Original article

Prevalence of obsessive compulsive disorder among first year medical students in Sylhet division

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Summary

Obsessive-compulsive disorder (OCD) is a chronic psychiatric disorder. High prevalence of emotional suffering and common mental disorders had been reported among medical students. The academic demands, increased responsibility, competition and lack of leisure time may lead to increased stress and anxiety. There is an immense scarcity of information about this common distressing and disabling disorder in Bangladeshi context. The objective of this study was to determine the prevalence of OCD among 1st year medical students in Sylhet division and find out other correlates. This was a cross sectional study done from 1st March 2022 to 31st January 2023 where 563 students were consecutively selected as sample; among which 546 retained as sample. A predesigned semi structured questionnaire, Obsessive-Compulsive Inventory - Revised (OCI-R), Yale-Brown Obsessive Compulsive Scale Bangla (Y-BOCS); Depression, anxiety and stress scale 21 (DASS-21) and Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) were used as tools. The results showed that, majority of the participants were female, from government medical college, came from overprotective family and 42% of students never heard of OCD. Obsessive-compulsive symptoms (OCS) was present in 280 (51.28%) and OCD was present among 84 (15.38%) students. Seventy five percent of them had mild to moderate symptom severity. An independent samples t-test was used to compare the mean OCI-R score across categorical variables. The t-test was statistically significant for family history of psychiatric illness and those with over protective family. OCS was significantly associated with anxiety, depression and stress and those with positive OCS had higher level of anxiety, depression and stress than those with negative OCS (22% versus 7%; 28% versus 9.2% and 10.4% versus 1.8%). In OCS subscale, ordering (n=51, 20.2%) was most common followed by obsessing (n=50, 19.8%), checking (n=24, 9.5%), hoarding (n=18, 7.1%), washing (n=12, 4.7%) and neutralizing (n=10, 4%). OCD was significantly associated with family history of psychiatric illness (÷2: 21.146; p<0.001) and over protective family (÷2: 19.742; p<0.001). Merit score was not related with DASS-21 score or OCI-R score but a significant correlation was noted between OCI-R and DASS-21 score. Findings of this study hopefully would ensure periodic follow-up of student's mental health and overall mental health promotion in the community.

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Introduction

Obsessive-compulsive disorder (OCD) is a chronic psychiatric disorder. It is one of the top 10 medical disorders that disable people globally, according to World Health Organization (WHO).[1] Obsessions and compulsions are two of its facets. An undesirable intrusive idea, doubt, picture or impulse that keeps

coming to mind is known as an obsession. Obsessions are ego-dystonic; being discordant with the one's views, and thus causing distress. The person frequently views the interruptions as absurd and exaggerated and makes an effort to resist them. Compulsions are recurring actions or thoughts that a person feels compelled to carry out as a result of an obsession or in accordance with strict rules that must be followed. They are almost often unintentional and resistance is rare.[2] As per studies, OCD is the fourth most common mental illness globally.[3] OCD affects 1-2% of youth and 1% of adults.[4-7] A meta-analysis in 2020 revealed, OCD has a lifetime prevalence of 1.5% for women and 1.0% for men.[8] Concerns about contamination along with washing or cleaning, worries about harming oneself or others alongside checking, intrusive aggressive or sexual thoughts along with mental rituals, and worries about symmetry together with ordering or counting are common sets of obsessions and compulsions in OCD patients.[9,10] Obsessions involving dirt and contamination have been demonstrated to predominate in Bangladesh's early and late-onset OCD, followed by obsessions with religion and sexuality.[11]

Most of OCD cases manifest in adolescence and early adulthood. The age of 20 was used as the cutoff point between the populations; those under 20 were from the early-onset group, while people beyond 20 were from the late-onset group.[12] Although both hereditary and environmental variables play a significant influence, the exact etiology that underpins OCD development is yet unknown. Twin studies, which found a genetic contribution of 45–65% in studies on children and 27–47% in investigations on adults, provide substantial evidence for the heritability of OCD. Stress has a notable impact on the cortico-striato-thalamic pathway among environmental factors. Data from functional magnetic resonance imaging (fMRI) and positron emission tomography (PET) scan showed that OCD patients' cortico-striato-thalamo-cortical circuits had elevated metabolic activity and blood flow comparable to findings during chronic stress.[13]

