



Addressing stress among medical students and professionals: Strategies for optimizing student health and success

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ABSTRACT

Background: Medical students throughout the world are subjected to high rates of occupational stressors. In addition, in the developing world there is a shortage of mental health providers and widespread social stigma of mental disorders, which may prevent individuals suffering from stress induced disorders from getting the treatment they need. Policy changes can have broad impact in helping people cope with occupational stress, potentially preventing mental health issues. **Objectives:** This study aimed to examine stress in a group of undergraduate and graduate medical students at a college of medicine in India and make policy recommendations based on findings. **Methods:** This study adapted a questionnaire and administered it to a sample of medical students India. **Results:** Participants reported many somatic and cognitive stress symptoms. A large portion of stress appears to be related to the field of medicine. **Conclusions:** The large percentage of medical students suffering from stress suggest an acute need for adoption of policies that close the gaps in access to mental, emotional, and behavioral health care through appropriate screening tools, referrals, interventions, and support services.

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STRESS AMONG MEDICAL STUDENTS IN INDIA: A CRITICAL NEED FOR EARLY SCREENING AND TIMELY INTERVENTION

Experiencing stress, when an individual is unable to cope with the demands placed on them [1], is an undeniable reality of being human, especially for those exposed to higher rates of stressors, such as medical students [2]. However, for many individuals this inevitable stress can have many negative effects on physical health as well as mental, emotional or behavioral health, hereafter “behavioral health.” Behavioral health issues are ubiquitous, but developing countries face additional challenges with barriers to access, lack of understanding, and perceived and existing stigma [3]. Therefore, many individuals fail to seek or delay seeking treatment, resulting in a high incidence of stress-induced disorders. This study examines stress among Indian undergraduate and graduate medical students, a population of highly stressed individuals with extremely limited access to behavioral health care [4] and uses the data and literature review to develop a model and suggestions for policy.

BEHAVIORAL HEALTH AND CULTURE

Ability to cope with stress varies by individual and is influenced by culture [5]. Thus, examining stress across cultures is essential. In addition, manifestation of stress symptoms differs in developing countries. Patients often present with somatization, reporting somatic complaints such as headaches or gastrointestinal concerns without the typical Western cognitive and mood symptoms [4]. Early treatment is especially beneficial but challenging in the developing world with an access gap, where there is higher demand for behavioral health services than available practitioners [5]. Patel [4] underscores the scope of this problem in India: “The reality of mental health care in India is bleak: A population of over a billion is served by <4000 psychiatrists” (p. S26) with many concentrated in urban areas. As such, there is a critical need to bridge the access gap in behavioral health through timely screening, necessary referrals, interventions, and support services.

BEHAVIORAL HEALTH AND MEDICAL STUDENTS

Medical students are frequently subjected to higher rates of chronic and acute occupational stress. Academic and personal

stressors impact the behavioral health of medical students [6]. Stress among medical students has often been recognized to have detrimental effects such as decreased academic and clinical performance, physical symptoms, psychological distress, emotional exhaustion, and burnout [7,8]. Rates of behavioral health issues during medical school appear to be widespread but vary by study from 31% for depression [9] to 80% for at least one form of distress [10]. Brazeau *et al.* [11] suggest that medical students may be distressed even before beginning studies, but in a study of new students at six U.S. institutions, beginning medical students were found to have better behavioral health than other college graduates, thus suggesting it is the medical experience which may be causing distress.

Stress during medical school may also have lasting effects, with doctors continuing to suffer after graduation. Ghosh and Joshi [12] report that physicians often have stress-induced physical health risk factors, engage in maladaptive coping, and face increased risk of mental illness and suicide. However, physicians are hesitant to seek help because of time restraints, fear of exposure, and stigma [13].

Doctors experiencing extreme stress or burnout are less likely to provide quality patient care, possibly endangering patients through poor decision-making or incorrectly performed procedures [14]. In addition, standards of care can suffer as overstressed practitioners may try to cope by being more detached and less empathetic [15]. It is important to identify suffering individuals as early as possible to prevent extended suffering and poor functioning.

