

Depression, Anxiety and Their Associated Factors Among Medical Students

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ABSTRACT

Objective: To determine the frequency of anxiety and depression among medical students of Wah Medical College and their associations with sociodemographic and educational characteristics if any.

Study Design: Cross-sectional survey.

Place and Duration of Study: Wah Medical College, from September 2007 to March 2008.

Methodology: A sample of 279 students was included in the study after excluding first year medical students because they were admitted for less than 6 months. A self administered Encounter Form was administered.

Sociodemographic and educational characteristics included age, gender, birth order, number of siblings, monthly income, monthly expenditure on education, academic performance in professional examination, past medical and past psychiatric history, substance abuse and family history of psychiatric illness. Beck depression inventory and beck anxiety inventory were used to assess the level of depression and anxiety. The chi-square test was applied at 5% level of significance to determine associated factors for anxiety and depression respectively.

Results: The mean age of students was 21.4±1.41 years with female preponderance i.e. 202 (72.4%). Anxiety was present in 133 (47.7%) students and depression in 98 (35.1%) students. Both were found concomitantly in 68 (24.37%) students. Age (p=0.013), gender (p=0.016), examination criteria dissatisfaction (p=0.002) and overburden with test schedule (p=0.002) were significantly associated with depression.

Anxiety was significantly associated with gender (p=0.007), birth order (p=0.049), year of study (p=0.001), examination criteria dissatisfaction (p=0.010) and overburden with test schedule (p=0.006).

Conclusion: One third of students were found to have anxiety and depression which was associated with the socio-demographic and educational factors as stated above.

Key words: Anxiety. Depression. Medical students. Age. Female gender. Education characteristic. Examination.

INTRODUCTION

Young adulthood is characterized as an identity-forming period in which individuals experience social and physical changes, as well as various conflicts in emotional, behavioral, sexual, economic, academic, and social areas.¹ A number of studies have focused on the mental health of young medical students as medical school is considered to be a time of significant psychological distress for physicians in training.² Some aspects of training may have unintended negative effects on medical students' mental and emotional health.³ These studies have reported high prevalence rates of psychiatric disorders, such as anxiety and depression, among medical students.^{1,4-6}

Several studies suggest a high prevalence of depression and anxiety among medical students with levels of

overall psychological distress consistently higher than in the general population and age matched peers.^{7,8} In a study conducted in the UK, psychiatric morbidity was found in 16% cases, whereas prevalence rate of depression was found to be in the range of 14-24%.⁹ Similarly, in Turkish medical students, this prevalence was calculated to be 21.9%.¹ In another study, 335 undergraduate Chinese medical students were assessed for depressive symptoms and nearly half of them were found to be depressed with 2% having severe depression.⁴ Anxiety and depression were found to be present in 70% and 60% according to two Pakistani studies respectively.^{5,6} Stressors specific to medical school for development of anxiety and depression were information and input overload, financial indebtedness, lack of leisure time and pressure of work and career choices.^{10,11} Associated non-academic risk factors for development of anxiety and depression were female gender,⁷ having family history of depression and anxiety,^{1,5} loss of close relative in past one year⁵ and substance abuse.^{5,12}

The objectives of the study were to determine the frequency of anxiety and depression among medical students of Wah Medical College and their associations with sociodemographic and educational characteristics if any.

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METHODOLOGY

This cross-sectional survey was conducted at Wah Medical College, from September 2007 to March 2008. Medical Students of all academic sessions from 2004-2007, from Wah Medical College were included in the study except for the first year. There were a total of 393 students in the second, third, fourth and final year of MBBS. Students who were present at the time of data collection and who fulfilled the specified selection criteria were explained about the study and procedure of filling the proforma. Informed consent was received by the students at the time of data collection.

Students inducted in the medical college for less than 6 months and those with organic pathology or physical and psychotic illnesses were excluded. Two hundred and eighty five students out of 393 were distributed the questionnaire and after completion of the questionnaire they were referred to Department of Psychiatry for physical and mental state examination, which was conducted by psychiatrist and medical officers in the department. Out of 285, 6 students were excluded from the study because 3 students were found to have physical deficit and were referred to Medical OPD. The other 3 students were found to be suffering from psychotic illnesses. Therefore, 279 students were finally included in the study. A self administered Encounter Form was administered which comprised of socio-demographic and educational variables, Beck Depression Inventory (BDI) and Beck Anxiety Inventory (BAI). Socio-demographic and educational characteristics included age, gender, birth order, number of siblings, residence, monthly income, and monthly expenditure on education, academic performance, stress related to professional examination, past medical and past psychiatric history, family history of psychiatric illness and substance abuse.⁵

