Original Article

**Depression among first and fifth year medical students in Riyadh, Saudi Arabia.**

Abdulaziz Almalki a\*, Abdullah Almalki a, Abdullah Kokandi a, Bandar Aldosari a, Abdulaziz Bin Baz a, Shoog Alfadhel b, Abdulaziz Alsuwayyigh a, Rgad Alsadoun b, Bandar Haddad c.

*a College of Medicine, Imam Muhammed Ibn Saud Islamic University, Riyadh, Saudi Arabia.*

*b College of Medicine, King Saud bin Abdulaziz University for Health Sciences, Riyadh, Saudi Arabia.*

 *c Clinical Neuroscience Department, College of Medicine, Imam Mohammed Ibn Saud Islamic University, Riyadh, Saudi Arabia.*

\*corresponding author: Abdulaziz Saeed Almalki, College of Medicine, Imam Mohammed Ibn Saud Islamic University, Riyadh, Saudi Arabia, Email: Abdualaziz.Almalki@gmail.com

**Abstract**

Background and objectives: depression is a common serious medical disease characterized by persistent sadness that affect more than 300 million individuals worldwide. Our theory is that medical students will suffer depressive symptoms after long duration of exposure to the stressful environment of medical colleges. Our aim is to determine the presence of depressive symptoms and compare the level of depression between 5th year and 1st-year medical students in Riyadh.

Method: The study is cross-sectional with convenient sampling from two medical colleges in Riyadh in the Kingdom of Saudi Arabia. The study was carried out in October - November 2017, and the English version of Beck's Depression Inventory questionnaire was used. Statistical analysis was administered using the statistical package for social sciences (SPSS). Chi-square test was used as an analytical tool, where P-value less than 0.05 was considered as statistically significant.

Results: The questionnaire was answered by 241 participants. The age variable shows a bimodal distribution. First-year students were 19 (±0.8) years old, and fifth-year students were 23 (±2.1) years old. Fifth-year students were 53.5% of the total sample, and male students accounted for 63.1% of the total sample. After analysis, the results show that male students scored higher than female students on the lower side of the scale in both years. Most of the first-year female students scored a higher level of depression in comparison to males (p=<0.001), whereas in the fifth-year students’ data, there was no difference between males and females (p=0.4).

Conclusion: our study shows a new pattern of reported depressive symptoms among 1st and 5th year medical students. Also suggests that depression is more common among female medical students than their counterparts. For future studies, we recommend using randomized sampling in a cohort study including all levels of medical students to further investigate and confirm the findings.

Keywords**:** depression; medical students; cross-sectional; Beck's depression inventory questionnaire; Saudi Arabia.

**1. Introduction**

Depression is a common serious medical disease characterized by persistent sadness that affects more than 300 million individuals worldwide. It causes a social burden that involves the ill individual, his family, and community. In addition, depression burdens communities and countries economically, and causes work-related issues increasing suicide rates. [1, 2, 3] In the United States, around 10% of physician office visits are related to depression. [4] Approximately 43% of individuals with severe depressive symptoms reported hardships and serious obstacles at home and social events. [5] According to the National Vital Statistical Reports in 2014, there are 13.4 suicide deaths per 100,000 people. [6]

Medical students show a higher prevalence of depressive symptoms than the general population. [7] For example, in a study of medical students in china, it was found that 51% of the sample had moderate to severe depression on the PHQ9 scoring system. [8] Another study on medical students in European and English-speaking countries shows variable prevalence of depression ranging from 6% to 66%. [9]

*1.1. Significance of the study.*

In the United States, a prospective study was done to compare the risk of depression among medical students in their 1st and 3rd years. The findings show a rise in the risk of depression in the 3rd year medical students compared to the risk in the 1st year. [10]

Studies on Saudi Arabian medical students show as high prevalence of depressive symptoms as other studies done in several countries. [11] To the best of researchers’ knowledge, there are six studies concerned with the prevalence of depression among medical students in Saudi Arabia. In a cross-sectional study on pre-clinical years students, it showed a high prevalence of depression. All in all, there was an increase in the risk of depression among 3rd-year students in comparison to 2nd-year students. [12]

Our theory is that medical students will suffer depressive symptoms after long duration of exposure to the stressful environment of medical colleges that expect them to acquire a vast amount of knowledge in a restricted time.

*1.2. Objectives of the study.*

Our primary objective was to determine a pattern of reporting depressive symptoms among 5th year and 1st-year medical students in Riyadh, Saudi Arabia. Our secondary objective was to compare the reporting of depressive symptoms between both genders.

**2. Materials and Methods**

*2.1. Demographic characteristics of the participants*

The population of the study is 470 students who are 1st year and 5th year students in Imam Muhammed ibn Saud Islamic University and Princess Nourah bint Abdulrahman University in Riyadh, Saudi Arabia. This is a cross-sectional study that was carried out in October - November 2017.