Support Structure in Medical School

Based on a huge body of work by Tinto [16,17], individual characteristics are a large factor in school persistence and success but social and academic integration are also crucial elements. This theory has been studied and applied to enhance college student satisfaction and retention across the globe [18]. Tinto [16] reports that the more integrated students are the more likely they are to continue schooling. Integration appears to be most influential during the 1st year of college. While this relationship has been mostly studied in undergraduates, it can be extended to medical students [19], who also may be the most vulnerable during their 1st year and may need interventions to provide additional support such as a successful student-led stress management program [20] or more positive interactions with faculty and peers.

Work-life Balance in Medical School

Work-life balance has been found to be related to stress and burnout, but can be difficult to achieve in the field of medicine [21]. Medical students have to make personal and social sacrifices to meet the academic, clinical, and emotional demands of medical school [22]. The excessive workload may hinder the ability to engage in productive coping, such as using social support and recreation activities [23]. Students also often move away from extended family support to attend

school. In addition, immediate family can buffer stress and help in achieving work-life balance, but demands of family may intensify work-life conflict and create greater distress. Policies to aid in achieving work-life balance and provide academic and occupational support would benefit medical students by enhancing well-being.

OBJECTIVE

It is an important to identify at risk medical students early to prevent extended suffering because of delayed diagnosis and medical intervention. India is the world's leader in the number of medical students [24] but their stress has not been well studied [25]. This study examines the prevalence of stress among medical students and professionals in India using a computer-based questionnaire called Stressometer. Although many questionnaires on stress exist, most focus on consequences of stress or stressful life events. Thus, they do not provide the holistic focus that was desired to examine stress in India and bridge the access gap created in stress related health care. The Stressometer was developed by psychiatrist Dr. Sandeep Vohra through an adaptation of questions and concepts from a book on stress management by Peiffer [27]. The study identifies the major work-life stressors and proposes a policy framework to minimize work-life conflict through organizational and academic support structure among medical students.

METHODS

Participants

Ninety-five medical students from a private medical school in India participated in the study. Undergraduate and graduate students from various years in school were randomly selected by the dean of the medical school and all participated. Most (55.8%) were male. The mean age was 30.65 years.

Questionnaire

The questionnaire included 50 questions divided into five subscales of 10 questions each. These subscales related to human nature (e.g., irritability), circumstances (e.g., recent job changes or marriage), human body and mind (symptoms of stress; e.g., anxiety or disturbed sleep), home life (e.g., lack of family support), and work life (e.g., unsupportive colleagues).

Procedure

Data were collected in 2015. After receiving informed consent, the researchers administered the self-screening questionnaire on the internet-based Stressometer platform. All participants were provided explanations of their results.

Ethical Considerations

The Institutional Review Board (IRB) of No Worry No Tension Healthcare approved the study protocol (reference number: NWNNT: A24/2015). The IRB gave permission for the medical

students to participate and participants gave written informed consent to take part in the research.

Data Analysis

Descriptive statistics were calculated to examine the response patterns. Scores on questions were examined by subscales and the total score. Spearman correlations were used to analyze the relation between the subscales and total score. Answers of can't say or not applicable were scored as missing. Analyses of data were performed using SPSS version 23.

RESULTS

Several questions had noteworthy patterns of responses (total $n = 95$). In terms of recent circumstance changes, the majority (61.1%, $n = 58$) had seen increase in their job responsibility [Table 1]. A substantial number of students reported they have been more irritable or emotional in the last month (70.5%, $n = 67$) and have started getting worrying thoughts or feel anxious (66.3%, $n = 63$) [Table 2]. In addition, many reported somatic symptoms such as disturbed sleep (51.6%, $n = 49$) and erratic eating patterns (49.5%, $n = 47$). Furthermore, a sizeable minority feel like leaving everything and going away (39.0%, $n = 37$).

Table 1: Descriptive statistics for selected yes/no questions

Question topic	Yes (%)	No (%)	Can't say/not applicable (%)
Type of job changed	25.3	62.1	12.7
Job responsibility increased	61.1	29.5	9.5
Moved	17.9	77.9	4.2
Sick or accident	14.7	83.2	2.2
Illness, death or accident of someone close	26.3	72.6	1.1
Financial difficulty	28.4	68.4	3.3
Married recently	3.2	92.6	4.2

