

# Psychological impacts of COVID-19 pandemic on the university students in Egypt

Eman R. Ghazawy<sup>1,\*</sup>, Ashraf A. Ewis<sup>1,2</sup>, Eman M. Mahfouz<sup>1</sup>,  
Doaa M. Khalil<sup>3</sup>, Ahmed Arafa<sup>3,4</sup>, Zeinab Mohammed<sup>3</sup>,  
El-Nabgha F. Mohammed<sup>5</sup>, Ebtessam E. Hassan<sup>1</sup>, Sarah Abdel Hamid<sup>6</sup>,  
Somaya A. Ewis<sup>6</sup>, and Abd El-Nassir S. Mohammed<sup>7</sup>

<sup>1</sup>Faculty of Medicine, Department of Public Health, Minia University, El-Minia, Minia, 61511 Egypt, <sup>2</sup>Faculty of Health Sciences – AlQunfudah, Department of Public Health and Occupational Medicine, Umm AlQura University, Meccah, Saudi Arabia, <sup>3</sup>Faculty of Medicine, Department of Public Health, Beni-Suef University, Beni-Suef, Minia, 61511 Egypt, <sup>4</sup>Department of Public Health, Graduate School of Medicine, Osaka University, Osaka, Japan, <sup>5</sup>Faculty of Arts, Department of Psychology, Minia University, El-Minia, Minia, 61511 Egypt, <sup>6</sup>Faculty of Medicine, Undergraduate Students, Beni-Suef University, Beni-Suef, Minia, 61511 Egypt and <sup>7</sup>Faculty of Medicine, Department of Occupational Medicine, Sohag University, Sohag, Minia, 61511 Egypt

\*Corresponding author. E-mail: emanghazawy@yahoo.com

## Summary

University students are at elevated risk for mental health problems. The COVID-19 pandemic and subsequent public health measures taken to combat it burdened the students' life with additional dramatic psychological impacts. The aim of this study was to investigate the psychological impacts that affected the university students in Egypt during the COVID-19 pandemic. An online survey was sent to the Egyptian university students via all means of online communication during the first week of May 2020 by using a non-probability snowball sampling. A survey included a short version Depression Anxiety Stress Scale-21 (DASS-21) and socio-demographic data. Overall, 70.5, 53.6 and 47.8% of Egyptian students had depression, anxiety and stress, respectively. Being a female, having a relative or acquaintance infected with COVID-19, having a preexisting chronic disease and lacking of psychological support from families, community and universities increase the risk of depression, anxiety and stress among Egyptian students. Being a medical student is associated with depression while, spending more time to follow news of COVID-19 pandemic is associated with increased anxiety. Egyptian students experience varying levels of psychological disturbance during COVID-19 pandemic. This study suggests that mental health of the university students should be carefully, monitored during the crisis and the universities should provide psychological-oriented services, adapted to these circumstances to mitigate its emotional impact on the students.

**Key words:** COVID-19, university students, psychological impacts, Egypt

## BACKGROUND

On 11 March 2020, the World Health Organization (WHO) declared, the novel Corona Virus Disease (COVID-19) as a pandemic after it has spread in more than 110 countries by then. This COVID-19 pandemic continued its course, crossing the borders to all the continents invading most of the globe and it affected almost all countries and territories very far away from its starting origin in Wuhan, China, on December 2019 (WHO, 2020; Wang *et al.*, 2020).

Essentially, COVID-19 is an infectious viral disease that is transmitted from human-to-human through droplets whether direct; during coughing, sneezing of a patient or a carrier of the disease or indirect; through getting in contact with the patient's droplets on close contact, shaking hands, using his personal articles or touching surfaces soaked with his droplets containing the virus. The COVID-19 virus finds its way into the human body through the mucus membranes of the mouth, nose and eyes (UNICEF, 2020; Li *et al.*, 2020).

Clinical picture of COVID-19 infected patients varies significantly, from being asymptomatic to having severe form of the disease. In most cases, high fever, cough, chest tightness, chills, sore throat, general weakness, fatigue, muscular pain, diarrhea, impaired taste and smelling sensations could occur. In the severe cases, pneumonia, acute respiratory distress syndrome, micro-coagulopathies, sepsis and septic shock may occur, and in many instances it could lead to death. Reports show that clinical deterioration can occur rapidly, often during the second week of the course of the disease (Huang *et al.*, 2020).

Additionally, patients with underlying medical problems such as cardiovascular disease, diabetes, chronic respiratory disease, cancer and old-age people are more likely to experience serious illness (Guo *et al.*, 2020).

As on the morning of 12 June 2020, a total of 7 628 356 confirmed cases of COVID-19 infections and its death toll points toward 408 645 deaths. Scenario is changing every day with increase in number of infection and death (Corona Virus Resource Centre, 2020).

