

**PREVALENCE AND CORRELATING FACTORS OF ANXIETY AND
DEPRESSION AMONG ALLIED HEALTH SCIENCES
UNDERGRADUATES IN THE POST-COVID-19 ERA: A CROSS-
SECTIONAL STUDY**

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ABSTRACT

Background: Undergraduate students are one of the most vulnerable groups around the globe and the COVID-19 pandemic has had a major effect on their mental health. It is possible to produce accurate post-pandemic mental health estimates for KMU students, a significant but understudied group in the area, by using such an AKUADS instrument for anxiety and depression within a multi-institute framework. In the wake of the COVID-19 pandemic, this study sought to determine the incidence of mental health distress among undergraduates enrolled in KMU Peshawar main campus institutes in Peshawar and to explore associated factors.

Methods: Undergraduates participating in Khyber Medical University's allied health sciences programs were participants of this cross-sectional study. A validated AKUADS screening measure for depression and anxiety was utilized in the pre-structured questionnaire to collect the data. For the demographic data, SPSS version 24 was used to analyze the data using frequency and percentages; for associations, Pearson's chi-square test with statistical significance set at $p < 0.05$ was used

Results: In total 324 students participated in the survey. Overall, 180 students (55.6%) tested positive for anxiety and depression. In comparison to male; female students were more prone to experience anxiety as well as depression. Participants from the Institute of Physical Medicine and Rehabilitation and Paramedical Sciences had lower odds to experience anxiety and depression. Participants reported having suicidal thoughts, with 7.7% indicating ongoing suicidal thoughts. Age, year of study, place of residence, physical exercise, and social activity did not show any significant correlations.

Conclusion: In the post-pandemic era, undergraduate health sciences students continue to experience significant rates of depression, anxiety, and suicide thoughts. In order to address psychological distress in this population, focused, institution-level mental health screening and support programs are necessary.

INTRODUCTION:

Common mental illnesses, especially anxiety and depression, often manifest in late juvenescence and early adulthood, a time of huge social and developmental changes, and contribute significantly to the world's disease burden. Academic pressure, competitive settings, extended study sessions, heavy workloads, and early clinical exposure, all of which are often linked to higher account of mental disorder than the wide population are all experienced by university students. [1,2]. Numerous studies carried out both during and after the pandemic in various regions have documented a wide-ranging but consistently high frequency of anxiety and depression among undergraduates enrolled in universities. [3].

In Pakistan, multiple single-center studies have documented substantial symptoms of depression and anxiety in medical undergraduates, especially in post-pandemic period [4, 5, 6]. However, no published study has evaluated post-pandemic mental health outcomes among students at Khyber Medical University (KMU), Peshawar's constituent institutes of paramedics and allied health science.

With 25 questions covering psychological and somatic symptoms, the Aga Khan University Anxiety and Depression Scale (AKUADS), a Pakistani tool validated for screening depression and anxiety symptoms, offers a suitable measure for large-scale student assessments and an appropriate method for identifying students with potential anxiety and depression

[7]. Using such tools within a multi-institute framework offers an opportunity to generate reliable post-pandemic mental health estimates for KMU students, an important but understudied population in the region.

Against this gap, the present study aimed to discover the prevalence of depression and anxiety and to identify associated factors among undergraduates enrolled in KMU constituent institutes in Peshawar following the Corona Virus-19 pandemic. In order to increase student well-being, institutional initiatives ranging from early identification and counseling to academic and psychosocial support must be informed by a deeper understanding of these determinants.

METHODOLOGY

Students participating in undergraduate programs from six of Khyber Medical University's (KMU) constituent institutes main campus in Peshawar participated in a descriptive cross-sectional study. Students were chosen at predetermined intervals from official attendance lists using a systematic random method within each stratum of proportionate stratified random sampling. Using an estimated 2,560 undergraduate students, an estimated 34% prevalence of anxiety and depression, a 95% confidence level, a 5% margin of error, and 80% study power, OpenEpi was used to determine the sample size, yielding a final sample of 324 individuals. The Aga Khan University Anxiety and Depression Scale (AKUADS), a validated 25-item paper-based questionnaire measuring psychological and physical symptoms, was used to collect data in person. Age, gender, institute, year of study, place of residence, physical activity, and social activity were independent variables, whereas anxiety and depression state based on AKUADS scores was the dependent variable. For the demographic data, SPSS version 24 was used to analyze the data using frequency and percentages; for the categorical data, Pearson's chi-square test with statistical significance set at $p < 0.05$ was used to discover associations. Data was collected between September 2023 to May 2024. Ethical approval was obtained from the Institutional Review Board of Khyber Medical University (approval number KMU/IPHSS/Ethics/2022/PO/077). All study participants gave written informed consent, and confidentiality was maintained by anonymizing questionnaires, restricting access to identifiable

data to the principal investigator only and securely storing all physical data files in a locked cabinet.

