Original Article

Assessment of Mental Well-being in the Medical & Non-medical Students in the Twin Cities of Pakistan: A Cross-Sectional Study

Malaika Aman[1], Muhammad Majid Shafi[2], Manahil Asmat[3], Aayet Zulfiqar[4], Saba Maryam[5], Mehwish Riaz[6]
[1,2,3,4] Student of 4th Year MBBS, Rawalpindi Medical University
[5]Post-graduate Trainee, Community Medicine, Rawalpindi Medical University
[6]Assistant Professor, Community Medicine, Rawalpindi Medical University

Author's Contribution
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Corresponding Author
Muhammad Majid Shafi,
4th Year MBBS Student,
Rawalpindi Medical University,
Rawalpindi
Email: majidshafi2001@gmail.com

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Abstract

Background: Worldwide, especially in Pakistan, concerns are growing regarding the prevalence of mental health issues among university students.

Objectives: This research aims to look at mental health in a variety of academic domains, find out how common mental health issues are among students in Pakistan's twin cities, and look at possible connections between sociodemographic factors and depression, stress, and anxiety.

Materials and Methods: A cross-sectional survey of 352 undergraduate students from eight medical and eight non-medical universities was carried out using the Depression Anxiety Stress Scales (DASS-21). To find correlations between different demographic characteristics and mental health outcomes, statistical analyses were conducted using Chi-square testing, Mann-Whitney U tests, and logistic regression.

Results: The study found that 70.7% of students experienced depression, 74.1% experienced anxiety, and 21% experienced stress above normal levels. Non-medical students reported higher levels of depression (76.7%) and anxiety (68.66%) compared to medical students (62.7% and 37.3%, respectively). Stress levels were comparable between the two groups. Significant associations were found between depression, anxiety, and the field of study ($p<0.05$). Gender was significantly associated with stress ($p=0.017$) and anxiety ($p=0.035$), with a higher prevalence among female students.

Conclusion: The results show that anxiety and depression are common among Pakistani university students, with non-medical students being more susceptible. The study emphasizes how important it is for institutions to have targeted mental health interventions and support services to successfully deal with these problems.

Keywords: Students, Mental Health, Stress, Anxiety, Depression.

Introduction

In response to the rising global incidence of mental health issues, the World Health Organization declared October 10th as World Mental Health Day to promote mental health and prevent suicide.[1] Good mental health is defined as a state of well-being that allows individuals to handle everyday challenges and perform productive tasks effectively.[2] Common Mental Disorders (CMDs) often manifest before age 24, with 40% of youth experiencing depression before age 20, and onset frequently occurring in their mid-20s.[3] University students face significant obligations from family and education, causing psychological stress, depression, and anxiety.[4] Untreated mental illness can negatively impact academic performance and quality of life, leading to suicidal ideation, marital instability, substance misuse, and reduced academic integrity.[5]

Research indicates that 24% to 34% of university students globally show symptoms of depression.[3] Psychiatric disorders, such as depression and anxiety, can hinder college attendance and graduation rates. Among American Indian college students, depression is a major health challenge, second to suicide and alcoholism.[6] Studies reveal that 12% of medical students experience suicidal ideation, with higher suicide rates among female students.[1] Factors contributing to disturbed psychological health and the provision of support have been extensively researched.[7] Depression, anxiety, and stress are prevalent among both undergraduate medical and non-medical students, with no significant differences in the severity or occurrence of psychological comorbidities, except for anxiety.[8]

During the COVID-19 pandemic, a Bangladeshi study showed that university students' mental health deteriorated within a month.[9] In the UAE,about one-third of university students experienced depression, affecting their educational abilities.[10] In Saudi Arabia, medical students showed depression prevalence ranging from 1.4% to 73.5% and anxiety from 7.7% to 65.5%.4 Research also indicates that depressive episodes are influenced by family history and minority ethnic status.[11]

