Depression and stress levels of medical students: A public-private comparative study of Barisal, Bangladesh

Dr. Mohammad Abdul Aleem[1], Dr. Nusrat Mostafa Nourin[2], Dr. Tamanna Mahfuza Tarin[3], Dr. Silvia Rushni[4], Nusrat Jahan Deepa[5*]

1. *Dr. Mohammad Abdul Aleem, American International University, Dhaka- 1229, Bangladesh, Cell: +8801711474068, Email: dr.aleem.bd@gmail.com*
2. *Dr. Nusrat Mostafa Nourin, American International University, Dhaka- 1229, Bangladesh,*
3. *Dr. Tamanna Mahfuza Tarin, American International University, Dhaka- 1229, Bangladesh*
4. *Dr. Silvia Rushni, American International University, Dhaka- 1229, Bangladesh*
5. *Nusrat Jahan Deepa, American International University, Dhaka- 1229, Bangladesh.*
*Corresponding author: Dr. Mohammad Abdul Aleem
American International University, Dhaka- 1229, Bangladesh

Abstract
Background: *In low-resource settings like Bangladesh, limited research exists on the mental health of undergraduate medical students, who experience more stress due to their academic curriculum than students in other faculties. This study examined depression and stress prevalence among medical students in public and private institutions, exploring factors influencing these mental health outcomes.*
Method: *This descriptive cross-sectional study included 784 medical students from public(n=392) and private (n=392) institutes. The validated instruments - the Beck Depression Inventory (BDI-II) and the Perceived Stress Scale (PSS-10) was used to evaluate prevalence and severity depression and stress respectively.*
Result: *The mean PSS-10 score was 19.4± 5.8 (SD) and 21.6 ±3.4 (SD) in public and private medical school respectively. Majority of the medical student reported a moderate amount of stress in both public (75%) and private (94.4%) medical school. The mean BDI-II score was 17.3 ±10.6(SD) and 28.6± 10(SD) in public and private medical school respectively. Majority of the public medical student had minimal depression (41%) whereas private medical student had severe depression (53%). BDI-II score, PSS score and severity of stress and depression was significantly different between private and public medical school students (p<0.001). Furthermore, factors like age, gender, years of medical school, and phase of study were associated with depression level (p<0.001).*
Conclusion: *The study underscores the necessity for specific interventions to tackle mental health issues among medical students, especially those in private institutions. These results provide nuanced insights into mental health variations within medical education, guiding future research and policy initiatives.*
Keywords: *depression, stress, health research, medical education, Bangladesh*

I. Introduction

Medical education constitutes a challenging and intensive expedition, cultivating future healthcare practitioners to deliver proficient and empathetic patient care [1-9]. This journey entails a thorough curriculum, immersive clinical encounters, and specialized training, arming students with the crucial knowledge and competencies essential for their prospective roles [10,11]. Studies have consistently demonstrated that well-structured medical education programs contributes significantly to enhanced clinical decision-making, diagnostic accuracy, and patient safety [12]. Furthermore, effective medical education fosters ethical and compassionate patient care, aligning seamlessly with the fundamental principles of medical professionalism [13]. While pursuing medical education, students encounter various stressors arising from academic, personal, social, emotional, physical, and family factors [14,15]. The journey of becoming a doctor involves multiple psychological transitions, the combination of high academic expectations, long hours, and the emotional intensity of patient care responsibilities creates a challenging environment, placing medical students and trainees at an increased risk of developing depressive symptoms and stress [13-15].

While education is typically considered a safeguard for mental health, the university years often coincide with high-risk life stages and introduce their own stressors [16]. Upon transitioning from high school to university, students face the challenge of leaving their homes, bringing with them hopes and expectations that

---

may be unrealistic in the face of adapting to a new environment [17]. This transformative period involves not only bring about physical changes but also the expectation to meet new social and academic demands, requiring students to take greater personal responsibility for their well-being. Medical education is usually perceived as being stressful. The stress encountered by medical student's initiates early in the training process [13]. While a certain level of stress is acknowledged as a typical aspect of medical training and can serve as a source of motivation for some, not all students perceive the stress as manageable [11-16].

