



## Prevalence of Depression, Anxiety and Stress (by DASS Scoring System) among Medical Students in Islamabad, Pakistan

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### Authors' contributions

This work was carried out in collaboration between all authors. Author FR designed the study, authors AQ and AMR wrote the protocol and author FR wrote the first draft of the manuscript. Authors AQ and MA managed the literature searches, author FR did the analyses of the study. All authors read and approved the final manuscript.

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### ABSTRACT

**Objective:** To determine the prevalence of depression, anxiety and stress (by DASS scoring system) among purposive sample of medical students in Islamabad, Pakistan.

**Study Design:** Cross-sectional survey (June, 2014 to November, 2014)

**Sampling Technique:** Purposive sampling (non-probability)

**Methods:** The questionnaire used in this study consisted of three components: A socio-demographic questionnaire that required each student to provide their age, gender and year of study, as well as marks obtained as mean % scoring in the professional examinations and DASS scale (the Depression, Anxiety, and Stress Scale).

**Procedure:** Sixty-six medical students were the participants who were attending private and public medical universities in Pakistan. Following the granting of ethical approval from the university and medical college to conduct the study, medical students from first year to fifth year were contacted

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after purposive sampling and after the conclusion of one of their lectures. They were each given a questionnaire package to complete and return to the researcher before leaving the lecture room.

**Results:** The prevalence of depression was 40.9%, where 9.09% were mildly depressed, 16.67% moderately depressed, 13.64% severely depressed and 1.52% were extremely severely depressed. The prevalence of anxiety was 74.2%, where 13.64% were mildly anxious, 27.27% were moderately anxious, 19.70% were having severe anxiety and 13.64% were suffering from extremely severe anxiety. The prevalence of stress was 50%, out of which 18.18% were mildly stressed, 24.24% were moderately stressed and 7.58% were severely stressed.

**Conclusion:** There is a high prevalence of anxiety followed by stress and depression among the purposive sample of medical students during their academic training. Instructors, examiners, and universities should consider the stressors while assessing students on their academic basis.

*Keywords: Medical students; anxiety; academic training.*

## 1. INTRODUCTION

Medical school is recognized as a stressful environment that often has a negative effect on students' academic performance, physical health, and psychosocial well-being, as these medical students are quite susceptible to depression, anxiety and stress due to multiple factors like academic challenges, environmental changes, ultimate goal achievement plans and life challenges such as academic evolution from school to university and the difference including the ultimate responsibility from the vantage point of a student to a capable physician [1-4].

The prevalence of depression among medical students in public universities has been estimated to be 10.4% in Greece by Yusoff MS et al. 15.2% in USA, 24% in UK, 29.1% in India by Sida S et al. and 43.8% in Pakistan by Jadoon NA et al. [5-7] The prevalence of depression among private medical students, however, has been estimated to be 19% in USA, 21.7% in Malaysia by Zaid ZA et al. 49.1% in India by Singh A et al. and 60% in Pakistan by Inam SN [8-10].

Given the inconsistent findings regarding the relationship between levels of depression and anxiety and gender, year of study and stage of training (preclinical or clinical) and the fact that studies have typically been undertaken in public universities in Pakistan and other countries, there is a need to further investigate these relationships and to investigate them among students in medical schools in private universities in Pakistan.

## 2. MATERIALS AND METHODS

Sample size calculation was done using WHO SAMPLE SIZE calculator, where P

(prevalence) = 10.4%<sup>6</sup> and confidence interval=95%, absolute precision= 0.08, Sample size calculation=56, so selecting 10 extra, final sample size= 66 students.

In this cross-sectional study, sixty six medical students were selected by purposive sampling technique, who were attending private and public medical colleges in Islamabad and Rawalpindi, Pakistan. The questionnaire used in this study consisted of three components: A socio-demographic questionnaire that required each student to provide their age, gender and year of study and a DASS scoring system (the Depression, Anxiety and Stress Scale) [11].