Research during COVID-19 indicated that non-medical students in Saudi Arabia experienced higher anxiety levels before and after switching to online learning compared to medical students, whose anxiety levels decreased during clinical rotations and online learning.[12] A study in Sialkot showed that over half of university students experience significant mental health issues.[13] In Faisalabad, all students frequently experienced low levels of stress, with medical students being less able to manage stress compared to non- medical students.[14]

In Pakistan, university students face challenges due to a lack of career guidance and mental health support. Factors like competition, financial issues, and pressure to succeed increase the risk of mental health problems, especially depression. Understanding the prevalence of stress, anxiety, and depression among university students is crucial for creating targeted interventions.[3] University campuses are pivotal for interventions as they mark the transition from youth to adulthood. Addressing mental health issues during this period is essential to prevent symptom escalation and to build strong social support networks.6 However, studies on Pakistani medical students often lack generalizability due to methodological shortcomings. Our study aims to use the DASS-21 tool for a standardized assessment of the mental well-being of medical and non-medical students, ensuring adequate sampling for more generalized results.[8]

Materials and Methods

A descriptive cross-sectional survey was conducted to determine the prevalence of stress, anxiety, and depression among university students in Rawalpindi and Islamabad, and to compare the mental well-being level between medical and non-medical students of the cities. Convenience sampling was used to select the universities and collect responses.

Participants included undergraduate students from eight medical universities (RMU, IMDC, FMDC, IIMC, Foundation University Medical College, Shifa College of Medicine, AMC, HBS Medical and Dental College) and eight non-medical universities (NUST, FAST, Bahria University, PMAS-Arid Agriculture University, IIUI, Quaid-e-Azam University, NUML, COMSATS Islamabad).

Responses were collected in April-May 2024. Students with any diagnosed chronic medical or mental ailment or who had failed any semester/annual exam were excluded. Based on the assumption of 45.89% anxiety in medical students and 60.26% anxiety in non-medical students from previous research, the sample size was calculated using a two-sample comparison of proportions.[15] Each subpopulation's target sample size was 176, totaling 352, with a 95% confidence interval and 5% margin of error. A total of 392 students responded, with 352 valid responses used for analysis.

An online questionnaire using Google Forms was sent to the selected universities, targeting students from the second year to the final year of medical programs and from the second semester to the final semester of non-medical programs. The questionnaire had two sections: socio-demographic details and the Depression Anxiety Stress Scales (DASS-21).[16]

The first section collected data such as name, age, gender, family income, boarding status, travel time, employment status, field of study, and academic performance. This helped find associations between demographics and mental well-being. The DASS-21, a condensed form of the 42-item DASS, was used to gauge symptoms of stress, anxiety, and depression. It includes 21 items, with seven items for each subscale (DASS-D for depression, DASS-A for anxiety, and DASS- S for stress), rated on a 4-point Likert scale. Scores for each subscale were doubled before evaluation. Scores were categorized to indicate levels of depression, anxiety, and stress. This instrument has been validated in multiple studies, including one involving students from San Jorge University (SJU) in Zaragoza, Spain.[17]

Data were viewed in Excel for Windows and analyzed using SPSS version 27. Descriptive statistics were used to analyze sample characteristics, while percentages and frequencies described categorical variables. The Kolmogorov-Smirnov test evaluated the normality of anxiety, stress, and depression scores. Nonparametric tests, such as Spearman's rank correlation, Mann-Whitney U, and Pearson's Chi-squared, were used due to non-parametric data distribution. The relationship between the field of study and DAS was investigated using Pearson's Chi-squared test. Binary logistic regression analysis was performed to identify significant factors related to anxiety, stress, and depression, using odds ratios (OR) to estimate associations. Outcome categories of DAS components namely mild, moderate, severe and extremely severe were recoded into a single category for prevalence assessment and for binary logistic regression analysis.

