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# Anxiety and Depressive Symptoms Developed During COVID-19 and Their Impact on the Academic Performance of Egyptian College Students

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## Abstract

**Introduction:** The COVID-19 pandemic has increased levels of anxiety and depression among the public; however, the impact on the faculty of medicine students in Egypt with respect to academic achievement has not been well-documented.

**Objective:** Assessment of the prevalence of depression and anxiety among medical college students in Egypt during COVID-19 pandemic and impact thereof on their academic achievement.

Participants: 396 college students participated in this study and filled the questionnaire representing Egypt governates.

**Methodology:** An online survey was conducted via Google Forms addressing undergraduate students of all medical fields belonging to all Egyptian universities. A previously validated questionnaire sheet containing standardized scale for anxiety and depression, named Hospital Anxiety and Depression Scale (HADS) form is used in this study.

**Results and Conclusion:** Among the 396 participants, 28.5% experience symptoms of anxiety, and 35.6% are considered to have developed anxiety disorder. With respect to depressive symptoms, 21.2% are borderline and 38.1% experience actual depressive symptoms. However, there has been no significant association between these mental health issues and academic achievement. Families with sufficient savings and income as well as male students have fallen among the protective factors. High prevalence of depressive symptoms and anxiety among medical students during COVID 19 pandemic is alarming. Evidently, there is no significant impact on students' academic performance; nevertheless, further studies are required to detect the long-term impact of this pandemic on student performance.

**Keywords:** Anxiety; Depression; COVID-19; Medical students; Mental health; Academic performance

## Introduction

With The COVID-19 healthcare crisis has emerged in an unimaginable magnitude and momentum [1]. On 26 March 2020, over 3 billion people had been partially or completely locked down and had been required to comply with social distancing guidelines which led to deterioration of people's mental stability [2]. Studies have also showed a noticeable prevalence of mental illness among health care workers dealing with COVID-19 [3].

Moreover, students' lives and societies had been on lock down, erasing social and peer support networks that are considered protective of their

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mental health. Therefore, these students will face difficulties in moving on with their lives not to mention keeping up with the requirements of the healthcare degrees. Thus, a sizable number of students experience mental disorders, showing further symptoms of anxiety and / or depression [4].

Depressive disorders are illnesses that affect humans emotionally, physically and intellectually [5]. Even though a depressive mood might not be detectable, students may show signs of physical symptoms including without limitation fatigue, pain, and / or sleep disorder. A person diagnosed with chronic anxiety and / or depression is more likely to experience relapse [6].

Moreover, a study has shown that a sizable number of students experiences symptoms of anxiety and stress upon returning to clinics or schools. Generally, even in the absence of a public health crisis, medical college students show high prevalence of anxiety. A previous meta-analysis reported that the estimated global rate of anxiety among medical students is 28%, and another cross-sectional study indicated high prevalence of anxiety symptoms ranging between 31% and 46% [7].

In respect of depression, a study in Kuwait was conducted to assess mental illness status among healthcare professionals and undergraduate medical students. The study reported that 66.6% experience mild to severe signs of depression [8]. Another study conducted in Mexico among undergraduate and graduate students suggested that they have negative thoughts, mental exhaustion, and energy depletion [9]. Accordingly, this study aims to assess the prevalence of depression and anxiety during the COVID-19 pandemic and the impact thereof on academic performances of Egyptian college students.

## Methodology

### Study Design and Setting

It is a cross sectional, self-administered questionnaire-based study.

### Study sample and participants

The least sample size needed for cross sectional studies using Epi info software with 95% confidence level and 5% confidence limits is 384. All undergraduate students from collages: Medicine, Dentistry, Pharmacy, Physical Therapy, Nursery, and Science might have participated in the study. An online Google form questionnaire was available from 25 Oct 2021 through 11 Nov 2021 and published among student social media groups in 12 of Egyptian governmental and private universities. Students from Tanta, Alexandria, Horus, Cairo, and Assuit Universities responded. 276 students completed the questionnaire. Moreover, a printed-out questionnaire was used for face-to-face interviewing with other students who did not participate online. The total number of participants amounted to 397. After exclusion of one incomplete questionnaire, the total number of participants was 396.

