Adjustment disorder among first year medical students at King Saud University, Riyadh, Saudi Arabia, in 2020

Fahad A. Alhussain, Abdulhakim I. Bin Onayq, Dawood H. Ismail, Mohammed A. Alduayj, Turki A. Alawbathani, Mohammed A. Aljaffer

Abstract:

BACKGROUND: The general health and well-being of medical students has become a matter of concern, as medical students have higher levels of stress than their nonmedical peers. Long-standing stress may lead to serious outcomes, such as depression, anxiety, poor quality of life, or adjustment disorders. This study aimed to estimate the proportion of first year medical students who have adjustment disorder and explore possible risk factors.

MATERIALS AND METHODS: This cross-sectional study was conducted among all first-year medical students at King Saud University, College of Medicine, Saudi Arabia. The adjustment disorder-new model 20 (ADNM-20) was used to assess adjustment disorder with the stressor and item lists. The item list scores were summed and a cutoff point >47.5 was designated as a high risk of developing the disorder. Descriptive analysis included computing mean and standard deviation for continuous variable while frequency and percentages for categorical variables. Chi-square test and logistic regression analysis determined risk factors for having an adjustment disorder and the stress of attending a medical school.

RESULTS: The study enrolled 267 students but only 128 completed the ADNM-20 survey. Out of 267 students, the most commonly reported recent stressor was too much/too little work, and 52.8% reported having difficulty in meeting deadlines. The most common core symptom expressed by the medical students was avoidance behavior with a mean score of 10.91 ± 3.12, followed by preoccupation with stressors with a mean score of 10.66 ± 3.10. The factors significantly associated with having adjustment disorder were being female, younger age, recent illness of a loved one, having family conflicts, and having too much or too little work.

CONCLUSION: First year medical students are at increased risk of adjustment disorder. Screening and awareness programs may be considered for preventing adjustment disorder. Increased student-staff interactions may provide support to adapt to their new environment and help reduce social adjustment difficulties.

Keywords:

Adjustment disorder, medical education, medical students, stress

Department of Psychiatry, College of Medicine, King Saud University, Riyadh, Saudi Arabia

Address for correspondence:
Dr. Fahad A. Alhussain, College of Medicine, King Saud University, P. O. Box 230155, Riyadh 12372, Saudi Arabia. E-mail: alhussain. fahad4@gmail.com

Introduction

The general health and well-being of medical students have become a matter of concern as the demands of medical schools become increasingly more stressful.[1] Stress is omnipresent and drives people to perform to the best of their ability. However, excessive or persistent stress leads to psychological and physical ill-health.[2] A previous systematic review showed that stress is prevalent in university students and has

significant negative effects on their quality of life.[3] Multiple factors such as tight time schedules, increased workload, fears of failing, and highly competitive environments are associated with higher stress and psychological illnesses in students.[4]

The prevalence of psychological distress is higher in medical students than in their nonmedical peers[5-7] with a 33.8% global prevalence of anxiety in medical students.[8] The prevalence of stress is even greater in first year medical students since they need to cope with all sorts of stressors in a short period.[8] Long-standing stress can lead to serious outcomes, such as burnout, depression, anxiety, poor mental or physical quality of life, and adjustment disorder.[9,10] Moreover, the inability to cope with such stressors may lead to adjustment disorder.[11]

According to DSM-IV, the adjustment disorder is defined as "the presence of emotional or behavioral symptoms in response to an identifiable stressor, occurring within 3 months of the onset of the stressor, these symptoms are clinically demonstrated as either of the following: marked distress, in excess to what would be expected from exposure to the stressor, or significant impairment of social, occupational, or academic functioning."[12] In addition to impacting the quality of life and psychological health, adjustment disorder also significantly increases suicidal ideation.[13] According to the American Psychiatric Association, the prevalence of adjustment disorder was in the range of 5%–20% in outpatient mental health treatment.[14] Clinically, adjustment disorder can be classified into six main subtypes: depressed mood, anxiety, mixed anxiety and depression, disturbance of conduct, mixed disturbance of conduct and emotions, and an unspecified subtype.[15] A scale known as the adjustment disorder-new model 20 (ADNM-20), has been developed to easily assess adjustment disorder and improve conceptualization.[16] This scale measures both core and accessory symptoms including preoccupation with the stressor, failure to adapt, avoidance, depression, anxiety, and impulsivity to determine the patient's subtype.[15]

