

Stress, Anxiety, Depression Among Medical Undergraduate Students at Benha University and Their Socio-Demographic Correlates

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ABSTRACT

Background: Medical students display poorer mental health when compared to equivalent peers. Learning environment, educational debt, hard workload, and sleep disturbance make them more liable for mental disorders as anxiety and depression.

Objective: The aim of the current work was to determine prevalence and factors associated with depression, anxiety and stress among medical students.

Patients and Methods: A cross-sectional study using a self-administered questionnaire was distributed to students in the six grades at Benha Faculty of Medicine. Students were chosen by stratified random sample technique. The total participants were 597.

Results: Out of included students; 88.8%, 82.6% & 82.7% experienced depression, anxiety, and stress respectively. A statistically significant difference between smokers and non-smokers (14.3 ± 4.9 & 11.5 ± 5.6 respectively) was found regarding depression score. The mean anxiety and stress scores were significantly higher between females (9.78 ± 5.4 & 13.03 ± 4.9 respectively) than males. The third grade had the highest mean of anxiety and stress score (10.1 ± 4.8 , p value = 0.03 & 14.02 ± 3.9 , p value = 0.000 respectively). There was a statistically significant difference in depression and anxiety scores as regarding Personal income. There were statistically significant associations between student average achievement score, social activity, transportation and mean score of depression, anxiety, stress.

Conclusion: It could be concluded that medical students experienced high degrees of depression, anxiety, and stress. Smoking, female gender, personal income, achievement score were significantly associated with mental problems.

Keywords: Anxiety, Depression, Medical student, Stress

INTRODUCTION

Mental and emotional challenges between university students constitute an emerging public health problem^(1, 2). Although this problem includes all academic studies, it was thought that the prevalence may be higher among medical students⁽³⁾.

Medical students show poorer psychosocial state when compared to their same age peers⁽⁴⁾, and have higher prevalence of depression and burnout than the general population⁽⁵⁾. Worldwide, about one third of the medical students suffer from depression or depressive symptoms^(6, 7), anxiety and psychosomatic disorder⁽⁸⁾.

Different stressors threaten medical students' mental health. Some known stressors include: adaptation to the medical school environment, educational debt, hard workload, sleep disturbance, difficult patients, poor learning environments, financial issues, information overload and career planning⁽⁹⁾.

Medical School is a stressful environment. The courses expose the student to variable sources of stress since admission into the university include the excessive study load, personal and the professors' desire for excellence, lack of leisure time and contact with death, and other stressors⁽¹⁰⁾.

These stressors may have various sequels like anxiety, depression, poor academic performance, impaired competency, medical errors and attrition from medical schools⁽⁹⁾. Stress can also impair attention and

concentration, affect decision making, and good physician patients relationships⁽¹¹⁾. This may lead to poorer physical health, substance misuse⁽¹²⁾.

Rational: Although Medicine is supposed to keep and promote the health of population, the study of medicine is difficult and medical students work harder than most other students making them more liable for mental disorders so we have to put in consideration the mental state of the students.

The aim of the current study was to determine the prevalence of depression, anxiety, and stress among medical students at Benha Faculty of Medicine and their associations with socio-demographic and other characteristics.

PATIENTS AND METHOD

This cross-sectional study included a total of 597 medical students at Benha Faculty of Medicine, Benha University. This study was conducted between October to December 2020.

The six grades of Benha Faculty of Medicine were listed. Students were chosen by stratified random sample technique. The total number of students at Benha Faculty of Medicine during the academic year 2020-2021 was 3512. Web-based self-administered online questionnaire was distributed upon 664 (at least 10% of population) students via Face book groups



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related to each grade and the response rate was 90%. All students who accepted to participate were included. The total number of students who agreed to fill the questionnaire completely was 597.