### Exclusion criteria

Students diagnosed and taking treatments for any mental disorders are excluded from this study.

## Study Tool to assess the Psychological Impact on the College Students and their Academic Performance

A validated questionnaire from a previous cross-sectional study that had been conducted in Jordan (HADS) as of July 2020 [10]. In addition, certain questions related to sociodemographic data had been validated by 5 experts in the field of Community Medicine and had been added at the beginning of the survey. Thus, the questionnaire consists of 3 main parts:

### Part 1

The sociodemographic data of a participant (16 items) including: age, gender, University, college, academic year, father's education and occupation, mother's education and occupation, residence, family income, academic achievement last year (2020 – 2021) and the year before COVID – 19 (2019 – 2020), whether or not they had been infected, whether or not they had had the vaccine as well as the reason for not having the vaccine, and the sources of information.

### Part 2

HADS scale for anxiety is composed of 7 questions which were answered as (always-often-sometimes-rarely) including: feeling tense or wound up, having panic attacks, anxiety, having stomach butterflies, and restlessness.

### Part 3

HADS scale of Depressive signs is composed of 7 questions on whether he / she still enjoys things, can laugh and see the funny side, feels cheerful, slowed down, has lost interest in how they dress, looks forward to enjoyment and still enjoys a good book, radio, or TV program.

### Scoring of the HADS scale

Scoring for each item of anxiety and depression ranges from zero to three. A subscale score of >8 denotes anxiety or depression. Scores From 0 to 7 means normal. Scores from 8 to10 specifies borderline cases and above 11 means being diagnosed with clinical anxiety or depression.

### Statistical Analysis

Data was analyzed using IBM SPSS program, version 26. Qualitative data was reported in numbers and as a percentage. For comparison between variables, chi square test was used. Regression analysis was carried out to detect signs of anxiety and depression. The level of indication was chosen to be > 0.05.

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## Results

### Demographic features

50.8% of the participants have over 21 years old. Females accounted for 67.7%. ~2 thirds (61.9%) live in urban areas. Most students (87,4%) study in governmental universities, and ~3 quarters (78%) of students study at the Faculty of Medicine. Approximately half of the participants (42.2%) are 5th year medical students. Students whose fathers received higher education and work in governmental institutions are found in 73.7% and 58.1% of the cases respectively. Therefore, 66.4% of students have highly educated mothers of whom 53.5% have paid jobs. There is sufficient family income in 47.2% of participants and sufficient saving in 45.5% of participants. The academic achievement before the COVID – 19 was excellent in 53.5% of the cases, very good in 29.8% of the cases, good in 14.6% of the cases, and bad in 2% of the cases. After the COVID – 19 year (2021), this achievement changed to excellent in 54.3% of the cases, very good in 26,3% of the cases, good in 14.1% of the cases, and bad in 5.3% of the cases. Nearly two thirds of students (62.4%) have not been diagnosed with COVID – 19, and the majorities (87.4%) are vaccinated Table (1).

### Prevalence of anxiety and depressive symptoms

Figure (1) showed that 35.8% are normal students with no anxiety symptoms, 28.5% experience signs of anxiety but are borderline, and 35.6% are diagnosed with anxiety