The COVID-19 pandemic enforced many international governments to take rigorous decisions to control the infections or at least to lower its speedy transmission. Many countries declared nationwide lock-down, banned the local and international flights, suspended attendance to schools, universities and business operations, declined all kinds of gatherings and asked the people to stay at home. Additionally, the media coverage has been focusing on the hot issue of COVID-19 in an hourly manner, by announcing the numbers of newly

confirmed infections and the new reported deaths in every country. As a result the people were affected by such world panic actions and presented a wide range of psychological disturbances (Chen *et al.*, 2020; Yang *et al.*, 2020; Li *et al.*, 2020).

On 14 February, Egypt announced its first COVID-19 case. Thereafter, Egypt scaled up preventive measures, with a partial lockdown starting on 25 March. As of 31 March, Egypt announced 710 COVID-19 cases and 46 related deaths. By the beginning of April of 2020, there were over 800 confirmed cases, with more than 50 fatalities, and a rapid tendency toward increase. This might be an underestimate, as the facilities of 2019NCV test are very limited (Hassany *et al.*, 2020).

University students are the most active and widely moving age group. Suddenly, with COVID-19 pandemic they were directly affected by banning their attendance to the universities, staying at home, not meeting friends, not exercising, no traveling, as well as the fear of getting infected or infecting any of their family members or friends. This extraordinary stressful new life and the required precautions before going out or returning home or even going shopping added burdens to the students.

These were not their only stressors, but they had to attend online classes instead of attending their university classrooms, missing the face-to-face learning and the clinical/practical or training lessons.

To investigate these psychological impacts that affected the university students in Egypt, we performed this study.

## METHODS

### Study design and participants

All the university students in Egypt were invited to participate in this cross-sectional survey during the first week of May 2020. Because of the lockdown in most countries and in Egypt as well, a non-probability snow-ball sampling technique was used.

A Google survey was created and the link to the survey was sent to the participants by e-mails and via the available social media channels.

Starting from the recorded contact details of the university students in the Public Health Departments, Faculty of Medicine of Minia, Beni-Suef, Sohag and Cairo Universities in Egypt.

### Data collection

We designed an Arabic questionnaire composed of four sections to collect the data.

Section 'Background' included a detailed explanation of the steps, aims and eligibility criteria of the study.

Section 'Methods' included questions about the socio-demographic data of the students including age, sex, university, faculty, grade and city where he/she lives.

Section 'Results' included questions about the previous month only and includes the following: average daily sleeping hours (<6, 6–8 or >8 h/day), watching or reading news about COVID-19 (<1, 2–4 or >4 h/day), getting enough emotional support from family, society and university.

Section 'Discussion' included the Arabic version of the Depression Anxiety Stress Scale-21 (DASS-21). The DASS-21 is a quantitative measure of depression, anxiety and stress symptomatology (seven statements each) during the past week.

The depression statements evaluate hopelessness, dysphoria, self-deprecation, devaluation of life, lack of interest and involvement, anhedonia and inertia. The anxiety statements evaluate skeletal muscle effects, autonomic arousal, situational anxiety and subjective experience of anxious affect.

The stress scale evaluates nervous arousal, difficulties in relaxation and being easily upset or over-reactive.

Every participating student should decide how much the statements apply for him/her using a scale from 0 to 3 where 0 refers to 'did not apply to me at all', 1 refers to 'applied to me to some degree or some of the time', 2 refers to 'applied to me to a considerable degree or a good part of the time' and 3 refers to 'applied to me very much or most of the time'.

The score of each axis is multiplied by 2 to lie within a 0–42 scale where higher scores indicate worse outcomes (Lovibond and Lovibond, 1995; Ali *et al.*, 2017).

The subscales are scored as follows: for depression; normal (0–9), mild (10–13), moderate (14–20) and severe to extremely severe ( $\geq 21$ ), for anxiety; normal (0–7), mild (8–9), moderate (10–14) and severe to extremely severe ( $\geq 15$ ), and for stress; normal (0–14), mild (15–18), moderate (19–25) and severe to extremely severe ( $\geq 26$ ) (Lovibond and Lovibond, 1995).

### Ethical consideration

The study protocol was in accordance with the Helsinki declaration and was approved by the research ethical committee of Minia University. The conditions and eligibility criteria of the study was described in the 'Background' section of the questionnaire and students had to agree to proceed to fill in the questions of the rest of the sections and to submit their answers when finishing the questionnaire. They have the full will to

determine filling out or declining the survey. Choosing to proceed, filling out and submitting the questionnaire was considered as approval and informed consent of participation.

### Statistical analyses

Data were analyzed using the Statistical Package for Social Science (SPSS) released in 2013 (IBM SPSS Statistics for Windows, Version 22.0, IBM Corporation, Armonk, NY, USA). An analysis of descriptive statistics was conducted to illustrate the demographic and other selected characteristics of the respondents; mean  $\pm$  standard deviation and frequency distribution for numerical and categorical variables, respectively.

Multivariate binary logistic regression was used to identify the significant factors that affect the presence of depression, anxiety and stress among the students. *p* values <0.05 were considered statistically significant.