Depression, significantly impacts an individual's emotions, thoughts, and actions which is often characterized by prolonged periods of low mood or diminished interest in activities [18,19]. Unipolar depression is the number one cause of the Global Burden of Disease among young people aged 10-24 worldwide [20], and approximately three-quarters of first time mental health diagnoses are made by age 25 [21]. Medical students are reported to have a higher prevalence of depressive symptoms compared to peers in other disciplines.[18]Additionally, stress, a natural response to challenging situations, is inherent in medical education but can lead to adverse effects when chronic or excessive, such as burnout [19-21]. The sources of stress in medical education are diverse, including academic pressures, patient care responsibilities, and high-stakes examinations. These stressors not only affect the mental well-being of medical students but also have implications for patient care and learning outcomes. Beyond individual consequences, depression in medical students has been associated with unprofessional conduct, emphasizing the intricate relationship between mental health and the cultivation of medical professionalism. The demanding nature of medical education, marked by a heavy academic workload, long hours, sleep deprivation, and emotional stress from patient care, contributes to the development of depression in medical students [22,23]. Moreover, Stress has the potential to evoke emotions such as fear, incompetence, uselessness, anger, and guilt, and has been linked to the development of both psychological and physical disorders [22.23].

In Bangladesh, the duration of the undergraduate medical education program is notably longer, consisting of a 5-year course plus a 1-year internship, compared to the typical 4-year duration of other bachelor degrees [24]. This extended duration is identified as a potential factor contributing to the development of depression and anxiety [25]. Alarmingly, there have been instances of suicide among Bangladeshi medical students [26]. A study in Bangladesh has examined stress prevalence among public and private medical students and reported than more than half of the undergraduate medical students were suffering from academic stress [27]. Therefore, it is crucial for an educational institution to assess the mental status of students and its associated factors. Necessary steps then ought to be taken to improve the mental health of students where possible. This will help them to achieve their intended goal of producing competent medical graduates. This current study aimed to compare the prevalence of stress and depression among undergraduate medical students in private and public medical universities and investigate the associated factors of depression among medical students.

II. Methodology

Study design and sample
This cross-sectional study was conducted among medical students who are enrolled in the Bachelor of Medicine, Bachelor of Surgery (MBBS) program in public and private medical school in Barisal district of Bangladesh. A total of 784 students participated in this study, of which 392 were from public medical university and 392 were from private medical university. Students who were already diagnosed with major depressive disorder, bipolar mood disorder, schizophrenia, and other major psychological disorders and under medication were excluded from the study. This study adhered to ethical guidelines, obtaining clearance from the Institutional Review Board/Ethical Review Committee of American International University - Bangladesh (AIUB). All participants willingly agreed to take part in the research, expressing their consent through a detailed informed consent form integrated into the initial page of the questionnaire. Additionally, no incentives were provided to the participants, and their involvement was entirely voluntary, with no coercion involved in the recruitment process.

Questionnaire development and data collection
The study was carried out in-person by volunteer research assistants who explained the study's objectives to the participants. The participants were queried about their physical and mental health, including whether they were taking any medications for mental health issues. Data for the study were collected using a semi-structured questionnaire, which took approximately 30 minutes to complete. The questionnaire comprised multiple-choice and Likert scale questions, covering socio-demographic information and data related to depression and stress. To assess depression, the Beck Depression Inventory (BDI-II) was employed. This self-report questionnaire consisted of 21 items, and scores were assigned to indicate the severity of individual symptoms, ranging from 0 to 3. The cumulative scores ranged from 0 to 63, with interpretations categorized as minimal (0–13), mild depression (14-19), moderate depression (20–28), and severe depression (29 –63). The

depression cut-off score was 19. The questionnaire demonstrated strong internal consistency, with a high Cronbach's alpha of 0.88 and 0.85 among governmental and private medical students [28-30]. Stress was assessed using the Perceived Stress Scale (PSS-10), which gauges the perception of life as chaotic, unforeseen, and overwhelming. Respondents rated statements on a 5-point Likert scale, and cumulative scores ranged from 0 to 40, with higher scores indicating greater stress levels. The Bangla version of PSS-10 showed significant correlation with the original English version, and it demonstrated strong internal consistency with a high Cronbach's alpha of 0.67 and 0.59 among governmental and private medical students, respectively affirming its suitability for assessing perceived stress among Bangladeshi individuals [31,32].

Data management and analysis
Descriptive statistics were completed relating to respondent's characteristics which were expressed as frequencies and percentages for categorical variables and means and standard deviations for continuous variables. Pearson's Chi-square test and independent student t-test analysis was performed to determine the differences. We utilized binary logistic regression to compute odds ratios (ORs) along with their corresponding 95% confidence intervals (95% CIs) for identifying factors linked to stress and depression. For the analysis, we established a cut-off value of ≥19 for depression as indicators of depression. Data was analyzed using the Statistical Package for Social Sciences (SPSS) version 25. A p value <0.05 was considered statistically significant in the analysis.

