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Sherif, Roba F.; Saeed, Nagat M.; Sherif, Gofran A.; Rabab, Khiria S.; Sherif, Fathi M.

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Prevalence of depression among Libyan medical students

Roba F. Sherif^a, Nagat M. Saeed^a, Gofran A. Sherif^b, Khiria S. Rabab^b, Fathi M. Sherif^{b,*} 

^aDepartment of Pharmacology, Faculty of Medicine, University of Tripoli, Tripoli, Libya

^bDepartment of Pharmacology and Clinical Pharmacy, Faculty of Pharmacy, University of Tripoli, Tripoli, Libya

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ABSTRACT

Introduction: Psychological stress is a common psychiatric disorder in medical students and sometimes is associated with depression. Students at university usually met a great pressure that they face in their study life and to the hard circumstances in the everyday life. The aim of this study is to estimate the prevalence of depression and stress among university medical students in Libya.

Materials and methods: Data was collected by three different questionnaires: the first questionnaire is 6-ITEM Kutcher Adolescent Depression Scale (KADS), the second questionnaire is Patient Health Questionnaire-9 (PHQ-9) which are used to diagnose and to assess the severity of depression. The third questionnaire is a simplified self-scoring test for evaluating stress and tension levels. The three questionnaires have all been distributed to the medical sciences students at University of Tripoli in March and May, 2019. According to the registered students in the academic year, 2018/2019, the sample size was composed of 170 students.

Results: The major finding of screening revealed that 45% of the total students suffering from depression during their study. This high prevalence composed of mild and moderate type of depression among the students (45% and 25%, respectively). On the other hand, about 40% and 50% of the students have identified as mild and moderate stress, respectively. About 10% of the students have detected as severe stress.

Conclusions: This study indicates a high prevalence of mild and moderate depression among medical university students in Libya. Results suggest that university mental health services and programs addressing the students are highly recommended.

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* Corresponding author.

E-mail address: Fmosherif@yahoo.com

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Prevalencia de depresión entre los estudiantes de medicina de Libia

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Introducción: El estrés psicológico es un trastorno psiquiátrico común en los estudiantes de medicina y, en ocasiones, se asocia con la depresión. Los estudiantes universitarios suelen encontrarse con una gran presión a la que se enfrentan en su vida de estudio y ante las duras circunstancias de la vida cotidiana. El objetivo de este estudio es estimar la prevalencia de depresión y estrés entre estudiantes universitarios de medicina en Libia.

Materiales y métodos: Los datos se recopilaron mediante tres cuestionarios diferentes: el primer cuestionario es la Escala de depresión adolescente de Kutcher de 6 elementos (KADS), el segundo cuestionario es el Cuestionario de salud del paciente-9 (PHQ-9) que se utiliza para diagnosticar y evaluar la gravedad de depresión. El tercer cuestionario es una prueba de autoevaluación simplificada para evaluar los niveles de estrés y tensión. Los tres cuestionarios se han distribuido a los estudiantes de ciencias médicas de la Universidad de Trípoli en marzo y mayo de 2019. Según los estudiantes registrados en el año académico 2018/2019, el tamaño de la muestra estaba compuesto por 170 estudiantes.

Resultados: El principal hallazgo de la evaluación reveló que el 45% del total de estudiantes sufrían depresión durante su estudio. Esta alta prevalencia estaba compuesta por depresión de tipo leve y moderada entre los estudiantes (45% y 25%, respectivamente). Por otro lado, alrededor del 40% y 50% de los estudiantes se han identificado con estrés leve y moderado, respectivamente. Alrededor del 10% de los estudiantes han detectado un estrés severo.

Conclusiones: Este estudio indica una alta prevalencia de depresión leve y moderada entre los estudiantes universitarios de medicina en Libia. Los resultados sugieren que los servicios y programas universitarios de salud mental dirigidos a los estudiantes son altamente recomendados.