## RESULTS

A total of 1335 Egyptian students from 20 universities participated in the study. The 21–22 year age group constituted 54.8% of the sample. Approximately 61.8% of the students were females and 50.3% resided in urban areas, 52% of the students from medical colleges (Medicine, Pharmacy, Dentistry and Nursing) and 48% were non-medical colleges. The majority of the students (86.5%) were healthy whereas, 13.5% reported some health conditions namely bronchial asthma, diabetes mellitus, hypertension and obesity. About 23.7 and 9.2% of the students had relatives/acquaintances who were infected or died with COVID-19, respectively (Table 1).

Table 2 shows that the psychological health status of college students was affected to varying degrees. Overall, 70.5% of Egyptian students had depression; 24.6, 36.3 and 9.7% were mild, moderate and severe depression, respectively. About 53.6% of students suffered from anxiety of them; 13.6% were mild, 24.7% were moderate and 15.3% were severe to extremely severe. Whereas the proportion of stress among the students was 47.8%, of them; 14% had mild, 19.6% had moderate and 14.2% had severe/extremely severe stress. Based on the score ranges from the DASS manual, the mean scores of depression, anxiety and stress for all students were found at mild level ( $12.58 \pm 6.3$ ), ( $8.36 \pm 6.6$ ) and ( $15.17 \pm 8.3$ ), respectively.

This study showed that the majority of Egyptian students (95.5%) were annoyed about the emerging COVID-19. More than half (54.5%) thought that

**Table 1:** Demographic information of the studied Egyptian university students

Demographic characteristics	N (%)
Age groups	
17–18	38 (2.8)
19–20	332 (24.9)
21–22	723 (54.8)
23–24	184 (13.8)
≥25	49 (3.7)
Sex	
Male	510 (38.2)
Female	825 (61.8)
Residence	
Urban	672 (50.3)
Rural	663 (49.7)
College (type of study)	
Medical	694 (52)
Non-medical	641 (48)
Academic year	
First	152 (11.4)
Second	191 (14.3)
Third	403 (30.2)
Fourth	448 (33.6)
Fifth/sixth	141 (10.5)
Health status	
Healthy	1155 (86.5)
Suffer from chronic disease	180 (13.5)
Sleeping (h/day)	
<6 h	195 (14.6)
6–9 h	864 (64.7)
>9 h	276 (20.7)
Relative or acquaintance infected with COVID-19	
No	764 (57.2)
Yes	317 (23.7)
Not sure	254 (19.1)
Relative or acquaintance died of COVID-19	
No	1084 (81.2)
Yes	123 (9.2)
Not sure	128 (9.6)
Receiving psychological support <sup>a</sup>	
From family	960 (71.9)
From community	384 (28.8)
From university	411 (30.8)

<sup>a</sup>Numbers do not add to 100% as respondents might have more than one response.

COVID-19 pandemic deserves much concern and 39.9% reported that it is very dangerous and terrifying disease. Only 5.6% of students felt the media coverage of the disease is exaggerated. About one-third (32.6%) of the students claimed that they had enough knowledge about the disease. The most commonly stated sources of knowledge were social media (60.8%) followed by

**Table 2:** Prevalence of depression, anxiety and stress among the Egyptian university students during the COVID-19 pandemic

Items	N (%)
Depression scale	
Normal	394 (29.5)
Mild	328 (24.6)
Moderate	484 (36.3)
Severe	129 (9.6)
Extremely severe	0 (0.0)
Mean depression score (mean ± SD)	12.58 ± 6.3
Anxiety scale	
Normal	620 (46.4)
Mild	182 (13.6)
Moderate	330 (24.7)
Severe	111 (8.3)
Extremely severe	92 (7.0)
Mean anxiety score (mean ± SD)	8.36 ± 6.6
Stress scale	
Normal	697 (52.2)
Mild	187 (14.0)
Moderate	262 (19.6)
Severe	169 (12.7)
Extremely severe	20 (1.5)
Mean stress score (mean ± SD)	15.17 ± 8.3

internet websites (20.4%), while a minor proportion of students (2.5%) showed no interest in following COVID-19 pandemic. The majority of students (82.5%) spent <1 h/day to follow regular updates on COVID-19 (Table 3).

The precautionary measures adopted by the Egyptian university students were shown in Table 3, where 63.3 and 45%, of the students stayed at home and were committed to social distancing. About 31.5% of the students wear masks, gloves and use antiseptics when leaving their houses, however, 61.2% of them did not use antiseptics after returning home.

Table 4 shows the multivariable-adjusted ORs (95% CIs) for factors associated with psychological status of Egyptian university students. Being a female had higher odds to have depression, anxiety and stress; the multivariable-adjusted OR (95% CI) were 1.67 (1.28–2.21), 1.71 (1.33–2.19) and 1.81 (1.39–2.33), respectively. Studying at medical colleges was associated with students' depression; OR = 1.46 (1.12–1.59), but not with their stress or anxiety status. Students who had relative or acquaintance infected with COVID-19 were about one and half times more likely to have depression, anxiety and stress than those who did not know affected person. The presence of a chronic health problem was

**Table 3:** Perceptions and precautionary measures of the studied Egyptian university students regarding the COVID-19 pandemic