Medical students have the propensity to develop adjustment disorder since they experience multiple risk factors such as homesickness, change in living conditions, difficulty in making new friends, education pressure, and expectation.[17] Therefore, every university and education ministry should investigate and assess the magnitude of the problem of adjustment disorder and its associated risk factors. The aim of this study was to estimate the proportion of first year medical students who have adjustment disorder and explore its possible risk factors.

Materials and Methods

A cross-sectional observational study was conducted on all first year medical students at King Saud University, College of Medicine, Saudi Arabia, to assess the proportion that had adjustment disorder and explore the possible risk factors. Ethical approval was obtained from the Institutional Review Board (IRB) vide Letter No. 19/0156/IRB dated 08/12/2019 and informed written consent was taken from all participants.

A questionnaire was distributed to the students through an online survey during their break. Data collection started on January 27, 2020, and lasted for 1 month. The dates were determined specifically to avoid examination periods. The estimated time for completion of the questionnaire was 7–10 min. The study objectives and methods were explained to the participants, who were also instructed on how to complete the questionnaire.

ADNM-20 is a self-reported measurement of assessing adjustment disorder with a stressor list and an item list.[16] In the stressor list, the participants had the option to select out of a list of life stressors that which they had experienced recently and which was the most impactful/stressful. The item list consisted of multiple questions related to the most distressing event in the last 6 months on a four-point Likert scale from 1 (never) to 4 (often). The ADNM-20 item scores were summed, and a cut-off point >47.5 was designated as a high risk of developing an adjustment disorder.[18] The ADNM-20 is divided into core symptoms of adjustment disorder and accessory symptoms. The core symptoms consisting of preoccupation and the failure to adapt were assessed by four items. The accessory symptoms included avoidance, depressive mood, anxiety, and impulse disturbances.[15] Incomplete surveys were excluded. Demographic questions included age, gender, marital status, nationality, and permanent residence.

Statistical data analysis: The mean and standard deviation were used to describe the continuous variables, while categorical variables were described as frequency and percentages. The multiple response dichotomy analysis was applied to describe the variables with more than one option (e.g., experienced recent stressors). The Kolmogorov–Smirnov test of statistical normality was used to assess the metric variables. The Bivariate Chi-squared test of association was used to assess the correlations between categorical variables. The students perceived ADNM-20 score and its sub-scale scores were computed according to the author's scoring manual, and the total score was dichotomized into low- versus high-adjustment disorder based on a cutoff value of 47.5 points. Multivariate binary logistic regression analysis

was applied to assess the student's odds of having an adjustment disorder and the stress of attending a medical school; the association between predictor-independent variables was expressed as a multivariate-adjusted odds ratio (OR) with 95% confidence intervals. Figures were created using Excel spreadsheets Version 2010, and the SPSS IBM v21 (Armonk, NY) statistical data analysis program was used for data analysis with the alpha significance level of 0.050 level.

Results

Enrolled in this study were two hundred and sixty-seven medical students, 155 of whom had experienced a recent stressor. However, only 128 of them completed the ADNM-20 survey. Table 1 displays the descriptive analysis of the students' sociodemographic characteristics. Most of the medical students (56.2%) were male, only a few of whom (4.6%) were ever married; 3.7% were non-Saudi expatriates, and 92.5% were Riyadh residents. Some (13.9%) students had previously been diagnosed with a mental illness, but most (66.3%) revealed that they experienced stress as a result of attending medical school.

Out of 267 students participating in the survey, only 155 reported recent stressors. The most recently experienced stressor was too much/too little work for 52.9% of the students [Table 2 and Figure 1], followed by time pressures and the difficulty of meeting deadlines both experienced by 52.8% of the students. The most impactful/stressful events for 28.9% of the students were too much/too little work followed by time pressures and the difficulty of meeting deadlines for 27.2% of the students.