At least 25 to 60 percent of OCD patients described significant life experiences (most being stressful), in relation to the beginning of their OCD, emphasizing the role of stress in initiating OCD.[14] OCD with co morbidity was shown to be common in children and adolescents in a research conducted in Bangladesh.[15] Individuals with OCD might also have co-occurring mental health issues such depression, drug abuse, eating disorders, post-traumatic stress disorder, anxiety disorders and suicidal ideation.[16-18] It had been noted that medical students had a high level of emotional distress and mental disorders. Stress and anxiety might increase due to academic obligations, increasing responsibilities, competitiveness, and a lack of free time.[19] Also, compared to their counterparts of the same age, medical students reported higher levels of psychological distress.[20-25] While mild stress might improve academic performance, excessive stress among medical students had been linked to depression, burn out and somatic complaints.[17,26-29] Undergraduate medical students were more likely to develop OCD owing to the stressful nature of medical school as part of the heavy curriculum, less free time, and being taught, trained, and expected to be more accurate, perfect and obsessive. OCD, on the other hand, could have a negative impact on academic achievement, overall well-being, social engagement and suicide ideation. Issues that, if not identified and treated early, could have a significant impact on one's life.[3,30-32] Moreover, anxiety symptoms in general, and obsessive-compulsive symptoms (OCS) in particular, had been linked to the increasing responsibilities and high academic expectations of medical school. The presence of OCS considerably added to higher stress and made the adaption process more difficult for medical students.[32] OCD is a common but still undiagnosed psychiatric disorder among people, and that only a small portion of patients receive adequate treatment. There was an immense scarcity of information about this common distressing and disabling disorder in Bangladeshi context. Medical students being future doctors needed early assessment and intervention both to help them to overcome the issue which might go unnoticed otherwise and also to minimize impact of future stress of medical life upon mental health. So the study was aimed to determine the prevalence of OCD among 1st year medical students in Sylhet division and find out other correlates.

Materials and methods

This is a cross sectional study conducted from 1st March 2022 to 31st January 2023 in all the private and government medical colleges in Sylhet. Study population were 1st year medical students of these medical colleges from which consecutive sampling technique were used to draw sample. Foreign medical students, those not in attendance and students unwilling to participate were excluded from the study. Among 563 students, 546 were retained as sample. Students filled up pre designed, pretested semi structured questionnaire including socio-demographic and other related variables. They also filled up Obsessive-Compulsive Inventory - Revised (OCI-R) Bangla; Yale-Brown Obsessive Compulsive Scale Bangla (Y-BOCS); Depression, anxiety and stress scale (DASS-21) Bangla and those who were screened positive filled up questionnaire that could detect OCD using Diagnostic and Statistical Manual of

Mental Disorders, Fifth Edition (DSM-5) criteria. Obsessive Compulsive Inventory - Revised (OCI-R), which was one of the most popular self-rated tool to screen and asses OCD was translated by one of the authors and applied in this study after pre-testing on 30 medical students. All the tools above also went through rigorous pretesting prior administration. The OCI-R is a self-reporting measure to assess the distress associated with obsessions and compulsions in both clinical and non-clinical samples. The OCI-R consists of 18 items equally divided into those 6 subscales; washing, checking, obsessing, neutralizing, ordering, and hoarding. Participants rate the degree to which they were bothered or distressed by the OCD symptoms in the past month on a 5-point scale from 0 (not at all) to 4 (extremely). The total score ranges from 0-72, and each subscale score ranges from 0-12. Mean scores were calculated for each of the subscales, and an overall mean 'distress' score was provided (rounded to 2 decimal places). Each score was presented as a mean out of a possible maximum of '4'. A total score of 18 or more, or a mean score of 2.5 or more in any of the subscales suggested the presence of OCD, but was not diagnostic. As described by authors of the scale to increase specificity and sensitivity, a cut-off score 21 was used in this study. The OCI-R both the English and other originally translated OCI-R language versions had proven satisfactory psychometric properties. Yale Brown obsessive compulsive scale (Y-BOCS) was used to measure severity of OCD. A previously validated and standardized survey instrument, Depression Anxiety Stress Scale (DASS 21) Bangla version, was used to collect information on depression, anxiety, and stress. The data were analyzed using Statistical Package for the Social Sciences (SPSS) 25. Descriptive statistics were expressed as frequency and percentages and chi-square test were carried out to find association between qualitative variables. Student-t test was used to compare means and correlation was assessed by Pearson Co-relation co-efficient.