**Table 1:** Characteristics of the study participants.

| Variable | No (%) 396 |
|---|---|
| **Age (21.23 ± 1.664)** | |
| Less than and equal to 21years | 195 (49.2) |
| More than 21 years | 201 (50.8) |
| **Gender** | |
| Males | 128 (32.3) |
| Females | 268(67.7) |
| **University** | |
| Governmental | 346 (87.4) |
| Private | 50 (12.6) |
| **Faculties** | |
| Biotechnology | 3 (8) |
| Dentistry | 22 (5.6) |
| Medicine | 311(78.5) |
| Nursery | 1 (.3) |
| Pharmacy | 33 (8.3) |
| Physical Therapy | 13 (3.3) |
| Science | 13 (3.3) |
| **Academic year** | |
| 1st year | 9 (2.3) |
| 2nd year | 101 (25.5) |
| 3rd year | 50 (12.6) |
| 4th year | 36 (9.1) |
| 5th year | 167 (42.2) |
| 6th year | 33 (8.3) |
| **Fathers' education** | |
| High | 292 (73.7) |
| Middle | 92 (23.2) |
| Low | 12 (3.0) |
| **Fathers' occupation** | |
| Governmental | 230 (58.1) |
| Private | 166 (41.9) |
| **Mother's education** | |
| High | 263 (66.4) |
| Middle | 29 (7.3) |
| Low | 104 (26.3 |
| **Mother's occupation** | |
| Housewife | 184 (46.5) |
| Paid job | 212 (53.5) |
| **Residence** | |
| Urban | 245 (61.9) |
| Rural | 151 (38.1) |
| **Family income** | |
| Enough and saving | 180 (45.5) |
| Enough | 187 (47.2) |
| Not enough | 29 (7.3) |
| **Academic achievement before COVID19** | |
| Excellent | 212 (53.5) |
| Very good | 118 (29.8) |
| Good | 58 (14.6) |
| Bad | 8 (2.0) |
| **Academic achievement After COVID19** | |
| Excellent | 215 (54.3) |
| Very good | 104 (26.3) |
| Good | 56 (14.1) |
| Bad | 21 (5.3) |
| **Infected with COVID19** | |
| Yes | 149 (37.6) |
| No | 247 (62.4) |
| **Vaccinated against COVID 19** | |
| Yes | 346 (87.4) |
| No | 50 (12.6) |

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disorder. Figure (2) shows that 40.7% are normal, 21.2% have borderline symptoms, and 38.1% show clear signs of depression.

### Anxiety and depressive symptoms and students' related determinants (psychological impact)

On the Scale of Anxiety: approximately 34.4% of participants aged 21 years old or less, experience borderline symptoms of anxiety compared to 40% who showed clear signs of anxiety disorder among those who are >21 years old. With respect to gender, females are the dominant part accounting for 29.1% with borderline symptoms, and 41.4% show clear signs of anxiety. The preclinical academic level had higher percentage of borderline symptoms (31.2%) compared to 40.3% of clinical academic level are diagnosed with anxiety. The academic performance of students with borderline symptoms was stable by 30.7% but jumped to 42.7% in students with clear signs.

Individuals uninfected with COVID – 19 virus experience borderline symptoms by 30.4%. However, 40.3% of the infected students are diagnosed with anxiety. Approximately one third (30.3%) of students who are vaccinated have borderline symptoms and 36.4 % are diagnosed with anxiety.

On the Scale of Depression: the group aged 21 years old or less is dominant in borderline symptoms (24.1%) and actual depressive symptoms are found in 34.9%. Females have higher prevalence of borderline and actual symptoms accounting for 21.3% and 40.3% respectively. Paramedical faculties experience borderline symptoms by 23.1%, and 42.3% are diagnosed with depression. 23.8% of preclinical level students have borderline symptoms Compared to 39.4% clinical level students. Stable academic performance was reported by 23.6% of the borderline group and increased to 44% of the group diagnosed with depression. Nearly 22% of uninfected students had borderline symptoms, and 42.3% of infected students are diagnosed with depression. Approximately 22% of the unvaccinated had borderline symptoms, and 39% of the vaccinated are diagnosed with such disorder Table (2).