III. Result

Demographic profile of study population
The demographic characteristics of the study population are provided in table-1. The mean age of medical students was approximately 22 years with majority being ≤22 years and the male female ratio was about 1:1 in both public and private medical school. There was no significant difference in age, gender and marital status between public and private medical students (p>0.05). The majority of the undergraduate medical student were in 2nd year (public:28.3% and private: 39.5%), first phase of study (public:38.8% and private:45.9%). There was a significant difference in year of study, phase of study and monthly family income between private and public medical students (p<0.001).
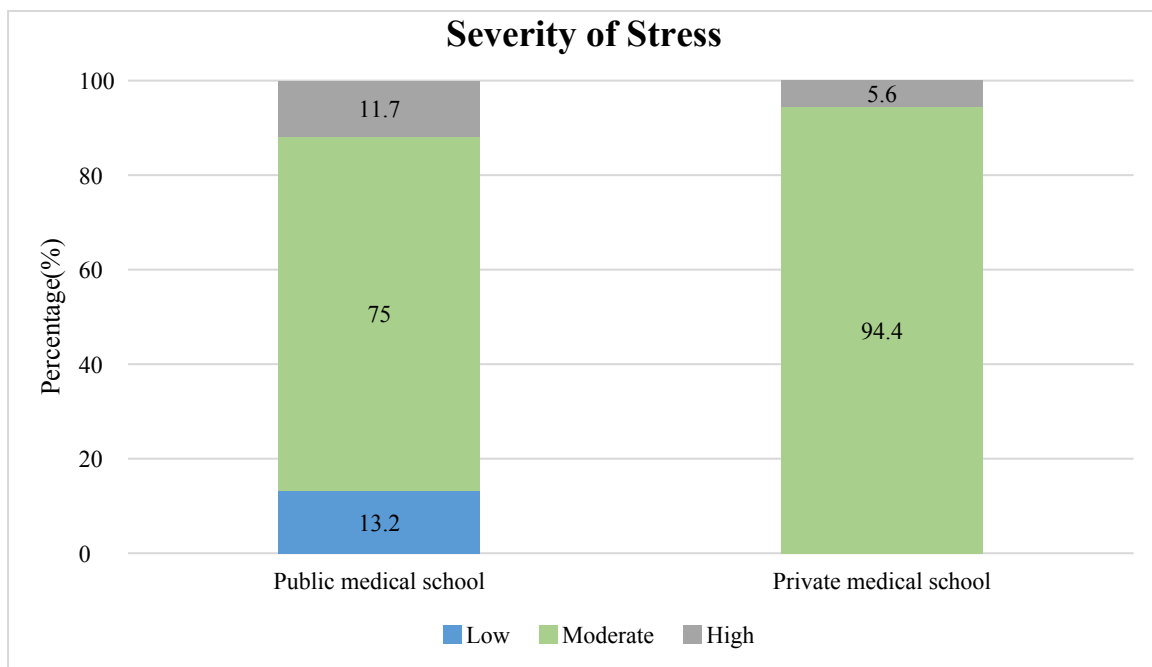
Prevalence and severity of stress
The mean PSS-10 score was 19.4± 5.8 (SD) and 21.6 ±3.4 (SD) in public and private medical school respectively. Majority of the medical student reported a moderate amount of stress in both public (75%) and private (94.4%) medical school.11.7% and 5.6% reported high level of stress in public and private medical school respectively. none of the students in private medical school reported low level of stress where as 13.2% of public school reported low level of stress. PSS score and severity of stress was significantly different between private and public medical school students (p<0.001) *(table 1 and figure-1).*

Table-1 Demographic, stress and depression profile of study population (n=784)

	Public medical school n=392 n(%)	Private medical school n=392 n(%)	p-value*
Age (years)			0.05
≤22	263(67.1)	234(59.7)	
>22	129(32.9)	158(40.3)	
Mean	21.99	21.98	0.905**
Gender			0.182
Male	208(53)	192(49)	
Female	184(47)	200(51)	
Marital status			0.544
Never married	349(89)	341(87)	
Married	43(11)	51(13)	
Monthly family income(BDT)			<0.001
≤50,000	359(91.6)	86(21.9)	
>50,000	33(8.4)	306(78.1)	
Study year			<0.001
1st year	40(10.2)	24(6.1)	