Table 2: Descriptive statistics for selected Likert questions

Question topic	Never (%)	Sometimes (%)	Often (%)	Always (%)	Yes (%)	Can't say/not applicable
Recently more irritable or emotional	25.3	58.9	8.4	3.2	70.5	4.3
Recently getting worrying or anxious thoughts	30.5	48.4	13.7	4.2	66.3	3.3
Disturbed sleep	47.4	37.9	7.4	6.3	51.6	1.1
Erratic eating	44.2	33.7	13.7	2.1	49.5	6.4
Heart beats fast even when resting	65.3	20.0	3.2	2.1	25.3	9.5
Tired or weak	38.9	40.0	12.6	5.3	57.9	3.2
Stomach troubles	57.9	23.2	13.7	4.2	41.1	1.1
Body aches	61.1	29.5	5.3	2.1	36.9	2.1
Unexplained dizziness	55.8	31.6	5.3	1.1	38.0	6.4
Feel like leaving everything	58.9	33.7	3.2	2.1	39.0	2.2
Insufficient family support	67.4	26.3	3.2	1.1	30.6	3.3
Isolated or lonely at home	71.6	22.1	0.0	3.2	25.3	3.3
Someone close stressed	26.3	51.6	12.6	3.2	67.4	6.4
Work formalities interfere with work	43.2	24.2	5.3	5.3	34.8	22.1
Feel isolated at work	44.2	32.6	8.4	3.2	44.2	11.6
Work atmosphere stressful	27.4	57.9	3.2	5.3	66.4	6.4
Colleagues/peers unsupportive	46.3	37.9	8.4	3.2	49.5	4.3
Deal with colleague/peer hostility	41.1	30.5	9.5	2.1	42.1	16.8
Work more than colleagues/peers	21.1	42.1	16.8	8.4	67.3	11.6
Inadequate equipment	47.4	30.5	6.3	2.1	38.9	13.7

Stress at home was found mostly when they felt someone close to them was stressed (67.4%, $n = 64$) with participants infrequently reporting insufficient support from family (30.6%, $n = 29$) or loneliness or isolation at home (25.3%, $n = 24$). In terms of work stress, 66.3% ($n = 63$) found their work atmosphere to be stressful, 49.5% ($n = 47$) found their colleagues/peers to be unsupportive, and 42.1% ($n = 40$) had to deal with hostility from their colleagues/peers [Table 2].

All correlations between the subscales and total score were significant except between human nature and work life [Table 3].

Model

A descriptive model was developed based on the pattern of responses and the literature review [Figure 1]. This model includes aspects of the academic and occupational space that are potential stressors; namely work environment (e.g., safety, equipment, classrooms, library), workload (e.g., time pressures, high workload, academic stressors like exams and evaluations, clinical pressures), patient interactions (e.g., aggressive patients, emotional experiences), and employee value (e.g., treatment by residents and attendings). These factors are affected by training and become occupational stressors that are attenuated by work-life balance, family support structure, and work support structure and identified by screening tools. Certain aspects of the occupational space are more modifiable for stress reduction purposes. For instance, it may be impossible to prevent emotional experiences resulting from patient death; but if problematic workplace safety or inadequate equipment is an issue, it could be resolved. Coping interventions may also be necessary, such as providing peer and supervisor training to provide support for students identified as highly stressed or diagnosed with a behavioral health disorder. Another example would be mindful based stress reduction training to enhance

Table 3: Correlations between subscales and overall score. All $P < 0.001$ unless noted

	Body/mind	Nature	Work life	Home life	Circumstances	Overall
Body/mind						
Nature	0.587					
Work life	0.308 ($P=0.002$)	0.171 ($P=0.098$)				
Home life	0.342 ($P=0.001$)	0.239 ($P=0.020$)	0.481			
Circumstances	0.391	0.247 ($P=0.016$)	0.320 ($P=0.002$)	0.257 ($P=0.012$)		
Overall	0.780	0.618	0.701	0.678	0.542	