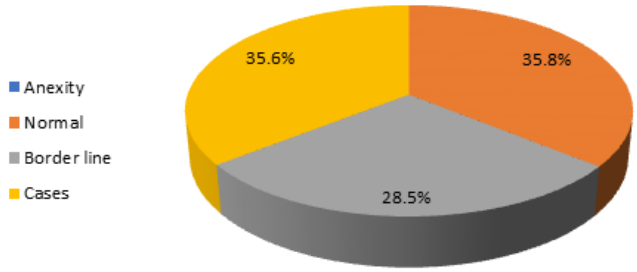


**Figure 1:** Prevalence of anxiety during COVID19 among study participants.

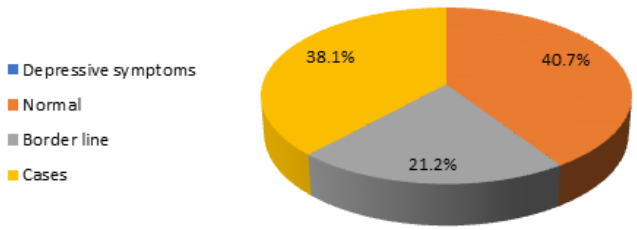


**Figure 2:** Prevalence of depressive symptoms during COVID19 among study participants.

## Anxiety and depressive Symptoms and Family Related Determinants (psychological impact)

### On the scale of anxiety

Residents of rural areas have borderline symptoms by 33.8%, on the contrary 37.6% of the group living in urban areas have been diagnosed with anxiety. Students with fathers working for the private sector account for 32% of borderline symptom. However, 37% of participants' fathers with governmental jobs are diagnosed with anxiety. Borderline symptoms are present in 32.1% of students whose mothers are housewives, however, 39.2% of students with mothers having paid jobs are diagnosed with such disorder. 29.4% of students with sufficient saving and family income have borderline symptoms; however, 51.7% of those with insufficient income are diagnosed with such disorder.

### On the scale of depression

Rural areas residents had both borderline & cases by 23.8%, 40.4% respectively. In addition, 22.6% of borderline cases were found among those whose fathers had governmental jobs. But 39.2% of actual cases were found among those with fathers' private jobs. Also, 21.7% of borderline cases had mothers with paid jobs, and 40.2% of actual cases had housewives' mothers. Not sufficient family income was reported by 31% of borderline cases and 55.2% of actual cases Table (3).

### Determinants of anxiety and depression among students during COVID 19 pandemic (psychological impact)

Students at governmental universities have a greater chance of protection against borderline anxiety symptoms (Odds ratio=0.285). Males also have a much higher chance of protection against actual anxiety disorder compared to females (odds ratio= 0 .271).

Regarding depressive symptoms, those with sufficient income have a much greater chance of protection against the borderline symptoms compared to those with insufficient saving and family income (odds ratio=0.256 and 0.171 respectively). Those with actual depressive symptoms have a much greater chance of protection against depression among students with their family income was sufficient (odds ratio=0.298) and those with their family income sufficient and saving (odds ratio=0.153) (Table 4).

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**Table 2:** Students' related determinants of anxiety and depressive symptoms during COVID 19 pandemics.

| | Anxiety | | | Depressive symptoms | | |
|---|---|---|---|---|---|---|
| | Borderline No (%) 113 (28.5) | Case No (%) 141 (35.6) | $X^2$ (P) | Borderline No (%) 84 (21.2) | Case No (%) 151 (38.1) | $X^2$ (P) |
| **Age groups** | | | | | | |
| ≤21 years | 67 (34.4) | 59 (30.3) | 7.678 | 47 (24.1) | 68 (34.9) | 2.596 |
| >21 years | 46 (22.9) | 82 (40.8%) | (0.022)* | 37 (18.4) | 83 (41.3) | -0.27 |
| **Gender** | | | | | | |
| Males | 35 (27.3) | 30 (23.4) | 15.315 | 27 (21.1) | 43 (33.6) | 2.031 |
| Females | 78 (29.1) | 111 (41.4) | (0.000)* | 57 (21.3) | 108 (40.3) | -0.36 |
| **University** | | | | | | |
| Governmental | 89 (25.7) | 12 (35.3) | 15.315 | 71 (20.5) | 131 (37.9) | 1.295 |
| Private | 24 (48.0) | 19 (38.0) | (0.000)* | 13 (26.0) | 20 (40.0) | -0.52 |
| **Faculties** | | | | | | |
| Medical | 104 (28.1) | 134 (36.2) | 1.002 | 78 (21.1) | 140 (37.8) | 0.423 |
| Para-medical | 9 (34.6) | 7 (26.9) | -0.606 | 6 (23.1) | 11 (42.3) | -0.81 |
| **Academic level** | | | | | | |
| Preclinical | 50 (31.2) | 46 (28.8) | 5.522 | 38 (23.8) | 58 (36.2) | 1.093 |
| Clinical | 63 (26.7) | 95 (40.3) | -0.063 | 46 (19.5) | 93 (39.4) | -0.58 |
| **Academic performance** | | | | | | |
| Increase | 24 (29.3) | 35 (42.7) | 6.33 | 17 (20.7) | 36 (43.9) | |
| Decrease | 24 (23.5) | 41 (40.2) | -0.176 | 17 (16.7) | 43 (42.2) | 4.421 |
| Stable | 65 (30.7) | 65 (30.7) | | 50 (23.6) | 72 (34.0) | -0.35 |
| **Infection with COVID19** | | | | | | |
| Yes | 38 (25.5) | 60 (40.3) | 2.405 | 30 (20.1) | 63 (42.3) | 1.765 |
| No | 75 (30.4) | 81 (32.8) | -0.3 | 54 (21.9) | 88 (35.6) | -0.41 |
| **Vaccination against COVID 19** | | | | | | |
| Yes | 105 (30.3) | 126 (36.4) | 8.908 | 73 (21.1) | 135 (39.0) | 0.983 |
| No | 8 (16.0) | 15 (30.0) | (0.012)* | 11 (22.0) | 16 (32.0) | -0.61 |
| *Significant | | | | | | |

