ORIGINAL ARTICLE

Level of Anxiety among Undergraduate Students of Major Public Sector Dental and Medical Colleges, Peshawar

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ABSTRACT

OBJECTIVE: To find out the level of anxiety among undergraduate students of major public sector dental and medical colleges in Peshawar

METHODOLOGY: This cross-sectional, descriptive study was conducted in two public sector hospitals, Khyber Medical College and Khyber College of Dentistry Peshawar, before their annual objective structured clinical examination (OSCE) from March to April 2021. Institutional ethical permission was granted through IREB Ethical approval Certificate. Students of MBBS and BDS were included in the study. Students with any psychiatric illness or thyroidal illness taking medications were excluded. Non-probability convenience sampling technique was used for sample collection. A validated and pretested generalized anxiety disorder (GAD) 7 scale was used to measure anxiety. Results were analyzed using SPSS version 20. A P-value of less than 0.05 was considered significant.

RESULTS: Out of 342 students, 333 (223 MBBS and 110 BDS) were enrolled in the study. Nine students were excluded from the study. One hundred and eighty-eight were male, and 145 were female. The mean age was 23.54±1.98 SD years. Nighty six (28.8%) students had minimal anxiety, 100 (30%) had mild anxiety, 75(22.5%) had moderate anxiety, and 62(18.6%) had severe anxiety. There was a significant difference in anxiety levels of both genders (P-value ≤ 0.001). With a cut-off value of ≥10, 138 (41.4%) had a diagnosis of GAD. There was no significant difference in anxiety levels of MBBS and BDS students (P-value 0.073).

CONCLUSION: Generalized anxiety disorder affects a large population of medical students, affecting female students more than males.

KEYWORDS: Anxiety, Prevalence, Medical students, Mental health, Anxiety disorders, GAD Scale

INTRODUCTION

Generalized anxiety disorder (GAD) is one of the most common mental health disorders worldwide, affecting up to 20% of adults worldwide. Excessive, uncontrolled, persistent worrying is the cardinal feature of GAD. Non-specific psychological and physical symptoms often accompany this.[1]

The 12-month prevalence of GAD in the US adult population of 18-64 years is 2.9%, and the lifetime prevalence is 7.7 in females and 4.6% in males. The etiology is not well understood. However, one model believes that people with GAD experience continuous stimulation of brain areas associated with mental activity and thinking the following worry-inducing stimuli.[2]

Medical students are constantly at risk of developing GAD symptoms during their study tenure. The medical profession is considered one of the most demanding, devoting, and academically stressful worldwide. Such demands and stress negatively impact their psychological well-being, academic performance, and learning, pushing them into GAD or depression.[3]

Various studies have been conducted on anxiety and stress among medical students worldwide, reporting different prevalence in different countries.[4] A local study conducted in 2010 reported a prevalence of 47.7% among medical students.[5] Comparing the anxiety prevalence among medical students of different continents, it was found that medical students of the Middle East and Asian origin had a high level of anxiety compared to other continents. High anxiety levels were reported in female medical students compared to male colleagues.[6] However, a study conducted in Nepal in 2020 concluded that there was no significant difference between the anxiety level of BDS and MBBS students.[7]

Several scales are available for the diagnosis and severity assessment of GAD. GAD-7 is a validated and pretested tool for diagnosing and assessing the severity of anxiety. A score of 10 or more has sensitivity and specificity of 89% and 82% for diagnosing GAD. Its scores correlate with more functional disability.[8]

Anxiety and stress are the mainframe factors and may contribute to poor academic performances of medical and dental undergraduates. Limited national studies are available on this topic. This study was conducted to know the level of anxiety of medical/dental students before the annual objective structured clinical examination (OSCE) and whether there is any difference between the anxiety levels of both genders. This study will lay the foundation for the Public Sector Medical Colleges in Khyber Pakhtunkhwa.

