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ORIGINAL ARTICLE

Prevalence of negative mental health status during COVID-19 pandemic among general population of seven Arab countries: A cross-sectional study of 28843 participants

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ABSTRACT

Background: Previous studies documented a narrow scope of knowledge about the negative mental health status during the lockdown following the COVID-19 pandemic, especially in Arab countries.

Aim: We aimed to assess the association between negative mental health status and the COVID-19 pandemic and determine the different factors affecting mental health among the general population of seven Arab countries.

Methods: This study is a multinational cross-sectional questionnaire-based survey conducted online from June 11, 2020 to June 25, 2020. The depression, anxiety, and stress Scale 21 Items (DASS-21) and the Event scale–Revised Arabic version (IES-R-13) scales were used. Multiple linear regressions were performed to study the association between the scales' total scores with COVID-19 and demographic characteristics.

Results: A total of 28,843 participants from seven Arab countries were included. During the COVID-19 pandemic, the prevalence of mental health disorders has significantly increased. A total of 19006 participants (66%) were affected by

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Submitted: 14-Mar-2022, **Revised:** 18-Oct-2022, **Accepted:** 17-Dec-2022, **Published:** 13-Jan-2023

Access this article online	
Website: www.indianjpsychiatry.org	Quick Response Code
DOI: 10.4103/indianjpsychiatry.indianjpsychiatry_202_22	

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How to cite this article: Abdelsattar NK, Alrawi AG, Abdelraoof MI, Zaazouee MS, Elsayed SM, Farhat AM, *et al.* Prevalence of negative mental health status during COVID-19 pandemic among general population of seven Arab countries: A cross-sectional study of 28843 participants. Indian J Psychiatry 2023;65:90-102.

variable degrees of depression, 13,688 (47%) had anxiety, and 14,374 (50%) had stress ranging from mild to severe. Higher levels were associated with other factors, such as lower age, female gender, chronic disease, unemployed, fear of getting infected, and a history of psychiatric disorders.

Conclusion: Our study findings show an increased incidence of mental disorders during the pandemic. This is expected to play a crucial role in guiding a psychological support strategy provided by healthcare systems to the general public during pandemics.

Key words: Anxiety, Arab, COVID-19, depression, general population, stress

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INTRODUCTION

In December 2019, a pneumonia outbreak of unknown etiology first emerged in Wuhan, China. Scientists identified the causative agent of this outbreak as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), also called Coronavirus disease 2019 (COVID-19/2019-nCoV).[1–3] The mystery about the nature and the infectivity power of COVID-19, besides the annoying social distancing measures, anxiety, stress, and depression were noticed among the general population.[1,2] Previous studies on SARS, MERS, Equine Influenza, H1N1, or Ebola epidemics showed different examples of mental health affection during such events[4–7]; as predicted from any outbreak of novel or serious infectious nature; boding that COVID-19 will affect the mental health status of large segments of the population. Mental health affection may be greater than the risk of physical health affection by the new virus, reducing the quality of life and sleep. This may increase the susceptibility to becoming infected; good mental health and sleep lead to good immunity, improving the fight against the new virus.[8,9] Many risk factors may contribute to the degree of mental health affection, including age, gender, awareness about the virus, source of information, isolation measures applied, previous contact with COVID-19 patients, economic status, education level, occupation, residence, and presence of comorbidity.[10,11] Recent studies about COVID-19 mainly discuss the clinical symptomatology of patients with the virus,[12,13] and fewer studies discuss mental health affection focusing on China, showing a narrow scope of knowledge about the mental health of individuals during the epidemic lockdown in different countries of the world affected by the virus, especially in Arab countries. Hence, this cross-sectional study aimed to assess the prevalence of negative mental health status, including (stress, anxiety, and depression) during the COVID-19 pandemic. Also, we aimed to determine the different factors affecting it among the general population of seven Arab countries.

METHODS

Study design and participants

This study was a multinational cross-sectional questionnaire-based survey. The survey was online to measure the risk of depression, stress, and anxiety in seven Arab countries during the COVID-19 pandemic. The targeted population was the general adult population (aged >16 years old) who depended mainly on the internet as a source of information. To decrease the selection bias generated by the online survey, part of the population was reached through phone call interviews. Participants who had been reached via phone calls were randomly selected. The study followed The Checklist for Reporting Results of Internet E-Surveys (CHERRIES)[14] (Supplementary Material).