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1. INTRODUCTION

Psychiatric disorder is a disturbance in an individual's cognition, emotion regulation or behavior [1]. Depression is one of the most common and treatable psychiatric illnesses characterized by depressed mood, loss of interest and pleasure, reduced energy, feelings of guilt, disturbed sleep and poor concentration. Severe cases of depression may lead to attempt suicide or suicide [2]. There are various forms of depression varied between mild to severe conditions as psychotic depressions [3-7]. Depression among university students is an extremely prevalent and widespread mental issue in several countries [8]. This is due to the great pressure that university students face in their educational study life and to the hard conditions in everyday life. University students are a special group of individuals that are lasting a critical transitory period during study (including hormonal changes and changes in environmental conditions). Several published reports showed depression is well-correlated to the brain chemical changes. Thus, genetic and environmental causes have a

role in depression etiology [9]. It is a mixed disorder often mistaken for a single clinical mental disease. This is usually seen in elderly patients and connected with severity of somatic symptoms [10]. Precise diagnosis that requires a complete physical and psychological evaluation is needed for an appropriate therapy [11]. In the USA, about 10% of adults had depression in a given 2-week period [12, 13] and nearly twice as common among women [14]. Almost 80% of adults with depression reported at least some difficulty with work, home or social activities due to their depression symptoms. This is based on scores from the Patient Health Questionnaire (PHQ-9), a symptom-screening questionnaire that allows for criteria-based diagnoses of depressive disorders [15].

Depression often comes with symptoms of anxiety which can be chronic or frequent and can lead to significant impairments in an individual's ability to take care of daily duties. Stress is a feeling of strain and pressure [16] and is a type of psychological pain [17]. Stress can be external and related to the environment [18] and can be internal perceptions that cause an individual to experience anxiety or other negative emotions [19]. Acute stress is a common

form among humans and concerns with the pressures of the close future or recent past [19]. Chronic stress has a wearing effect on people that can become very serious health risk if it continues for a long period. It can lead to memory loss, damage spatial recognition and produce a decreased drive of eating. It increases the risk of stroke, heart attack, ulcer and depression [20]. Women are able to take longer durations of stress than men without showing the same maladaptive changes [21].

Psychological distress among university students has been a concern for public health authorities around the globe. Among students, medical students are particularly prone to psychological distress and morbidity [22, 23]. University medical schools are stressful environments that can affect the well-being of students. Previous studies indicated that many medical students experience higher stress and more depression in comparison to other general populations and other non-medical university students [24]. A relatively recent meta-analysis study showed that depression affects about one third of medical students worldwide [25]. Within the above mentioned background, the aim of this study is to screen depression and anxiety among medical students in Libya.

2. MATERIALS AND METHODS

In this study, the sample size was determined and found to be 170 subjects (95% confidence level and 50% population proportion) according to the registered students at the final years of the Medical Sciences Faculties of University of Tripoli, Libya (2018/2019). This university is the largest and oldest university in Libya and located in the capital. Since most of the medical students are females, thus, the number of participants ($n=170$) were only female students at the graduation year in pharmacy, medicine and medical technology faculties to minimize the biological variations. All the participants aged between 23-25 years old. The study was held in the mid study (term) to ensure that students are not undergoing any stress related to final examinations. Three different questionnaires (see below) have been distributed by the investigators in March, April and May, 2019. Two questionnaires for screening and diagnosis of depression and the third questionnaire for assessing severity of stress. The first two questionnaires are: 6-item Kutcher Adolescent Depression Scale, KADS and Patient Health Questionnaire-9, PHQ-9. KADS consists of six questions, each question has four choices and each choice has a specific score. The total scores that each student gets tell whether a student suffers from depression or not. If the score is less than six points, it