Results

In total 546 students were consecutively selected as sample. The results showed that majority (54.4%) were from government medical colleges. Most (n=338, 62%) of them were female, came from nuclear family (n=437, 80%) of urban area (n=403, 73.8%) and currently residing in government hostel (n=249, 45.6%). Nine (1.6%) reported illicit drug intake, 47 (8.6%) reported of positive family history of a psychiatric illness and 26.7% perceived their family as overprotective (Table 1). According to the previous knowledge of OCD, 41.4% (n=226) students never heard of OCD (Figure 1).

Table 1: Socio-demographic variables of the students (n-546)

Variables	Frequency	Percentage
Sex		
Male	208	38.0
Female	338	62.0
Habitant		
Urban	403	73.8
Rural	143	26.2
Residential place		
Government hostel	249	45.6
Private hostel	120	22.0
Own home	147	26.9
Others	30	5.5
Family type		
Nuclear	437	80.0
Joint	109	20.0
Illicit drug intake		
Yes	9	1.6
No	537	98.4
Family history of psychiatric illness		
Yes	47	8.6
No	499	91.4
Overprotective family		
Yes	146	26.7
No	400	73.3
Facility		
Government	297	54.4
Private	249	45.6
Merit score (mean±SD)	69.17±10.48	

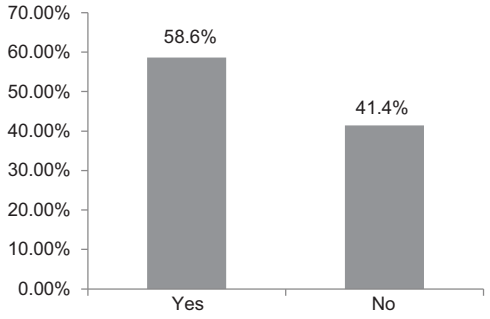

Figure 1: Previous knowledge of students regarding OCD (n=546)

After applying OCI-R, OCS was present in 280 (51.28%) students. DSM-5 application revealed OCD was present among 84 (15.38%) students (Figure 2).

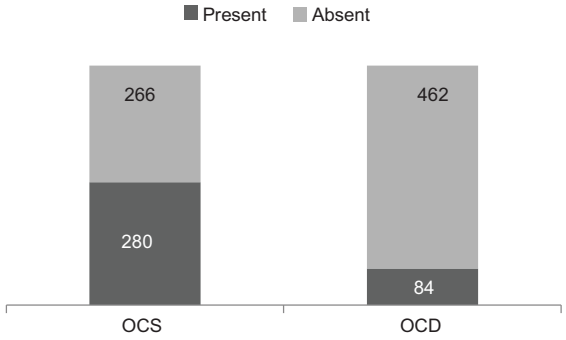

Figure 2: Prevalence of OCS and OCD in 1st year medical college students (n-546)

Most of the participants had mild to moderate symptom severity (n=63, 75%). Majority were from government medical colleges (n=154, 51.85%). Presence of OCD was also more among government than private medical colleges (n=53, 17.84% versus n=32, 12.85%) (Figure 3).

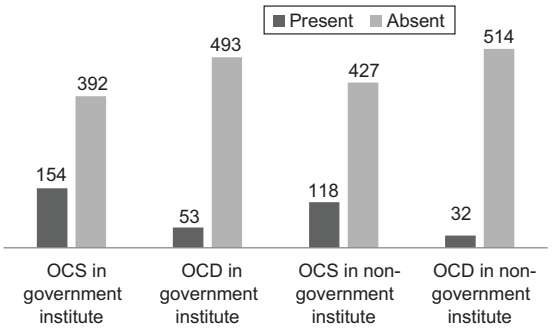

Figure 3: Prevalence of OCS and OCD in government and private medical colleges (n=546)

An independent samples t-test was used to compare the mean OCI-R score across categorical variables. The t-test was statistically significant for family history of psychiatric illness; with mean OCI-R score of positive family history of psychiatric illness (mean=24.81, SD=13.04), was significantly higher (mean difference 5.2909, 95% CI [.823, 9.760]), than those who did not have positive family history (mean=18.55, SD=11.26), t (248)=3.590, p<0.05. Significant effect was also noted, as those with over protective family has mean OCI-R score (mean=24.28, SD=11.58) higher (mean difference 6.986, 95% CI [3.690, 10.280]), than who did not have over protective family (mean=17.23, SD=10.98), t (250)=4.175, p< 0.001. No significant effect was noted between means of other variables (Table-2).