Sampling

A convenience sampling method was undertaken to acquire the responses from the participants via online distribution of the survey and random phone interviews. We calculated the independent sample size for each country separately using the equation $n = z^2P\ (1 - P)/d^2$ for a level of confidence of 95%, where n is the sample size, z is the z score, P is the population proportion, d is the degree of freedom: $z = 1.96$, estimated 50% (0.5) response distribution and 0.05 tolerated margin of error, a sample of 384 participants can be considered as a minimal sample to represent the populations. However, due to the limitations of convenience sampling and online surveying of the potential participants, a design effect (DE) factor is included in the equation. DE is the ratio of the estimated variance observed with a certain type of sampling to the expected variance of the estimate had the sample been collected using simple random sampling (SRS). For some respondent-driven sampling studies, it was recommended to be around three to four. So, a DE of 3 to 4 is applied and multiplied by the minimal sample size calculated by the previous equation as a correction factor to adjust the sample size. Finally, a minimum sample of 1152 to 1536 participants was considered to represent each country.

Questionnaire development and studied outcomes

The primary outcomes were the prevalence of depression, stress, anxiety, and the risk of developing post-traumatic stress disorder (PTSD) among the population during the pandemic. The depression, anxiety, and stress Scale 21 Items (DASS-21) is a set of three self-report scales designed to measure the severity of the emotional status of

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depression, anxiety, and stress. It was used to determine the prevalence of psychological problems during the COVID-19 pandemic. Each question of DASS-21 items has answers categorized from 0 to 3 (0 for never, 1 for sometimes, and 2 for often, 3 for always). The total depression subscale score is divided into normal (0 to 4), mild depression (5 to 6), moderate depression (7 to 10), severe depression (11 to 13), and extremely severe depression (+14). The total anxiety subscale score is divided into normal (0 to 3), mild anxiety (4 to 5), moderate anxiety (6 to 7), severe anxiety (8 to 9), and extremely severe anxiety (+10). The total stress subscale score is divided into normal (0 to 7), mild stress (8 to 9), moderate stress (10 to 12), severe stress (13 to 16), and extremely severe stress (+17).

Event scale–revised Arabic version (IES-R-13) is a brief measure designed to screen risk for PTSD in adults developed from the 13-item Children's Revised Impact of Event scale (CRIES-13). The authors amended the scale to assess the impact of the COVID-19 pandemic on PTSD risk prevalence. The amendment replaced the phrase the shocking event with "the COVID-19 pandemic," as in questions 1,2,4,5,6,7,8,9, and 10. The answers to IES-R-13 items are divided into (not at all, rarely, sometimes, or often).

The secondary outcome was to assess the possible factors associated with depression, stress, anxiety, and the risk of developing (PTSD). These factors include (1) sociodemographic factors: including age, gender, marital status, and job, (2) contact with COVID-19 case, (3) economic status, including job insecurity and the monthly income of individuals, (4) education level, (5) previously diagnosed psychological disorders, (6) awareness and methods of isolation measures undertaken in different areas around the countries, (7) source of information during the pandemic, (8) fear of contracting the disease, (9) location of residence, and (10) quarantine and social distancing. DASS-21 and IES-R-13 scales translation has been validated among the adult Arab population[15–17]

Data collection and handling

After announcing the study launching on Facebook research groups, collaborators from the included countries interested in the study theme were recruited between June 1, 2020 and June 7, 2020. Two authors explained the study concept and data collection methods to the collaborators. They also were responsible for following up on the collaborators and ensuring a fair distribution of data collection between the different regions in each country. Data collection took 14 days, from June 11, 2020 to June 25, 2020. We collected data by two methods. The first method was publishing open Google forms in posts on various social media platforms continuously and repeatedly (Facebook, Whatsapp, Twitter, Instagram, and LinkedIn). The second method was through phone call interviews. Each collaborator was required to select 30 contacts from their contact list and then randomly choose 10 out of 30. Then after obtaining their permission, the collaborator asked the questionnaire questions, and their answers were recorded in an excel sheet. Each collaborator had to collect 100 responses through the online form and 10 responses through phone calls. Personal data such as the participant's name was not collected. Filling out the online questionnaire was mandatory, with no incentives offered. The number of items on every page differed as each page represented a part of the questionnaire. The biggest part included 21 items. There were four pages in the questionnaire. Filling all the questionnaires was mandatory with no not applicable option as the questionnaire is formed of many scales with prespecified choices. The respondents could not review or change their responses after submitting them, but before that, they could change their options.

Statistical analysis

Data were analyzed using statistical package for the social sciences software version 26. Continuous data were presented as the median and interquartile range (IQR) in the case of non-parametric data. Dichotomous variables were presented in the form of frequencies and percentages. Numbers and percentages of responses were calculated according to the number of respondents per response in relation to the total number of responses to a question. Multiple linear regression was used to compare each assumed factor affecting mental health and the IES-R-13 scale total scores, reflecting the psychological impact of the COVID-19 pandemic. The *P* value was considered significant at <0.05.