indicates that the student has no depression, but if it is above six, it is considered a possible depression and may need thorough assessment (see below). The questionnaire of PHQ-9 consists of nine questions and each question has four choices, each choice has specific scores, the total scores that the person gets determine the severity of depression. Thus, the total scores can be interpreted as: no depression if less than four, mild depression from 5 to 9, moderate depression from 10 to 14, moderately severe depression from 15 to 19 and severe depression from 20 to 27. With regard to the stress questionnaire for measuring severity of stress and tension levels, the questionnaire consists of 10 questions and each one has three choices, each choice has specific scores. The total scores determine the severity of stress. It can be interpreted as mild stress up to 6, moderate stress from 7 to 12 and severe stress from 13 to 18 [26]. The study protocol was submitted to the University ethics committee (15/2019) for ethical approval. In addition, all students involved in this study had personally informed about the study and agreed to participate. Students with any physical diseases and drug use or abuse were excluded from the study. Data measured as frequency and percentage for each question of the above questionnaires.

3. RESULTS

The first depression module of the questionnaire that is used in this study (as mentioned above) is 6-item KADS. It includes the six depression criteria being scored from 0 = hardly ever to 3 = all of the time. This module is used for assessing depression among medical students by summing the scale score that is expected to equal a value at or above six suggests a possible depression and needs for more thorough assessment. A score below six indicates a probable no depression. Figure 1, out of 170 medical students, 92 students had a total score less than six indicated not depressed (about 55%) and 78 students had a total score higher than six indicated a possible depression and need for more thorough assessment (about 45%). The six items of KADS relating to evaluating depression among the students are shown in Table 1 with the prevalence for each symptom.

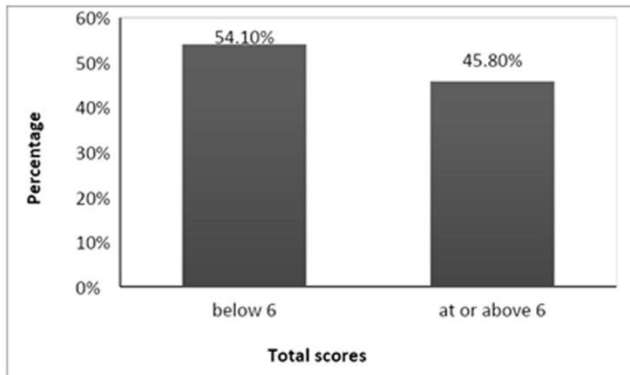


Figure 1: Percentage of depression occurrence according 6-ITEM Kutcher Adolescent Depression Scale (KADS) of medical students in Lybia.

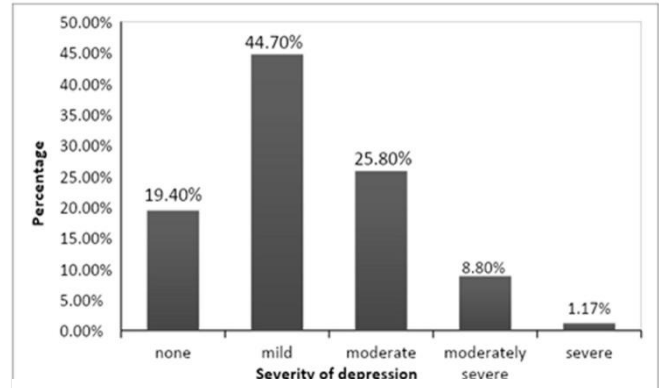


Figure 2: Distribution of depression among medical students in Libya medical according Patient Health Questionnaire-9 (PHQ-9).