Questionnaire:

The Depression, Anxiety, and Stress Scale (DASS-21) (13) was used to assess the psychological distress among participating students through determining the symptoms of depression, anxiety, and stress over the last week. It is a 21-item questionnaire with a four-point (0–3) answer scale. These items were divided into 3 subscales; depression, anxiety and stress; 7 items for each subscale. Each subclass’s score equals the sum of seven corresponding questions ranging from 0 to 21. Regarding depression, scores less than 4 were considered ‘normal’ 5-6 were ‘mild’, 7-10 were ‘moderate’, 11-13 were ‘severe’ and scores more than 14 were considered ‘extremely severe’. As regarding anxiety subscale, scores less than 3 met ‘normal’ category, while 4-5 were considered ‘mild’, 6-7 were ‘moderate’, 8-9 were ‘severe’ and scores more than 10 were considered ‘extremely severe’. Stress scores below 7 met ‘normal’ status, scores between 8-9 met ‘mild’ stress, 10-12 correlated with ‘moderate’ stress, 13-16 were ‘severe’ stress and scores greater than 17 met ‘extremely severe’ stress.

In addition, a specially designed questionnaire to assess the factors associated with psychological distress was used. It included questions about demographic characteristics (gender, year of study, marital status, residence state), financial characteristics (monthly family income, personal income), and habits (cigarettes and shisha smoking status).

Ethical Consideration:

Official approvals from The Research Ethics Committee in Benha Faculty of Medicine and Vice dean for students & education affairs of Benha Faculty of Medicine were obtained before conduction of this work. Also we obtained a written consent from all participating students. This study has been carried out in accordance with the code of Ethics of the World Medical Association (Declaration of Helsinki) for studies involving humans.

Statistical analysis

The collected data were tabulated and analyzed using the Statistical Package for Social Science (SPSS, version 21). Categorical data were expressed as number and percentage; Continuous variables were expressed as mean and standard deviation. Suitable tests of significance were calculated. Comparison between groups was done using student t test or ANOVA when it was appropriate. The accepted level of significance in this work was 0.05.

RESULTS

The results of current study show that 88.8% & 82.6% & 82.7% of medical students experienced depression, anxiety, and stress, respectively in different degrees (Figure 1), more than one third (37.9%) suffered from extremely severe depression and 45.9% experienced extremely severe anxiety while 30.8% had severe stress (Table 1).

It reveals that there is a statistically significant difference between smokers and non-smokers (14.3±4.9&11.5±5.6 respectively) regarding depression score. The mean score of anxiety and stress are high among females (9.78±5.4&13.03±4.9 respectively) when compared with males (11.26±5.9 & 11.80±4.9 respectively) and this differences are statistically significant (p value=.000* & .004*respectively). Most of students lived with their parents. However, there were students (14.9%) who lived alone. The depression, anxiety, and stress levels were nearly similar between the two groups (Table 2).

The third grade has the highest mean of anxiety and stress scores (10.1±4.8, p value =0.03* & 14.02±3.9, p value =0.000* respectively). Family income has no significant effect on the mean of the three scores, However there was a statistically significant difference in depression, anxiety and stress scores as regarding Personal income (p= .007, p= .000 & p= .01 respectively) (Table 3).

There were statistically significant associations between student average achievement score, social activity, transportation and mean scores of depression, anxiety, and stress (Table 4).

Table (1): Prevalence of depression, anxiety and stress among the studied group:

| Depression 597 (100%) | | Anxiety 597(100%) | | Stress 597 (100%) | | |
|-----------------------|------------------|-------------------|------------------|-------------------|------------------|------------|
| Normal | 67(11.2%) | Normal | 104(17.4%) | Normal | 103(17.3%) | |
| Depression (530) | Mild | 56(9.4%) | Mild | 72(12.1%) | Mild | 65(10.9%) |
| | Moderate | 141(23.6%) | Moderate | 80(13.4%) | Moderate | 108(18.2%) |
| | Severe | 107(17.9%) | Severe | 67(11.2%) | Severe | 179(30.8%) |
| | Extremely severe | 226(37.9%) | Extremely severe | 274(45.9%) | Extremely severe | 142(24.8%) |