Ethical consideration

The study protocol was approved by the Ethics Committee of the Faculty of Medicine, Fayoum University (#R 152). Online consent in the form of a web page containing all study details was obtained from each participant before starting the survey. Oral consent was obtained before asking the questions at phone call interviews.

RESULTS

General sociodemographic and COVID-19-related characteristics

A total of 28,843 participants in seven Arab countries (Algeria, Egypt, Jordan, Libya, Palestine, Sudan, and Syria) filled out the study questionnaire. The median age of participants was 23 years. Thirty-one percent (31%) were males, 75% were single, 81% were urban citizens, 74% were college students, 10% had one or more chronic diseases, and 12% worked in the medical/health sector. Participants spent a median time of 5 h on social media per day. During the study period, 7% of participants had a history of contact with COVID-19 patients, 71% feared getting a COVID-19 infection, and 62% worried about reaching their primary needs during the pandemic. Participants had a good attitude towards

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COVID-19 quarantine, as 50% of participants stuck to their ministries of health quarantine guidelines. As a result of the pandemic, the income of 58% of the participants had decreased or stopped, while 2% had increased income. Only 24% of participants got daily COVID-19 information through their ministries of health and World Health Organization (WHO) websites; however, the majority (52%) got information via social media platforms.

The detailed characteristics of our study participants are given in Table 1.

Self-reported psychiatric disorders before the COVID-19 pandemic

Of the included participants, 18% reported having sleep disorders before the COVID-19 pandemic, 17% reported anxiety, 13% reported depression, 3% reported PTSD, 2% reported addiction, 1% reported bipolar disorder, and 1% reported schizophrenia, Appendix Table 1.

Depression, anxiety, and stress among participants during the COVID-19 pandemic

During the COVID-19 pandemic state and according to the DASS-21 scale, 11%, 8%, and 13% of the study sample had severe depression, anxiety, and stress, while 16%, 13%, and 9% had extremely severe depression, extremely severe anxiety, and extremely severe stress, Appendix Table 2.

The impact of COVID-19 according to the IES-R-13 scale

Regarding the IES-R-13 scale, the higher the score, the higher the probability of having PTSD. The median IES-R-13 score for the participants is 26 (IQR: 16–36). The details of the IES-R-13 subscales are presented in Appendix Table 3.

Depression, anxiety, and stress in relation to COVID-19 and demographic characteristics

Multiple linear regression was performed to study the association between depression, anxiety, stress, and PTSD scores with COVID-19 and demographic characteristics.

Stress

A higher stress level was associated with lower age, female gender, chronic disease, no income, not having a job, fear of getting infected, and ever dealing directly with COVID-19 patients (all $P < 0.05$). A higher degree of stress was observed in patients with a history of psychiatric disorders such as PTSD, depression, sleep disorders, anxiety, addiction, and bipolar disorder (all $P < 0.05$). A lower degree of stress was associated with being married than those who are single, having the WHO as the primary source of information compared to social media, having a history of schizophrenia, and complying with the instructions imposed by the Ministry of Health (all $P < 0.05$). Moreover, a lower degree of stress was observed for Libya, Palestine, and Sudan compared to Algeria. Participants who showed 75% to 100% commitment to home quarantine tended to

Table 1: The sociodemographic characteristics of the included participants

Characteristics	*n* (%)
Age in years, median (IQR)	23 (20-28)
Gender	
Male	9021 (31)
Female	19822 (69)
Marital status	
Single	21605 (75)
Married	6639 (23)
Widow	256 (1)
Divorced	343 (1)
Residency	
Algeria	5299 (18)
Egypt	5875 (20)
Jordan	2892 (10)
Libya	2547 (9)
Palestine	2852 (10)
Sudan	3506 (12)
Syria	5872 (20)
Region	
Rural	5397 (19)
Urban	23446 (81)
Education	
Did not join any school	258 (9)
Pre-university Education	4463 (16)
University education	21442 (74)
Postgraduate studies	2680 (9)
Job	
Unemployed	17391 (60)
Medical/health sector	3508 (12)
Non-medical/health sector	7944 (28)
Chronic diseases	3010 (10)
Daily hours on social media, median (IQR)	5 (4-8)
Sources of daily news of COVID-19	
Not interested in COVID daily news	5277 (18)
Family, friends, and surrounding community	1856 (6)
Social media	14859 (52)
World Health Organization and the Ministry of Health	6851 (24)
Fear of getting COVID-19 infection	
Rare	8341 (29)
Sometimes	15352 (53)
Always	5150 (18)
History of contact with COVID-19 infected person/s	2136 (7)
Income during the COVID-19 pandemic	
Stopped	2553 (9)
Decreased significantly	5769 (20)
Slight decrease	8258 (29)
No change	11816 (41)
Increased	447 (2)
Adherence to Ministry of health quarantine guidelines	
Rarely	2268 (8)
Sometimes	12077 (42)
Always	14498 (50)
Percentage of adherence to Ministry of Health guidelines	
0-25	2914 (10)
25-50	3869 (13)
50-75	7897 (27)
75-100	14163 (49)
Worry about reaching participant's primary needs	
No	10993 (38)
Sometimes	9307 (32)
Yes	8543 (30)

Contd...