Table 1. Data for 6-ITEM Kutcher Adolescent Depression Scale (KADS) of the Libyan medical students (n=170)				
Questions	Hardly ever	Much of the time	Most of the time	All of the time
Low mood, sadness, feeling down, depressed, just can't be bothered?	49 (28.82%)	51 (30%)	63 (37.06%)	7 (4.12%)
Feeling of worthlessness, hopelessness, letting people down, not being a good person?	101 (59.41%)	3 (1.76%)	22 (12.94%)	44 (25.89%)
Feeling tired, feeling fatigued, low in energy, hard to get motivated, have to push to get things done, want to rest or lie down a lot?	29 (17.06%)	70 (41.18%)	48 (28.23%)	23 (13.53%)
Feeling that life is not very much fun, not feeling good when usually would feel good, not getting as much pleasure from fun things as usual?	68 (40%)	48 (28.23%)	46 (27.06%)	8 (4.71%)
Feeling worried, nervous, panicky, tense, keyed up, anxious?	43 (25.29%)	65 (38.24%)	48 (28.23%)	14 (8.24%)
Thoughts, plans or actions about suicide or self-harm?	161 (94.70%)	5 (2.94%)	1 (0.59%)	3 (1.76%)

In this study, the second questionnaire for depression screen is Patient Health Questionnaire-9 (PHQ-9) which includes nine depression criteria being scored from 0 = never at all to 3 = nearly every day. The module is used for assessing depression severity among the students by summing the scale score that is expected to equal a value between 0 and 27 to indicate the severity status. The score of 0-4 and 5-9 suggest no and mild depression, respectively, while 10-14, 15-19 and 20-27 for moderate, moderate severe and severe depression, respectively. Based

on the scores from the PHQ-9, the prevalence of depression among the students was found to be as: out 170 students 33 of the total students (19.4%) have no depression while 76 (44.7%) and 44 (25.8%) of the students had mild and moderate depression, respectively. Moderate severe depression and severe depression denoted 15 (8.8%) and 2 (1.17%), respectively (Figure 2). The prevalence of each symptom among the students according to the PHQ-9 questionnaire is shown in Table 2. In this part of study, some of the students reported suicidal ideation (using item

9 of the PHQ-9 for screening suicidal ideation). About 5% of the total students answered several days and only 3% answered more than half the days, whereas, zero percentage nearly every day and 91.1% (not at all).

Figure 3 and Table 3 show data of the third questionnaire (simplified self-scoring test for gauging stress and tension levels). It consists of 10 questions that assess the severity of stress. Thus, we count the scores that each student got, if

Table 2. Data for Patient Health Questionnaire-9 (PHQ-9) of the Libyan medical students (n=170)

Questions	Not at all	Several days	More than half the days	Nearly every day
Little interest or pleasure in doing things?	36 (21.17%)	102 (60%)	25 (14.71%)	7 (4.12%)
Feeling down, depressed or hopeless?	63 (37.06%)	75 (44.12%)	22 (12.94%)	10 (5.88%)
Trouble falling or staying asleep too much?	41 (24.12%)	56 (32.94%)	44 (25.88%)	29 (17.06%)
Feeling tired or having little energy?	12 (7.06%)	73 (42.94%)	48 (28.23%)	33 (21.77%)
Poor appetite or overeating?	53 (31.17%)	53 (31.17%)	34 (20%)	30 (17.66%)
Feeling bad about yourself or that you are failure or have let yourself or your family down?	97 (57.06%)	51 (30%)	10 (5.88%)	12 (7.06%)
Trouble concentrating or things, such as reading the newspaper or watching television?	60 (35.29%)	77 (45.29%)	23 (13.53%)	10 (5.88%)
Moving or speaking so slowly that other people could have noticed? Or the opposite being so fidgety or restless that you have been moving around a lot more than usual?	97 (57.06%)	46 (27.06%)	15 (8.82%)	12 (7.06%)
Thoughts that you would be better off dead or of hurting yourself in some way?	155 (91.18%)	10 (5.88%)	5 (2.94%)	0 (0%)