*2.2. Inclusion and exclusion criteria.*

The inclusion criteria involved adult male and female medical students who agreed to participate in the study while attending the college of medicine in Imam Muhammed ibn Saud Islamic University or Princess Nourah bint Abdulrahman University in Riyadh, Saudi Arabia. The exclusion criteria involved any medical students who did not give their consent or declined to cooperate.

*2.3. Materials and equipment.*

The researchers used The English version of Beck's Depression Inventory. Previous studies were conducted with the English version of Beck's Depression Inventory and confirmed its validity and reliability as a tool to screen for and score the depressive symptoms. [13]

The questionnaire includes two sections critical to our objectives. The 1st section consists of general demographic questions about age, gender, and academic year. The 2nd section is the Beck's Depression Inventory questionnaire - English version. The sampling method was convenient, where our targeted population was 1st and 5th year medical students in Imam Muhammed ibn Saud Islamic University and Princess Nourah bint Abdulrahman University in Riyadh.

The original scoring system was used to interpret the data extracted using Beck's Depression Inventory. Beck’s questionnaire consisted of 21 questions with four choices to each question. Each choice equals a number points varying from 0 to 3. The total lowest score in all the questions can be 0 points, and the highest possible score is 63 points. A high score means that the degree of depression the respondent has is severe. Finally, the system categorizes the scores into six levels: (1-10) normal, (11-16) mild mood disturbance, (17-20) Borderline Clinical Depression, (21-30) Moderate depression, (31-40) severe depression, and (>40) extreme depression.

*2.4. Ethical statement.*

The students were approached during breaks or at the end of lectures. They were acquainted with the purposes of the study. Consents were taken, and full confidentiality of the participants and the obtained information were assured. The study received approval from the Office of Research Ethics at the Imam Muhammed ibn Saud Islamic University, College of Medicine.

*2.5. Statistical analysis.*

Statistical analysis was administered using the statistical package for social sciences (SPSS). Chi-square test was used as an analytical tool. P-value less than 0.05 was considered as statistically significant.

**3. Results**

The questionnaire was answered by 241 participants who matched the criteria for the study. In table 1, the age variable shows a bimodal distribution, where first-year students are 19 (±0.8) years old, and fifth-year students are 23 (±2.1) years old. Fifth-year students make up 53.5% of the total sample, in which male students accounted for 63.1% of the total sample (P=0.002).

Table 1. Demographic Data of the respondents

|  |  |  |  |
| --- | --- | --- | --- |
|  | 1st year (n=112) | 5th year (n=129) | Total |
| Age, mean (SD) | 19.5 (±0.890) | 23.67 (±2.18) | 21.7 (± 2.6) |
| Gender | Male, n (%) | 59 (38.8%) | 93 (61.2%) | 152 |
| Female, n (%) | 53 (59.6%) | 36 (40.4%) | 89 |

Table 2 demonstrates the difference between first-year and fifth-year male and female students. Regarding depression scale, male students scored higher than female students on the lower side of the scale in both years. Most of the first-year female students scored a higher level of depression in comparison to males (p=<0.001). On the other hand, fifth-year students showed no difference between males and females (p=0.4).

Table 2. Depression levels among 1st and 5th year medical students.

|  |  |  |
| --- | --- | --- |
| 1st year | 5th year | Depression scale |
| Male | Female  | Male | female |
| 32 | 9 | 46 | 12 | Normal |
| 12 | 12 | 14 | 8 | mild mood disturbance |
| 8 | 8 | 7 | 5 | Borderline Clinical Depression |
| 5 | 11 | 17 | 5 | Moderate depression |
| 1 | 8 | 8 | 5 | severe depression |
| 1 | 5 | 1 | 1 | extreme depression |
| 59 | 53 | 93 | 36 | Total |
| <0.001 | 0.441 | p-value |

**4. Discussion**

The purpose of the present paper was to study and evaluate a pattern of reporting depression among medical school students who belong to different academic years. The researchers chose to apply the study to students of 1st and 5th years from both genders using Beck-Depression-Inventory-BDI scale.

*4.1 Difference between 1st and 5th-year students*

In comparison, first-year students scored a higher level of depression in both genders, which contradicts the theory proposed by the present paper that suggests that depression increases over time from the first level to the fifth. The proposed theory in the present paper matches the findings of a previous study. [8] The study that aimed to assess depressive symptoms compared the prevalence of depression among medical students in their 1st year and 3rd year and showed a significantly increased risk of depression in 3rd-year medical students compared to 1st-year medical students. [8] On the other hand, there was a Chinese study that compared the prevalence of depression among second and 3rd-year medical students and found that there was no significant difference among the students. [9] These contradictions between results could be due to societal differences. For example, in Saudi Arabia, most of high schools do not put the students under heavy stress. When these students move to college and start their 1st year, they go under heavy stress due to the strict grading systems and demanding academic life.