Table 1: Contd...

Characteristics	*n* (%)
Number of persons at the same home, median (IQR)	5 (4-6)
Area of home in m^2, median (IQR)	135 (90-200)

Note. All data are presented as frequencies (percentages) unless mentioned otherwise.

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have higher stress than those not complying, and those who were anxious about accessing basic necessities had higher stress than those who were not anxious (all $P < 0.05$), Table 2. The adjusted *R* squared for different models is 0.19 for stress.

Depression

A higher level of depression was associated with lower age, female gender, chronic disease, no income, not having a job, spending more hours on social media, fear of getting infected, and ever dealing directly with COVID-19 patients (all $P < 0.05$). A higher degree of depression was observed in patients with a history of psychiatric disorders such as PTSD, depression, sleep disorders, anxiety, addiction, and bipolar disorder (all $P < 0.05$). A lower degree of depression was associated with being married than those who are single, living in rural areas, having the WHO as the primary source of information compared to social media, having a history of schizophrenia, complying with the instructions imposed by the Ministry of Health (all $P < 0.05$). A lower degree of depression was observed in Libya and Palestine compared to Algeria, and a higher degree of depression was observed in Egypt and Jordan compared to Algeria (all $P < 0.05$). Participants who showed 75% to 100% commitment to home quarantine tended to have higher depression than those not complying, and those who were anxious about accessing basic necessities had higher depression levels than those who were not anxious (all $P < 0.05$), Table 3. The adjusted *R* squared for different models is 0.18 for depression.

Anxiety

A higher level of anxiety was associated with the lower age, female gender, divorced as compared to single participants, having a chronic disease, being with no income, considering society as the primary source of information as compared to social media, fear of getting infected, ever dealing directly with COVID-19 patients (all $P < 0.05$). A higher degree of anxiety was observed in patients with a history of psychiatric disorders such as PTSD, depression, sleep disorders, anxiety, addiction, and bipolar disorder. A lower degree of anxiety was associated with being married than those who are single, having the WHO as the primary source of information compared to social media, and complying with the instructions imposed by the Ministry of Health (all $P < 0.05$). A lower degree of anxiety was observed in Libya, Palestine, Sudan, and Syria compared to Algeria, and a higher degree of anxiety was observed in Egypt compared to Algeria (all $P < 0.05$). Participants who were anxious about accessing basic necessities had higher anxiety levels than those who were not anxious, Table 4. The adjusted R squared for different models is 0.20 for anxiety.

Post-traumatic stress disorder (PTSD), based on the IES-R-13 score in relation to both COVID-19 and demographic characteristics

A higher level of PTSD was associated with a lower age, female gender, having a chronic disease, being educated as compared to those who did not go to school, being with no income, having a job, the number of hours on social media, having the society as the primary source of information as compared to social media, fear of getting infected, ever dealing directly with COVID-19 patients (all $P < 0.05$). A higher degree of PTSD is observed in patients with a history of psychiatric disorders like depression, sleep disorders, anxiety, and addiction. A lower degree of PTSD was associated with being married than those who are single, having the WHO as the primary source of information compared to social media, and complying with the instructions imposed by the Ministry of Health. A lower degree of PTSD was observed in Jordan, Libya, Palestine, Sudan, and Syria compared to Algeria, and a higher degree of PTSD was observed in Egypt compared to Algeria (all $P < 0.05$). Participants who were anxious about accessing basic necessities had higher PTSD levels than those who were not anxious, Table 5. The adjusted *R* squared for different models is 0.22 for the IES-R-13 score.

DISCUSSION

This study was carried out to detect the prevalence of depression, stress, and anxiety among the general population of seven Arab countries through June 2020. The study findings suggest the negative mental effect of the COVID-19 pandemic. A total of 5191 participants experienced mental health disorders such as anxiety, depression, risk of PTSD, addiction, and bipolar disorder. According to the results of the DASS-21 scale, 19,006 participants (66%) were affected by variable degrees of depression, 13,688 (47%) had anxiety, and 14,374 (50%) had stress that ranged from mild to severe.