OCS was significantly associated with anxiety, depression and stress and those with positive OCS had higher level of anxiety, depression and stress than those with negative OCS (22% versus 7%; 28% versus 9.2% and 10.4% versus 1.8%) (Table-3).

In OCS subscale, ordering (n=119, 21.5%) was most common followed by obsessing (n=99, 17.9%), checking (n=52, 9.4%), hoarding (n=32, 5.8%), washing (n=25, 4.5%) and neutralizing (n=21, 3.8%) (Figure 4).

Merit score was not related with DASS-21 score or OCI-R score but a significant correlation was noted between OCI-R and DASS-21 score (Table-4). OCD was significantly associated with family history of psychiatric illness (÷2: 21.146; p<0.001) and over protective family (χ2: 19.742; p<0.001) (Table-5).

Table 2: Mean difference of OCI-R score between categorical variables (n=546)

Variables	Category	Number	Mean	SD	t
Sex	Male	208	20.25	11.38	1.897
	Female	338	18.32	11.58	
Habitant	Urban	403	19.33	11.85	.936
	Rural	143	18.28	10.58	
Family history of psychiatric illness	Yes	47	24.81	13.04	3.590**
	No	496	18.55	11.26	
Family type	Nuclear	437	19.27	11.85	.863
	Joint	109	18.21	10.18	
Illicit drug intake	Yes	9	17.89	9.78	-.308
	No	536	19.09	11.57	
Overprotective family	Yes	146	24.08	11.58	6.360**
	No	399	17.23	10.98	

Table 3: Anxiety, depression and stress in students with or without OCS (n=546)

	OCS		Non OCS		χ^2	p
	Yes	No	Yes	No		
Depression	120 (22%)	426 (78%)	38 (7%)	508 (93%)	55.307	.000
Anxiety	153 (28%)	393 (72%)	50 (9.2%)	496 (90.8%)	71.646	.000
Stress	57 (10.4%)	489 (89.6%)	10 (1.8%)	536 (96.9%)	35.965	.000

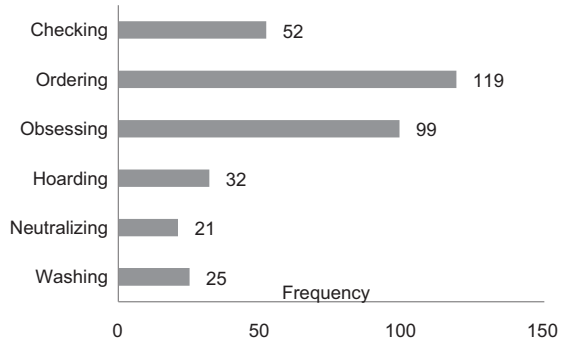

Figure 4: Frequency of OCI-R positive subscales (n-280)

Table 4: Correlation between merit score, DASS-21 and OCI-R (n=546)

	Merit score	DASS 21 score	OCI-R score
r	1-	.008	-.027
	.027	.612*	1
Significance		.848	.522
	.522	.000*	

Table 5: Socio-demographic data and their association with OCD (n=546)

Variables (n)	OCD		χ^2	p value
	Yes	No		
Sex				
Male	33	175	.060	.807
Female	51	287		
Habitant				
Urban	63	340	.073	.787
Rural	21	122		
Residential place				
Gov. hostel	44	205		
Private hostel	18	102	3.122	.373
Own home	20	127		
Others	02	28		
Household composition				
Nuclear	71	366	1.251	.263
Joint	13	96		
Illicit drug intake				
Yes	2	7	.508	.776
No	82	457		
Family history of psychiatric illness				
Yes	18	29	21.146	.000*
No	66	433		
Overprotective family				
Yes	39	107	19.742	.000*
No	45	355		