Results & Analysis:

Total 324 undergraduate students were contributed in the study. Participant characteristics are summarized in table 1.

The distribution of AKUADS scores is presented in table 2. The mean total AKUADS score was 22.88 (SD 11.94), with a mean psychological subscale score of 13.30 (SD 7.16) and a mean somatic subscale score of 9.58 (SD 6.30).

Table 1: Distribution of AKUADS Scores Among Students (n = 324)

Variable	Category	Count	Column %
Age of Participant	18–21	155	47.8%
	22–25	151	46.6%
	26+	18	5.6%
Gender	Male	170	52.5%
	Female	154	47.5%
Institute & Department	INS	51	15.7%
	IPDM	7	2.2%
	IPH&SS	19	5.9%
	IPMR	53	16.4%
	IPMS	168	51.9%
	IPS	26	8.0%
Studying Year	First year	95	29.3%
	Second year	90	27.8%
	Third year	76	23.5%
	Fourth year	54	16.7%
	Fifth year	9	2.8%
Residence	Home	152	46.9%
	Hostel	172	53.1%
Physical Activity	Yes	234	72.2%
	No	90	27.9%
Social Activity	Yes	161	49.7%
	No	163	50.3%

Table 2: Distribution of AKUADS Scores Among Students (n = 324)

Variable	Mean ± SD	Minimum	Maximum
Total AKUADS score	22.88 ± 11.94	2	67
Psychological subscale (13 items)	13.30 ± 7.16	1	37
Somatic subscale (12 items)	9.58 ± 6.30	0	36

180 students (55.6%) experienced anxiety as well as depression based on the AKUADS cut-off score, whereas 144 students (44.4%) were categorized as normal (figure 1). Table 3 displays the distribution by gender.

Figure 1: Depicting gender wise the prevalence of anxiety and depression

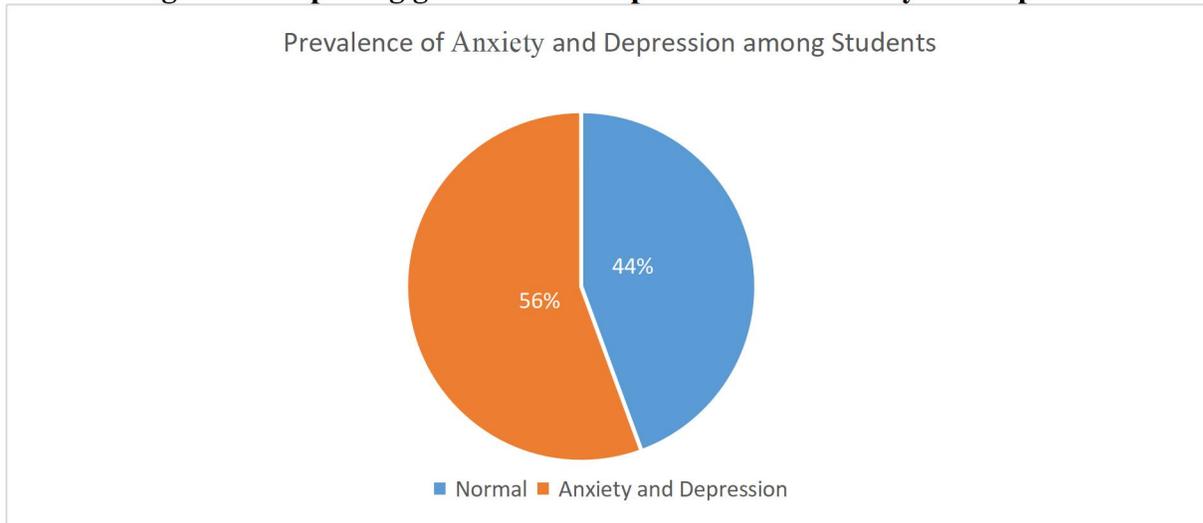


Table 3: Gender wise distribution of Anxiety and Depression 324)

Anxiety and Depression Status	Male n (%)	Female n (%)	Total n (%)
Normal (AKUADS < 20)	87 (60.4)	57 (39.6)	144 (100)
Anxiety & Depression (AKUADS ≥ 20)	83 (46.1)	97 (53.9)	180 (100)

A significant percentage of individuals also reported having suicidal thoughts. In all, 25 students (7.7%) reported having suicide thoughts constantly, whereas 172 students (53.1%) reported never having suicidal thoughts. Table 4 displays the distribution of suicidal ideation responses.