**Table 3:** Home (family) related determinants of anxiety and depressive symptoms during COVID 19 pandemics among participants.

| | Anxiety | | | Depressive symptoms | | |
|---|---|---|---|---|---|---|
| | Borderline No (%) 113(28.5) | Case No (%) 141(35.6) | $X^2$ (P) | Borderline No (%) 84(21.2) | Case No (%) 151(38.1) | $X^2$ (P) |
| **Residence** | | | | | | |
| Urban | 62(25.3) | 92(37.6) | 3.326 | 48(19.6) | 90(36.7) | 2.562 |
| Rural | 51(33.8) | 49(32.5) | -0.19 | 36(23.8) | 61(40.4) | -0.278 |
| **Fathers' education** | | | | | | |
| High | 86(29.5) | 102(34.9) | 3.645** | 55(18.8) | 108(37.0) | 7.827 |
| Middle | 26(28.3) | 35(38.0) | -0.449 | 27(29.3) | 37(40.2) | -0.098 |
| Low | 1(8.3) | 4(33.3) | | 2(16.7) | 6(50.0) | |
| **Fathers' occupation** | | | | | | |
| Governmental | 60(26.1) | 85(37.0) | 1.618 | 52(22.6) | 86(37.4) | 0.641 |
| Private | 53(31.9) | 56(33.7) | -0.449 | 32(19.3) | 65(39.2) | -0.726 |
| **Mother's education** | | | | | | |
| High | 72(27.4) | 98(37.3) | 1.474 | 48(18.3) | 97(36.9) | 9.975 |
| Middle | 32(30.8) | 35(33.7) | -0.834 | 6(20.7) | 12(41.4) | -0.092 |
| Low | 9(31.0) | 8(27.6) | | 30(28.8) | 42(40.4) | |
| **Mother's occupation** | | | | | | |
| Housewife | 59(32.1) | 58(31.5) | 3.14 | 38(20.7) | 74(40.2) | 0.64 |
| Paid job | 54(25.5) | 83(39.2) | -0.206 | 46(21.7) | 77(36.3) | -0.726 |
| **Family income** | | | | | | |
| Enough and saving | 53(29.4) | 52(28.9) | | 36(20.0) | 54(30.0) | |
| Enough | 54(28.9) | 74(39.6) | 9.123 | 39(20.9) | 81(43.3) | 18.187 |
| Not enough | 6(20.7) | 15(51.7) | -0.057 | 9(31.0) | 16(55.2) | (0.001) * |
| **Fishers Exact test *significant | | | | | | |

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**Table 4:** Multivariate analysis of determinants of anxiety and depression among students during COVID 19 pandemic.