The current study also assessed if the COVID-19 pandemic was a risk of PTSD using a modified IES-R-13 scale. The risk of PTSD was identified in 11,248 of the study sample. Several factors have been found to increase the risk of psychological affection. Such factors include female and jobless respondents; those with high IES-R-13 scores were more depressed, anxious, and stressed. Egypt and Algeria showed the highest frequencies of depression, anxiety, and stress, possibly due to the population's lifestyle in the mentioned countries. However, Palestine and Libya showed the lowest levels. This may be referred to as the usual exertion of stress and mental health affection due to the hard times and political situation in those mentioned countries. The findings suggest that the COVID-19 pandemic may be associated with higher risks of mental health issues,

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Table 2: Stress in relation to sociodemographic and pandemic characteristics of participants

	Coefficient	*P*	Confidence interval for the coefficient	
Age	-0.03	<0.001	-0.04	-0.02
Gender				
Male (REF)				
Female	1.21	<0.001	1.08	1.34
Marital status				
Single (REF)				
Married	-0.42	<0.001	-0.60	-0.24
Divorced	0.20	0.465	-0.33	0.73
Widowed	0.01	0.988	-0.66	0.67
Having chronic disease	0.75	<0.001	0.55	0.95
Education level				
Did not join any school (REF)				
Pre-university	0.10	0.772	-0.56	0.75
University	0.29	0.389	-0.36	0.93
Postgraduate	0.45	0.183	-0.21	1.12
Residence				
Urban (REF)				
Rural	-0.13	0.088	-0.29	0.02
Income during the pandemic				
Stopped (REF)				
Decreased significantly	-0.30	0.011	-0.53	-0.07
Decreased slightly	-0.91	<0.001	-1.13	-0.69
Stable (not changed)	-1.20	<0.001	-1.42	-0.99
Increased	-1.24	<0.001	-1.75	-0.74
Having a job				
No (REF)				
Yes	-0.41	<0.001	-0.54	-0.28
Number of hours on social media	0.15	<0.001	0.13	0.17
Source of information				
Social media (REF)				
Society	0.14	0.255	-0.10	0.39
World Health Organization	-0.20	0.005	-0.34	-0.06
Not interested	0.16	0.056	0.00	0.32
Fear of being infected				
Rarely (REF)				
Sometimes	0.54	<0.001	0.40	0.67
Always	1.80	<0.001	1.61	1.98
Ever dealt directly with COVID-19 patients	0.74	<0.001	0.51	0.96
History of PTSD	0.45	0.020	0.07	0.83
History of depression	2.08	<0.001	1.87	2.28
History of sleep disorders	0.73	<0.001	0.54	0.92
History of Anxiety	1.60	<0.001	1.40	1.80
History of Addiction	0.71	0.002	0.27	1.15
History of Schizophrenia	-1.02	0.003	-1.68	-0.35
History of Bipolar disorder	0.92	0.001	0.36	1.49
Country				
Algeria (REF)				
Egypt	0.18	0.069	-0.01	0.38
Jordan	0.12	0.303	-0.11	0.35
Libya	-0.62	<0.001	-0.87	-0.38
Palestine	-0.68	<0.001	-0.91	-0.45
Sudan	-0.59	<0.001	-0.81	-0.37
Syria	-0.02	0.829	-0.21	0.17
Complying with the instructions imposed by the Ministry of Health				
Rarely (REF)				
Sometimes	-0.33	0.009	-0.57	-0.08
Always	-0.80	<0.001	-1.07	-0.54
The percentage of commitment to home quarantine				
0-25% (REF)				
25-50	-0.11	0.374	-0.36	0.13
50-75	0.00	0.973	-0.23	0.23
75-100	0.48	<0.001	0.25	0.72
Currently anxious about accessing basic necessities				

Contd...

Table 2: Contd...

	Coefficient	*P*	Confidence interval for the coefficient	
No (REF)				
Sometimes	0.67	<0.001	0.54	0.81
Yes	1.37	<0.001	1.22	1.52
The number of people sharing the house	0.01	0.063	0.00	0.03
Area of the house	0.00	0.061	0.00	0.00

REF: is the reference category.