Items	N (%)
How do you feel about the pandemic of COVID-19?	
I am not caring	60 (4.5)
Somewhat annoyed	450 (33.7)
Severely annoyed	518 (38.8)
Terrified	307 (23.0)
Do you think that COVID-19 pandemic deserves all this concern?	
It deserves attention and concern	727 (54.5)
It is very dangerous and terrifying	533 (39.9)
Media coverage about this disease is exaggerated	75 (5.6)
Do you have enough information about COVID-19 and its prevention?	
Yes	435 (32.6)
To some extent	784 (58.7)
No	116 (8.7)
Sources of your information about COVID-19 pandemic <sup>a</sup>	
I do not care neither read nor hear	33 (2.5)
Social media	812 (60.8)
Family members/friends	78 (5.9)
Doctors	106 (7.9)
Television	149 (11.2)
News internet sites	273 (20.4)
Time spent daily to follow regular updates on COVID-19 pandemic	
<1 h	1102 (82.5)
2–4 h	148 (11.1)
>4 h	85 (6.4)
Are you committed to staying at home?	
Yes	845 (63.3)
To some extent	429 (32.1)
No	61 (4.6)
Are you committed to social distancing?	
Yes	601 (45.0)
Most of time	583 (43.7)
No	151 (11.3)
Do you use masks, gloves and antiseptics when you go out of your house?	
Yes	421 (31.5)
Sometimes	481 (36.1)
No	433 (32.4)
Do you use antiseptics when you return home?	
Yes	817 (61.2)
Sometimes	297 (22.2)
No	221 (16.6)

<sup>a</sup>Numbers do not add to 100% as respondents might have more than one response.

associated with increased odds for psychological disturbances; the multivariable-adjusted OR (95% CI) were 1.88 (1.22–2.91), for depression, 2.06 (1.44–2.97) for anxiety and 1.64 (1.14–2.34) for stress. More time spent to follow updates about the COVID-19 disease was a significant predictor for the anxiety; OR = 1.29 (1.04–1.62).

Students who reported lacking psychological support from their families were about two times more likely to have depression; OR = 2.43 (1.72–3.45), anxiety; OR = 1.84 (1.39–2.45) and stress; OR = 2.67 (1.99–3.56) than the other students. Additionally, lack of social support from community or university was associated with higher odds to have psychological

**Table 4:** Binary logistic regression analysis for factors associated with depression, anxiety and stress among the Egyptian university students during the COVID-19 pandemic

Dependent variables and significantly associated variables	Adjusted OR (95% CI)	p-value
Dependent variable: depression		
Sex (female)	1.67 (1.28–2.21)	0.0001
Type of study (medical)	1.46 (1.12–1.59)	0.005
Relative or acquaintance infected with COVID-19	1.36 (1.02–1.82)	0.04
Suffer from a chronic disease	1.88 (1.22–2.91)	0.004
Lack of psychological support from family	2.43 (1.72–3.45)	0.0001
Lack of psychological support from community	1.61 (1.21–2.15)	0.001
Lack of psychological support from university	1.51 (1.13–2.02)	0.006
Adequate sleeping hours (6–9 h)	0.62 (0.46–0.82)	0.001
Dependent variable: anxiety		
Sex (female)	1.71 (1.33–2.19)	0.0001
Relative or acquaintance infected with COVID-19	1.42 (1.09–1.86)	0.008
Suffer from a chronic disease	2.06 (1.44–2.97)	0.0001
Daily time spent to follow updates on COVID-19 pandemic	1.29 (1.04–1.62)	0.02
Lack of support from family	1.84 (1.39–2.45)	0.0001
Lack of support from community	1.51 (1.14–1.99)	0.004
Adequate sleeping hours (6–9 h)	0.59 (0.47–0.76)	0.0001
Dependent variable: stress		
Sex (female)	1.81 (1.39–2.33)	0.0001
Relative or acquaintance infected with COVID-19	1.64 (1.25–2.14)	0.0001
Suffer from a chronic disease	1.64 (1.14–2.34)	0.007
Lack of psychological support from family	2.67 (1.99–3.56)	0.0001
Lack of psychological support from community	1.57 (1.18–2.09)	0.003
Lack of psychological support from university	1.52 (1.14–2.02)	0.004
Adequate sleeping hours (6–9 h)	0.51 (0.40–0.66)	0.0001

Dependent variables: depression score >9; anxiety score >7 and stress score >14.  
OR, odds ratio, CI, confidence interval.

disturbances. Whereas, sleeping adequate hours (6–9 h) per day were inversely associated with all psychological impacts.

## DISCUSSION

University students are at elevated risk for mental health problems, and many studies have documented that students report consistently higher levels of mental health problems than the general population (Tomoda *et al.*, 2000; Stallman, 2010; Gaspersz *et al.*, 2012; Denovan and Macaskill, 2017; Tran *et al.*, 2017; Mortier *et al.*, 2018; Williams *et al.*, 2018). There are numerous complex and inter-related factors that may be contributing to the rise of mental health issues among college students. They experience multiple stressors such as life-stage transitions, academic pressure resulting from exams, study load, intense pressure to succeed academically, accommodation problems, adjusting to new social

and geographical environments and worries about the future (Heckman *et al.*, 2014; Acharya *et al.*, 2018).