The DASS is a 42-item questionnaire which includes three self-report scales designed to measure the negative emotional states of depression, anxiety and stress. Each of the three scales contains 14 items, divided into subscales of 2-5 items with similar content. The Depression scale assesses dysphoria, hopelessness, devaluation of life, self-deprecation, lack of interest/involvement, anhedonia and inertia. The Anxiety scale assesses skeletal muscle effects, situational anxiety, and subjective experience of anxious affect. The Stress scale (items) is sensitive to levels of chronic non-specific arousal. It assesses difficulty relaxing, nervous arousal, and being easily upset/agitated, irritable/over-reactive and impatient. Respondents are asked to use 4-point severity/frequency scales to rate the extent to which they have experienced each state over the past week [11].

### 2.1 Scoring

Scores of Depression, Anxiety and Stress are calculated by summing the scores for the relevant items. The depression scale items are 3,

5, 10, 13, 16, 17, 21, 24, 26, 31, 34, 37, 38, 42. The anxiety scale items are 2, 4, 7, 9, 15, 19, 20, 23, 25, 28, 30, 36, 40, 41. The stress scale items are 1, 6, 8, 11, 12, 14, 18, 22, 27, 29, 32, 33, 35, 39. To use the Scoring Template (below) print on to a plastic overhead. The score for each of the respondents over each of the sub-scales, are then evaluated as per the severity-rating index of DASS scoring [11].

Mean, standard deviations, frequency tables, graphs and pie charts were used to analyze the data and to find out the prevalence of depression, anxiety and stress, among purposive sample of medical students of private and public medical colleges in Pakistan. Following the ethical approval from the college authorities to conduct the study, medical students from first year to final year were contacted after the conclusion of one of their lectures and were invited to participate in the study. Students who agreed in writing to participate were each given a questionnaire package to complete and return to the researcher before leaving the lecture room.

### 3. RESULTS

Mean age of students was 22.15 (SD 1.304) Minimum 20 and maximum 26. Males were 28 (40%) and female students were 38 (54.3%). 18 students (25.7%) belonged to the government medical colleges and 48 (68.6%) belonged to the private medical colleges). Mean and SD was calculated for the quantitative data like age, whereas frequency percentage was calculated for the categorical variables like gender, private and public medical college students etc. Statistical test of significance Anova was applied for calculating the p values, regarding the impact of depression, anxiety and stress (as individual factors), on the overall students performance of their mean % scoring of 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> professional examination results.

Results show that after the application of the statistical test Anova, depression had no significant impact on the overall students performance of their mean % scoring of 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> professional examination results (p value was not significant). Anxiety had a significant role on the overall mean % scoring of students performance regarding 1<sup>st</sup> Professional exams, 2<sup>nd</sup> and 3<sup>rd</sup> professional examination results. Students of 1<sup>st</sup> professional examination were found to be anxious as the p value was significant (<0.05). Anxiety had no impact on the academic performance of students of 2<sup>nd</sup>

professional examination (p value was found to be not significant), although, anxiety had an impact on the academic performance of students of 3<sup>rd</sup> professional exams (p value significant =0.034). Stress had no significant role on the overall students performance regarding their mean % scoring of 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> professional exam results (p value not significant).

Results show the significant relationship between gender and stress, depression and anxiety in medical students. Female students were more stressed out than male students (p<0.05).

Students of private medical colleges were found out to be more depressed. Results according to DASS scoring show 55.7% of students had no depression, 8.6% had mild depression, 15.7% had moderate depression, 12.9% students were severely depressed and 1.8% students were in extremely severe depression.

Results according to DASS scoring<sup>11</sup> showed that 24.3% students had no anxiety, 12.9% were mildly anxious, 25.7% were moderately anxious, 18.6% were severely anxious, 12.9% had extremely severe anxiety. 47.1% students did not have stress, 17.1% were mildly stressed, 22.9% were moderately stressed, 7.1% were under severe stress.

### 4. DISCUSSION

Compared to other countries the results of our study had a higher prevalence of depression, as compared to another study based on medical students attending an American private university with prevalence of 19%, but lower than that of medical students attending private universities in India with prevalence of 49.1% as reported by Singh A et al. [9] The prevalence of students with depression in the present study is higher than was found among medical students attending public universities in Greece (10.4%) as reported by Yusoff MS et al. [7] Malaysia (21.7%) by Zaid ZA et al. [8] and India by Sida S et al. [5] and UK by Hendryx MS et al. [12].