Table 3: Depression in relation to sociodemographic and pandemic characteristics of participants

	coefficient	*P*	Confidence interval for the coefficient	
Age	-0.02	<0.001	-0.03	-0.01
Gender				
Male (REF)				
Female	0.86	<0.001	0.73	0.99
Marital status				
Single (REF)				
Married	-1.09	<0.001	-1.27	-0.90
Divorced	0.08	0.762	-0.63	0.46
Widowed	0.19	0.586	-0.86	0.49
Having chronic disease	0.61	<0.001	0.41	0.81
Education level				
Did not join any school (REF)				
Pre-university	0.03	0.934	-0.64	0.69
University	0.34	0.307	-0.32	1.00
Postgraduate	0.62	0.075	-0.06	1.29
Residence				
Urban (REF)				
Rural	-0.22	0.006	-0.37	-0.06
Income during the pandemic				
Stopped (REF)				
Decreased significantly	-0.61	<0.001	-0.84	-0.37
Decreased slightly	-1.25	<0.001	-1.47	-1.02
Stable (not changed)	-1.48	<0.001	-1.70	-1.26
Increased	-2.18	<0.001	-2.69	-1.67
Having a job				
No (REF)				
Yes	-0.61	<0.001	-0.74	-0.48
Number of hours on social media	0.19	<0.001	0.17	0.21
Source of Information				
Social media (REF)				
Society	0.14	0.263	-0.11	0.39
World Health Organization	-0.39	<0.001	-0.53	-0.24
Not interested	0.46	<0.001	0.29	0.62
Fear of being infected				
Rarely (REF)				
Sometimes	0.20	0.004	0.06	0.34
Always	1.16	<0.001	0.97	1.35
Ever dealt directly with Covid patients	0.60	<0.001	0.38	0.83
History of PTSD	0.44	0.024	0.06	0.83
History of depression	2.73	<0.001	2.52	2.94
History of sleep disorders	0.41	<0.001	0.21	0.60
History of Anxiety	0.99	<0.001	0.79	1.20
History of Addiction	1.05	<0.001	0.60	1.50
History of Schizophrenia	-1.04	0.003	-1.71	-0.36
History of Bipolar disorder	1.16	<0.001	0.58	1.73
Country				
Algeria (REF)				
Egypt	0.85	<0.001	0.66	1.05
Jordan	0.70	<0.001	0.47	0.94
Libya	-0.28	0.024	-0.53	-0.04
Palestine	-0.32	0.007	-0.56	-0.09
Sudan	0.02	0.827	-0.20	0.24
Syria	0.50	<0.001	0.31	0.70

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Table 3: Contd...

	coefficient	*P*	Confidence interval for the coefficient	
Complying with the instructions imposed by the Ministry of Health				
Rarely (REF)				
Sometimes	-0.50	<0.001	-0.75	-0.25
Always	-1.04	<0.001	-1.31	-0.77
The percentage of commitment to home quarantine				
0-25% (REF)				
25-50	-0.10	0.456	-0.35	0.16
50-75	0.01	0.938	-0.24	0.22
75-100	0.50	<0.001	0.26	0.74
Currently anxious about accessing basic necessities				
No (REF)				
Sometimes	0.55	<0.001	0.41	0.69
Yes	1.26	<0.001	1.11	1.41
The number of people sharing the house	0.00	0.965	-0.01	0.01
Area of the house	0.00	0.473	0.00	0.00

REF: is the reference category

Table 4: Anxiety in relation to sociodemographic and pandemic characteristics of participants

	coefficient	*P*	Confidence interval for the coefficient	
Age	-0.01	0.001	-0.02	0.00
Gender				
Male (REF)				
Female	0.92	<0.001	0.82	1.02
Marital status				
Single (REF)				
Married	-0.34	<0.001	-0.48	-0.19
Divorced	0.55	0.008	0.15	0.96
Widowed	0.32	0.219	-0.19	0.83
Having chronic disease	1.05	<0.001	0.90	1.20
Education level				
Did not join any school (REF)				
Pre-university	-0.40	0.120	-0.90	0.10
University	-0.47	0.064	-0.97	0.03
Postgraduate	-0.39	0.137	-0.90	0.12
Residence				
Urban (REF)				
Rural	0.07	0.223	-0.04	0.19
Income during the pandemic				
Stopped (REF)				
Decreased significantly	-0.12	0.182	-0.30	0.06
Decreased slightly	-0.43	<0.001	-0.60	-0.26
Stable (not changed)	-0.59	<0.001	-0.76	-0.43
Increased	-0.44	0.024	-0.83	-0.06
Having a job				
No (REF)				
Yes	-0.04	0.399	-0.14	0.06
Number of hours on social media	0.11	<0.001	0.09	0.12
source of information				
Social media (REF)				
Society	0.42	<0.001	0.23	0.60
World Health Organization	-0.14	0.013	-0.25	-0.03
Not interested	0.12	0.060	-0.01	0.24
Fear of being infected				
Rarely (REF)				
Sometimes	0.47	<0.001	0.37	0.58
Always	1.58	<0.001	1.44	1.72
Ever dealt directly with Covid patients	0.92	<0.001	0.75	1.09
History of PTSD	1.09	<0.001	0.79	1.38
History of depression	1.53	<0.001	1.37	1.68
History of sleep disorders	0.50	<0.001	0.35	0.65
History of Anxiety	1.51	<0.001	1.36	1.66
History of Addiction	0.68	<0.001	0.34	1.01