Beck Depression Inventory-II (English version)¹⁷ was applied to assess the level of depression in participants. It is a 21-item self-administered instrument, rated on 4-point scale ranging from 0-3. The Beck Depression Inventory has a cut off score of 14, with the range of 14-19 for mild depression, 20-28 for moderate depression and 29-63 for severe depression. Beck Anxiety Inventory was applied to assess the level of anxiety in participants.¹⁸ It is also a 21-item inventory rated on a 4-point scale ranging from 0-3. Beck Anxiety Inventory has a cutoff score of 8, with the range of 8-15 for mild anxiety, 16-25 for moderate anxiety and 26-63 for severe anxiety.

Statistical analysis was done by using SPSS software version 11.0. Descriptive statistics like mean with standard deviation were calculated for variables like age. Frequencies along with percentages were calculated for categorical variables e.g. presence of anxiety and depression amongst medical students based on

screening tests, Beck Depression Inventory and Beck Anxiety Inventory. A chi-square test was applied at 5% level of significance ($\alpha=0.05$) to look for any existing association between sociodemographic and educational characteristics, anxiety and depression. Fisher exact test was applied to look for association if the expected cell count was less than 5 in more than 20% cells.

RESULTS

A total of 279 students were included in the study. The response rate turned out to be 71% and the attrition rate was 29%. Eight six (30.8%) students from the 2nd year, 78 (28%) students from the 3rd year, 62 (22.2%) students from the 4th year and 53 (19%) students from the final year participated in the study. The mean age of the students was 21.4+1.41 years. There were 202 (72.4%) females and 77 (27.6%) males. Depression was present in 98 (35.1%) students and anxiety was present in 133 (47.7%) students. These were found concomitantly in 68 (24.37%) students. Mild symptoms of depression were found in 55 (19.7%) students, moderate in 31 (11.1%) and severe in 12 (4.3%) students. On the other hand, mild anxiety symptoms were present in 77 (27.60%) students, moderate in 38 (13.6%) students and severe in 18 (6.5%) students. Both the symptoms were more common in second year medical students with a 43% frequency of depression and 61.6% for anxiety.

Sociodemographic and educational characteristics looked for any existing association with anxiety and depression respectively, which are mentioned in Table I and II respectively. Anxiety was significantly associated with gender ($p=0.007$), birth order ($p=0.049$), year of study ($p=0.001$), examination criteria dissatisfaction ($p=0.010$) and an overburdened test schedule ($p=0.006$). Depression was found to be significantly associated with age ($p=0.013$), gender ($p=0.016$), being overburdened with test schedule ($p=0.002$) and examination criteria dissatisfaction ($p=0.002$).

DISCUSSION

Anxiety and depression were present concomitantly in 68 (24.37%) of students which corresponds with 20.9%¹³ and 21%⁴ in two other studies. However, this percentage is quite low as compared to the findings of Khan *et al.* (70%) and Inam, *et al.* (60%).^{5,6} The reason might be that in those studies anxiety and depression had a significant association with drug abuse and a family history of psychiatric illness. Another reason might be the difference of instrument used to assess anxiety and depression. Depression was present in 98 (35.1%) of students which is in line with the findings of 39.9% in an Indian study,¹⁵ whereas anxiety symptoms were present in 113 (47.7%) which is contrary to the findings of 66.05 % in the Indian study.¹⁵

Table I: Association of anxiety with potential risk factors.