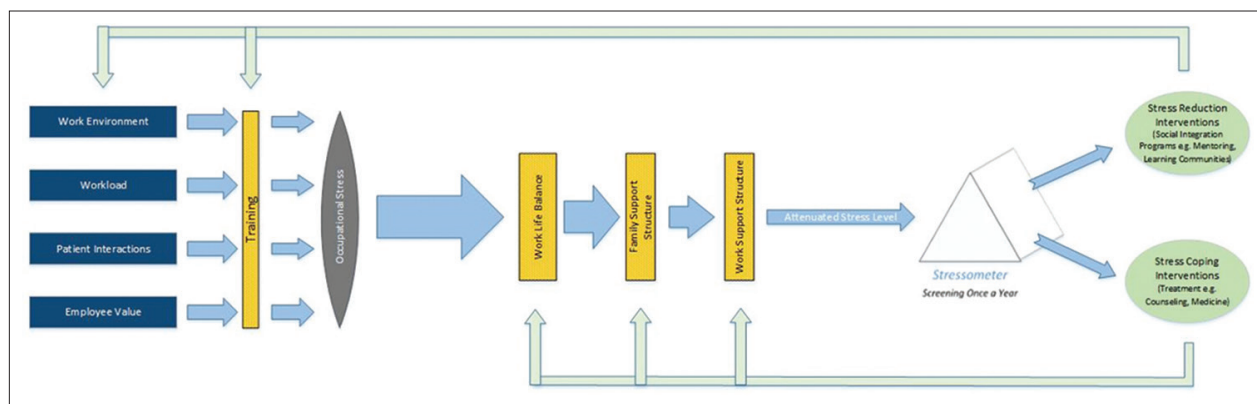


Figure 1: A model connecting occupational stress, stress attenuators, and possible interventions

coping with high stress [27]. Given the pervasive levels of stress among medical students, this model can be applied to medical schools worldwide facing similar challenges.

DISCUSSION

As expected, stress appears to be fairly widespread throughout the sample, reiterating the need for screening and intervention. Just below half reported they felt like leaving everything and going away, which is a substantially high number at that level of desperation. Despite reporting stress symptoms, these participants are continuing to train and serve in the medical field. Major life stress events were infrequently reported. Therefore, it appears that other chronic sources are likely causing most of the stress-related issues in this sample. In terms of symptoms of stress, a considerable number reported somatic symptoms of behavioral health issues. An equally high incidence of cognitive symptoms was reported among a majority of these medical students suggesting they may have been pushed so far past their stress tolerance that they were willing to overcome the typical somatization seen in India.

In identifying sources of stress, the majority of participants reported good support from family and good relations with family and friends. However, many reported that a close family member or friend was stressed, which may increase stress if those individuals are unable to provide adequate social support and buffer stress from other sources.

A sizeable portion of these medical students do not feel that their occupational climate is supportive enough with the majority reporting that the work environment is stressful. In addition, many feel isolated and reported unsupportive, hostile colleagues. The level of somatic symptoms report may be connected to the academic and occupational environment.

Consequences

Although they are extremely stressed, the medical students may still feel satisfied with their experience. For instance, in a survey of trauma doctors and nurses, although almost half reported emotional difficulties due to their jobs, but 90% still reported that their work was satisfying [28]. The feeling of satisfaction may suppress the manifestation of stress-related symptoms, which can go unnoticed and may lead to maladaptive coping as well as other mental and behavioral health issues. If these issues are not addressed through screening and interventions, there is a risk of losing potential doctors to suicide or withdrawal from school [10,12]. In addition, for those who do complete their education, there is a risk of suffering and incapacitated practitioners providing less than optimal care [29], thus both the doctors and their patients may suffer.

Suggestions for Policy

As stated in the model section, many potential stressors can be addressed; such as ensuring a safe work and academic environment, providing adequate equipment, and encouraging a supportive environment. However, many aspects of medical school are inherent and remain likely stressors; namely academic and clinical demands and negative or emotional patient interactions. To address medical student behavioral health as well as their performance levels, medical schools and the associated health-care providers need to strive to create optimal work environments. They should address potential stressors and their affects through screenings, referrals for mental health services, stress reduction and coping interventions, and support services.

It is crucial to screen medical students at least once a year as stress levels may vary and problems can develop at any point [30]. In addition, many behavioral health issues, especially

depression, may be recurring [13]. Frequent screenings and behavioral health solutions that aid the entire student body of such high stress programs should be implemented to ensure students do not fall into the access gap [31]. Intervention will need to be addressed given that Daya Singh Sandhu, an expert on mental health in India, estimated that counseling centers were only available in 5% of Indian universities in 2011 [32]. Although it may now be improved, this percentage is troubling given that Tinto [16] asserts that counseling, mentoring, and advising is very influential on student adjustment and coping. The college of medicine in this study did have counselors available through the Department of Psychology and referrals were offered to participants as needed, so perhaps potential solutions such as in-house counseling are able to bridge some of the gap when full counseling centers are not available.