The COVID-19 pandemic and the measures adopted against it such as school and university closures potentially caused novel, once-in-a-lifetime stressors and disruptions of daily life for most students worldwide. Therefore, as expected the Egyptian university students have been affected by the COVID-19 pandemic and its consequent public health measures with notable impact on their psychological status. Nearly, 70.5, 53.6 and 47.8% of the Egyptian students showed signs of psychological symptoms according to anxiety, depression and stress subscales, respectively. The prevalence were higher compared with a study using similar instruments among Turkish university students (Bayram and Bilgel, 2008), where the prevalence of depression, anxiety and stress were 27.1, 47.1 and 27.0%, respectively. Another study among Malaysian university students showed that the prevalence of depression, anxiety and stress

symptoms of moderate severity and above were 37.2, 63.0 and 23.7%, respectively (Shamsuddin *et al.*, 2013). Likewise, 24.9% of Chinese college students experienced anxiety because of the COVID-19 outbreak (Cao *et al.*, 2020).

Evidence from previous study documented that 18–20 years old individuals are vulnerable to mental illnesses and 75% of mental illnesses have first-time onset during the youth years (Downs *et al.*, 2018). For many students, commencing university is associated with leaving home for the first time, and increased independence, pressure, and responsibility (Verger *et al.*, 2009). Farrer *et al.* (Farrer *et al.*, 2016) stated that Australian students in their first year of study were at significantly greater risk of experiencing major depression. Additionally, Othman *et al.* (Othman *et al.*, 2019) reported more anxiety among the initial year's students in a Canadian university. On contrary, the present study on the Egyptian students found no association between academic year and the level of depression, anxiety and stress. This could be attributed to the novel COVID-19 pandemic that affected the mental health of all students regardless of their academic year.

The current study showed that female gender was associated with increased anxiety, depression and stress. This finding is in line with the results of previous studies (Wang *et al.*, 2020; Qiu *et al.*, 2020; Mazza *et al.*, 2020), which have consistently found associations between female gender and increased psychological disturbance. This can be explained by the fact that females express their feelings as one of the ways to cope with stressful events and they are more liable to over complaint about physical and psychological symptoms (Amir and El Gillany, 2010; Shamsuddin *et al.*, 2013). Female gender has been identified as the most potent predictor of post-traumatic stress disorder symptoms after pandemics (Liu *et al.*, 2020). According to Wang *et al.* (Wang *et al.*, 2020), anxiety disorder has been seen at three-fold higher levels in Chinese women than in men during the COVID-19 pandemic.

Our findings showed that studying at medical colleges was associated with students' depression, the multivariable-adjusted OR (95% CI) was 1.46 (1.12–1.59). Evidence from several studies had shown that medical students worldwide experience significant rates of psychological distress and psychiatric morbidity (Puthran *et al.*, 2016; Wilkes *et al.*, 2019; Frajerman *et al.*, 2019; Quek *et al.*, 2019). With a lot of uncertainty, accompanying the COVID-19 pandemic globally and its subsequent rapid changes in medical information there were many of the unprecedented public health measures. These measures included self-isolation, suspension of

most of the life activities with the general lockdown including closure of the universities, canceled university practical and clinical lectures, practical exams and worries of the students, specially the medical ones regarding their academic progress and grades represented an extra burden, additional stress and significant psychological impact on the studied Egyptian university students.

In line with our findings, a systematic review of 29 studies showed that the prevalence of anxiety and depression among students in medical schools in Europe, the UK and elsewhere in the English-speaking world outside of North America was 7.7–65.5 and 6.0–66.5%, respectively (Hope and Henderson, 2014).

Besides, as expected, our results show that Egyptian students who reported chronic diseases had higher odds to have stress, anxiety, and depression compared with healthy students. Wang *et al.* (Wang *et al.*, 2020) found that a medical history of chronic illness has been associated with higher levels of psychological distress among Chinese population. Similar results were reported by Mazza *et al.* (Mazza *et al.*, 2020) who studied the psychological distress among Italian people during the COVID-19 pandemic. A possible explanation for this result is that persons with a history of medical problems who also perceive their health as poor might feel more vulnerable to contracting a new disease (Hatch *et al.*, 2018).

Students who had relatives or acquaintances infected with COVID-19 were about one and half times more likely to have depression, anxiety and stress than those who did not know affected person, which is consistent with the results of a study conducted by Cao *et al.* (Cao *et al.*, 2020) who found that having relatives or acquaintances infected with COVID-19 was a risk factor for increasing the anxiety of college students in China (OR = 3.007, 95% CI = 2.377–3.804). This might be related to the high contagiousness of the new COVID-19 (World Health Organization, 2020; Song *et al.*, 2019).