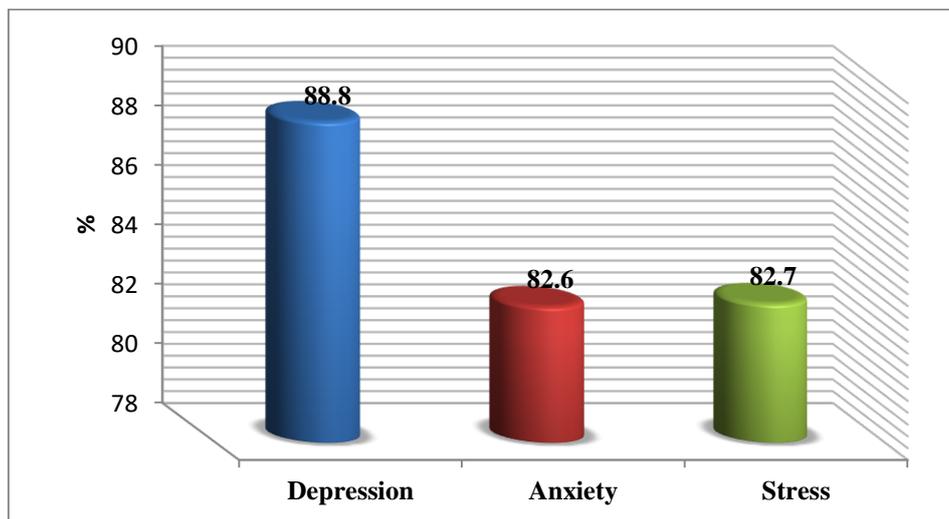


Figure (1): Over all prevalence of depression, anxiety and stress among the studied group

Table (2): Association between mean scores of depression, anxiety, stress scores and socio demographic characteristics:

| | | Depression score | | Anxiety score | | Stress score | |
|------------------------|--------------------|------------------|----------------|---------------|----------------|--------------|----------------|
| | | Mean±SD | Test (P value) | Mean± SD | Test (P value) | Mean±SD | Test (P value) |
| Gender | Male (202) | 11.26±5.9 | 1.04 (>0.05) | 7.81±5.2 | 4.3(.000*) | 11.80±4.9 | 2.9(.004*) |
| | Female (395) | 11.76±5.4 | | 9.78±5.4 | | 13.03±4.9 | |
| Smoking | No (567) | 11.5±5.6 | 2.5 (.01*) | 9±5.3 | 1.8(> 0.05) | 12.5±4.9 | 1.5 (> 0.05) |
| | Yes (30) | 14.3±4.9 | | 10.9±5.9 | | 14±4 | |
| Residence | Urban (158) | 11.2±5.2 | 0.59 (>0.05) | 9.4±5 | 0.96(> 0.05) | 12.7±4.6 | 0.47 (> 0.05) |
| | Rural (351) | 11.5±5.6 | | 8.9±5.4 | | 12.5±5 | |
| Place of living | Alone (89) | 11.7±5.7 | 0.81 (>0.05) | 9.4±6 | 0.46(> 0.05) | 12.4±5.5 | 0.46 (> 0.05) |
| | With parents (508) | 11.6±5.5 | | 9±5.3 | | 12.7±5 | |

Table (3): Association between mean scores of depression, anxiety, stress scores and faculty grade, marital status, income:

| | | Depression Score | | Anxiety score | | Stress score | |
|------------------------------|----------------------|------------------|----------------|---------------|----------------|--------------|----------------|
| | | Mean±SD | Test (P value) | Mean± S.D | Test (P value) | Mean±SD | Test (P value) |
| Faculty grade | First (93) | 10.7±5 | 1.4 (> 0.05) | 8.02±5.2 | 2.6(.03*) | 11.53±4.9 | 4.8(.000*) |
| | Second (122) | 11.1±5.8 | | 8.4±5.5 | | 11.50±4.9 | |
| | Third (88) | 12.5±5.3 | | 10.1±4.8 | | 14.02±3.9 | |
| | Fourth (90) | 11.2±5.3 | | 10±5.6 | | 12.87±5 | |
| | Fifth (158) | 12.1±5.6 | | 9.5±5.4 | | 13.40±4.8 | |
| | Sixth (46) | 11.8±6 | | 8.5±5.3 | | 11.87±5.3 | |
| Marital status | Single (456) | 11.56±5.5 | 0.146 (> 0.05) | 9.01±5.3 | 1.3(> 0.05) | 12.45±4.9 | 3.5(0.03*) |
| | Engaged(43) | 12.02±4.4 | | 10.33±6 | | 14.37±4.9 | |
| | Married (8) | 11.38±5.6 | | 9.75±6 | | 14.25±4 | |
| Monthly Family Income | less than 2000 (62) | 12.5±6 | 0.84 (> 0.05) | 10.7±5.7 | 1.9(> 0.05) | 13.15±5.2 | 1.2(> 0.05) |
| | 2000-4000 (205) | 11.4±5.3 | | 8.9±5.3 | | 12.5±5 | |
| | 4000-6000 (169) | 11.8±5.5 | | 8.9±5.3 | | 12.9±4.5 | |
| | more than 6000 (161) | 11.3±5.8 | | 8.9±5.3 | | 12.2±5 | |
| Personal income | Insufficient(37) | 13.59±5.6 | 5(0.007*) | 12.14±5.6 | 8.2(.000*) | 14.7±4.7 | 4.6(.01*) |
| | Intermediate (246) | 12.00±5.3 | | 9.4±5.3 | | 12.8±4.9 | |
| | Sufficient (296) | 10.97±5.7 | | 8.5±5.3 | | 12.2±4.8 | |

Table (4): Association between mean scores of depression, anxiety, stress scores and student score, social activity, transportation:

| | | Depression score | | Anxiety score | | Stress score | |
|---------------------------|-----------------------|------------------|-----------------|---------------|-----------------|--------------|-----------------|
| | | Mean± SD | Test (P value) | Mean± SD | Test (P value) | Mean± SD | Test (P value) |
| Student average Score | A(232) | 10.3±5.5 | 13.5 (.000*) | 8.5±5.3 | 3.5 (.02*) | 12.05±4.8 | 5.1 (.002*) |
| | B(227) | 11.6±5.3 | | 9.1±5.3 | | 12.5±4.9 | |
| | C(107) | 13.3±5.3 | | 10.02±5.6 | | 13.3±5.1 | |
| | D(33) | 15.4±4.7 | | 10.9±5.2 | | 15.3±3.7 | |
| Social activity | not active(58) | 16.2±5.2 | 41.9 (.000*) | 12.43±5 | 19.6 (.000*) | 15.7±4.1 | 21.5 (.000*) |
| | Intermediate(286) | 12.3±5.2 | | 9.5±5.3 | | 13.06±4.7 | |
| | Active(253) | 9.7±5.2 | | 7.9±5.2 | | 11.4±4.9 | |
| Transportation to faculty | Exhausting(151) | 12.87±5.5 | 5.7 (.004*) | 10.47±5.5 | 6.8 (.001*) | 14.25±4.6 | 11.9 (.000*) |
| | Less comfortable(240) | 11.01±5.5 | | 8.82±5.3 | | 12.22±4.8 | |
| | Comfortable(206) | 11.32±5.6 | | 8.47±5.2 | | 11.87±4.9 | |

DISCUSSION

This study shows that most of medical students suffered from depression, anxiety and stress (88.8% 82.6% & 82.7% respectively). This is similar to other studies conducted in other parts of Egyptian universities as well as in other parts of the world (14, 15, 16). It is well known that medical students are vulnerable to particular challenges and stressors which can impact their psychological state and quality of life. Medical students are exposed to stressors both due to their medical education and stressors of everyday life which could explain this high prevalence of psychological illnesses among them (17, 18). However, depression, anxiety and stress were significantly higher as compared to the students in western countries. University of Michigan Medical School, in 2010, reported 14.3% of their students to be depressed (19). The prevalence of depression among United Kingdom medical students was reported to be 24% (20).