Table 3 displays the descriptive analysis of the medical students' overall perceptions of adjustment disorder ADNM-20 scale score and its sub-scale scores. The medical students' overall mean perceived adjustment disorder ADNM-20 score was 44.16 ± 11.30, maximum possible score = 80, which highlights a moderate level of perceived adjustment difficulty. However, with a cutoff point of 47.5% to determine the high risk of adjustment disorder, most (44.5%) medical students fell into the high-risk category. Furthermore, the medical students' mean perceived preoccupation with stressors subscale score was 10.66 ± 3.10 points, suggesting that the students could experience substantive preoccupation with stressful thoughts in general. Furthermore, the students' failure to adapt sub-scale score was 9.91 ± 3.34 points, indicating that they had substantial difficulty adapting. In addition, the students' mean perceived depressive mood subscale score of 7.51 ± 2.32 points is indicative of a high probability density of depression. The students' anxiety subscale score of 5.23 ± 1.71 points suggests high perceived anxiety and their impulsive

Table 1: Characteristics of first year medical students at King Saud University, Riyadh, 2020 (*n*=267)

	N (%)
Sex	
Male	150 (56.2)
Female	117 (43.8)
Age group (years)	
18	11 (4.1)
19	171 (64.0)
20	74 (27.7)
21 or more	11 (4.1)
Marital state	
Never married	255 (95.5)
Ever married	12 (4.5)
Nationality	
Saudi	257 (96.3)
Non-Saudi	10 (3.7)
Residence	
Inside Riyadh	247 (92.5)
Outside Riyadh	20 (7.5)
Have you been diagnosed with any mental illnesses previously?	
No	230 (86.1)
Yes	37 (13.9)
Do you find medical school stressful?	
No	90 (33.7)
Yes	177 (66.3)

Table 2: Recent and most stressful life events among first year medical students at King Saud University, Riyadh, 2020 (*n*=155)*

	Recent life stressors N (%)	Most impactful stressor N (%)
Divorce/separation	4 (2.6)	3 (2.6)
Family conflicts	38 (24.5)	21 (18.4)
Conflicts in work life	21 (13.5)	8 (7.0)
Conflict with neighbors	2 (1.3)	1 (0.9)
Illness of loved one	31 (20)	15 (13.2)
Death of loved ones	41 (26.5)	29 (25.4)
Adjustment due to retirement	4 (2.6)	1 (0.9)
Unemployment	3 (1.9)	1 (0.9)
Too much/too little work	82 (52.9)	33 (28.9)
Pressure to meet deadlines/time pressure	82 (52.8)	31 (27.2)
Moving to a new home	15 (9.7)	3 (2.6)
Financial problems	18 (11.6)	9 (7.9)
Serious accidents	10 (6.5)	5 (4.4)
Assault	1 (0.6)	1 (0)
Termination of an important leisure	5 (3.2)	9 (0.9)
Other (any other stressful event)	10 (6.5)	9 (7.9)

*Some responders reported more than one event

disturbance subscale score of 7.47 ± 2.57 points suggests substantive perceived impulsiveness as result of stressful events.

Table 3: Adjustment disorder-new model 20 overall scale and its subscale scores among first year medical students at King Saud University, Riyadh, 2020 (*n*=128)

	Mean±SD	Range of scores (Minimum - Maximum)
Adjustment disorder ADNM-20 score	44.16±11.30	20-74
High adjustment disorder score (≥47.5 points), *N* (%)		
No	71 (55.5)	
Yes	57 (44.5)	
Preoccupation with stressors	10.66±3.10	4-16
Failure to adapt	9.91±3.34	4-16
Avoidance behavior	10.91±3.12	4-16
Depressed mood	7.51±2.32	3-12
Anxiety	5.23±1.71	2-8
Impulse disturbance	7.47±2.57	3-12
Adjustment disorder ADNM-20 score	44.16±11.30	20-80

ADNM-20=Adjustment disorder-new model 20, SD=Standard deviation

Table 4: Logistic regression analysis results: Association between high risk of adjustment disorder and various factors (*n*=128)