2nd year	110(28.3)	154(39.5)	
3rd year	105(26.8)	38(9.7)	
4th year	40(10.2)	101(25.8)	
5th year	97(24.7)	75(19.1)	
Phase of study			<0.001
First	152(38.8)	180(45.9)	
Second	105(26.8)	38(9.7)	
Third	41(10.5)	102(26)	
Final	94(23.9)	72(18.4)	
PSS-10 score, mean±SD	19.4± 5.8	21.6 ±3.4	<0.001**
BDI-II, mean±SD	17.3 ±10.6	28.6± 10	<0.001**

Abbreviations: BDI-II=Beck Depression Inventory-II;;PSS-10=Perceived Stress Scale-1
*p-value obtained by chi-square test;**p-value obtained by independent student t-test

*p-value significant (>0.001), obtained by chi square test
Figure-1: Severity of stress among public and private medical school students

Prevalence and severity of depression

The mean BDI-II score was 17.3 ±10.6(SD) and 28.6± 10(SD) in public and private medical school respectively. Majority of the public medical student had minimal depression (41%) whereas private medical student had severe depression (53%). BDI-II score and severity of depression was significantly different between private and public medical school students (p<0.001) *(table 1and figure-2).*
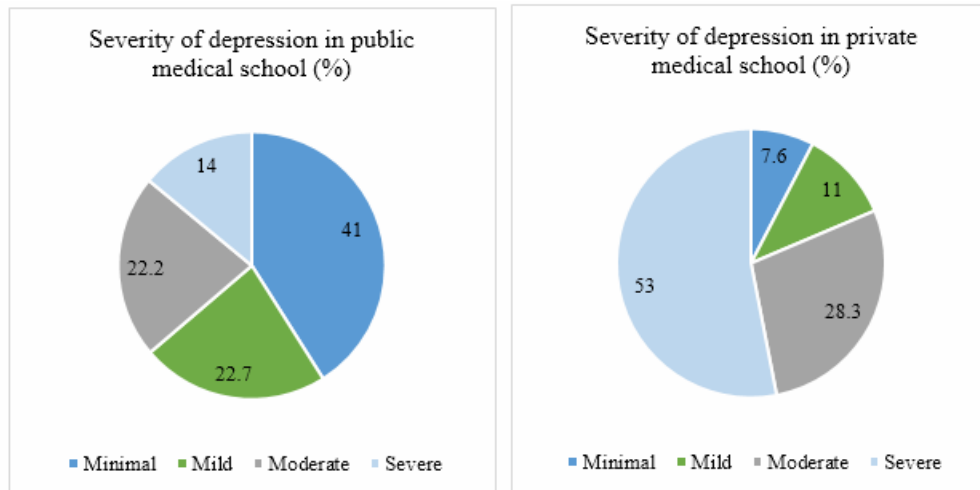
p-value significant (>0.001), obtained by chi square test
Figure-2: Severity of depression among public and private medical school students

Factors associated with depression
At a cut of value ≥19, students aged >22 years in the public medical School, the odds of experiencing depression were not significantly different from the reference group (Odds Ratio = 0.96, 95% CI: 0.62-1.50, p = 0.870). However, in private medical students, those aged >22 years have significantly higher odds of experiencing depression (Odds Ratio = 2.02, 95% CI: 1.15-3.54, p = 0.010). Male students in the public medical school had 47% reduced odds of experiencing depressive symptoms compared to females (Odds Ratio = 0.53, 95% CI: 0.35-0.80, p = 0.003). No association was found among the students of private medical school In the public medical school, students in their third and fifth years of medical education had significantly higher odds of depression, 4.04 (95% CI: 1.71-9.58, p = 0.001) and 2.80 (95% CI: 1.17-6.72, p = 0.021), respectively. Among the private medical students, findings were the same as public medical students. Third (95% CI: 1.96-52.27, p = 0.006) and fifth (95% CI: 1.01-7.84, p = 0.048) years students had higher odds of having depressive symptoms. In addition, higher odds of depression were observed among fourth-year students pursuing a medical degree in private medical school (95% CI: 3.79-5.11, p = <0.001). The "Second" (Odds Ratio = 2.94, 95% CI: 1.73-5.00, p < 0.001) and "Final" phase (Odds Ratio = 2.04, 95% CI: 1.17-3.53, p = 0.012) medical students of public institutes had a higher of depression compared to the "First" phase. Whereas, in the private medical institutes, students of all the phases showed significantly increased odds of "Depression" (Odds Ratios: 7.92, 10.78, and 2.2, respectively). No significant associations are observed between monthly income as well as marital status with depression and stress in either the public or private medical students.