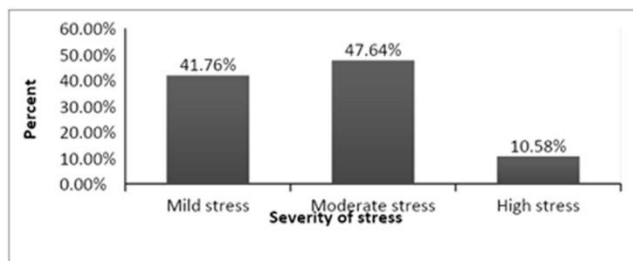


Figure 3: Level of severity of stress among medical students in Libya.

the total scores are zero to six then indicate mild stress. If the total scores from 7-12, then it directs moderate stress and if 13 to 18 then it is high or severe stress. Figure 3 shows that 41.76% and 47.64% of the students had mild and moderate stress, respectively, while high or severe stress represented 10.58% of the total students. The prevalence of each symptom among the students by stress questionnaire is shown in Table 3.

Severity of stress is assessed by a simplified self-scoring test for gauging stress and tension levels, as mild stress if total score is 0-6, moderate stress is 7-12 and high stress is 13-18.

Table 3. Data for stress questionnaire (simplified self-scoring test for gauging stress and tension levels) of medical students in Libya (n=170)

Item	Rarely	Few times a week	Often
Feel I tense, anxious or have nervous indigestion?	82 (48.24%)	63 (35.06%)	25 (14.70%)
People at work/home make me feel tense?	82 (48.24%)	54 (31.76%)	34 (20%)
Eat/drink/smoke I in response to tension?	104 (61.18%)	36 (21.16%)	30 (17.66%)
Have I got tension, migraine, headaches or pain in neck or shoulders or insomnia?	85 (50%)	49 (28.84%)	36 (21.16%)
Can't I turn off my thoughts at nights or on weekends long enough to feel relaxed and refreshed the next day?	39 (22.94%)	63 (35.06%)	68 (40%)
Find me it difficult to concentrate on what I am doing because of worrying about other things?	37 (21.76%)	73 (42.95%)	60 (35.29%)
Take me tranquilizers or other drugs to relax?	155 (91.18%)	10 (5.88%)	5 (2.94%)
Have I got difficulty in finding enough time to relax?	31 (18.24%)	75 (44.11%)	64 (37.65%)
Once I find time, is it hard for me to relax?	82 (48.24%)	51 (30%)	37 (21.76%)
Is my day made up for many deadlines?	73 (42.95%)	56 (32.94%)	41 (24.11%)

4. DISCUSSION

Depression is a major mental illness worldwide with high prevalence among university students, lowering their functioning and quality of life. Using standardized psychological assessment questionnaires, this study revealed a high prevalence of depression and stress among Libyan medical students. To the best of our knowledge, this is the first report about the prevalence of depression and stress among university students in Libya. Accordingly, this study showed a high prevalence of depression (45%) among Libyan undergraduate medical students of mild and moderate type. This is incompatible with previous results of several other national published studies [23 -33]. Thus, recent systematic reviews and meta-analysis indicated that the prevalence of depression among medical students worldwide was around 30% [24-27]. In another study carried out in Vietnam by Quynh et al. screened medical students at eight different medical universities showed a high prevalence of depression symptoms, 45% [28], this finding is in good accord with our present findings. It is also comparable with other study conducted at the Royal College of Surgeon in Bahrain showed that 40% of the participants have depressive symptoms [23]. Similarly, a study conducted at Foundation University Medical College in Pakistan reported about

50% of the students had depression and anxiety disorders [29]. In addition, a study conducted in Egypt reported depression is prevalent in about 60% of the total medical students [30]. Depression is also detected in 60% of the medical students in the 1st and 4th academic years as found in Al-Fayoum University in Egypt in 2017 [31]. Overall, these discrepancies between the published finding rates of depression in different nations could be explained by utilization of different methods for assessments for depression, in addition to different population characteristics.