Missing values were not replaced, and a significance level of $p < 0.05$ with a 95% confidence interval (CI) was adopted for all analyses.

Results

Three hundred and fifty-two undergraduate students participated in this study, of which 150(42.6%) and 202(57.4%) were medical and non-medical respectively. Around 79(47.3%) of the participants were male. About 136(38.6%) of participants belonged to the age group 19-20, 169(48.0%) from the age group 21-22, and 47(13.3%) from the age group 23-25 & above. 43(71.3%) and 71(64.9%) of the medical and non-medical students were boarders respectively. About 202(57.4%) of the sample belonged to the middle class and 20(5.68%) and 130(37%) of the students belonged to the lower and upper class respectively. 306(87%) of the participants were unemployed whereas 46(13%) were employed during the study period. A greater percentage of medical students chose their first option. Table I lists the participants' academic background and sociodemographic details.

Table-I Socio-demographic characteristics and academic profile of the study participants

	Medical Students (n=150)	**Non-medical (n=202)**	**Total (n=352)**
Age (frequency, percentage)			
19-20 years	57(38.0%)	79(39.1%)	136(38.6%)
21-22 years	74(49.3%)	95(47%)	169(48.0%)
23-25 years & above	19(12.7%)	28(13.9%)	47(13.3%)
Gender			
Male	79(47.3%)	90(55.4%)	169(48%)
Female	71(52.7%)	112(44.6%)	183(52%)
Residence during the study period			
Boarder	43(71.3%)	71(64.9%)	114(32.3%)
Non-boarder	107(28.7%)	131(35.1%)	238(67.6%)
Family monthly income (in Pakistani rupees)			
Lower class (30,000-50,000)	4(2.7%)	16(7.9%)	20(5.68%)
Middle class (50,000-150,000)	73(48.7%)	129(63.9%)	202(57.4%)
Upper class (150,000+)	73(48.7%)	57(28.2%)	130(37%)

Employment status during the study period			
Unemployed	140(93.3%)	166(82.2%)	306(87%)
Employed/Freelancing	10(6.7%)	36(17.8%)	46(13%)
Your current field was your first preference at the time?			
No	18(12.0%)	49(24.3%)	67
Yes	122(81.3%)	136(67.3%)	258
Maybe	10(6.7%)	17(8.4%)	27
Academic performance			
CGPA (non-medical)			
1-2	-	3(1.5%)	3(1.5%)
2-3	-	58(28.7%)	58(28.7%)
3-4	-	141(69.8%)	141(69.8%)
Last Professional exam percentage (medical)			
50-70%	52(34.7%)	-	52(34.7%)
70-90%	94(62.6%)	-	94(62.6%)
90-100%	4(2.7%)	-	4(2.7%)

Data presented as frequency (%).

Upon further analysis, 70.7%, 74.1%, and 21% of the study population had depression, anxiety, and stress levels above normal respectively Figure 1. Non-medical students reported higher levels of depression and anxiety as compared to medical students. Stress was found to be somewhat evenly distributed between the two fields of study i.e., medical (11.3%) and non-medical (10.4%). The results indicated significant deviations from normality for anxiety ($D = 0.175$, $p = 0.010$), stress ($D = 0.165$, $p = 0.019$), and depression ($D = 0.154$, $p = 0.033$). The chi-square test was used to find the association between depression, anxiety, stress, and other variables. Stress was significantly associated with gender ($p=0.017$). The field of study was significantly related to levels of depression ($p=.017$) and anxiety ($p=.014$). The Mann-Whitney U test was used to compare the mean scores for stress, anxiety, and depression between the medical and non-medical research sectors. It was discovered that there was a statistically significant difference between the three variables: stress ($p=0.003$), anxiety ($p=<0.001$), and depression ($p=0.001$). Based on DASS-21 scores, Table II displays the degrees of stress, anxiety, and depression experienced by medical and non- medical students.