| | | Anxiety | | | | Depression | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | B | Sig. | Exp (B) | 95% Confidence | | B | Sig. | Exp (B) | 95% Confidence | | |
| | | | | Lower | Upper | | | | Lower | Upper | |
| Border line | Intercept | 0.986 | 0.16 | 0.164 | | | 1.031 | 0.15 | | | |
| | [gender (males) | -.418- | 0.13 | 0.128 | 0.658 | 0.384 | -.092- | 0.76 | 0.912 | 0.511 | 1.627 |
| | [University (Governmental) | -1.486- | 0 | 0.226 | 0.092 | 0.559 | -.285- | 0.49 | 0.752 | 0.335 | 1.689 |
| | [Academic perf (increase] | 0.14 | 0.69 | 1.15 | 0.579 | 2.281 | 0.012 | 0.97 | 1.012 | 0.497 | 2.063 |
| | [Academic perf. (decrease] | -.206- | 0.52 | 0.814 | 0.433 | 1.529 | -.303- | 0.38 | 0.739 | 0.376 | 1.449 |
| | [Income=Enough] | 0.248 | 0.67 | 1.282 | 0.404 | 4.067 | -1.361- | 0.03 | 0.256 | 0.074 | 0.894 |
| | [Income=Enough and saving] | 0.022 | 0.97 | 1.022 | 0.323 | 3.24 | -1.768- | 0.01 | 0.171 | 0.049 | 0.598 |
| | Age groups Less than and equal to 21years | 0.299 | 0.27 | 1.349 | 0.793 | 2.294 | 0.285 | 0.32 | 1.33 | 0.76 | 2.329 |
| Cases | Intercept | 1.613 | 0.01 | | | | 1.45 | 0.03 | | | |
| | [gender (males) | -.984- | 0 | 0.374 | 0.219 | 0.639 | -.271- | 0.29 | 0.763 | 0.463 | 1.255 |
| | [University (Governmental] | -.873- | 0.07 | 0.418 | 0.165 | 1.06 | -.088- | 0.81 | 0.916 | 0.444 | 1.89 |
| | [Academic perf (increase] | 0.599 | 0.07 | 1.82 | 0.95 | 3.489 | 0.438 | 0.15 | 1.55 | 0.849 | 2.83 |
| | [Academic perf. (decrease] | 0.288 | 0.33 | 1.333 | 0.751 | 2.367 | 0.206 | 0.46 | 1.229 | 0.714 | 2.114 |
| | [Income=Enough] | -.368- | 0.45 | 0.692 | 0.267 | 1.793 | -1.211- | 0.04 | 0.298 | 0.095 | 0.939 |
| | [Income=Enough and saving] | -.878- | 0.07 | 0.416 | 0.159 | 1.085 | -1.878- | 0 | 0.153 | 0.048 | 0.486 |
| | Age groups Less than and equal to 21years | -.313- | 0.23 | 0.731 | 0.439 | 1.218 | -.105- | 0.67 | 0.901 | 0.559 | 1.452 |

## Discussion

Over the years, anxiety and depression constitute a major public health issue that is addressed among different groups of people. COVID – 19 has emerged and affected all people. Medical field students are expected to show greater suffering from anxiety and depressive symptoms due to lockdown and online learning [4].

According to this study, it is found that there has been a significant association between lower family income and the severity of anxiety scores. This finding is in line with the study conducted in Jorden and China [10,11]. In addition, both sufficient saving and family income are found to be significantly protective against actual depressive symptoms (odds ratio=0.298 and 0.153 respectively). However, sufficient family income shows a significantly higher chance of protection against the borderline condition compared to insufficient saving and family income (odds ratio=0.256 and

0.171 respectively). However, both had higher protection compared to families with lower income. This finding proves that financial stability of families during global pandemics can greatly affect the metal state of family members. During COVID-19 pandemic, there was spreading fear of the need to be hospitalized in severe infections which will cost a lot. Students who knew that their family financial state was sufficient and saving had been protected against anxiety or depression during COVID-19.