Tinto [17] underscores that understanding what drives students to drop out does not equate to knowing how to make them stay. Overall, the most beneficial intervention is likely to be a three pronged approach, which includes screening to identify at risk individuals, treatment of individuals in need, and social integration programs, which ideally would prevent stress levels from becoming problematic. Such an approach could maximize retention and graduation rates of students by helping them integrate, build coping skills and flourish in medical schools.

Tinto emphasizes the importance of learning communities, which are created when students move through the curriculum together and are encouraged to learn collaboratively. Zhao and Kuh [33] found that learning community participation improved student performance and satisfaction measures, even when controlling for student ability. Learning communities and other avenues to enhance peer and supervisor support would be beneficial. In addition, stress reduction measures, such as yoga, could be offered and encouraged through these learning communities. Yoga has been found to have a vast number of psychological and emotional benefits, including stress reduction and enhancement of well-being and cognition [34]. These benefits would be indispensable during examination periods.

Medical students as well as physicians who are early in their careers are frequently reported to be hesitant to seek behavioral health treatment because of lack of time, the stigma of behavioral health disorders, the view that admitting them is a sign of weakness, and the fear that admitting they need help may damage their future career through prejudice against those who have sought help [35]. For example, Givens and Tjia [13] found that only 22% of their sample found to be depressed had sought help from mental health specialists. Even more disturbing is that behavioral health treatment was sought by only five out of 12 students who reported contemplating suicide. Enhancing support through learning communities and similar interventions may encourage students to seek help rather than suffer in silence.

Doctors face huge challenges because they have to learn and apply “vast amounts of cognitive knowledge while maintaining sensitivity and empathy for their patients” [36]. Early diagnosis and treatment of behavioral health issues are essential for both

individuals, those close to them, and their future patients. The culture at medical schools and hospitals may influence the willingness of medical students and early career doctors to seek help, saving the lives of doctors and those they serve.

Limitations and Future Work

This study has limitations being solely based on self-report data obtained from medical students, thus subject to response bias. Future studies should include evaluations from those close to the individual; such as family members, colleagues, and supervisors. This additional information can aid in identification of stress-related issues. Other possible expansions are including a full clinical analysis and/or physiological data (e.g., cortisol levels) for a more thorough analysis of stress and its consequences.

Overall, more research is essential on this vulnerable and underserved group. The data and model call for the adoption of policies that close the gaps in access to mental, emotional, and behavioral health care through appropriate screening tools, referrals, interventions, and support services.

REFERENCES

1. Lazarus RS. Coping theory and research: Past, present, and future. *Psychosom Med* 1993;55:234-47.
2. Giri P, Baviskar M, Phalke D. Study of sleep habits and sleep problems among medical students of pravara institute of medical sciences loni, Western maharashtra, India. *Ann Med Health Sci Res* 2013;3:51-4.
3. Trivedi JK, Sareen H, Dhyani M. Rapid urbanization - Its impact on mental health: A South Asian perspective. *Indian J Psychiatry* 2008;50:161-5.
4. Patel V. Research priorities for Indian psychiatry. *Indian J Psychiatry* 2010;52 Suppl 1:S26-9.
5. World Health Organization. The World Health Report 2006 - Working Together For Health. Geneva. Available from: <http://www.who.int/whr/2006/en/>. [Last accessed on 2016 Apr 25].
6. Gupta S, Choudhury S, Das M, Mondol A, Pradhan R. Factors causing stress among students of a medical college in Kolkata, India. *Educ Health (Abingdon)* 2015;28:92-5.
7. Chaudhury PK, Deka K, Chetia D. Disability associated with mental disorders. *Indian J Psychiatry* 2006;48:95-101.
8. Pöhlmann K, Jonas I, Ruf S, Harzer W. Stress, burnout and health in the clinical period of dental education. *Eur J Dent Educ* 2005;9:78-84.
9. Sharma A, Gupta SK, Khare N, Agarwal SS. Assessment of depression among medical students of private university in Bhopal, India. *Subst Abuse* 2015;5:12.
10. Dyrbye LN, Harper W, Durning SJ, Moutier C, Thomas MR, Massie FS Jr, *et al*. Patterns of distress in US medical students. *Med Teach* 2011;33:834-9.
11. Brazeau CM, Shanafelt T, Durning SJ, Massie FS, Eacker A, Moutier C, *et al*. Distress among matriculating medical students relative to the general population. *Acad Med* 2014;89:1520-5.
12. Ghosh AK, Joshi SR. Physician's health: Time to take care. *J Assoc Physicians India* 2008;56:13-4.
13. Givens JL, Tjia J. Depressed medical students' use of mental health services and barriers to use. *Acad Med* 2002;77:918-21.
14. Seshadri S. Substance abuse among medical students and doctors: A call for action. *Natl Med J India* 2008;21:57-9.
15. Thomas MR, Dyrbye LN, Huntington JL, Lawson KL, Novotny PJ, Sloan JA, *et al*. How do distress and well-being relate to medical student empathy? A multicenter study. *J Gen Intern Med* 2007;22:177-83.
16. Tinto V. *Completing College: Rethinking Institutional Action*. Chicago, IL: University of Chicago Press; 2012.
17. Tinto V. Research and practice of student retention: What next? *J Coll Stud Retent* 2006;8:1-19.
18. Scott G, Shah M, Grebennikov L, Singh H. Improving student