Factors	Anxiety	No anxiety	p-value
Age			
20 or less	41	32	0.060
More than 20	92	114	
Gender			
Male	27	50	0.007
Female	106	96	
Number of siblings			
None or 1	27	25	0.292
2 or more	100	115	
Birth order			
Youngest	32	25	0.049
Middle	45	36	
Oldest	37	57	
Family type			
Nuclear	104	116	0.372
Combined	27	26	
Monthly income			
Less than PKR 60,000	42	57	0.551
PKR 60,000-100,000	16	22	
Above PKR 100,000	15	13	
Father's profession			
Govt. servant	25	26	0.902
Business man	31	37	
Physician	19	21	
Engineer	14	15	
Teacher	5	7	
Army	3	4	
Private firm	6	2	
Others	26	27	
Monthly expenditure on studies			
PKR 1000-40,999	65	72	0.340
PKR 41,000-50,999	8	6	
Residing in hostel/rented home			
Hostel	63	63	0.788
Rented home	19	21	
Day scholar	51	61	
Year of study			
Second	53	33	0.001
Third	36	42	
Fourth	30	32	
Final	14	39	
Overburdened with test schedule			
Yes	81	66	0.006
No	48	75	
Dissatisfaction with examination criteria			
Yes	65	92	0.010
No	68	53	
Supplementary in exam			
Yes	33	39	0.398
No	100	106	
Stressors			
Educational	36	18	0.478
Social	4	1	
Past psychiatric history			
Yes	4	1	0.163
No	128	141	
Substance abuse			
Yes	5	4	0.455
No	127	138	
Family history of psychiatric illness			
Yes	6	2	0.118
No	126	140	

P-value= Level of significance ≤ 0.05 .

Table II: Association of depression with potential risk factors.

Factors	Depression	Not depressed	p-value
Age			
20 or less	34	39	0.013
More than 20	64	142	
Gender			
Male	19	58	0.016
Female	79	123	
Number of siblings			
None or 1	19	33	0.471
2 or more	75	140	
Birth order			
Youngest	27	30	0.090
Middle	26	55	
Oldest	29	65	
Family type			
Nuclear	80	140	0.437
Combined	18	35	
Monthly income			
Less than PKR 60,000	31	68	0.905
PKR 60,000-100,000	12	26	
Above PKR 100,000	10	18	
Father's profession			
Govt. servant	19	32	0.632
Business man	20	48	
Physician	13	27	
Engineer	12	17	
Teacher	5	7	
Army	2	5	
Private firm	5	3	
Others	16	37	
Monthly expenditure on studies			
PKR 1000-40,999	47	90	0.457
PKR 41,000-50,999	4	10	
Residing in hostel/rented home			
Hostel	44	82	0.921
Rented home	15	25	
Day scholar	38	74	
Year of study			
Second	37	49	0.215
Third	28	50	
Fourth	18	44	
Final	15	38	
Overburdened with test schedule			
Yes	63	84	0.002
No	31	92	
Dissatisfaction with examination criteria			
Yes	43	114	0.002
No	54	67	
Supplementary in exam			
Yes	26	64	0.484
No	72	134	
Stressors			
Educational	27	27	0.210
Social	4	1	
Past psychiatric history			
Yes	3	2	0.234
No	93	176	
Substance abuse			
Yes	4	5	0.391
No	92	173	
Family history of psychiatric illness			
Yes	3	5	0.575
No	93	173	

P-value= Level of significance ≤ 0.05 .

In many studies including this one, the presence of anxiety and depression was higher in 2nd year medical students as compared to 3rd and 4th year medical students.^{5,6,16} The reason might be that stress is associated with a new study environment and greater degree of work load with obligations to succeed.^{5,7,13} A decrease in anxiety symptoms of 3rd and 4th year medical students can be explained by a gradual adaptation to the environment and the study course.

In this study, being 20 years old or less was significantly associated with the level of depressive symptoms. However, this finding can not be supported by other studies as this factor has not been studied. Female gender was significantly correlated with development of anxiety and depression similar to Western studies which reported psychological distress higher among female students.^{1,7} This can be due to the reason that females have a higher percentage of psychiatric illnesses or there was a higher percentage of female students (72.4%) in this sample. Other sociodemographic variables such as number of siblings, family type, father's profession, monthly income, and monthly expenditure on education were also considered, but no association with anxiety and depression was established for them. Similarly, in the Pakistani study, such demographic variables did not affect the prevalence of anxiety and depression.⁶ On the other hand, findings of another study suggest that students with a lower family income and higher level of father's education have higher BDI scores.¹ Birth order has been rarely studied and only one study found no significant association with anxiety and depression among medical students.⁶

As far as academic stressors are concerned, academic performance especially in the First Professional, examination criteria dissatisfaction and being overburdened with test schedule were significantly associated with anxiety, which is the case in a number of other studies as well, suggesting academic stressors as being a source of psychological distress among medical students.^{13,15} The most common sources of stress according to a study conducted in Nepal were staying in a hostel, high parental expectations and a vastness of syllabus and tests/exams,¹³ whereas a study conducted in Pakistan found different stress factors such as drug abuse (40.1%) and family history of depression (28.9%).⁵ On the contrary, in this study only 9 students were found to have a positive drug history and family history respectively.