Table 4: Showing distribution of suicidal ideation

Response Category	Frequency (n)	Percentage (%)
Never	172	53.1
Sometimes	83	25.6
Mostly	44	13.6
Always	25	7.7
Total	324	100

Correlations between lifestyle and demographic traits with anxiety and depression are depicted in Table 5. No statistical significant associations found between age group, school, year of study,

residence, physical activity, or social involvement. On the other hand, anxiety and depression were significantly correlated in females ($p=0.010$).

Table 5: Illustrating association between anxiety/depression and other variables

Variable	B	SE	Wald	p	Exp(B)	95% CI
Age	0.130	0.246	0.28	0.597	1.14	0.70 – 1.84
Gender (Female vs Male)	0.826	0.253	10.63	0.001*	2.29	1.39 – 3.76
INS	-1.113	0.569	3.83	0.050	0.33	0.11 – 1.00
IPDM	-1.602	0.923	3.01	0.083	0.20	0.03 – 1.23
IPH&SS	-0.081	0.717	0.01	0.910	0.92	0.23 – 3.76
IPMR	-1.519	0.580	6.86	0.009*	0.22	0.07 – 0.68
IPMS	-1.040	0.513	4.11	0.043*	0.35	0.13 – 0.97
Study year	-0.122	0.127	0.92	0.337	0.89	0.69 – 1.14
Residency (Hostel vs Home)	0.330	0.239	1.90	0.168	1.39	0.87 – 2.22
Physical activity	0.005	0.072	0.01	0.946	1.01	0.87 – 1.16
Social activity (Yes vs No)	-0.134	0.244	0.30	0.583	0.88	0.54 – 1.41
Constant	-0.205	0.805	0.07	0.799	0.81	–
Cox & Snell $R^2 = 0.068$; Nagelkerke $R^2 = 0.091$ Overall $\chi^2(11) = 21.72$, $p = 0.027$ * $p < 0.05$						

DISCUSSION:

Our study found that during the post-pandemic period, just over half of Khyber Medical University's undergraduate allied health sciences students experienced symptoms of anxiety and depression. A significant mental health burden that continues after the pandemic's acute phase is shown by the observed prevalence of 55.6%. Anxiety and depression rates among undergraduates in the South Asia and Middle East have been compared during and after the COVID-19 epidemic, with estimates ranging from roughly 38% to 52%. [8,9,10,11].

Compared to numerous studies carried out in Europe and East Asia during the post-pandemic era, this study reports a higher prevalence of anxiety and depression. Research indicates that between 12% and 29% of university students in Germany and Japan suffer from anxiety and depression [12–13]. Such differences may reflect variation in academic pressure, availability of mental health support services, and sociocultural attitudes toward psychological distress and help-

seeking behavior [14]

The risks of anxiety and depression among female soared high than among male students, which is in line with results from other research done both in Pakistan and globally. Academic stress, societal expectations, and varying exposure to psychosocial stressors have all been linked to gender-related disparities in mental health among allied health students. [15, 16]. The persistence of this association suggests that female gender remains an important independent risk factor in this population.

A significant percentage of students reported experiencing suicide thoughts in addition to anxiety and depression. While over 50% of participants said they had never had suicide thoughts, nearly half said they had at least occasionally, and 7.7% said they had suicidal thoughts on a regular basis. Similar rates of suicide thoughts among college students during and after the COVID-2019 pandemic have been documented in several nations, including China and Brazil. [17, 18]. The coincidence of suicidal thoughts with symptoms of depression and anxiety underscores the clinical relevance of psychological alarming in this population and highlights the need for early identification and timely referral pathways within university settings.

Age, year of study, place of residence, physical exercise, and social activities do not significantly correlate with anxiety or sadness. The influence of these parameters may be context-dependent or mediated by other unmeasured variables, according to similar null findings that have been reported in other studies. [14].

CONCLUSION

A significant proportion of undergraduate students at Khyber Medical University experienced symptoms of anxiety and depression and some of them had suicidal ideation in post-COVID-19 period. Female students were at significantly higher risk, and variation was observed across academic institutes. Overall, these findings stress the need for institution-level mental health screening, gender-sensitive interventions and accessible support mechanisms within university settings.

Limitations

This study's cross-sectional design restricts how the observed relationships might be causally interpreted. There is a chance of reporting bias because mental health outcomes were evaluated using a self-reported screening instrument rather than a clinical diagnosis. Generalizability to other university populations may be limited by the single-institution context. Furthermore, a descriptive analysis of suicidal ideation was conducted; associated factors were not explored.

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