High prevalence of psychological distress and its strong association with poor sleep quality amongst students was reported in previous studies; in Ethiopian (Lemma *et al.*, 2012), Malaysian (Shamsuddin *et al.*, 2013), Saudi Arabian (Aboalshamat *et al.*, 2015) and Nigerian students (Seun-Fadipe and Mosaku, 2017). In accordance with previous findings, the current study found that sleeping adequate hours (6–9 h) per day was associated with lower depression, anxiety and stress scores.

Spending more time to follow updates about the emerging COVID-19 pandemic was a significant predictor for the anxiety among the Egyptian students; OR = 1.29 (1.04–1.62). The overwhelming and



dramatic news headlines and erroneous news reports have added to anxiety and fear (Ayittey *et al.*, 2020). Additionally, our students cited that social media and internet websites were the main sources of their knowledge which requires attention that the unfiltered information broadcast by the news media and social media could explain their anxiety status. Recent reports demonstrated an association between frequent social media exposure and access to COVID-19 information and increased levels of depression and anxiety in the Chinese population during the COVID-19 pandemic (Guo *et al.*, 2020; Wang *et al.*, 2020). Worry feelings were also associated with exposure to COVID-19 information in social media, television and journals in India (Roy *et al.*, 2020). Therefore, avoidance to follow new stories about the COVID-19 pandemic can be considered as a good advice in order to escape its worse psychological impacts. Such avoidance of the worrying news of the pandemic has been identified as one of the behavioral coping methods employed during the severe acute respiratory syndrome epidemic, the Ebola epidemic and the H1N1 outbreak (Chew *et al.*, 2020).

Finally, lack of support from family, community and university social support was associated with the depression, anxiety and stress of college Egyptian students, which is consistent with previous findings (Thompson *et al.*, 2016; Chen *et al.*, 2020; Cao *et al.*, 2020). This result suggests that effective and robust social support is necessary during public health emergencies.

One of the major strengths of this study is that it includes a relatively large sample size that comprised students from different colleges from most of Egyptian universities all around the country. However, some limitations existed, which included the following; firstly, due to the cross-sectional nature of the study, it is difficult to determine the direction of effects and to determine whether any of the psychological impacts was a preexisting or a recently developed one. Longitudinal studies are needed to analyze the long-term impact of the new emerging pandemic on the psychological status of the students. Secondly, we adopted an online survey which may contribute to non-response bias in the study results. However, we believe that bias was potentially reduced by expanding the duration of the survey for ~2 weeks, distribution of the questionnaire targeted most of the universities in Egypt through different social media platforms while avoiding to ask any question related to the students' identity or personal information. Thirdly, data about how the students spend their leisure time is lacking it might be a confounding factor that necessitates further research.

In conclusion, Egyptian students experience varying levels of psychological disturbance during COVID-19 pandemic. Being a female, having a relative or acquaintance infected with COVID-19, having a preexisting chronic disease and lacking the psychological support from the family, the community and the university increase the risk of depression, anxiety and stress among Egyptian students. Being a medical student is associated with depression while, spending more time to follow news of the COVID-19 pandemic is associated with increased anxiety among the Egyptian university students. This study suggests that mental health of the university students should be carefully monitored during the crisis and the universities should provide psychological-oriented services that should be adapted to these circumstances to mitigate its emotional impact on the students.

## ACKNOWLEDGMENTS

We acknowledge all Egyptian university students for their cooperation.

## CONFLICT OF INTEREST STATEMENT

None declared.

## REFERENCES

- Aboalshamat, K., Hou, X. Y. and Strodl, E. (2015) Psychological well-being status among medical and dental students in Makkah, Saudi Arabia: a cross-sectional study. *Medical Teacher*, *37*, S75–S81.
- Acharya, L., Jin, L. and Collins, W. (2018) College life is stressful today—emerging stressors and depressive symptoms in college students. *Journal of American College Health*, *22*, 1–10.
- Ali, A. M., Ahmed, A., Sharaf, A., Kawakami, N., Abdeldayem, S. M. and Green, J. (2017) The Arabic Version of The Depression Anxiety Stress Scale-21: cumulative scaling and discriminant-validation testing. *Asian Journal of Psychiatry*, *30*, 56–58.
- Amir, M. and El Gillany, A. H. (2010) Self-reported depression and anxiety by students at an Egyptian Medical School. *Journal of Pakistan Psychiatric Society*, *2*, 71.
- Ayittey, F. K., Ayittey, M. K., Chiwero, N. B., Kamasah, J. S. and Dzuvoor, C. (2020) Economic impacts of Wuhan 2019-nCoV on China and the world. *Journal of Medical Virology*, *92*, 473–475.
- Bayram, N. and Bilgel, N. (2008) The prevalence and sociodemographic correlations of depression, anxiety and stress among a group of university students. *Social Psychiatry and Psychiatric Epidemiology*, *43*, 667–672.
- Cao, W., Fang, Z., Hou, G., Han, M., Xu, X., Dong, J. *et al.* (2020) The psychological impact of the COVID-19 epidemic