The study reported that most students in the Jorden (54%) have negative experience toward the learning process during COVID-19 quarantine period. However, approximately (68%) students show positive impact on their academic performance which was proven by their higher GPA [10]. This is explained in the study by higher probability of students to receive help in answering their exams due to deficiency of proper invigilation [12]. In this study, (42.7%) of anxiety cases and (44%) of depression cases have showed greater academic performance. This can be explained by the same improper invigilation of students during the exam time. In addition, the more stressed and anxious students are due to uncertainty during COVID-19, the more efforts they must put into studying and focusing on exams. Moreover, the lockdown and social distancing help students save time and spend this time in studying. However, this point might need an extra case control study to investigate the association between student stress and academic performance.

There were more anxiety cases among the females (41.4%) leading to a significant difference in the anxiety

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score (p=0.000). However, there is no significance regarding the gender in terms of the depression score (p=0.362). This is the same finding reported in the Turkish society [13] where females are identified as a risk factor for anxiety rather than depression [13]. Separately, a study performed in Central Region of Saudi Arabia [14] reported no significant correlations between students' gender, faculty, academic year, and their anxiety score [14]. The increased prevalence of anxiety among females found in this study is linked to high-stress levels among women which can be explained by their hormonal changes. The same observation is noticed among college students. There is a significance in anxiety score (p=0.000) and no significance in the depression score (p=0.523). There is higher percentage in both borderline and cases of anxiety (48% and 38% respectively) in private universities students.

There is no significant correlation between medical and para-medical study fields and anxiety or depression (p= 0.606 and P= 0.809, respectively). This can be explained by the near similar availability of knowledge to all college students nowadays through social media and internet causing them all to be prone to anxiety and depression related to COVID-19 news. This was not the same result for studies performed during MERS-CoV Outbreak [15] who reported that during pandemic times, medical staff had a higher risk than para-medical stuff to suffer from loneliness, anxiety, fear, insomnia, and other mental health problems [15].

Most students aged over 21 years show higher susceptibility (40.8% anxiety cases and 41.3% depression cases). Being medical students, they are more exposed to deal with patients during the clinical rotations, so they are more prone to anxiety about risk of infection and depression symptoms.

The recent spread of the Severe Acute Respiratory Syndrome Coronavirus (COVID – 19) pandemic seems to be associated with psychiatric implications [16]. Preliminary data suggests that patients with COVID–19 might experience delirium, depression, anxiety, and insomnia [17]. This study has found that 40.3% of the infected participants are diagnosed with anxiety and 42.3% are diagnosed with depression. Another cross-sectional study conducted in Iran in 2021 among medical students to evaluate the degree of depression, anxiety, and stress levels indicated that most students there have 2 or 3 days of COVID infection, the anxiety score of participants is 28.56 ± 4.68 and the depression score is 28.99 ± 4.42. Findings also recorded extremely severe clinical depression while anxiety levels are only severe. Severe symptoms of anxiety & depression are estimated to be 99.04%, 69.57% respectively [18].

This study evaluated the vaccination effect on the mental health of the students and recorded 36.4% of the vaccine on the scale of anxiety. 39% of the vaccines are on the Scale of Depression. 22% of the unvaccinated had only borderline symptoms of depression. However, there is no significant association between infection or vaccination and anxiety or depression. A cross sectional study was performed in 2021 among Japanese college students aged 21.4 years to investigate their psychological state and their willingness to be vaccinated. The unvaccinated group demonstrated anxiety associated with their will to receive vaccination. There was no difference in anxiety & depressive mood among the unvaccinated & the vaccinated group [19]. This discrepancy between this study's findings may be because willingness to get vaccinated could change over time [20,21] and the timing to collect responses was different as they conducted this survey from July to September 2021 at the beginning of the vaccination when anxiety and depression from vaccination couldn't be determined.

## Limitations

This study is a cross sectional study. Therefore, more types of studies with a higher level of substantiation should be conducted on this issue to prove the association between the COVID–19 pandemic and anxiety and depression and cohort studies should be conducted to evaluate anxiety and depression.

## Conclusion and Recommendations

In Conclusion, there is high prevalence of anxiety and depression among the medical college students during COVID 19 pandemic. In addition, certain protective factors are sufficient saving and family income, and are present among males. There are no significant changes regarding academic performance during the pandemic period. Further studies need to be conducted to assess the long-term effect of the Pandemic on the mental health and academic performance of students.

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