Table 2: Univariate association between factors and depression

Variables	Public		Private	
	OR(95%CI)	p-value	OR(95%CI)	p-value
Age category				
Less than 22 years	Reference		Reference	
More than 22 years	0.96 (0.62-1.50)	0.870	2.02 (1.15-3.54)	0.01
Gender				
Female	Reference		Reference	
Male	0.53 (0.35-0.80)	0.003	1.22 (0.73-2.03)	0.446
Years at Medical School				
One	Reference		Reference	
Two	1.53 (0.63-3.68)	0.344	1.33 (0.55- 3.23)	0.525
Three	4.04 (1.71-9.58)	0.001	10.13 (1.96-52.27)	0.006
Four	2.14 (0.78-5.85)	0.139	13.78 (3.79-50.11)	<0.001
Five	2.80 (1.17-6.72)	0.021	2.81 (1.01-7.84)	0.048
Phase of medical school				
First	Reference		Reference	
Second	2.94	<0.001	7.92	0.005

	(1.73-5.00)			(1.84-34.06)	
Third	1.56	0.244		10.78	<0.001
	(0.74-3.27)			(3.78-30.77)	
Final	2.04	0.012		2.2	0.026
	(1.17-3.53)			(1.10-4.41)	
Monthly income (in BDT)					
<= 50000	Reference			Reference	
>50000	1.01	0.986		0.81	0.528
	(0.48-2.11)			(0.43-1.54)	
Marital Status					
Married	Reference			Reference	
Unmarried	0.89	0.724		0.55	0.183
	(0.47-1.70)			(0.22-1.33)	

IV. Discussion

This study was a brief analysis of the presentation of overall prevalence and severity of stress, depression and socioeconomic demographics of medical students undergoing MBBS training representing both government and private medical school in Bangladesh. The mean age of the participants was 22 years, with an almost equal distribution of male and female students from both government and private colleges. Globally, medical students experience elevated rates of depression, thoughts of suicide, and burnout compared to the general population. This is likely attributed to the intense academic demands, psychosocial challenges, and existential stressors they face while adjusting to new college education and managing a rigorous academic timetable [26]. The present study findings have revealed that majority of the students in both private and public medical schools experienced stress and depression with private medical student experience more severe form of depression compared to public medical school students. Studies have indicated a significant prevalence of mental health issues among Bangladeshi medical students. These problems manifest in persistent sadness, mood swings, reduced interest or pleasure, difficulty concentrating and memorizing, diminished self-esteem, suicidal thoughts, self-blame tendencies, low energy, poor sleep, suboptimal mental health, and depression [26]. This underscores the persistent nature of these issues among medical students over time, suggesting a potential continuation into their future roles as physicians, possibly contributing to a higher incidence of mental health problems within this professional group [33].

The average age of participants in this study was approximately 22 years, aligning with similar findings in studies conducted in Karachi, Rawalpindi, Odisha, Cameroon, and Malaysia [34-38]. Notably, the average age observed in this study was lower than the average age of medical school entrants reported by the Association of American Medical Colleges, which is 24 years [39]. Nearly half (49.87%) of the participants were female medical students, a proportion consistent with a Bangladeshi web-based study. Despite societal challenges and gender disparities, recent trends indicate significant progress for female students in medical education, with a higher enrollment rate than their male counterparts in leading government medical colleges [40]. The government's emphasis on female education in Bangladesh is reflected in the high percentage of female students in the medical sector, demonstrating the success of efforts to promote gender inclusivity.

In our study, we identified a significant prevalence of moderate to severe stress and depression, affecting approximately 93% and 76% of the participants, respectively. These figures surpass the rates reported in prior studies, such as a study among first-year medical students in Bangladesh, where 59% experienced stress and 54.3% reported depressive symptoms [41]. Taha et al. found a 40% depression rate in their study in Saudi Arabia [42]. while Khan et al. identified approximately 70% of medical students in Karachi experiencing some form of mental distress [34]. Similarly, a study in India among undergraduate medical students reported a stress prevalence of 91%. The elevated levels of stress and depression in our study underscore a concerning trend compared to previous research [43].