	Adjusted OR	95% CI for OR	*P-value*
Females	2.478	1.094 - 5.610	0.030
Older age	0.397	0.191 - 0.824	0.013
Recent Illness of loved one	2.899	0.976 - 8.609	0.055
Recent Death of loved one	0.151	0.046 - 0.497	0.002
Family conflicts	2.843	0.909 - 8.886	0.072
Too much/too little work to do	2.719	1.060 - 6.979	0.037
Constant	3.480		0.168

Dependent variable=High ADNM-20 score (no/yes). ADNM-20=Adjustment disorder-new model 20, OR=Odds ratio, CI=Confidence interval
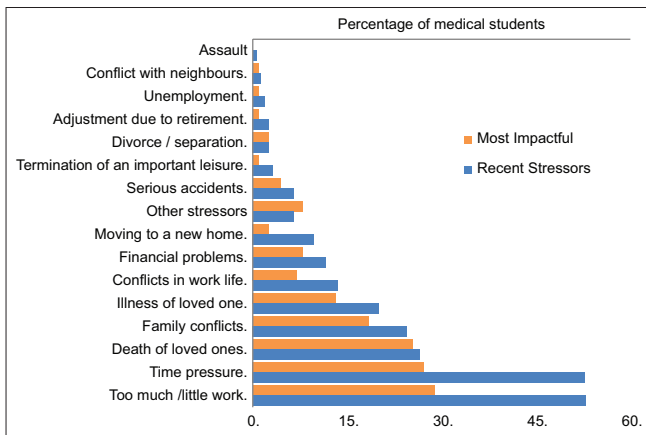

Figure 1: The mediacl students most recently experienced stressors and their impace rating
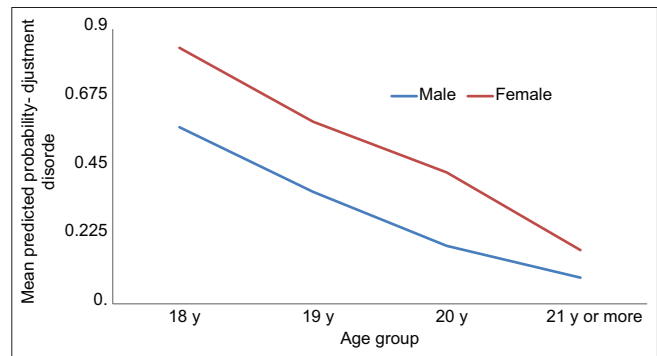

Figure 2: The association between the medical students age group and gender with their model predicted probability of having high adjustment disorder (ADMN-20) score. ADMN: Adjustment disorder-new model

Multivariate binary logistic regression analysis was applied to explain why medical students perceived less or more adjustment failure/disorder [Table 4]. It showed that female medical students were more likely to have a high risk of adjustment disorder with the OR of 2.48 compared to male students (*P* = 0.030), accounting for the other independent predictor variables in the analysis model. Furthermore, the students' age correlated significantly but negatively with their odds of having an adjustment disorder; for each year of increase in the students' age, their odds of having an adjustment disorder

declined by a factor equal to 60.3% times less than the average *P* = 0.013. Figure 2 illustrates that across all age groups, the mean predicted probability of being at high risk for adjustment disorder in general (the dashed lines) of female students exceeded that of males. Furthermore, the analysis showed that the students' experience of the recent illness of a loved one correlated positively but not statistically significantly with their odds of being at high risk of an adjustment disorder (*P* = 0.055). Moreover, students who experienced family conflicts were at increased odds of 2.84 times of being at high risk for adjustment disorder compared to those who had had

no recent family conflicts. However, this association was not statistically significant ($P = 0.072$). Students who reported that they had been under stress as result of too much/too little work were 2.72 times more at risk of adjustment disorder compared to those who had not experienced any stress ($P = 0.037$).

Discussion

The aim of this cross-sectional study was to assess the proportion of students with adjustment disorder and explore the associated risk factors in students in their first year at medical college (Foundation year). The general prevalence of stressors in first year medical students was 58.1%, and 21.3% of the students were at high risk for adjustment disorder, indicating adjustment problems in medical students.