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Table 4: Contd...

	coefficient	*P*	Confidence interval for the coefficient	
History of Schizophrenia	-0.36	0.169	-0.87	0.15
History of Bipolar disorder	0.95	<0.001	0.51	1.38
Country				
Algeria (REF)				
Egypt	0.31	<0.001	0.16	0.46
Jordan	0.08	0.368	-0.10	0.26
Libya	-0.66	<0.001	-0.85	-0.48
Palestine	-0.36	<0.001	-0.54	-0.18
Sudan	-0.35	<0.001	-0.51	-0.18
Syria	-0.36	<0.001	-0.51	-0.21
Complying with the instructions imposed by the Ministry of Health				
Rarely (REF)				
Sometimes	-0.25	0.008	-0.44	-0.06
Always	-0.60	<0.001	-0.80	-0.40
The percentage of commitment to home quarantine				
0-25% (REF)				
25-50	0.09	0.341	-0.10	0.28
50-75	-0.02	0.790	-0.20	0.15
75-100	0.11	0.220	-0.07	0.29
Currently anxious about accessing basic necessities				
No (REF)				
Sometimes	0.54	<0.001	0.43	0.64
Yes	1.06	<0.001	0.95	1.17
The number of people sharing the house	0.01	0.068	0.00	0.02
Area of the house	0.00	0.700	0.00	0.00

REF: is the reference category

Table 5: PTSD (based on IES-R-13 score) in relation to sociodemographic and pandemic characteristics of participants

	Coefficient	*P*	Confidence interval for the coefficient	
Age	-0.03	0.003	-0.06	-0.01
Gender				
Male (REF)				
Female	3.86	<0.001	3.54	4.19
Marital status				
Single (REF)				
Married	-0.01	0.954	-0.47	0.45
Divorced	-0.82	0.227	-2.15	0.51
Widowed	0.36	0.668	-1.29	2.01
Having chronic disease	0.60	0.017	0.11	1.10
Education level				
Did not join any school (REF)				
Pre-university	2.17	0.009	0.53	3.80
University	3.03	<0.001	1.41	4.65
Postgraduate	3.04	<0.001	1.38	4.70
Residence				
Urban (REF)				
Rural	0.34	0.077	-0.04	0.72
Income during the pandemic				
Stopped (REF)				
Decreased significantly	-0.76	0.010	-1.33	-0.18
Decreased slightly	-1.94	<0.001	-2.49	-1.39
Stable (not changed)	-2.51	<0.001	-3.05	-1.97
Increased	-1.21	0.058	-2.46	0.04
Having a job				
No (REF)				
Yes	0.33	0.047	0.00	0.65
Number of hours on social media	0.31	<0.001	0.27	0.36
source of information				
Social media (REF)				
Society	0.66	0.034	0.05	1.27
World Health Organization	-0.86	<0.001	-1.21	-0.51

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Table 5: Contd...

	Coefficient	*P*	Confidence interval for the coefficient	
Not interested	1.25	<0.001	0.85	1.65
Fear of being infected				
Rarely (REF)				
Sometimes	4.73	<0.001	4.39	5.07
Always	9.40	<0.001	8.93	9.87
Ever dealt directly with Covid patients	1.11	<0.001	0.56	1.66
History of PTSD	0.50	0.298	-0.44	1.45
History of depression	2.19	<0.001	1.68	2.70
History of sleep disorders	2.69	<0.001	2.21	3.18
History of Anxiety	2.71	<0.001	2.21	3.21
History of Addiction	1.05	0.061	-0.05	2.14
History of Schizophrenia	-1.47	0.083	-3.13	0.19
History of Bipolar disorder	0.06	0.931	-1.35	1.48
Country				
Algeria (REF)				
Egypt	2.00	<0.001	1.51	2.49
Jordan	-2.25	<0.001	-2.82	-1.67
Libya	-1.57	<0.001	-2.17	-0.97
Palestine	-2.23	<0.001	-2.81	-1.65
Sudan	-1.84	<0.001	-2.38	-1.30
Syria	-2.45	<0.001	-2.93	-1.97
Complying with the instructions imposed by the Ministry of Health				
Rarely (REF)				
Sometimes	0.06	0.836	-0.55	0.68
Always	-0.04	0.915	-0.70	0.63
The percentage of commitment to home quarantine				
0-25% (REF)				
25-50	0.83	0.008	0.22	1.45
50-75	0.49	0.091	-0.08	1.07
75-100	0.82	0.006	0.23	1.41
Currently anxious about accessing basic necessities				
No (REF)				
Sometimes	3.08	<0.001	2.74	3.42
Yes	4.43	<0.001	4.05	4.80
The number of people sharing the house	0.02	0.317	-0.02	0.05
Area of the house	0.00	0.480	0.00	0.00