The prevalence of depression among the sample of medical students in the present study was 40.9%, out of which 9.09% were mildly depressed, 16.67% were moderately depressed, 13.64% were severely depressed and 1.52% were extremely severely depressed (Table 1).

The prevalence of anxiety among students in the present study was 74.2%, out of which 13.64%

were mildly anxious, 27.27% were moderately anxious, 19.70% were having severe anxiety and 13.64% were suffering from extremely severe anxiety. (Fig. 1) compared to other countries data, the results of our study showed a prevalence rate of anxiety that is higher than that found in private medical colleges in a number of countries, for example, Israel (29.4%) and India (56%) [13,14]. Compared to the prevalence of anxiety among students attending public medical

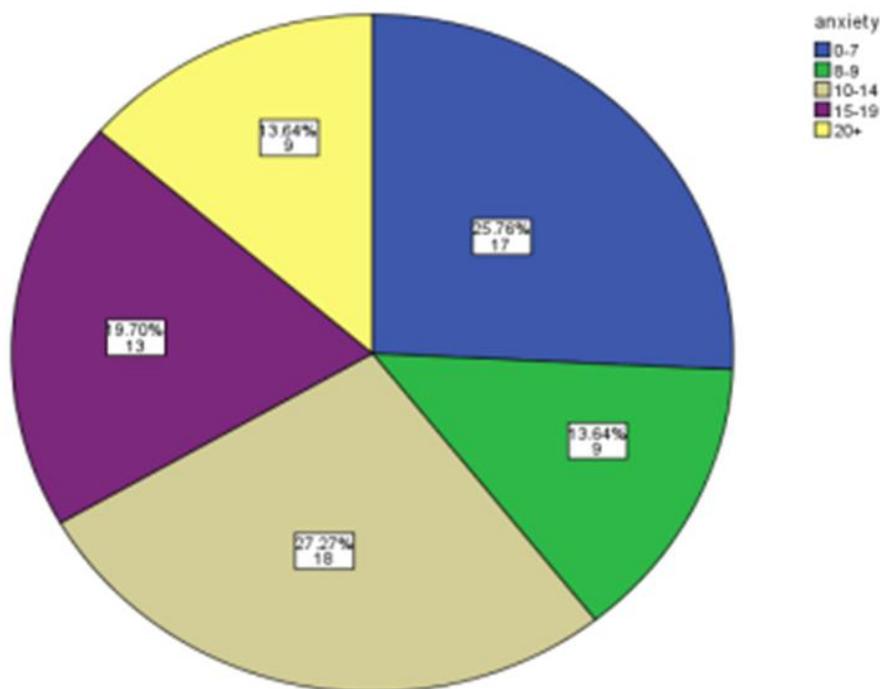
schools, the current prevalence rate is lower than those found in many countries, for example, Greece (65.5%), Malaysia (54.5%) and Beirut (69%) [15]. The reasons why the prevalence rate of anxiety in the present sample of students is generally lower than those reported in other studies are unclear and identify a need for further research in this area covering a larger sample size.

**Table 1. Categories of depression, anxiety and stress in medical students by DASS**

	Depression	Anxiety	Stress
Normal	0 – 9	0 - 7	0 – 14
Mild	10 – 13	8 – 9	15 – 18
Moderate	14 – 20	10 – 14	19 – 25
Severe	21 – 27	15 – 19	26 – 33
Extremely Severe	28+	20+	34 +

Source: [www.psy.unsw.edu.au/groups](http://www.psy.unsw.edu.au/groups)

Reference: Lovibond, S.H. & Lovibond, P.f. (1995) [11], Manual for the Depression anxiety Stress Scales. (2<sup>nd</sup> Ed) Sydney: Psychology Foundation.



**DASS Scoring:**

Normal : 0-7,

Mild : 8-9,

Moderate : 10-14,

Severe :15-19,

Extremely severe : 20+

**Fig. 1. Categories of anxiety**

A significant relationship, however, was found in the present study between gender and anxiety where more females than males experienced anxiety. This result is in contrast to those reported for students in some other private medical schools but consistent with those reported for students in some public universities [16]. The trend that females experience more anxiety than males may suggest that female medical students are more competitive, tend to be more concerned about working hard to secure higher marks in exams, are more concerned about their performance and most importantly, tend to indulge in less exercise [10]. More research is clearly needed before these suggestions can be confirmed or refuted according to this prerogative.