METHODOLOGY

This cross-sectional, descriptive study was carried out before the annual OSCE examination (session 2020) of MBBS and BDS Khyber Teaching Hospital Peshawar and Khyber College of Dentistry Peshawar, respectively. The annual OSCE of Medical undergraduates of KMC was conducted from March 25, 2021, to April 02, 2021, while the annual OSCE of dental undergraduates of KCD was conducted from March 08, 2021, to March 13, 2021. The total duration of the study was three weeks. Institutional ethical approval was granted for this research work through the institute's institutional review ethical board (IREB) (IREB/KMC/No: 642/DME/KMC; Dated 01/02/2021). This study took place before their OSCE exam. A total of 342 students (230 students of MBBS and 112 students of BDS) were enrolled. All final year MBBS, 2nd and 3rd year BDS students were included in the study. Students with any psychiatric or thyroidal problems under treatment were excluded from the study. So, based on the above criteria, 7 MBBS students and 2 BDS students were excluded from the study. Non-probability convenience sampling technique was used for sample collection. A preformed questionnaire was distributed among students, and their response was recorded after informed consent. The pilot study performed the questionnaire's content and faced validity earlier. Pretested and pre-validated GAD-7 scale was used to measure medical students' anxiety levels. This scale has four items and seven questions to answer, so the total score is 21 (0= not at all to 3=nearly every day). The student's anxiety levels were labeled as minimal (0-4), mild (5-9), moderate (10-14), and severe (15-21) based on points scored. A cut-off point of 10 or above had a sensitivity and specificity of 89% and 82% for diagnoses of GAD. [8]

All data obtained from the questionnaire were analyzed using SPSS version 20. Basic variables were analyzed using descriptive statistics, and a P-value of <0.05 was considered significant. The results were presented in the form of tables and graphs.

RESULTS

Of 342 students, 333 were included in the study, while nine were excluded. Out of 333 students, 188 were male, and 145 were female. The mean age was 23.54±1.98 SD years.
Out of 333 students, 96(28.8%) had minimal anxiety, 100 (30%) had mild anxiety, 75(22.5%) had moderate anxiety, and 62(18.6%) had severe anxiety (**Table I**).

TABLE I: LEVEL OF ANXIETY AMONG BOTH GENDERS

	Frequency	Percent	Male	Female
Minimal Anxiety 0-4	96	28.8	74 (77%)	22 (23%)
Mild Anxiety 5-9	100	30.0	62 (62%)	38 (38%)
Moderate Anxiety 10-14	75	22.5	31 (41%)	44 (49%)
Severe Anxiety 15-21	62	18.6	21 (34%)	41(66%)
Total	333	100.0		

When we compared the level of anxiety of both genders, females had a high level of anxiety compared to male students on the GAD-7 scale. This difference was statistically significant ($P < 0.001$). (**Table II**)

TABLE II: CORRELATION BETWEEN GAD AND GENDER OF STUDENTS

		GAD	Gender of Student
GAD	Pearson Correlation	1	.332
	Sig. (2-tailed)		**.001**
	N	333	333
Gender of Student	Pearson Correlation	.332	1
	Sig. (2-tailed)	**.001**	
	N	333	333

GAD → Generalized Anxiety Disorder

If we take a cut-off point of 10 or more for the diagnosis of GAD, 138 (41.4%) students had GAD, and there was a statistically significant difference between the anxiety levels of the two genders ($p < 0.001$). There was no significant difference in anxiety levels of MBBS and BDS students (P-value 0.073). (**Table III**)

TABLE III: PREVALENCE OF ANXIETY (CUT-OFF SCORE ≥10)

			Sex of Student		Total	Anxiety Level (F: M)
			Male	Female		
Cut off score	≥10	Count	52	86	138 (41.4%)	p-value < 0.001**
	<10	Count	136	59	195 (58.6%)	
Total		Count	188	145	333	

** P-value < 0.05 is significant.

Table IV is documenting the score of individual components on the GAD-7 scale.