According to the ADNM-20 scale, 21.3% of first year medical students were at high risk for adjustment disorder, which is in contrast to a previous study that used the ADNM-20 scale during the COVID-19 pandemic that reported 57.6% of their study participants at high risk of adjustment disorder.[19] Another study that assessed adjustment problems in students showed that 42.5% of the students at Ethiopian University, and 48% of the students at Jimma University, Ethiopia, had adjustment problems.[17,20] In addition, a previous local study conducted at the Gulf University of Bahrain found that 36.8% of the medical students had potential adjustment disorders, the highest prevalence being in first year medical students.[21]

The stressors most reported by the students were too much/too little work, followed by time pressures and the difficulty of achieving time deadlines. The most common core symptom of adjustment disorder reported by the participants was a preoccupation with stressors, which is in line with previous local studies. At King Saud University, the prevalence of the medical students' stress was 63.7% which was even higher in first year students at 78.7%.[22] Furthermore, at a neighboring college in Riyadh, King Saud Bin Abdulaziz University for Health Sciences, the prevalence of medical students' stress was 53.2%.[23] The most commonly reported accessory symptoms, which could play an important role in the degree of suspicion of adjustment disorder in college students experiencing stress, was avoidance. Furthermore, the medical students exhibited a high probability density of depression and anxiety. First-year students were more affected by the depressive category of adjustment disorders.[24]

Based on the literature review, it was hypothesized that sex, age, and family issues were risk factors for adjustment disorder.[25,26] Indeed, females were at a high risk for adjustment disorder. A previous study that used the ADNM-20 scale also reached a similar conclusion.[19] Regarding age, 64% of the students were 19-year-old, 27% were 20-year-old and the rest were either 18 or 21 years and above, and there was a statistically significant inverse relationship between adjustment disorder and age.

Personal issues are as important as the demographics,[17] but the death of a loved one, family conflicts, and the illness of a loved one were the most reported stressors not related to the medical school or demographics. This result is comparable to that of the Duhok University study in which personal illness or that of a loved one and family issues were the leading stressors.[25] In our study, the illness of a loved one and family conflicts were only slightly positively correlated with adjustment disorder. However, all personal factors could influence a student's ability to adjust to medical school.

We recommend that preventive measures such as screening and awareness programs should be considered for medical students to help them adapt to their new environment. Increased student-staff interactions could provide support to adapt to reduce social adjustment difficulties.

Our findings should be limited to the setting of the study, King Saud University. Since the study design was cross-sectional, a true causal relationship could not be established. Further longitudinal studies on a national scale are necessary to establish the causal relationships between adjustment disorder and medical students.

Conclusion

Medical students are exposed to tremendous amounts of stress, making them susceptible to developing an adjustment disorder. This study improves our understanding of adjustment disorder in first year medical students at King Saud University and adds to our knowledge that females and younger students, as well as those under too much stress, are at an increased risk of developing an adjustment disorder. The symptoms of adjustment disorder in first year medical students are mainly characterized by avoidance, followed by depression and anxiety.

Conflicts of interest
There are no conflicts of interest.

References

1. Behere SP, Yadav R, Behere PB. A comparative study of stress among students of medicine, engineering, and nursing. Indian J Psychol Med 2011;33:145-8.

2. Halkos G, Bousinakis D. The effect of stress and satisfaction on productivity. Int J Prodity Perform Manage 2010;59:415-31.

3. Ribeiro ÍJ, Pereira R, Freire IV, de Oliveira BG, Casotti CA, Boery EN. Stress and quality of life among university students: A systematic literature review. Health Prof Educ 2018;4:707.

4. Mabvuure N. A non-traditional method of teaching general practice to medical students: Notes summarising. Br J Gen Pract 2012;62:70.

5. Sreeramareddy CT, Shankar PR, Binu VS, Mukhopadhyay C, Ray B, Menezes RG. Psychological morbidity, sources of stress and coping strategies among undergraduate medical students of Nepal. BMC Med Educ 2007;7:26.

6. Dyrbye LN, Massie FS Jr., Eacker A, Harper W, Power D, Durning SJ, *et al.* Relationship between burnout and professional conduct and attitudes among US medical students. JAMA 2010;304:1173-80.