Regarding associations between year of study and stage of training (clinical or pre/para-clinical), and depression and anxiety, results from the present study indicate no statistical significance; however, a trend can be seen that suggests depression and anxiety increase as students go on to their advanced medical training. The only exception to this trend occurs in the first year where the prevalence of depression and anxiety is greater than in any other year. This could be due to a number of exclusive stress variables which the first year students have to face, regarding their progress from the high school to a medical university, melancholy because of undue stress of studies, tentative familiarity with academic procedures and tough schedules, juggling a new time table with their personal lives, the process of making new friends, and increased expectations from family and faculty.

Anova test was applied to find out p value between categories of anxiety and First professional examination mean % scoring (Table 2) as well as Third professional examination mean % scoring (Table 3) and p

values were significant, (0.05 and 0.34 respectively).

The increase in the prevalence of both depression and anxiety as students progress through their program is in evidence in the medical literature along with the physical and mental manifestations of anxiety and depression [16]. The self-help programs should be made available to the medical students at the instigation of and throughout the medical training programs, along with the provision of counseling services.

The prevalence of stress among the sample of medical students in the present study was 50%, out of which 18.18% were mildly stressed, 24.24% were moderately stressed and 7.58% were severely stressed (Table 1).

Different studies have shown that anxious students, as compared to non-anxious students, usually experience notably more frustrations, related to failure to accomplish the work, daily hassles, and delays in reaching goals, heavy workload, many assignments, too many test activities, frequent strain and inability to make decisions and inability to answer for lecturers, pressures (due to deadlines, overwork and conflicts in interpersonal relations), and changes (rapid and too many occurring at the same time) [17,18].

These stressors gradually diminish when students advance in their medical program but some students may not be able to overcome these stressors, thus leading to poor academic performance, substance abuse, and mental illnesses [19,20].

Anova test was applied to find out p value between categories of anxiety and first professional examination mean % scoring and p value was <0.05 (significant).

**Table 2. Anxiety with first professional exams mean % scoring (ANOVA)**

Anxiety	N	Mean	Std. Deviation	Std. Error
0-7	17	67.24	3.977	.965
8-9	9	68.89	3.621	1.207
10-14	18	65.33	4.765	1.123
15-19	13	67.77	5.434	1.507
20+	9	63.44	2.744	.915
Total	66	66.53	4.555	.561

*P=0.05 (significant)*

Anova test was applied to find out p value between categories of anxiety and third year professional examination mean % scoring and p value was <0.034 (significant).

**Table 3. Categories of anxiety with third professional exams mean % scoring (ANOVA)**

Anxiety	N	Mean	Std. deviation	Std. error
0-7	17	69.93	4.202	1.019
8-9	9	71.33	4.690	1.563
10-14	17	67.88	4.833	1.172
15-19	13	67.99	4.839	1.342
20+	9	65.00	3.674	1.225
Total	66	68.52	4.757	.590

*P=0.034 (significant)*

## 5. CONCLUSION

There is a high prevalence of anxiety followed by stress and depression, in medical students during their academic training. Future studies are needed to focus on sifting out the unique independent predictors affecting and ultimately leading to stress and anxiety in the medical students lives, so that prevention programs could be designed for effective dealing with these variables to minimize the overall burden of stress and anxiety among the students.

## 6. LIMITATIONS

This study has a few limitations. One of the limitations is that this study did not focus on other causes for depression and anxiety such as the inherent personality, demographic information, and family conditions or status. Second limitation is that the findings of this study may not be generalized as the results are based upon few private medical colleges in Pakistan.

## CONSENT

All authors declare that 'written informed consent was obtained from the medical students for publication of this cross sectional study and accompanying data analysis. The names and identity of the students was kept confidential.

## ETHICAL APPROVAL

Ethical permission prior to the commencement of this study was obtained from the Institution's ethical committee and review board (University and Medical College). Informed written consent was obtained prior to the selection of the students and before data was gathered.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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