TABLE IV: GAD-7 SCORE OF INDIVIDUAL COMPONENT

		Gender of Students		Total
		Male	**Female**	
Feeling nervous, anxious, or on edge	Not at all	68	18	86
	Several days	72	51	123
	More than half a days	23	29	52
	Nearly every day	25	47	72
Total		**188**	**145**	**333**
Not being able to stop or control worrying	Not at all	74	23	97
	Several days	64	50	114
	More than half a days	24	25	49
	Nearly every day	26	47	73
Total		**188**	**145**	**333**
Worrying too much about different things	Not at all	66	17	83
	Several days	62	47	109
	More than half a days	31	32	63
	Nearly every day	29	49	78
Total		**188**	**145**	**333**
Trouble relaxing	Not at all	86	31	117
	Several days	55	37	92
	More than half a days	26	35	61
	Nearly every day	21	42	63
Total		**188**	**145**	**333**
Being so restless, being hard to sit still	Not at all	122	51	173
	Several days	32	40	72
	More than half a days	21	30	51
	Nearly every day	13	24	37
Total		**188**	**145**	**333**
Becoming easily annoyed or irritable	Not at all	82	26	108
	Several days	60	37	97
	More than half a days	26	38	64
	Nearly every day	20	44	64
Total		**188**	**145**	**333**
Feeling afraid as if something awful might happen	Not at all	74	25	99
	Several days	60	45	105
	More than half a days	25	25	50
	Nearly every day	29	50	79
Total		**188**	**145**	**333**

DISCUSSION

Anxiety is a normal and often healthy emotion. However, when an individual feels disproportionate levels of anxiety, then it becomes a mental health problem.[9] Anxiety disorders are the most common psychiatric disorders reported worldwide.[10] Many patients report anxiety-related symptoms and visit their primary health doctor. Despite the high prevalence, they are still under-recognized and undertreated.[11] Stress is one of the significant causes of anxiety disorders, causing multiple visits to health care facilities.[12] Medical students are considered vulnerable to different types of anxiety disorders because of their tough study schedules, high academic demands, high career devotion, and stress in clinical work in hospital wards.[13,14] Medical students are considered more prone to anxiety disorders than other professions.[15] Fewer studies have been conducted in Pakistan on the prevalence of anxiety disorders among medical students, and two reported 60% and 70% anxiety prevalence.[16,17] We have conducted this study on MBBS and BDS medical students to sort out their level of anxiety before appearing in their annual OSCE examination. We have also compared the anxiety level of both genders to determine whether there is any statistically significant difference between the two.

We enrolled 342 medical students in our study. Nine students were excluded for not fulfilling the inclusion criteria. Of 333 students, 237 (71.2%) had some level of anxiety (mild to severe). If we dissect the levels of anxiety, 100 (30%) had mild anxiety, 75 (22.5%) had moderate anxiety, and 62 (18.6%) had severe anxiety. A local cross-sectional study by Alvi T et al. reported an anxiety prevalence of 47.7% among students of Wah Medical College, which was relatively low compared to our research.[5] With modernization, mental health problems are increasing in severity and number due to several challenges medical students face in their careers; this may be why we reported a high prevalence compared to the above study conducted in 2010. The other reason for low prevalence may be the difference in tools used for assessment.

Inam SNB et al. reported 60% prevalence among the study population of Ziauddin Medical University using the Aga Khan University Anxiety and Depression Scale (AKUADS), while Khan et al. reported 70% anxiety prevalence in his study.[16,17] The results of both studies correlate with our research results. In India, a study reported a 66.9% prevalence of anxiety in undergraduate medical students, nearly correlating with my results.[18] Another Indian study conducted in Bihar in 2020 found that 45.5% of the students were suffering from symptoms of GAD, which is low compared to our research.[19] A study conducted at a Turkish University in 2008 showed a prevalence of 47.1% among medical students.[20] A study conducted in Egypt showed a high prevalence of anxiety (73%) among undergraduate medical students.[21] The results of this study are almost similar to our research. Two studies conducted in Brazil and Great Britain showed a prevalence of 37.2% and 32.2%, respectively.[22,23] Similar low prevalence (34.9%) was reported in a study conducted in Saudi Arabia.[24] A possible explanation could be the low percentage of OSPE/OSCE in summative assessment. The low levels of anxiety in these countries may be multifactorial; well-structured academic syllabus, well conducive educational environment, well socioeconomic status, less prevalent family history of anxiety and depression, less competitive environment, adequate time for nonacademic activities, and less post-graduation job pressure.

