales, ensuring strong internal consistency and reliability. Its previous use in Pakistani student populations further supports its cultural relevance and validity. In the methodology, the DASS-21 also serves as the operational definition for depression, anxiety, and stress in this study. Scores were categorized according to standard cutoff values provided in the DASS manual. Data were analyzed using SPSS version 26.0. Descriptive statistics were calculated to determine prevalence rates, while inferential analyses were performed to explore associations between demographic variables and mental health outcomes. The IRB of LRIHS gave ethical approval. All the participants were informed before collecting data and giving their informed consent, which was done in accordance with the ethical principles of the Declaration of Helsinki. They were informed in detail about the purpose of the study, their free will to take part, the confidentiality of the information, and the option of discontinuing participation at any point. Anonymity was upheld in the study.

RESULTS

Out of the total participants, 294 (84%) were female and 56 (16%) were male. The age of students ranged from 17 to 24 years, with a mean age of 19.59 years. Student distribution was as follows in academic years: 31.71 in the 1st year, 32.86 in the 2nd year, 30.86 in the 3rd year, and 4.57 in the 4th year. On the body mass index (BMI), 38.86% of the students were underweight, 52.27% were normal, and only 8.57% were overweight, as shown in table 1.

Table 1: Socio-Demographic Characteristics of Study Participants (n=350)

Variables	Category	n (%)	Mean ± SD
Age	<20	138 (39.43%)	18.52 ± 0.59
	≥20	212 (60.57%)	20.84 ± 0.53
BMI	Underweight	136 (38.8%)	16.51 ± 1.41
	Normal	184 (52.5%)	20.76 ± 1.65
	Overweight	30 (8.5%)	28.48 ± 2.19
Gender	Male	56 (16%)	-
	Female	294 (84%)	

Year	1 st Year	111 (31.7%)	-
	2 nd Year	115 (32.8%)	
	3 rd Year	108 (30.8%)	
	4 th Year	16 (4.5%)	
Department	BS MLT	73 (20.8%)	
	BS HND	47 (13.4%)	
	BS OTT	53 (15.4%)	
	BS RIT	86 (24.5%)	
	BS MICRO	8 (2.2%)	
	DPT	83 (23.7%)	

Overall, the prevalence of depression among students was as follows: 3.43% had extremely severe, 8.57% severe, 22.57% moderate, 18.29% mild, and 47.14% were within normal limits. For anxiety, 15.43% experienced extremely severe anxiety, 8.57% severe, 23.43% moderate, 7.71% mild, and 44.86% were normal. Stress levels were distributed as follows: 2.57% extremely severe, 10.86% severe, 15.71% moderate, 19.71% mild, and 51.14% normal. These prevalence rates are summarized. Among the male students (n=56), none experienced extremely severe depression; 14.29% reported severe depression, 23.21% moderate, 21.43% mild, and 41.07% had normal levels. For anxiety, 10.71% of males reported extremely severe anxiety, 3.57% severe, 19.64% moderate, 1.78% mild, and 64.28% were normal. In terms of stress, 1.79% experienced extremely severe stress, 7.14% severe, 17.86% moderate, 8.93% mild, and 64.29% were within normal levels. Among female students (n=294), 4.08% had extremely severe depression, 7.48% severe, 22.45% moderate, 17.69% mild, and 48.30% were normal. Regarding anxiety, 16.32% experienced extremely severe anxiety, 9.52% severe, 24.14% moderate, 8.84% mild, and 41.1% were normal. Stress levels in females were as follows: 2.72% extremely severe, 11.56% severe, 15.31% moderate, 21.77% mild, and 48.64% normal. Depression and anxiety were more prevalent among male, whereas stress levels were slightly higher in female. Gender-specific prevalence data are provided in table 2.

Table 2: Prevalence of Depression, Anxiety, and Stress by Severity and Gender among Study Participants (n=350)

Variables	Category	Depression	Anxiety	Stress
Total (n=350)	Normal	165 (47.1%)	157 (44.9%)	179 (51.1%)
	Mild	64 (18.2%)	27 (7.7%)	69 (19.7%)
	Moderate	79 (22.5%)	82 (23.4%)	55 (15.7%)
	Severe	30 (8.5%)	30 (8.5%)	38 (10.8%)
	Extremely Severe	12 (3.4%)	54 (15.4%)	9 (2.5%)
Male (n=56)	Normal	23 (41%)	36 (64.2%)	36 (64.3%)
	Mild	12 (21.4%)	1 (1.78%)	5 (8.9%)
	Moderate	13 (23.2%)	11 (19.64%)	10 (17.8%)
	Severe	8 (14.2%)	2 (3.57%)	4 (7.1%)
	Extremely Severe	0	6 (10.71%)	1 (1.8%)

Female (n=294)	Normal	142 (48.3%)	121 (41.1%)	143 (48.6%)
	Mild	52 (17.7%)	26 (8.8%)	64 (21.7%)
	Moderate	66 (22.4%)	71 (24.1%)	45 (15.3%)
	Severe	22 (7.5%)	28 (9.5%)	34 (11.5%)
	Extremely Severe	12 (4.1%)	48 (16%)	8 (2.7%)

The prevalence of mental health concerns also differed by academic year. In first-year students, depression, anxiety, and stress were reported at rates of 60.4%, 55.9%, and 49.6%, respectively. Second-year students showed 57.4% depression, 54.8% anxiety, and 52.3% stress. Third-year students had a depression rate of 52%, anxiety of 62%, and stress of 47.3%. In contrast, fourth-year students had significantly lower rates: 31.25% for depression, 6.25% for anxiety, and 18.75% for stress. These findings suggest that first-year students experienced the highest depression rates, third-year students the highest anxiety levels, and second-year students the most stress. Detailed year-wise data is presented in table 3.