Table-II Depression, anxiety, and stress disorders among medical & non-medical students

Category	Medical students	Non-medical students	P-value
Depression			
Prevalence	94(62.7%)	155(76.7%)	0.004*
Normal	56(37.3%)	47(23.3%)	0.017*
Mild	21(14.0%)	27(13.4%)	0.001^
Moderate	51(34.0%)	74(36.6%)	
Severe	17(11.3%)	39(19.3%)	
Extremely severe	5(3.3%)	15(7.4%)	
Anxiety			
Prevalence	103(37.3%)	158(68.66%)	0.043*
Normal	47(31.3%)	44(21.8%)	0.014*
Mild	14(9.3%)	11(5.4%)	<0.001^
Moderate	33(22.0%)	38(18.8%)	
Severe	23(15.3%)	32(15.8%)	
Extremely severe	33(22.0%)	77(38.1%)	
Stress			
Prevalence	17(10.4%)	21(11.3%)	0.779
Normal	133(88.7%)	181(89.6%)	0.504
Mild	11(7.3%)	17(8.4%)	0.003^
Moderate	6(4.0%)	4(2.0%)	

Data expressed as frequency (%). The significance of the association was determined using the Chi-square test. *Statically significant at $p<0.05$. "^" Represents the statistically significant difference in mean scores of depression, anxiety, and stress between the two fields of study determined by the Mann-Whitney U test. ^Statically significant at $p<0.05$.

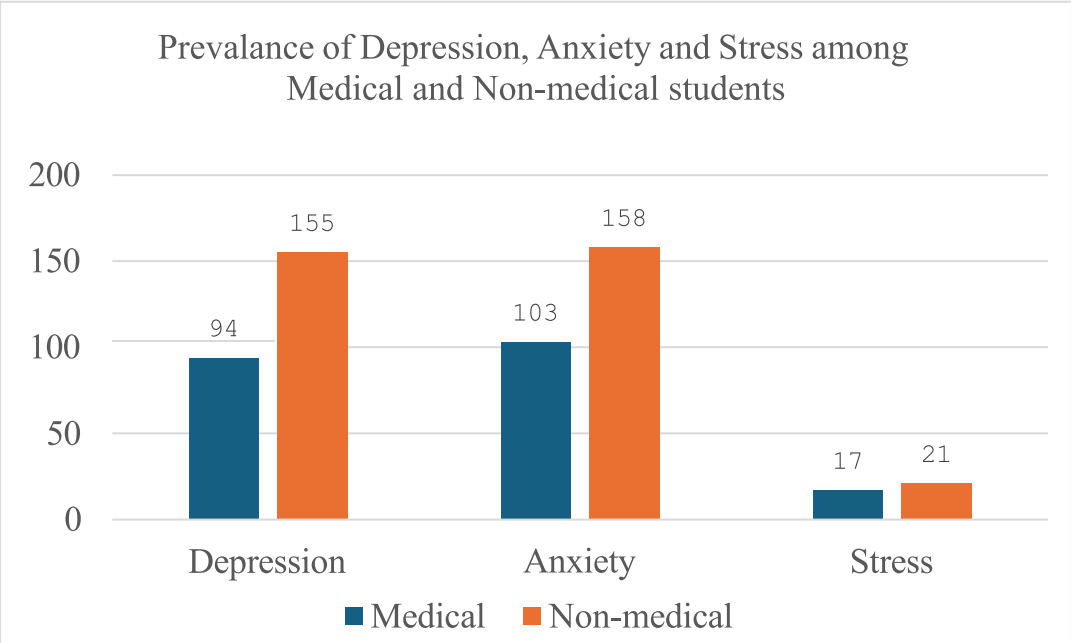

Figure 1 Prevalence of Depression, Anxiety, and Stress among Medical and Non-medical students.

The Spearman rank correlation test was applied to find the relation between the three variables of DAS-21 depression, anxiety, and stress. Table III shows that all three variables have statistically significant positive correlations(p=0.000). This means that higher scores on one measure were associated with higher scores on the other two measures.