In this study, those scoring ≥ 10 (moderate to extremely severe anxiety) were considered to have a diagnosis of anxiety. This cut-off point has a sensitivity and specificity of 89% and 82% in diagnosing GAD.[8] In our study, 138 (41.4%) students scored ≥ 10 and were labelled as students with generalized anxiety disorder. In our study, mild anxiety was present in 30%, moderate anxiety in 22.5%, and severe anxiety in 18.6%. A study conducted in Saudi Arabia in 2019 showed mild anxiety in 36.4%, moderate in 23.8%, and severe in 7.4%.[25] The

results of this study nearly correlate with my research. Local research conducted at Wah Medical College recorded low levels of mild, moderate, and severe anxiety compared to our research.[5]

In our study, females' anxiety level was high compared to males, and this difference was statistically significant (p valve <0.001). In a study in America, female students were twice as anxious as their male colleagues, and this difference was substantial.[26] Two studies conducted abroad compared anxiety levels of both gender, and it was found that females had significantly more anxiety symptoms than males.[25,27] The results of these two studies validate my results. There may be different reasons for this difference. Females may be more sensitive and over report minor issues than males; they may have low self-esteem and lack of competence; they may be more goal-oriented, causing more stress and burden on their minds. Females may have more psychosocial problems and stresses in our dominant male society. Two studies' results revealed no significant difference in the anxiety levels of both genders.[6,19]

We also determined in our study that the stress levels of both MBBS students and BDS students before their examination were similar (p valve 0.073).

Limitation of study
Different institutions have different academic and educational environments, so the prevalence may not be the same as in our study. This study was conducted on a small population of medical students, so it cannot be generalized to all medical students of different institutions. No-random sampling technique is another frame factor of this study, and a large population study with randomization sampling is required to generalize results.

CONCLUSION

Generalized anxiety disorder is a well-recognized mental health problem in medical students affecting more than half of the students. Female medical students are more affected as compared to male colleagues. It is recommended that stress management lectures with the students and psychological counseling, especially during preparation for the exam, so their bright future may not be jeopardized.

Ethical permission: Khyber Medical College Peshawar ERC letter no. 642/DME/KMC, Dated: 01-02-2021.

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DATA SHARING STATEMENT: The data supporting this study's findings are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

AUTHOR CONTRIBUTIONS
Khan Z: Literature review, SPSS work
Khan I: Critical review
Wazir ZM: Compilation of data
Khaliq A: Collection of data
Fida Z: Methodology, Computer data entry
Haider I: Discussion writing