7. Dyrbye LN, Thomas MR, Shanafelt TD. Systematic review of depression, anxiety, and other indicators of psychological distress among U.S. and Canadian medical students. Acad Med 2006;81:354-73.

8. Quek TT, Tam WW, Tran BX, Zhang M, Zhang Z, Ho CS, *et al.* The global prevalence of anxiety among medical students: A meta-analysis. Int J Environ Res Public Health 2019;16:2735.

9. 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.

10. Strain JJ. The psychobiology of stress, depression, adjustment disorders and resilience. World J Biol Psychiatry 2018;19:S14-20.

11. Bachem R, Casey P. Adjustment disorder: A diagnosis whose time has come. J Affect Disord 2018;227:243-53.

12. American Psychiatric Association DS, Association AP. Diagnostic and Statistical Manual of Mental Disorders: DSM-5. Washington, DC: American Psychiatric Association; 2013.

13. Chung MS, Chiu HJ, Sun WJ, Lin CN, Kuo CC, Huang WC, *et al.* Association among depressive disorder, adjustment disorder, sleep disturbance, and suicidal ideation in Taiwanese adolescent. Asia Pac Psychiatry 2014;6:319-25.

14. Goodnick PJ. Summary from the 153rd meeting of the American psychiatric association. 13-18 May 2000, Chicago, Illinois, USA. Expert Opin Pharmacother 2000;1:1067-9.

15. Maercker A, Brewin CR, Bryant RA, Cloitre M, van Ommeren M, Jones LM, *et al.* Diagnosis and classification of disorders specifically associated with stress: Proposals for ICD-11. World Psychiatry 2013;12:198-206.

16. Einsle F, Köllner V, Dannemann S, Maercker A. Development and validation of a self-report for the assessment of adjustment disorders. Psychol Health Med 2010;15:584-95.

17. Belay Ababu G, Belete Yigzaw A, Dinku Besene Y, Getinet Alemu W. Prevalence of adjustment problem and its predictors among first-year undergraduate students in Ethiopian university: A cross-sectional institution based study. Psychiatry J 2018;2018: 1-7.

18. Lorenz L, Bachem RC, Maercker A. The adjustment disorder – New module 20 as a screening instrument: Cluster analysis and cut-off values. Int J Occup Environ Med 2016;7:215-20.

19. Vancappel A, Jansen E, Bachem R, Bray A, Egreteau L, Réveillère C, *et al.* Validation of the French ADNM-20 in the assessment of emotional difficulties resulting from COVID-19 quarantine and outbreak. BMC Psychol 2021;9:180.

20. Jemal J. Assessing major adjustment problems of freshman students in Jimma University. Ethiopian J Educ Sci 2012;7:1-14.

21. Bader A, Ahmed A, Fatimah A, Mohammad A, Abdulelah B, Fatimah A, *et al.* Adjustment disorder among medical students in Arabian Gulf University Bahrain, a cross-sectional, descriptive study. Int J Adv Res (Indore) 2018;6:442-6.

22. Abdulghani HM, AlKanhal AA, Mahmoud ES, Ponnamperuma GG, Alfaris EA. Stress and its effects on medical students: A cross-sectional study at a college of medicine in Saudi Arabia. J Health Popul Nutr 2011;29:516-22.

23. Almojali AI, Almalki SA, Alothman AS, Masuadi EM, Alaqeel MK. The prevalence and association of stress with sleep quality among medical students. J Epidemiol Glob Health 2017;7:169-74.

24. Rodgers LS, Tennison LR. A preliminary assessment of adjustment disorder among first-year college students. Arch Psychiatr Nurs 2009;23:220-30.

25. Yaseen YA. Adjustment disorder: Prevalence, sociodemographic risk factors, and its subtypes in outpatient psychiatric clinic. Asian J Psychiatr 2017;28:82-5.

26. Robert HE, Bourgeois B, Narriman SC. Study Guide to Psychiatry: A Companion to the American Psychiatric Publishing Textbook of Psychiatry. Washington, D.C: American Psychiatric Publishing Inc.; 2008.