Table-III Spearman correlation between different variables of DASS-21 among Medical and Non-medical students

	Depression	**Anxiety**	**Stress**
Depression	-	0.618*	0.391*
Anxiety	0.618*	-	0.000*
Stress	0.204*	0.391*	-

*Statically significant at p<0.05.

All the variables that were significantly associated with depression, anxiety, and stress were further analyzed by binomial logistic regression as depicted in Table IV. Depression was independently related to the field of study (OR=1.973, p=0.004) with higher chances of depression in non-medical students. Anxiety was independently associated with gender (OR=0.591, p=0.035) and family income (OR=0.601, p=0.043), with higher chances of anxiety among female students belonging to higher economic status. Stress was associated with female gender (OR=1.973. p=0.004) as well.

Table-III Logistic regression analysis of different factors on depression among medical and non-medical students

	OR	**p-value**	**95% Cl**		**Aor**	**p-value**	**95% Cl**	
			LL	UL			LL	UL
DEPRESSION								
Field of study	1.973	0.004*	1.238	3.144	1.973	0.004*	1.238	3.144
Age	1.284	0.163	0.904	1.825	-	-	-	-
ANXIETY								
Gender	0.591	0.035*	0.363	0.964	0.593	0.035	0.364	0.965
Family income	0.601	0.043*	0.368	0.984	-	-	-	-
Boarding status	0.914	0.735	0.544	1.536	-	-	-	-
STRESS								
Age	0.642	0.122	0.366	1.126	0.396	0.014	-	-
Gender	0.467	0.049*	0.219	0.996	-	-	0.1890	0.828

*Statically significant at p<0.05. OR= Odds ratio, aOR=Adjusted odds ratio

Discussion

Due to the increased prevalence of depression, stress, and anxiety, there have been growing concerns regarding mental well-being, especially in university students because they are passing through a stage that is quite sensitive and challenging.[18] University students are exposed to a stressful environment due to academic pressure, financial difficulties, career problems, and societal and parental demands to perform well in studies as well as secure a good job.[19] The age of students going to university varies from 18-25 years in which they transition from late adolescence to adulthood. This growth may exert a stressful effect on them when they start to realize their growing responsibilities. This may compromise their mental health, and they may experience stress anxiety and depression.[20]

The study aims to assess the prevalence of depression, anxiety, and stress among the different academia of Pakistan. According to a study conducted on the university students of Sialkot, 75% of the students have depression while stress and anxiety levels were 84.4% and 88.4% respectively.[21] Similarly, another study conducted in Pakistan reported high levels of anxiety among undergraduate students of Pakistan, the percentage being 85.1% while the percentage levels of stress and depression were 65% and 61% respectively.[18] Like these studies our study showed an increased prevalence of above the normal levels of anxiety which is 74.1%. However, in our study depression is more prevalent than stress in the undergraduate students of twin cities with the prevalence of

depression being 70.7% and stress being 10% above the normal levels. These results show that there is a high prevalence of depression. This may be due to the long-term strict schedule of examination and assessment which causes burnout of the students leading to depression in which they lose interest in daily activities as well as academic excellence is compromised. Similarly, the continuous pressure of never-ending exams with very few gaps among them does not give students enough time to relax and then start preparing for upcoming exams which results in fear and pressure of exams which may result in development of the anxiety.

Our study did not report a significant association between gender and the levels of depression(p value=0.093) which is consistent with some studies which were conducted on the students of professional colleges of Jammu, India, on the undergraduate pharmacy students in Malaysia and the MBBS student of Bangladesh.[22-24] Where the levels of stress significantly associated with gender (p value=0.017) which were in alignment with the findings in certain studies such as one conducted at Mid-Western Canadian university, Arsi University College of Health Sciences, Ethiopia and the one conducted at San Jorge University (SJU) in Spain.[26-27] In these studies, the levels of severe stress were higher in females than males such as percentages being 2.2.% in females vs 0% in males, 0.06% vs 0.03% in males, 8.98% vs 7.68% in males.[25-27] This may be due to the difficulty of females to cope with the difficult situation plus the desire to excel in academics which causes them a state of mental tension and excessive worry developing into symptoms of stress.