REFERENCES

1. Leonard K, Abramovitch A. Cognitive functions in young adults with generalized anxiety disorder. Eur Psychiatry. 2019; 56 (2): 1-7.
2. Locke AB, Kirst N, Shultz CG. Diagnosis and management of generalized anxiety disorder and panic disorder in adults. Am Fam Physician. 2015; 91(9): 617-24.
3. Wolf T.M. Stress, coping and health: Enhancing well-being during medical school. Med. Educ. 1994; 28: 8–17.
4. Kulsoom B, Afsar NA. Stress, anxiety, and depression among medical students in a multiethnic setting. Neuropsychiatr Dis Treat. 2015;11: 1713-22
5. Alvi T, Assad F, Ramzan M, Khan FA. Depression, Anxiety and Their Associated Factors Among Medical Students. JCPSP 2010; 20(2): 122-6.
6. Quek TT, Tam WW, Tran BX, Zhang M, Zhang Z, Ho CS, et al. The Global Prevalence of Anxiety Among Medical Students: A Meta-Analysis. Int J Environ Res Public Health. 2019;16 (15): 2735.
7. Bali H, Rai V, Khanduri N, Tripathi R, Adhikari K, Sapkota B. Perceived Stress and Stressors among Medical and Dental Students of Bhairhawa, Nepal: A Descriptive Cross-sectional Study. J Nepal Med Assoc. 2020; 58(226): 383-9.
8. Spitzer RL, Kroenke K, Williams JB, Löwe B. A brief measure for assessing generalized anxiety disorder: the GAD-7. Arch Intern Med. 2006;166(10): 1092–7.
9. Grenier S, Desjardins F, Raymond B, Payette MC, Rioux MÈ, Landreville P, et al. Six-month prevalence and correlates of generalized anxiety disorder among primary care patients aged 70 years and above: Results from the ESA-services study. Int J Geriatr Psychiatry. 2019; 34 (2): 315-23.
10. Mosley TH, Perrin SG, Neral SM, Dubbert PM, Grothues CA, Pinto BM. Stress, coping, and well-being among third-year medical students. Academic Medicine. 1994; 69: 765-7.
11. Moreira de Sousa J, Moreira CA, Telles-Correia D. Anxiety, Depression and Academic Performance: A Study Amongst Portuguese Medical Students Versus Non-Medical Students. Acta Med Port. 2018; 31(9): 454-62.
12. Moutinho ILD, Lucchetti ALG, Ezequiel ODS, Lucchetti G. Mental health and quality of life of Brazilian medical students: Incidence, prevalence, and associated factors within two years of follow-up. Psychiatry Res. 2019; 274: 306-12.
13. Aktekin M, Karaman T, Senol YY, Erdem S, Erengin H, Akaydin M. Anxiety, depression and stressful life events among medical students: a prospective study in Antalya, Turkey. Med Educ. 2001; 35(1): 12-7.
14. Mousa OY, Dhamoon MS, Lander S, Dhamoon AS. The MD Blues: Under-Recognized Depression and Anxiety in Medical Trainees. PLoS One. 2016;11(6): e0156554.
15. Mahendran S, Jothipriya A. A comparative study on 2nd-year syndrome among dental, medical, and nursing students. Int J Curr Adv Res. 2017; 6: 2954-7.
16. 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
17. 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.
18. Venkatarao E, Iqbal S, Gupta S. Stress, anxiety & depression among medical undergraduate students & their socio-demographic correlates. Indian J Med Res Suppl. 2015; 141: 354-7.
19. Kumar S, Kumar V, Singh N. Prevalence of Anxiety, Depression and their Associated factor among Medical students in Bihar. Int J of Health and Clinical Res. 2020; 3(12(S): 58–64.

20. Bayram N, Bilgel N. The prevalence and socio-demographic correlations of depression, anxiety, and stress among a group of university students. Soc Psychiatry Psychiatr Epidemiol. 2008; 43(8): 667–72.
21. Fawzy M, Hamed SA. Prevalence of psychological stress, depression and anxiety among medical students in Egypt. Psychiatry Res. 2017; 255: 186–94.
22. Moutinho ILD, De Castro Pecci Maddalena N, Roland RK. Depression, stress, and anxiety in medical students: a cross-sectional comparison between students from different semesters. Rev Assoc Med Bras. 2017; 63(1): 21–8.
23. Firth J. Levels and Sources of Stress in Medical Students. Br Med J. 1986; 292(6529): 1177–80.
24. Ibrahim NKR, Battarjee WF, Almehmadi SA. Prevalence and predictors of irritable bowel syndrome among medical students and interns in King Abdulaziz University, Jeddah. Libyan J Med. 2013; 8(1): 21287
25. Alatawi A , Alghamdi A , Albalwi A , Altayar M , Jalal M , Frah EAM. Prevalence of Generalized Anxiety Disorder (GAD) Among Saudi Medical Students and Associated Risk Factors. IJMRHS. 2020; 5(9): 1-9.
26. Ghodasara SL, Davidson MA, Reich MS, Savoie CV, Rodgers SM. Assessing student mental health at the Vanderbilt University School of Medicine. Acad Med. 2011; 86(1): 116–21.
27. Bassols AM, Okabayashi LS, da Silva AB. First- and last-year medical students: is there a difference in the prevalence and intensity of anxiety and depressive symptoms? Rev Bras Psiquiatr. 2014; 36(3): 233-40.