People with depression may have trouble doing normal day-to-day activities and feel as if life is not worth living. At a mild level, depression can cause mood fluctuations and short-lived emotional response but at moderate level, it may become a serious health condition that substantially impairs ability to cope with daily life. However, at severe level, depression can lead to suicide [2]. In the current study, based on scores from the PHQ-9, the prevalence of severity of depression among the medical students was found to be 45% and 25% of students had mild and moderate depression, respectively, while moderate severe and severe depression to be about 10% and 1%, respectively. In a study carried out in Alexandria, Egypt by Elsayy et al. reported 32% and 22% of the students have minimal and mild depression, respectively, while moderate and severe depression showed about 30% and 20%,

respectively [32]. In another recent study in Palestine by Shawahna et al. reported about 55% of the students had minimal depression, 20% had mild depression, 15% had moderate depression and 10% had severe depression [33]. The burden of depression on medical students could lead to low quality of life, dropout and ultimately suicidal ideation [34]. Various studies demonstrated that prevalence of moderate and severe depression decreased with an increase in the student's age and advance in the academic year [24, 31]. Despite the age of the students of this study (23-25 years) and are registered at the final year of graduation, it shows a high prevalence of mild and moderate depression. This could be related to local unusual situations faced to students as civil wars and continuing conflicts in Libya. Definitely, this has increased the risk of depression among the university students. The effects of depression may persist for a longer time that can have negative effects on an individual's personal and social life. Still, students with depressive symptoms suffer from other psychological difficulties as anxiety, burnouts and suicidal ideation and substance abuse [35, 36].

It is notable that in this study, the proportion of medical students reporting suicidal ideation (using item 9 of the PHQ-9 for screening suicidal ideation) is about 5%. Over the last two weeks how often have you had thoughts that you would be better off dead or of hurting yourself in some way? About 5% of the students answered several days, whereas 3% answered (more than half the days). In a previous study using the same PHQ-9 questionnaire for screening suicidal ideation showed suicidal ideation is about 10% of medical students [24]. A recent study showed 4.5% of the students who participating stated attempted suicide [31]. In a study by Pham et al., suicidal ideation is found by 7.7% among the medical students [37]. The changes in prevalence of suicidal ideation of the students between enrolling and between years in the course were reported by Schwenk et al. in which third- and fourth year students are more likely than first and second year students to report suicidal ideation (7.9% vs. 1.4%) [36].

Medical education is considered a highly stressful variable. It is not only a part of the university; however, it results from everyday responsibilities at home and school [39]. The stress-questionnaire of the present study was conducted to conclude the prevalence of stress among the students. The present result shows a high prevalence of mild and moderate stress in the students, 41% and 47%, respectively. Severe stress represented in 10% of the total medical students. Previous published studies showed that medical students have great exposure to psychological stress compared to their age-matched peers of other non-

medical faculties [40, 41]. Moreover, Elias et al. reported that medical students and final year students are more likely to experience higher levels of stress compared to other students. Thus, scores of Libyan students at the final year of the course are in accord with the previous results [41]. A recent study by Seedhom et al. also showed slightly higher prevalence of stress among the medical students than the non-medical students [42].

5. CONCLUSIONS

This study shows high prevalence of depression and anxiety among medical students in Libya. The mental and psychological problems of medical university students are a major health issue. Thus, a program of university mental health services is highly suggestive for such groups.