- on college students in China. *Psychiatry Research*, **287**, 112934.
- Chen, Q., Liang, M., Li, Y., Guo, J., Fei, D., Wang, L. *et al.* (2020) Mental health care for medical staff in China during the COVID-19 outbreak. *The Lancet Psychiatry*, **7**, e15–e16.
- Chew, Q. H., Wei, K. C., Vasoo, S., Chua, H. and Sim, K. (2020) Narrative synthesis of psychological and coping responses towards emerging infectious disease outbreaks in the general population: practical considerations for the COVID-19 pandemic. *Singapore Medical Journal*, **61**, 350–356.
- Corona Virus Resource Centre. (2020) John Hopkins University and Medicine. <https://coronavirus.jhu.edu/map.html>. (last accessed 20 May 2020)
- Denovan, A. and Macaskill, A. (2017) Stress and subjective well-being among first year UK undergraduate students. *Journal of Happiness Studies*, **18**, 505–525.
- Downs, N., Galle, E., Skehan, B. and Lipson, S. K. (2018) Be true to our schools-models of care in college mental health. *Current Psychiatry Reports*, **20**, 72.
- Farrer, L. M., Gulliver, A., Bennett, K., Fassnacht, D. B. and Griffiths, K. M. (2016) Demographic and psychosocial predictors of major depression and generalised anxiety disorder in Australian university students. *BMC Psychiatry*, **16**, 241.
- Frajerman, A., Morvan, Y., Krebs, M. O., Gorwood, P. and Chaumette, B. (2019) Burnout in medical students before residency: a systematic review and meta-analysis. *European Psychiatry*, **55**, 36–42.
- Gaspersz, R., Frings-dresen, M. and Sluiter, J. (2012) Prevalence of common mental disorders among Dutch medical students and related use and need of mental health care: a cross-sectional study. *International Journal of Adolescent Medicine and Health*, **24**, 169–172.
- Guo, Y. R., Cao, Q. D., Hong, Z. S., Tan, Y., Chen, S., Jin, H. *et al.* (2020) The origin, transmission and clinical therapies on coronavirus disease 2019 (COVID-19) outbreak - an update on the status. *Military Medical Research*, **7**, 11.
- Hassany, M., Abdel-Razek, W., Asem, N., AbdAllah, M. and Zaid, H. (2020) Estimation of COVID-19 burden in Egypt. *Lancet Infectious Diseases*, **20**, 896–897.
- Hatch, R., Young, D., Barber, V., Griffiths, J., Harrison, D. A. and Watkinson, P. (2018) Anxiety, depression and post traumatic stress disorder after critical illness: a UK-wide prospective cohort study. *Critical Care*, **22**, 310.
- Heckman, S., Lim, H. and Montalto, C. (2014) Factors related to financial stress among college students. *Journal of Financial Therapy*, **5**, 3.
- Hope, V. and Henderson, M. (2014) Medical student depression, anxiety and distress outside North America: a systematic review. *Medical Education*, **48**, 963–979.
- Huang, C., Wang, Y., Li, X., Ren, L., Zhao, J., Hu, Y. *et al.* (2020) Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. *The Lancet*, **395**, 497–506.
- Lemma, S., Gelaye, B., Berhane, Y. *et al.* (2012). Sleep quality and its psychological correlates among university students in Ethiopia: a cross-sectional study. *BMC Psychiatry*, **12**, 237. <https://doi.org/10.1186/1471-244X-12-237>
- Li, Q., Guan, X., Wu, P., Wang, X., Zhou, L., Tong, Y. *et al.* (2020) Early transmission dynamics in Wuhan, China, of novel coronavirus-infected pneumonia. *New England Journal of Medicine*, **382**, 1199–1207.
- Li, S.W., Wang, Y., Yang, Y. Y., Lei, X.M. and Yang, Y.F. (2020) Analysis of influencing factors of anxiety and emotional disorders in children and adolescents during home isolation during the epidemic of novel coronavirus pneumonia. *Chinese Journal of Child Health*, **28**, 1–9.
- Liu, N., Zhang, F., Wei, C., Jia, Y., Shang, Z., Sun, L. *et al.* (2020) Prevalence and predictors of PTSS during COVID-19 outbreak in China hardest-hit areas: gender differences matter. *Psychiatry Research*, **287**, 112921.
- Lovibond, S. H. and Lovibond, P. F. (1995) *Manual for the Depression Anxiety Stress Scales (DASS)*. Psychology Foundation Monograph. University of New South Wales, New South Wales, Australia.
- Mazza, C., Ricci, E., Biondi, S., Colasanti, M., Ferracuti, S., Napoli, C. *et al.* (2020) A nationwide survey of psychological distress among Italian people during the COVID-19 pandemic: immediate psychological responses and associated factors. *International Journal of Environmental Research and Public Health*, **17**, 3165.
- Mortier, P., Auerbach, R. P., Alonso, J., Bantjes, J., Benjet, C., Cuijpers, P. *et al.* (2018) Suicidal thoughts and behaviors among first-year college students: results from the WMH-ICS project. *Journal of the American Academy of Child & Adolescent Psychiatry*, **57**, 263–273.e1.
- Othman, N., Ahmad, F., El Morr, C. and Ritvo, P. (2019) Perceived impact of contextual determinants on depression, anxiety and stress: a survey with university students. *International Journal of Mental Health Systems*, **13**, 17.
- Puthran, R., Zhang, M. W. B., Tam, W. W. and Ho, R. C. (2016) Prevalence of depression amongst medical students: a meta-analysis. *Medical Education*, **50**, 456–468.
- Qiu, J., Shen, B., Zhao, M., Wang, Z., Xie, B. and Xu, Y. (2020) A nationwide survey of psychological distress among Chinese people in the COVID-19 epidemic: implications and policy recommendations. *General Psychiatry*, **33**, e100213.
- Quek, T. T. C., Tam, W. W. S., Tran, B. X., Zhang, M., Zhang, Z., Ho, C. S. H. *et al.* (2019) The global prevalence of anxiety among medical students: a meta-analysis. *International Journal of Environmental Research and Public Health*, **16**, 2735.
- Roy, D., Tripathy, S., Kar, S. K., Sharma, N., Verma, S. K. and Kaushal, V. (2020) Study of knowledge, attitude, anxiety & perceived mental healthcare need in Indian population during COVID-19 pandemic. *Asian Journal of Psychiatry*, **51**, 102083.
- Seun-Fadipe, C. T. and Mosaku, K. S. (2017) Sleep quality and psychological distress among undergraduate students of a Nigerian university. *Sleep Health*, **3**, 190–194.
- Shamsuddin, K., Fadzil, F., Ismail, W. S., Shah, S. A., Omar, K., Muhammad, N. A. *et al.* (2013) Correlates of depression,