Female students are more anxious and stressed than male students ($p = 0.000^*$ & $p = 0.004^*$ respectively) and this finding is in agreement with an Egyptian study showing that female students were exposed to mental distress more than male students (14). Also an Indian study found that female students were more severe depressed, anxious and stressed than males (21). Similar findings have been reported earlier in another Indian study (22). This gender difference may be due to the fact that females tend often to report concerns, stress, and their tendency to over report symptoms.

Rural students are more vulnerable to severe depression, anxiety and stress than those lived in urban areas, but this difference did not reach statistical significance. This is in accordance to an earlier Egyptian study (14). As Moving from rural to the open urban community could be a stressor to students plus absence of recreational facilities in rural area.

In the current study, comparing smokers with non-smokers showed that the mean score of depression was higher among smokers (14.3±4.9). This is in accordance

to a study conducted in Saudi Arabia that found that smoking was an important factor in causing depression (23).

The most interesting finding was that, 3rd grade students were more stressed than other grades. This is in agreement with a previous research, which demonstrated that mental stress was more prevalent among third year students (24).

However, the findings of the current study do not agree with the studies conducted in India where the 5th semester students had highest depression, anxiety and stress scores as compared to others (22). Two other studies have demonstrated that there is an increased mental distress during the clinical year (23, 24). This difference may be attributed to greater fear of fifth year students of not attaining their goal of being a doctor or may be due to excessive load of clinical subjects, also the clerkship phase starts and students rotate through various departments of hospital as their main method of training, students cited worry about their future and incomplete clinical practice skills, fear of harming patients, and high expectations from their parents.

The most important clinically relevant finding was that students had insufficient personal income shows the highest mean of depression, anxiety and stress score (13.59±5.6; 12.14±5.6 & 14.7±4.7). These results match those observed in earlier studies, as reported by study conducted in India which found that mental distress was seen to be higher among lower and moderate socio-demographic background students compared to the higher ones. (25) Also, Nigerian study found that financial problems and travelling between medical school and home were factors that caused psychological distress for students (26).

In this study, physical inactivity was found to cause high grades of depression, anxiety and stress among medical students. This was in agreement with American study found that medical students encouragement to engage in physical activity may help to protect them from the effects of burnout (27). Another study found that

physical activity with greater sense of self-control and better social interaction, may have positive effects on mental health ⁽²⁸⁾. Regarding transportation facilities, this study found that exhausting transportation was associated with severe depression, anxiety and stress. A study conducted in Saudi Arabia found that one of the top causes of stress among medical students were transportation problems to and from hospital ⁽²⁹⁾, adding to that difficulty of means of transportation in Egypt, the situation is more worse.

Another important finding was that students having low grades C & D were significantly exposed to severe depression, anxiety and stress more than other students. Previous published studies showed that higher degrees of anxiety and stress in medical students could negatively impact academic achievements ^(30, 31). Also, highly anxious medical students may find it difficult to cope with academic performance ⁽²⁶⁾.

Limitations of the study:

Unavailability of baseline data about mental health state of medical students at the time of engagement to the medical faculties in Egypt and sample recruitment from a single public medical college limits the generalizability of this study results. Also, it was not a follow up study, and described a picture of a specific period, so it is difficult to know how the behavior would change over time among the same students. The study was dependent on self-perceptions, and it could not reflect the complete real situation. Only depression, anxiety and stress were investigated in the present study while other predominant mental health problems were not observed in this student population.

CONCLUSION AND RECOMMENDATION

It could be concluded that medical school is a highly stressful environment. This study showed that the observed medical students experienced high degrees of depression, anxiety and stress. Great care to the psychological well-being of medical students is needed. Students' counseling committee in medical colleges, improving student well-being, providing supportive, preventive, and curative mental health services to help students to adapt with their future life is recommended. Medical colleges have to boost students to give more time to their social activities, and provide them with adequate tools to overcome different stresses along their medical education. Leisure activities could be integrated in curriculum to encourage better interaction between the students and their medical college.

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