* Indicated p<o.o5

Discussion

In our study, majority of respondents were female. This could be attributed to more female students enrolling into medical school than male counterparts replicated in other studies.[33] Hence, in clinical sample male female ratio affected OCD by OCD is close to 1; gender difference might not cause such difference in result outcome.[34] In current study, OCS was found in 51.28%. This finding was higher than expected but similar rate was reported in Iraq[35] but lower rate had been reported in Nigeria,[36] Saudi Arabia[19] and Brazil.[32] Prevalence of OCD was 15.38%. Very few study persists on OCD prevalence in medical students, but Sultan et al., reported rate of about 5.06%.[19] Like other psychopathologies reported by others, medical students of Bangladesh seemed more vulnerable than others in developing OCS and subsequent OCD than students from other countries.[37] Around 42% students never heard of OCD which was a reflection

of poor knowledge of and attitude towards mental health in Bangladesh.[38] Students on similar level of education showed much better knowledge on psychiatry.[39] Majority of students had mild symptoms which had been a consistent theme in most of studies focusing on medical students.[19,32,36] Both presence of OCS and OCD was significantly associated with family history of psychiatric disorders and overprotective family. Overprotection was associated with neuroticism, anxiety, interpersonal dependency;[40] so it was no wonder that its association with OCD had been established in other studies.[41] Genetic linkage was also an established risk factor which had been replicated in other studies as well although there had been studies where family history of psychiatric illness was not significantly associated with OCD.[13,35] Students more commonly had ordering followed by obsessing subscale positive. Similar results had been found in other studies as well.[18,32,35]

Depression, anxiety and stress were significantly higher in those with OCS than those without it. Similar report had been replicated in various other studies as well.[19,32,36,42] Medical students already suffered more stressors than their contemporaries of other discipline due to excessive workload, difficulties with studying and time management, conflicts in work-life balance and relationships, medical school peer relations, health concerns, and financial stressors.[43] A disease like OCD and their associated symptoms could make life of a student unbearable with added cost concern, illness perspective and academic failure.[44,45] There was a non-significant negative weak relation was found between total merit score with OCI-R mean score. This was a unique attempt to identify whether OCD or obsessional symptoms were in fact more among those with higher intelligence. According to a meta-analysis that was performed to quantitatively summarize the research on intelligence quotient (IQ) in OCD, mean IQ scores across OCD samples were in the normal range. They came to the conclusion that, while lower than controls, OCD was related with normative Full Scale IQ (FSIQ) and Verbal IQ (VIQ), as well as relatively lower Performance IQ (PIQ).[46]

This large scale study was first of its kind to detect OCD in medical students not in Bangladesh but also in around the world where large sample size and consecutive sampling technique had ensured generalizability of its findings. This study had looked into so much aspect related to OCD: demography, knowledge, severity, obsessive symptoms, dimensions, depression anxiety stress associated with such symptoms, merit score association; which was unique for any such related study in the World. But the tool to screen OCD which was one of the most popular and accepted tool to screen OCD was translated by researchers but not went through rigorous cross cultural adaptation and Validation process which could produce poor understanding as well as subsequent misconstrue responses. Furthermore, OCD was confirmed not by one to one basis but via their own responses which included DSM-5 criteria questionnaire. Researchers pretested and assessed whether students from similar background provide misconstrue answers and their response was satisfactory.

Conclusion

Majority of students showed poor knowledge regarding mental health which was a reflection of lack of knowledge regarding mental health in community. Thus mental health promotion might help with prompt identification and early treatment of mental illness. As these students had not yet faced with challenges of medical school but still had high level of psychopathology, this indicated students from their high school years should undergo periodic mental health screening and training to build mental resilience.

References

1. Murray CJ, Lopez AD. The Global Burden of Disease: A Comprehensive Assessment of Mortality and Disability from Diseases, Injuries and Risk Factors in 1990 and Projected to 2020. IRIS 1996;1:41.
2. American Psychiatric Association. Diagnostic and statistical manual of mental disorders. 5th ed. Arlington, VA: American Psychiatric Association; 2013.
3. Ansari E, Mishra S, Tripathi A, Kar SK, Dalal PK. Cross-sectional study of internalised stigma and medication adherence in patients with obsessive compulsive disorder. GPSYCH 2020;33(2):1-7.
4. Geller DA. Obsessive-Compulsive and Spectrum Disorders in Children and Adolescents. Psychiatr Clin North Am 2006;29(2):353-70.
5. Zohar AH. The epidemiology of obsessive-compulsive disorder in children and adolescents. Child Adolesc Psychiatr Clin N Am 1999;8(3):445-60.
6. Crino R, Slade T, Andrews G. The changing prevalence and severity of obsessive-compulsive disorder criteria from DSM-III to DSM-IV. Am J Psychiatry 2005;162(5):876-82.
7. Subramaniam M, Abdin E, Vaingankar JA, Chong SA. Obsessive-compulsive disorder: Prevalence, correlates, help-seeking and quality of life in a multiracial Asian population. Soc Psychiatry Psychiatr Epidemiol 2012;47(12):2035-43.
8. Fawcett EJ, Power H, Fawcett JM. Women are at greater risk of OCD than men: A meta-analytic review of OCD prevalence worldwide. J Clin Psychiatry 2020;81(4).
9. Bloch MH, Landeros-Weisenberger A, Rosario MC, Pittenger C, Leckman JF. Meta-analysis of the symptom structure of obsessive-compulsive disorder. Am J Psychiatry 2008;165(12):1532-42.
10. Mataix-Cols D, Do Rosario-Campos MC, Leckman JF. A multidimensional model of obsessive-compulsive disorder. Am J Psychiatry 2005;162(2):228-38.