Univariate analysis revealed that participants above 22 years and studying at a private medical institute had significantly high scores on the BDI-II scale. Iqbal et al. [36] and Fuad et al. [38] described the association between younger medical students and depression, whereas, Ngasa et al.[37] reported the higher odds of having depressive symptoms among the advanced age group. The increased prevalence of depression seen in medical students enrolled in private institutions can be attributed to various factors. One possible explanation is the heightened academic pressure these students face, which may be exacerbated by the necessity to meet substantial tuition fees and maintain rigorous academic standards. The financial burden associated with private education could escalate stress levels, as students might feel obligated to excel academically to justify the significant financial investment.

From this study, we found that male students of the public medical institutes had significantly lower depressive symptoms than females. However, we found no relationship between gender and depression in private institutes. Many previous studies demonstrated the association between being female and having a depressive state [37,38], whereas few researchers had the opposite opinion [44]. On the other hand, few previous reports found an association between gender and mental distress [45]. The elevated occurrence of

depression observed among female medical students in public medical institutions can be ascribed to a multifaceted interplay of several factors. Factors such as academic pressure, gender-specific stressors, and societal expectations likely converge to influence this phenomenon. Despite facing academic demands similar to those of their male counterparts, female students in medical education often contend with heightened competition. Furthermore, women may encounter additional stressors stemming from societal expectations, such as the potential difficulty in balancing academic pursuits with familial responsibilities or conforming to cultural norms. A more comprehensive exploration of this subject matter could provide a more nuanced understanding of the identified finding.

Furthermore, this study revealed a positive correlation between the duration of medical education and the likelihood of participants experiencing depressive symptoms. This trend aligns with findings from two studies conducted among medical students in Malaysia [38,45]. In contrast, a systematic review presented opposing results, indicating that the highest rates of depression were prevalent among Year 1 students, with a prevalence of 33.5% (95% CI 25.2–43.1%). The rates then gradually declined, reaching 20.5% (95% CI 13.2–30.5%) by Year 5 of medical education [46]. Steptoe et al., in their broader study involving university students, noted that individuals from Asian countries exhibited the highest levels of depressive symptoms, attributing this observation, at least in part, to comparatively lower perceptions of a sense of control among these students. The increase in depressive symptoms with advancing years of medical education may be attributed to shifts in responsibilities, heightened clinical exposure, and increased workload during these later stages [47].

The study has certain limitations that require careful consideration. Firstly, there is a potential for sampling bias, as the characteristics of participants may not accurately represent the broader population due to specific recruitment sources. Additionally, the use of a cross-sectional design, while revealing associations, does not establish causality. Relying on self-report measures such as the Beck Depression Inventory and the Perceived Stress Scale introduces the possibility of response bias. Cultural and language factors may influence how participants interpret and respond to the measures, affecting the validity of the results. Social desirability bias might lead participants to downplay their experiences of depression and stress. These limitations underscore the necessity for cautious interpretation and highlight areas for further research and refinement in addressing mental health concerns among medical students.

V. Conclusion

In conclusion, the comparison of depression and stress levels among public and private medical students reveals a nuanced interplay of factors influencing their mental well-being. Tailored interventions are needed to address the unique challenges faced by each group. Public medical students may grapple with a demanding curriculum and societal expectations, while private counterparts contend with academic pressure compounded by financial concerns. Comprehensive mental health support services should be established in both public and private institutions, offering accessible counseling and fostering peer support networks. Awareness campaigns destigmatizing mental health issues, mentorship programs, mental health education in the curriculum, and institutional policies addressing academic pressure are crucial components of a holistic approach to support the mental health of medical students.

References:

[1].   Adams J. Straining to describe and tackle stress in medical students. Med Educ. 2004;38(5):463–4.
[2].   Yusoff MSB, Rahim AFA, Yaacob MJ. Prevalence and sources of stress among Universiti Sains Malaysia medical students. Malaysian J Med Sci MJMS. 2010;17(1):30.
[3].   Yusoff MSB, Rahim AFA, Baba AA, Esa AR. Medical student selection process and its pre-admission scores association with the new students' academic performance in Universiti Sains Malaysia. Int Med J. 2011;18(4):327–31.
[4].   Yusoff MSB, Yee LY, Wei LH, Siong TC, Meng LH, Bin LX, et al. A study on stress, stressors and coping strategies among Malaysian medical students. Int J Students' Res. 2011;1(2).
[5].   Wolf T. Stress, coping and health: enhancing well   being during medical school. Med Educ. 1994;28(1):8–17.
[6].   Guthrie E, Black D, Bagalkote H, Shaw C, Campbell M, Creed F. Psychological stress and burnout in medical students: a five-year prospective longitudinal study. J R Soc Med. 1998;91(5):237–43.
[7].   Firth J. Levels and sources of stress in medical students. Br Med J (Clin Res Ed). 1986;292(6529):1177–80.
[8].   Dyrbye LN, Thomas MR, Shanafelt TD. Medical student distress: causes, consequences, and proposed solutions. In: Mayo Clinic Proceedings. Elsevier; 2005.1613–22.
[9].   Dyrbye LN, Thomas MR, Shanafelt TD. Systematic review of depression, anxiety, and other indicators of psychological distress among US and Canadian medical students. Acad Med. 2006;81(4):354–73.
[10].   Colleges A of AM, Education LC on M. Functions and structure of a medical school: standards for accreditation of medical education programs leading to the MD degree. Liaison Committee on Medical Education; 2003.
[11].   Group MSOW. Learning objectives for medical student education—guidelines for medical schools: report I of the Medical School Objectives Project. Acad Med. 1999;74(1):13–8.
[12].   Morrison GR, Ross SJ, Morrison JR, Kalman HK. Designing effective instruction. John Wiley & Sons; 2019.
[13].   Cruess RL, Cruess SR, Steinert Y. Teaching medical professionalism: supporting the development of a professional identity. Cambridge University Press; 2016.
[14].   Bergmann C, Muth T, Loerbroks A. Medical students' perceptions of stress due to academic studies and its interrelationships with other domains of life: a qualitative study. Medical education online. 2019;24(1):1603526.
[15].   Dyrbye LN, Thomas MR, Shanafelt TD. Systematic review of depression, anxiety, and other indicators of psychological distress among US and Canadian medical students. Academic medicine. 2006;81(4):354-73.
[16].   Ibrahim AK, Kelly SJ, Adams CE, Glazebrook C. A systematic review of studies of depression prevalence in university students. Journal of psychiatric research. 2013;47(3):391-400.
[17].   Pedrelli P, Nyer M, Yeung A, Zulauf C, Wilens T. College students: mental health problems and treatment considerations. Academic psychiatry. 2015;39:503-11.
[18].   World Health Organization (WHO). Depressive disorder (depression). 2023 [cited 2023 Dec 9]. https://www.who.int/news-room/fact-sheets/detail/depression
[19].   Rotenstein LS, Ramos MA, Torre M, Segal JB, Peluso MJ, Guille C, et al. Prevalence of Depression, Depressive Symptoms, and Suicidal Ideation Among Medical Students: A Systematic Review and Meta-Analysis. JAMA. 2016;316(21):2214–36.
[20].   Gore FM, Bloem PJ, Patton GC, Ferguson J, Joseph V, Coffey C, et al. Global burden of disease in young people aged 10–24 years: a systematic analysis. The Lancet. 2011;377(9783):2093-102.
[21].   Hoque R. Major mental health problems of undergraduate students in a private university of Dhaka, Bangladesh. European Psychiatry. 2015;30:1880.
[22].   Vitaliano PP, Russo J, Carr JE, Heerwagen JH. Medical school pressures and their relationship to anxiety. J Nerv Ment Dis. 1984;172(12):730–6.
[23].   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(1):1–8.
[24].   Bangladesh Medical & Dental Council (BMDC) (2018) Home page at: https://web.bmdc.org.bd/. Accessed 9 dec 2023
[25].   Mao Y, Zhang N, Liu J, Zhu B, He R, Wang X. A systematic review of depression and anxiety in medical students in China. BMC medical education. 2019;19(1):1-3.
[26].   Hasan MT, Hossain S, Gupta RD, Podder V, Mowri NA, Ghosh A, et al. Depression, sleeping pattern, and suicidal ideation among medical students in Bangladesh: a cross-sectional pilot study. Journal of Public Health. 2022;30(2):465-73.
[27].   Eva EO, Islam MZ, Mosaddek AS, Rahman MF, Rozario RJ, et al. Prevalence of stress among medical students: a comparative study between public and private medical schools in Bangladesh. BMC research notes. 2015;8:1-7.
[28].   Beck AT, Steer RA, Brown G. Beck depression inventory–II. Psychol Assess. 1996;
[29].   Mostafa ASMAH, Ahmed MN, Mullick MSI, Chowdhury NF, Akhter F, Alam MS. Validation of the Bangla version of beck depression inventory II. Brain Behav. 2020;10(3):e01563.
[30].   Bashar MI, Ahmed K, Uddin MS, Ahmed F, Emran A-A, Chakraborty A. Depression and Quality of Life among Postmenopausal Women in Bangladesh: A Cross-sectional Study. jmm. 2017;23(3):172–81.
[31].   Chakraborti A, Ray P, Sanyal D, Thakurta RG, Bhattacharayya AK, Mallick AK, et al. Assessing perceived stress in medical personnel: in search of an appropriate scale for the Bengali population. Indian J Psychol Med. 2013;35(1):29–33.
[32].   Islam MN. Psychometric properties of the Bangla version of PSS-10: Is it a single-factor measure or not? Hell J Psychol. 2020;17(1):15–34.
[33].   World Health Organization, Regional Office for South-East Asia (2007) WHO-AIMS report on mental health system in Bangladesh. WHO Regional Office for South-East Asia, New Delhi, India. 2007.
[34].   Khan MS, Mahmood S, Badshah A, Ali SU, Jamal Y. Original Article Prevalence of Depression, Anxiety and their associated factors among medical stu- dents in Karachi, Pakistan. Int J Psychol. 2012;3(2):583–6.
[35].   Azad N, Shahid A, Abbas N, Shaheen A, Munir N. Anxiety And Depression In Medical Students Of A Private Medical College. J Ayub Med Coll Abbottabad. 2017;29(1):123–7.
[36].   Iqbal S, Gupta S, Venkatarao E. Stress, anxiety & depression among medical undergraduate students & their socio-demographic correlates. Indian J Med Res. 2015;141(3):354.
[37].   Ngasa SN, Sama CB, Dzekem BS, Nforchu KN, Tindong M, Aroke D, et al. Prevalence and factors associated with depression among medical students in Cameroon: A cross-sectional study. BMC Psychiatry. 2017;17(1):1–7.