- retention: A University of Western Sydney case study. *J Inst R* 2008;14:9-23.
19. Arulampalam W, Naylor RA, Smith JP. A hazard model of the probability of medical school drop-out in the UK. *J R Stat Soc* 2004;167:157-78.
 20. Redwood SK, Pollak MH. Student-led stress management program for first-year medical students. *Teach Learn Med* 2007;19:42-6.
 21. Shanafelt TD, Boone S, Tan L, Dyrbye LN, Sotile W, Satele D, *et al*. Burnout and satisfaction with work-life balance among US physicians relative to the general US population. *Arch Intern Med* 2012;172:1377-85.
 22. O'Reilly E, McNeill KG, Mavor KI, Anderson K. Looking beyond personal stressors: An examination of how academic stressors contribute to depression in Australian graduate medical students. *Teach Learn Med* 2014;26:56-63.
 23. Dyrbye LN, Thomas MR, Shanafelt TD, editors. Medical student distress: Causes, consequences, and proposed solutions. *Mayo Clinic Proc* 2005;80:1613-22.
 24. Medical Council of India. List of Colleges Teaching MBBS. Available from: <http://www.mciindia.org/InformationDesk/ForStudents/ListofCollegesTeachingMBBS.aspx>. [Last retrieved on 2016 Mar 05].
 25. Abraham RR, Fan ES, Xin GN, Lim JT. A report on stress among first year students in an Indian medical school. *SE Asian J Med Educ* 2009;3:79-81.
 26. Rosenzweig S, Reibel DK, Greeson JM, Brainard GC, Hojat M. Mindfulness-based stress reduction lowers psychological distress in medical students. *Teach Learn Med* 2003;15:88-92.
 27. Peiffer V. Principles of Stress Management. London: Thorsons; 1996. p. 40-8.
 28. Alexander DA, Atcheson SF. Psychiatric aspects of trauma care: Survey of nurses and doctors. *Psychiatr Bull* 1998;22:132-6.
 29. Shanafelt TD, Balch CM, Bechamps G, Russell T, Dyrbye L, Satele D, *et al*. Burnout and medical errors among American surgeons. *Ann Surg* 2010;251:995-1000.
 30. Supe AN. A study of stress in medical students at Seth G.S. Medical College. *J Postgrad Med* 1998;44:1-6.
 31. Ludwig AB, Burton W, Weingarten J, Milan F, Myers DC, Kligler B. Depression and stress amongst undergraduate medical students. *BMC Med Educ* 2015;15:141.
 32. Shallcross L. It's a small world. *Counseling Today* 2011;53:42-47.
 33. Zhao CM, Kuh GD. Adding value: Learning communities and student engagement. *Res High Educ* 2004;45:115-38.
 34. Saoji AA. Yoga: A strategy to cope up stress and enhance wellbeing among medical students. *N Am J Med Sci* 2016;8:200-2.
 35. Chew-Graham CA, Rogers A, Yassin N. 'I wouldn't want it on my CV or their records': Medical students' experiences of help-seeking for mental health problems. *Med Educ* 2003;37:873-80.
 36. Levine RE, Bryant S. The depressed physician: A different kind of impairment. *Hosp Phys* 2000;36:67-73.

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