11. Algin S, Arafat SMY, Kushal SA, Ahmed SN, Sajib MWH. Variation in obsessive-compulsive symptoms between children and adults. Bangabandhu Sheikh Mujib Med Univ J 2018;11(2):130.
12. Anholt GE, Aderka IM, van Balkom AJLM, Smit JH, Schruers K, van der Wee, et al. Age of onset in obsessive-compulsive disorder: Admixture analysis with a large sample. Psychol Med 2014;44(1):185-94.
13. Pauls DL, Abramovitch A, Rauch SL, Geller DA. Obsessive-compulsive disorder: An integrative genetic and neurobiological perspective. Nat Rev Neurosci 2014;15(6):410-24.
14. Rosso G, Albert U, Asinari GF, Bogetto F, Maina G. Stressful life events and obsessive-compulsive disorder: Clinical features and symptom dimensions. Psychiatry Res 2012;197(3):259-64.
15. Chowdhury MHR, Mullick MSI, Arafat SMY. Clinical Profile and Comorbidity of Obsessive-Compulsive Disorder among Children and Adolescents: A Cross-Sectional Observation in Bangladesh. Psychiatry J 2016;2016:9029630.
16. Fenske JN, Petersen K, Medical M, Arbor A. Obsessive-Compulsive Disorder: Diagnosis and Management. ResearchGate 2015.
17. Huz I, Nyer M, Dickson C, Farabaugh A, Alpert J, Fava M, et al. Obsessive-Compulsive Symptoms as a Risk Factor for Suicidality in U.S. College Students. J Adolesc Health 2016;58(4):481-4.
18. Jaisoorya TS, Janardhan Reddy YC, Nair BS, Rani A, Menon PG, Revamma M, et al. Prevalence and correlates of obsessive-compulsive disorder and subthreshold obsessive-compulsive disorder among college students in Kerala, India. Indian Journal of Psychiatry 2017;59(1):56-62.
19. Sultan S, Fallata EO, Bashar MDA, Olaqi EE, Alsharif GH, BinSaleh RA, et al. Prevalence, sociodemographic and academic correlates of obsessive-compulsive disorder in the students of college of applied medical sciences, Umm Al-Qura university. J Obs Compuls Relat Disord 2021;28(1):100604.
20. Dyrbye LN, Thomas MR, Shanafelt TD. (2006). Systematic review of depression, anxiety, and other indicators of psychological distress among U.S. and Canadian medical students. Acad Med 2006;81(4):354-73.
21. Dyrbye LN, Thomas MR, Huntington JL, Lawson KL, Novotny PJ, Sloan JA, et al. Personal life events and medical student burnout: A multicenter study. Acad Med 2006;81(4):374-84.
22. Dyrbye LN, Harper ., Durning SJ, Moutier C, Thomas MR, Massie FS, et al. Patterns of distress in US medical students. Med Teach 2011;33(10):834-9.
23. Dyrbye LN, West CP, Satele D, Boone S, Tan L, Sloan J, et al. Burnout among u.s. medical students, residents, and early career physicians relative to the general u.s. population. Acad Med 2014;89(3):443-51.
24. 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):116-1-21.
25. Hirschtritt ME, Bloch MH, Mathews CA. Obsessive-compulsive disorder advances in diagnosis and treatment. J Am Med Assoc 2017;317(13):1358-67.
26. Toews JA, Lockyer JM, Dobson DJ, Simpson E, Brownell AK, Brenneis F, et al. Analysis of stress levels among medical students, residents, and graduate students at four Canadian schools of medicine. Acad Med 1997;72(11):997-1002.
27. Stecker, T. (2004). Well-being in an academic environment. Medical Education, 38(5), 465–478.
28. Santen SA, Holt DB, Kemp JD, Hemphill RR. Burnout in medical students: Examining the prevalence and associated factors. South Med J 2010;103(8):758-63.
29. Mosley TH, Perrin SG, Neral SM, Dubbert PM, Grothues CA, Pinto BM. Stress, Coping, and Well-being among Third-year Medical Students Acad Med 1994;69(9):765-7.
30. El-Gilany AH, Amro M, Eladawi N, Khalil M. Mental health status of medical students a single faculty study in Egypt. J Nerv Ment Dis 2019;207(5):348-54.
31. Huang J, Nigatu YT, Smail-Crevier R, Zhang X, Wang J. Interventions for common mental health problems among university and college students: A systematic review and meta-analysis of randomized controlled trials. J Psychiatr Res 2018;107:1-10.
32. Torres AR, Cruz BL, Vicentini HC, Lima MCP, Ramos-Cerqueira ATA. Obsessive-Compulsive Symptoms in Medical Students: Prevalence, Severity, and Correlates. Acad Psychiatry 2016;40(1):46-54.
33. Snyder A, Xiang D, Smith A, Esswein S, Toubat O, Di Capua J, et al. Gender disparities among medical students choosing to pursue careers in medical research: a secondary cross-sectional cohort analysis. BMC Med Educ 2021;21(1):1-10.
34. Lochner C, Stein DJ. Gender in obsessive-compulsive disorder and obsessive-compulsive spectrum disorders. Arch Womens Ment Health 2001;4(1):19-26.
35. Taher TMJ, Al-fadhul SAL, Abutiheen AA, Ghazi HF, Abood NS. Prevalence of obsessive-compulsive disorder (OCD) among Iraqi undergraduate medical students in time of COVID-19 pandemic. MEC Psych 2021;28(1).
36. Opakunle T, Aloba O, Opakunle O, Oyewole A, Osokoya O. Prevalence and correlates of obsessive–compulsive symptoms in a sample of undergraduate clinical medical students in Osogbo, Southwestern Nigeria. Niger J Health Sci 2017;17(2);66.
37. Alim SAHM, Rabbani MG, Karim E, Mullick MSI, Mamun AAl, Fariduzzaman, et al. Assessment of depression, anxiety and stress among first year MBBS students of a public medical college, Bangladesh. Bang J Psychiatry 2017;29(1):23-9.
38. Sarker MR., Khan MZR, Jahan N, Maruf MM, Chowdhury MWA, Hamid MA, et al. Attitudes towards psychiatry among undergraduate medical students. Bang J Psychiatry 2017;28(2):45-9.