Our results regarding the difference in reporting of depressive symptoms among first and 5th-year medical students could be due to the stress of college life because of the students’ inability to get adjusted to their new life that imposes on them a level of stress that they have not experienced before. For further research, the researchers recommend an inclusion of students from all the levels of medical college to clarify the pattern of association between reporting depressive symptoms and the levels of the students.

*4.2. Difference between Males and females*

Our results show that males, in comparison to females, scored low level of depression in both years, and this could be explained in the light of many factors, such as biological and sociocultural factors. This confirms that depression prevalence among females is higher than males, which is consistent with the data in WHO booklet that states that depression prevalence in 2015 is 4.4% of the global population and is more common among females than males. A study done in Saudi Arabia, Al-Qaseem University, investigating anxiety and depression in medical students, shows a high prevalence of depressive symptoms in females, which is consistent with other studies. [12] Multiple studies have demonstrated an increase in depression risk among females compared to males. [14-17]

To the best of the researchers’ knowledge, no studies were done in Saudi Arabia to investigate the difference in experiencing depressive symptoms between preclinical year and clinical year medical students. Our limitations include the nature of the followed method, a cross-sectional study limited with convenient sampling, and the inclusion of only two medical colleges and two levels of medical students.

**5. Conclusion**

To conclude, the study shows a new pattern of reported depressive symptoms among 1st and 5th year medical students, which evidently shows high reported symptoms among 1st year medical students compared to the 5th. Moreover, the study is consistent with the factsheet of WHO that states that depression is more common among females than males. [1]

**Acknowledgment:**

We profoundly thank Mr. Ziad Almalki for his insightful comments and editing.

**Conflict of interests:**

We do not have any conflict to disclose.

**References**

1- World Health Organization. Depression Fact sheet [Internet]. Geneva, Switzerland: World Health Organization; 22 Mar 2018 [22 Mar 2018; 31 January 2019]. Available from: <https://www.who.int/en/news-room/fact-sheets/detail/depression>

2- Smith K. Mental health: A world of depression. Nature. 2014;515(7526):180-181.

3- Kessler R, Berglund P, Demler O, Jin R, Koretz D, Merikangas K et al. The Epidemiology of Major Depressive Disorder: results from the National Comorbidity Survey Replication (NCS-R). JAMA. 2003;289(23):3095.

4- Rui P, Hing E, Okeyode T. National Ambulatory Medical Care Survey: 2014 State and National Summary Tables [Internet]. Unites State of America: Centers for Disease Control and Prevention; 15 Dec 2014 [15 Dec 2014; 31 Jan 2019]. Available from: <https://www.cdc.gov/nchs/ahcd/web_tables.htm#2014>

5- Pratt LA, Brody DJ. Depression in the U.S. household population, 2009–2012. National Center for Health Statistics. 2014; NCHS data brief (172):1-8.

6- Kochanek KD, Murphy SL, Xu JQ, Tejada-Vera B. Deaths: Final data for 2014. CDC, National Vital Statistics System. 2016;65(4):6,10.

7- Rotenstein L, Ramos M, Torre M, Segal J, Peluso M, 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.

8- Sobowale K, Zhou A, Fan J, Liu N, Sherer R. Depression and suicidal ideation in medical students in China: a call for wellness curricula. International Journal of Medical Education. 2014;5:31-36.

9- Hope V, Henderson M. Medical student depression, anxiety and distress outside North America: a systematic review. Medical Education. 2014;48(10):963-979.

10- Ludwig A, Burton W, Weingarten J, Milan F, Myers D, Kligler B. Depression and stress amongst undergraduate medical students. BMC Medical Education. 2015;15(1).

11- El-Gilany A, Amr M, Hammad S. Perceived stress among male medical students in Egypt and Saudi Arabia: Effect of sociodemographic factors. Annals of Saudi Medicine. 2008;28(6):442.

12- Inam SB. Anxiety and depression among students of a medical college in Saudi Arabia. Int J Health Sci (Qassim) 2007;1(2):295–300.

13- Kliem S, Mößle T, Zenger M, Brähler E. Reliability and validity of the beck depression inventory-fast screen for medical patients in the general German population. Journal of Affective Disorders. 2014;156:236-239.

14- Jadoon NA, Yaqoob R, Raza A, Shehzad MA, Zeshan SC. Anxiety and depression among medical students: a cross-sectional study. J Pak Med Assoc 2010;60 (8): 699 – 702.

15- John A, Towes MD, Jocelyn M, et al. " Analysis of stress levels among medical students residents and graduate students at four Canadian school of medicine ". Acad Med 1997; 72:997-1002.

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

17- Rosal MC, Ockene IS, Ockene JK, Barrett SV, Ma Y, Hebert JR. "A longitudinal study of students' depression at one medical school". Acad Med. 1997 Jun;72(6):542-6.