6. REFERENCES

1. American Psychiatric Association. *Diagnostic and statistical manual of mental disorders (DSM-5®)*. 5th ed. American Psychiatric Publishing; 2013.
2. World Health Organization. Suicide prevention. Available from: https://www.who.int/health-topics/suicide#tab=tab_1 (accessed Feb 2021).
3. Fava M, Cassano P. Mood disorders: Major depressive disorder and dysthymic disorder. In: Stern TA, Rosenbaum JF, Fava M, Biederman J, Rauch SL, editors. *Massachusetts General Hospital Comprehensive Clinical Psychiatry*. 1st ed. Philadelphia: Mosby Elsevier; 2008:29.
4. Practice guideline for the treatment of patients with major depressive disorder (revision). American Psychiatric Association. *Am J Psychiatry*. 2000;157(4 Suppl):1-45.
5. Little A. Treatment-resistant depression. *Am Fam Physician*. 2009;80(2):167-72.
6. Patel V, Pereira J, Mann AH. Somatic and psychological models of common mental disorder in primary care in India. *Psychol Med*. 1998;28(1):135-43. doi: 10.1017/s0033291797005941.
7. Murray D, Cox JL. Screening for depression during pregnancy with the Edinburgh Depression Scale. *J Reprod Infant Psychol*. 1990;8:99-107. doi: 10.1080/02646839008403615.
8. Sarokhani D, Delpisheh A, Veisani Y, Sarokhani MT, Manesh RE, Sayehmiri K. Prevalence of Depression among University Students: A Systematic Review and Meta-Analysis Study. *Depress Res Treat*. 2013;2013:373857. doi: 10.1155/2013/373857.
9. Forbes. Study Undermines Case for Antidepressants. Available from: <https://www.forbes.com/2010/01/05/antidepressant-paxil-placebo-business-healthcare-depression.html?sh=e08b0a738a39> (accessed Feb 2021).
10. Devane CL, Chiao E, Franklin M, Kruep EJ. Anxiety disorders in the 21st century: status, challenges, opportunities, and comorbidity with depression. *Am J Manag Care*. 2005;11(12 Suppl):S344-53.
11. Barbee JG. Treatment-Resistant Depression: Advances in Assessment. *Psychiat Times*. 2008;25(10).
12. Pratt LA, Brody DJ. Depression in the U.S. household population, 2009-2012. *NCHS Data Brief*. 2014;(172):1-8.
13. Center for Behavioral Health Statistics and Quality. Key substance use and mental health indicators in the United States: Results from the 2015 National Survey on Drug Use and Health (HHS Publication No. SMA 16-4984, NSDUH Series H-51). 2016. Available from <http://www.samhsa.gov/data/>.
14. Nazroo JY, Edwards AC, Brown GW. Gender differences in the prevalence of depression: artefact, alternative disorders, biology or roles? *Social Health Illn*. 1998;20(3):312-30. doi: 10.1111/1467-9566.00104.
15. Kalibatseva Z, Leong FT. Depression among Asian Americans: Review and Recommendations. *Depress Res Treat*. 2011;2011:320902. doi: 10.1155/2011/320902.
16. Mental Health America Stress. Available from: <https://www.mhanational.org/conditions/stress> (accessed Feb 2021).
17. Simandan D. On how much one can take: relocating exploitation and exclusion within the broader framework of allostatic load theory. *Health Place*. 2010;16(6):1291-3. doi: 10.1016/j.healthplace.2010.08.009.
18. Jones F, Bright J, Clow A. *Stress: myth, theory and research*. New York: Prentice Hall; 2001.
19. McGonagle KA, Kessler RC. Chronic stress, acute stress, and depressive symptoms. *Am J Community Psychol*. 1990;18(5):681-706. doi: 10.1007/BF00931237.
20. Sapolsky RM. *Why Zebras Don't Get Ulcers*. MacMillan USA; 2004.
21. Bowman RE, Beck KD, Luine VN. Chronic stress effects on memory: sex differences in performance and monoaminergic activity. *Horm Behav*. 2003;43(1):48-59. doi: 10.1016/s0018-506x(02)00022-3.