[38]. Fuad MD, Al-Zurfi BMN, Abdelqader MA, Abu Bakar MF, Elnajeh M, Abdullah MR. Prevalence and Risk Factors of Stress, Anxiety and Depression among Medical Students of a Private Medical University in Malaysia. Educ Med J. 2015;7(2).

[39]. Brendan Murphy. Going directly from college to medical school: What it takes. 2019 [cited 2023 Dec 2023].

[40]. Alo P. Women ahead in medical education. 2015 [cited 2023 Dec 23]. m: https://en.prothomalo.com/bangladesh/Women-ahead-in-medical-education#:~:text=On average 57 percent of,is female%2C official records show.

[41]. Alim AHMS, Rabbani GM, Karim E, Mullick SIM, Al-Mamun A, Khan ZRM. Assessment of depression, anxiety and stress among first year MBBS students of a public medical college, Bangladesh.1. Bang J Psychiatry. 2015;29(1):23–9.

[42]. Taha AZ, Sabra AA. Perceived stresses among male students in University of Dammam, Eastern Saudi Arabia: A comparative study. J Am Sci. 2012;8(6):291–8.

[43]. Satpathy P, Siddiqui N, Parida D, Sutar R. Prevalence of stress, stressors, and coping strategies among medical undergraduate students in a medical college of Mumbai. J Educ Health Promot. 2021;10(1):318.

[44]. Fuad MD, Al-Zurfi BMN, Abdelqader MA, Abu Bakar MF, Elnajeh M, Abdullah MR. Prevalence and Risk Factors of Stress, Anxiety and Depression among Medical Students of a Private Medical University in Malaysia. Educ Med J. 2015;7(2):1–12.

[45]. Lloyd C, Miller PM. The relationship of parental style to depression and self-esteem in adulthood. J Nerv Ment Dis. 1997;185(11):655–63.

[46]. Puthran R, Zhang MWB, Tam WW, Ho RC. Prevalence of depression amongst medical students: a meta-analysis. Med Educ. 2016;50(4):456–68.

[47]. Steptoe A, Ardle J, Tsuda A, Tanaka Y. Depressive symptoms, socio-economic background, sense of control, and cultural factors in university students from 23 countries. Int J Behav Med. 2007;14:97–107.