Table 3: Prevalence of Depression, Anxiety, and Stress by Academic Year among Study Participants (n=350)

Years	Category	Depression	Anxiety	Stress
1 st Year (n=111)	Normal	44 (39.6%)	49 (44.1%)	56 (50.5%)
	Mild	24 (21.6%)	26 (23.4%)	25 (22.5%)
	Moderate	29 (26.1%)	22 (19.8%)	14 (12.6%)
	Severe	9 (8.1%)	10 (9.0%)	11 (9.9%)
	Extremely Severe	5 (4.5%)	4 (3.6%)	5 (4.5%)
2 nd Year (n=115)	Normal	49 (42.6%)	52 (45.2%)	53 (47.7%)
	Mild	21 (18.3%)	14 (12.2%)	26 (23.4%)
	Moderate	29 (25.2%)	25 (21.7%)	16 (14.4%)
	Severe	11 (9.6%)	10 (8.7%)	19 (17.1%)
	Extremely Severe	5 (4.3%)	14 (12.2%)	1 (0.9%)
3 rd Year (n=108)	Normal	52 (48.1%)	41 (38.0%)	57 (52.8%)
	Mild	17 (15.7%)	14 (13.0%)	17 (15.7%)
	Moderate	28 (25.9%)	34 (31.5%)	23 (21.3%)
	Severe	9 (8.3%)	10 (9.3%)	8 (7.4%)
	Extremely Severe	2 (1.9%)	9 (8.3%)	3 (2.8%)
4 th Year (n=16)	Normal	11 (68.8%)	15 (93.8%)	13 (81.3%)
	Mild	2 (12.5%)	0 (0%)	1 (6.3%)
	Moderate	2 (12.5%)	1 (6.3%)	2 (12.5%)
	Severe	1 (6.3%)	0 (0%)	0 (0%)
	Extremely Severe	0 (0%)	0 (0%)	0 (0%)

DISCUSSION

This study aimed to address a gap in the literature by examining the prevalence of depression, anxiety, and stress (DASS) among Bachelor of Science (BS) and Doctor of Physical Therapy (DPT) students at Laeeque Rafiq Institute of Health Sciences (LRIHS), using the DASS-21 questionnaire and considering socio-demographic factors. The results showed that the female students were more stressed compared to male students who were more

depressed and anxious. The prevalence rates found in this study align with those reported in international and national research. For instance, a study from Fayoum University in Egypt found high levels of stress (62.4%), anxiety (64.3%), and depression (60.8%) among students, which are generally higher than the rates reported in our study [9]. Similarly, research conducted in Malaysian universities showed elevated levels of DASS, particularly among students aged 20 and above [10]. A study from Turkey reported prevalence rates of 27.1% for depression, 47.1% for anxiety, and 27% for stress [11], while a study in Punjab, Pakistan, showed depression at 52.8%, anxiety at 40.5%, and stress at 44.8% results that are comparable to those in our study [12]. Among Chilean students, depression, anxiety, and stress were reported at 42.3%, 53.5%, and 49.6%, respectively [13]. Saudi Arabian studies at Jazan and King Khalid Universities reported similar patterns, with rates often exceeding 50% across all three domains [14, 15]. In contrast, Indian research reported comparatively lower prevalence rates, especially for stress (4.2%), highlighting potential cultural, academic, and environmental differences influencing mental health [16]. A study from Women's Medical and Dental College, Abbottabad, reported strikingly high anxiety levels (85%), further emphasizing the variability in mental health outcomes across educational institutions and regions [17]. Year-wise analysis in our study revealed that first-year students had the highest depression rates, likely due to transition stress, adjustment to new academic demands, and reduced family support. Stress peaked in the second year, which may be linked to increasing academic workload, while anxiety was most prominent in the third year, possibly reflecting pressure from approaching clinical training and professional expectations. Final-year students showed the lowest rates, which may reflect better coping strategies and adaptation over time [18]. Cultural attitudes toward mental health, lower stress levels in Indian studies could reflect stronger family support systems and cultural resilience, while higher rates in Pakistan may be linked to academic competition, limited psychological support, and stigma around seeking help [19]. Gender differences observed in our study can also be interpreted in light of social and cultural factors. Female students often experience higher stress due to balancing academic, familial, and social expectations, while male students may be more prone to depression and anxiety due to financial pressure, societal expectations of responsibility, and reluctance to seek help [20].

CONCLUSIONS

This study identified that stress was more common in female and depression and anxiety higher in male. These findings emphasize the urgent need for institutions to establish regular mental health screenings, accessible counseling services, and resilience-building programs tailored to gender-specific needs. While limited to a single institution, this research highlights the importance of prioritizing student well-being in academic policies. Broader multi-institutional studies with diagnostic tools are essential to guide sustainable mental health interventions in Pakistani higher education.

Authors Contribution

Conceptualization: AA, SI, SS

Methodology: AA, MS, SI, KM, AS, IN

Formal analysis: MS, KM, AS, IN, SS

Writing review and editing: AA, MS, SI, KM

All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

All the authors declare no conflict of interest.

Source of Funding

The authors received no financial support for the research, authorship and/or publication of this article.

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