22. January J, Madhombiro M, Chipamaunga S, Ray S, Chingono A, Abas M. Prevalence of depression and anxiety among undergraduate university students in low- and middle-income countries: a systematic review protocol. *Syst Rev*. 2018;7(1):57. doi: 10.1186/s13643-018-0723-8.
23. Mahroon ZA, Borgan SM, Kamel C, Maddison W, Royston M, Donnellan C. Factors Associated with Depression and Anxiety Symptoms Among Medical Students in Bahrain. *Acad Psychiatry*. 2018;42(1):31-40. doi: 10.1007/s40596-017-0733-1.
24. 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. doi: 10.1001/jama.2016.17324.
25. Puthran R, Zhang MW, Tam WW, Ho RC. Prevalence of depression amongst medical students: a meta-analysis. *Med Educ*. 2016;50(4):456-68. doi: 10.1111/medu.12962.
26. Sun Y, Fu Z, Bo Q, Mao Z, Ma X, Wang C. The reliability and validity of PHQ-9 in patients with major depressive disorder in psychiatric hospital. *BMC Psychiatry*. 2020;20(1):474. doi: 10.1186/s12888-020-02885-6.
27. Tam W, Lo K, Pacheco J. Prevalence of depressive symptoms among medical students: overview of systematic reviews. *Med Educ*. 2019;53(4):345-54. doi: 10.1111/medu.13770.
28. Quynh AT, Dunne MP, Ngoc HL. Well-being, depression and suicidal ideation among medical students throughout Vietnam. *Vietnam J Med Pharm*. 2014;6(3):23-30.
29. 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.
30. Ibrahim MB, Abdelreheem MH. Prevalence of anxiety and depression among medical and pharmaceutical students in Alexandria University. *Alexandria J Med*. 2015;51(2):167-73. doi: 10.1016/j.ajme.2014.06.002.
31. Wahed WYA, Hassan SK. Prevalence and associated factors of stress, anxiety and depression among medical Fayoum University students. *Alexandria J Med*. 2017;53:77-84. doi: 10.1016/j.ajme.2016.01.005.
32. Elsayy WIH, Sherif AAR, Attia MSED, El-Nimr NA. Depression among medical students in Alexandria, Egypt. *Afr Health Sci*. 2020;20(3):1416-25. doi: 10.4314/ahs.v20i3.47.
33. Shawahna R, Hattab S, Al-Shafei R, Tab'ouni M. Prevalence and factors associated with depressive and anxiety symptoms among Palestinian medical students. *BMC Psychiatry*. 2020;20(1):244. doi: 10.1186/s12888-020-02658-1.
34. Paura L, Arhipova I. Cause analysis of students' dropout rate in higher education study program. *Procedia Soc Behav Sci*. 2014;109:1282-6. doi: 10.1016/j.sbspro.2013.12.625.
35. Dyrbye LN, West CP, Satele D, Boone S, Tan L, Sloan J, Shanafelt TD. 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. doi: 10.1097/ACM.000000000000134.
36. Jackson WC. Mindfulness and Perfectionism in Dentistry. *J Mass Dent Soc*. 2017;66(1):12-3.
37. Pham T, Bui L, Nguyen A, Nguyen B, Tran P, Vu P, et al. The prevalence of depression and associated risk factors among medical students: An untold story in Vietnam. *PLoS One*. 2019;14(8):e0221432. doi: 10.1371/journal.pone.0221432.
38. Schwenk TL, Davis L, Wimsatt LA. Depression, stigma, and suicidal ideation in medical students. *JAMA*. 2010;304(11):1181-90. doi: 10.1001/jama.2010.1300.
39. 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 Stud Res*. 2011;1:45-50.
40. 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(4):354-73. doi: 10.1097/00001888-200604000-00009.
41. Elias H, Ping WS, Abdullah MC. Stress and academic achievement among undergraduate students in Universiti Putra Malaysia. *Procedia Soc Behav Sci*. 2011;29:646-55. doi: 10.1016/j.sbspro.2011.11.288.
42. Seedhom AE, Kamel EG, Mohammed ES, Raouf NR. Predictors of Perceived Stress among Medical and Nonmedical College Students, Minia, Egypt. *Int J Prev Med*. 2019;10:107. doi: 10.4103/ijpvm.IJPVM_6_18.