It is recommended that students should be counselled about stress management techniques and coping skills. The limitations of this study also need to be mentioned. Students who had a record of confirmed mental illness were excluded but a clinical evaluation of every student

was not carried out to exclude mental illness. Data was anonymous, therefore, further work-up on students rating high on the Beck Depression Inventory and Beck Anxiety Inventory could not be carried out. The results of this study cannot be generalized as it was conducted on students of one Medical College only.

CONCLUSION

Anxiety was found in 133 (47.7%) students and depression was found in 98 (35.1%), whereas both were found in 68 (24.37%) of students. Anxiety was significantly associated with female gender, birth order, year of study, examination criteria dissatisfaction and overburdening with test schedule; whereas depression was significantly associated with age, female gender, examination criteria dissatisfaction and overburdening with test schedule. It seems that sociodemographic as well as educational risk factors are significantly associated with anxiety and depression.

REFERENCES

1. Kaya M, Genc M, Kaya B, Pehlivan E. [Prevalence of depressive symptoms, ways of coping, and related factors among medical school and health services higher education students]. *Turk Psikiyatri Derg* 2007; **18**:137-46. Turkish.
2. Dyrbye LN, Thomas MR, Shanafelt TD. Systematic review of depression, anxiety, and other indicators of psychological distress among U.S. and Canadian medical students. *Acad Med* 2006; **81**:354-73.
3. Dyrbye LN, Thomas MR, Shanafelt TD. Medical students distress: causes, consequences, and proposed solutions. *Mayo Clin Proc* 2005; **80**:1613-22.
4. Chan DW. Depressive symptoms and depressed mood among Chinese medical students in Hong Kong. *Compr Psychiatry* 1991; **32**:170-80.
5. Khan MS, Mahmood S, Badshah A, Ali SU, Jamal Y. Prevalence of depression, anxiety and their associated factors among medical students in Karachi, Pakistan. *J Pak Med Assoc* 2006; **56**:583-6.
6. Inam SNB, Saqib A, Alam E. Prevalence of anxiety and depression among medical students of private university. *J Pak Med Assoc* 2003; **53**:44-7.
7. Dahlin M, Joneborg N, Runeson B. Stress and depression among medical students: a cross-sectional study. *Med Educ* 2005; **39**:594-604.
8. Rosenthal JM, Okie S. White coat, mood indigo: depression in medical students. *N Engl J Med* 2005; **353**:1085-8.
9. Dahlin ME, Runeson B. Burnout and psychiatric morbidity among medical students entering clinical training: a three year prospective questionnaire and interview-based study. *BMC Med Educ* 2007; **7**:6.
10. Firth J. Levels and sources of stress in medical students. *Br Med J* 1986; **292**:1177-80.
11. Supe AN. A study of stress in medical students at Seth GS Medical College. *J Postgrad Med* 1998; **44**:1-6.
12. Pickard M, Bates L, Dorian M, Greig H, Saint D. Alcohol and

- drug use in second-year medical students at the University of Leeds. *Med Educ* 2000; **34**:148-50.
13. Sreeramareddy CT, Shankar PR, Binu VS, Mukhopadhyay C, Ray B, Menezes RG. Psychological morbidity, sources of stress and coping strategies among undergraduate medical students of Nepal. *BMC Med Educ* 2007; **7**:26-31.
14. Henning K, Ey S, Shaw D. Perfectionism, the imposter phenomenon and psychological adjustment in medical, dental, nursing and pharmacy students. *Med Educ* 1998; **32**:456-64.
15. Vaidya PM, Mulgaonkar KP. Prevalence of depression, anxiety and stress in undergraduate medical students and its co-relation with their academic performance. *Indian J Occupational Therap* 2007; **39**:7-10.
16. Guthrie EA, Black D, Shaw CM, Hamilton J, Creed FH, Tomenson B. Psychological stress in medical students: a comparison of two very different university courses. *Stress Med* 1997; **13**:179-84.
17. Beck Depression Inventory. [Internet]. 1996 [cited 2008 Jun 1]. Available from: <http://www.cps.nova.edu/~cpphelp/BDI2.html>
18. Beck Anxiety Inventory. [Internet]. 1993 [cited 2008 Jun 1]. Available from: <http://www.cps.nova.edu/~cpphelp/BAI.html>