- anxiety and stress among Malaysian university students. *Asian Journal of Psychiatry*, 6, 318–323.
- Song, Z., Xu, Y., Bao, L., Zhang, L., Yu, P., Qu, Y. *et al.* (2019) From SARS to MERS, thrusting coronaviruses into the spotlight. *Viruses*, 11, 59.
- Stallman, H. (2010) Psychological distress in university students: a comparison with general population data. *Australian Psychologist*, 45, 249–257.
- Thompson, G., McBride, R. B., Hosford, C. C. and Halaas, G. (2016) Resilience among medical students: the role of coping style and social support. *Teaching and Learning in Medicine*, 28, 174–182.
- Tomoda, A., Mori, K., Kimura, M., Takahashi, T. and Kitamura, T. (2000) One-year prevalence and incidence of depression among first-year university students in Japan: a preliminary study. *Psychiatry and Clinical Neurosciences*, 54, 583–588.
- Tran, A., Tran, L., Geghre, N., Darmon, D., Rampal, M., Rebouillat-savy, K. *et al.* (2017) Health assessment of French university students and risk factors associated with mental health disorders. *PLoS One*, 12, e0188187.
- UNICEF (2020). Coronavirus Disease (COVID-19): *What Parents Should Know*. <https://www.unicef.org/bangladesh/en/coronavirus-disease-covid-19-what394parents-should-know>.
- Verger, P., Combes, J.-B., Kovess-Masfety, V., Choquet, M., Guagliardo, V., Rouillon, F. *et al.* (2009) Psychological distress in first year university students: socioeconomic and academic stressors, mastery and social support in young men and women. *Social Psychiatry and Psychiatric Epidemiology*, 44, 643–650.
- Wang, C., Horby, P. W., Hayden, F. G. and Gao, G. F. (2020) A novel coronavirus outbreak of global health concern. *The Lancet*, 395, 470–473.
- Wang, C., Pan, R., Wan, X., Tan, Y., Xu, L., Ho, C. *et al.* (2020) Immediate psychological responses and associated factors during the initial stage of the 2019 coronavirus disease (COVID-19) epidemic among the general population in China. *International Journal of Environmental Research and Public Health*, 17, 1729.
- Wang, Y., Di, Y., Ye, J. and Wei, W. (2020) Study on the public psychological states and its related factors during the outbreak of coronavirus disease 2019 (COVID-19) in some regions of China. *Psychology, Health & Medicine*. <https://doi.org/10.1080/13548506.2020.1746817>.
- Wilkes, C., Lewis, T., Brager, N., Bulloch, A., MacMaster, F., Paget, M. *et al.* (2019) Wellbeing and mental health amongst medical students in Canada. *International Review of Psychiatry*, 31, 584–587.
- Williams, C., Dziurawiec, S. and Heritage, B. (2018) More pain than gain: effort—reward imbalance, burnout, and withdrawal intentions within a university student population. *Journal of Educational Psychology*, 110, 378–394.
- World Health Organization. (2020) *Emergencies: Novel Coronavirus 2019*. WHO, Geneva.
- World Health Organization. *Novel coronavirus (2019-nCoV) Situation Report—12*. <https://www.who.int/docs/default-source/coronaviruse/situation-reports/2020020>.
- Yang, Y., Li, W., Zhang, Q., Zhang, L., Cheung, T. and Xiang, Y. T. (2020) Mental health services for older adults in China during the COVID-19 outbreak. *The Lancet Psychiatry*, 7, e19.