Further analysis showed that there is a significant difference between the means of depression (p value=0.001), anxiety (p value=<0.001), and stress (p value=0.003) for medical and non-medical students. The results showed that there is a high prevalence of depression, anxiety, and stress among non-medical students. The reported results are in alignment with some studies such as one conducted in India where the non-medical students such as those of engineering and arts suffer from higher levels of physiological distress (p value=<0.001) than the medical students.[28] Another study conducted in Saudia Arabia shows that non-medical students have a significantly higher level of severe depression(7%) than that of medical students(4%).[27] There may be several reasons for these differences. For example, non-medical students may have taken degrees that were not their first choice due to their interests and they may struggle to adjust to that. Moreover, the continuous weekly assessment and then exams every three and six months may be difficult for students and can result in burnout finally developing into depression, anxiety, and stress. In addition to this, the career problem may be another reason for the increased levels of common mental disorders (CMDs). Non-medical students must worry about securing a job while medical students have enough job opportunities. The other reasons may include financial burdens, family expectations, and the demand of society to excel.

DASS-21 is a screening scale that uses symptoms to diagnose depression, anxiety, and stress which may lead to biased results because it depends on self-reporting by students.8 For this reason, investigators should work to develop another tool that responds to this bias. Moreover, the category used for depression, anxiety, and stress in the DASS-21 scale is used to define the score of the sample regarding the population but doesn't define the severity of disease, such as mild severity in the DASS scale represents that the score of the individual was above the mild score observed in

whole sample population which may or may not require psychological interventions but doesn't correspond to the mild severity of the disease.

The major reason for the CMDs being undiagnosed can be due to the lack of support an institution could provide in coping with these disorders. Half of the students with one or more mental health concerns in a previous study conducted at an American university did not seek therapy during the two-year follow-up after the study's baseline investigation.[29] The institution or the university should provide students with counseling and guidance sessions. Moreover, screening should be done to diagnose CMDs early and treat them before they emerge into major health issues. Institutions should give detailed information to students about potential problems and ways to cope with them. Procedures including cognitive restructuring, mindfulness, relaxation, conflict resolution, and effective communication should be developed.[30] Students friendly academic schedule should be made to avoid overwhelming them and effective ways how to manage their schedule should be taught to them.

We must acknowledge some limitations of our study. Firstly, the DASS-21 can be used for screening but is not a substitute for a clinical examination. Using an online questionnaire that relies on a participant's self-recall can lead to bias. Secondly, we collected responses from eight medical and non-medical universities each in the twin cities, so our results cannot be generalized to the entire Pakistani population. Thirdly, our data collection coincided with semester exams in many non-medical universities but not in medical universities. Lastly, the cross-sectional design of our study can establish the severity of negative emotions and the association between different variables but not their cause.

As for the recommendations, future studies should employ other tools as well to establish a formal diagnosis other than DASS-21. Increasing the study population and the sample size should also be considered. Also, the differences in academic conditions between medical and non-medical fields should be minimized. Lastly, future research should consider a longitudinal study design to establish the cause of stress

Conclusion

In the study, 70.7%, 74.1%, and 21% of the participants reported depression, anxiety, and stress levels above normal, respectively, with non-medical students exhibiting notably high rates of depression (76.6%) and anxiety (68.66%). Gender was identified as a significant factor influencing mental health, with stress being more prevalent among females and anxiety more common among females from higher socioeconomic backgrounds. The study highlighted the positive correlation between depression, anxiety, and stress, emphasizing the interconnectedness of these mental health issues.

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