39. Kihumuro RB, Kaggwa MM, Kintu TM, Nakandi RM, Muwanga DR, Muganzi DJ, et al. Knowledge, attitude and perceptions of medical students towards mental health in a university in Uganda. BMC Med Educ 2022;22(1):1-9.

40. Odenweller KG, Booth-Butterfield M, Weber K. Investigating Helicopter Parenting, Family Environments, and Relational Outcomes for Millennials. Commun Stud 2014;65(4):407-25.

41. Yoshida T, Taga C, Matsumoto Y, Fukui K. Paternal overprotection in obsessive-compulsive disorder and depression with obsessive traits. Psychiatry Clin Neurosci 2005;59(5):533-8.

42. Alvi T, Assad F, Ramzan M, Khan FA. Depression, anxiety and their associated factors among medical students. *J Coll Physicians Surg Pak* 2010;20(2):122-6.

43. Hill MR, Goicochea S, Merlo LJ. In their own words: stressors facing medical students in the millennial generation. Med Educ Online 2018;23(1).

44. Yang W, Tang Z, Wang X, Ma X, Cheng Y, Wang B, et al. The cost of obsessive-compulsive disorder (OCD) in China: a multi-center cross-sectional survey based on hospitals. GPSYCH 2021;34(6).

45. Pedley R, Bee P, Wearden A, Berry K. Illness perceptions in people with obsessive-compulsive disorder; A qualitative study. PLoS ONE 2019;14(3):1-25.

46. Abramovitch A, Anholt G, Raveh-Gottfried S, Hamo N, Abramowitz JS. Meta-Analysis of Intelligence Quotient (IQ) in Obsessive-Compulsive Disorder. Neuropsychol Rev 2018;28(1):111-20.