REF: is the reference category

and these results were consistent with previous studies on SARS and the current COVID-19 pandemic.[18–21]

In this study, about 72% feared getting a COVID-19 infection. A study of 1,354 Canadian adults in early February 2020 showed that one-third of the individuals interviewed were worried about the virus, and 7% were very worried.[22] At the time of the survey, there were only 4 Canadians infected, indicating a low risk for a country of 37 million inhabitants. This explains the high percentage who fear getting infected while the number of COVID-19 cases increases with time. Moreover, 14% of the present study sample showed severe depression, 16% showed severe anxiety, and 15% showed severe stress.

Previously, a study from January 31, 2020, to February 2, 2020, with 1210 individuals in 194 cities of China administered the DASS-21 scale, also found an association between the pandemic and the levels of psychological impact, anxiety, depression, and stress, among other variables, in the initial stage of the COVID-19 outbreak where 16.5% of the participants showed moderate-to-severe depressive symptoms; 28.8% had moderate-to-severe symptoms of anxiety, and 8.1% reported to moderate-to-severe stress levels.[23]

In this study, stress, anxiety, and depressive symptoms were observed in high frequency in females. This is consistent with a study conducted on the general population in Bangladesh, where they also found that females were vulnerable to such disorders.[21] Similarly, in the Chinese study of Gamonal Limcaoco *et al*. (2020)[20] and those of previous studies,[19,24] The reasons for this finding may be related to sex differences in coping with stress. Unsurprisingly, unemployed people had higher levels of stress than employed ones. This finding contradicts the results of a study conducted In India to explore the impact of COVID-19 and lockdown on the mental health of individuals, where DASS-21 was used to assess depression, anxiety, and stress among 1000 respondents, and they found no differences between employment status and stress rates.[25] In the current study, 77% of respondents believed that the COVID-19 crisis might affect their job,

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education, or income. This rate was not in accordance with another study's results that showed the impact on 56% of Americans.[26] This may be explained by the fact that lifestyle and standards of socioeconomic living are different in the studied populations. In addition, as expected, the results showed a significant correlation between psychological impacts and chronic diseases. These results corroborate studies showing that individuals with serious diseases or multiple comorbidities present higher psychological symptoms in the face of this crisis.[23] Thus, any psychological containment plan should consider these individuals and provide specially adapted tools and strategies for them to cope psychologically with the COVID-19 crisis.

A strong point of our study is the large number of participants included from different countries. Two methods were adopted for reaching the study sample, either by online questionnaire on social media platforms or by random phone calls to avoid oversampling of a specific group, and hence, avoid some selection bias. However, there were some limitations due to ethical requirements for anonymity and confidentiality. Collecting the respondents' contact details and personal information was not allowed. As a result, conducting a prospective study that would provide concrete findings to support the need for a focused public health initiative is not feasible. Another limitation of the study is that the IES-R-13 questionnaire has some semantic changes that may have an impact on its psychometric properties. Another limitation is self-reported psychological impact, anxiety, depression, and stress which may not always be aligned with assessment by mental health professionals. Moreover, due to the use of an online questionnaire, results gave higher participation of youth and females. Finally, only 10% of the population was accessed via phone, which is insufficient to eliminate all selection bias.

In conclusion, the findings of our study highlight that the COVID-19 pandemic seriously affects psychological status due to the unusual lifestyle, strict control, and social distance measures. With reference to the DASS-21 scale results, there is a consequence relation between suggested factors and the psychological status as females, single people, and jobless participants were more likely to develop stress, depression, and anxiety caused by the pandemic situation. In addition, the IES-R-13 scale modified by authors to assess the impact of the COVID-19 pandemic on PTSD risk showed a high risk of PTSD in 39% of the participants in the study. The present study results can give an overview of the general mental health status in the studied countries and can be used as a baseline for further prospective studies concerning the subject.

Acknowledgments

The authors would like to thank the study collaborators and study participants for their valuable participation.

Ethical approval and consent to participate

The study protocol was approved by the Ethics Committee of the Faculty of Medicine, Fayoum University (#R 152). All participants agreed to participate in accordance. The informed consent was provided on the first page of the survey.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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Appendix Table 1: Psychiatric disorders before the COVID-19 pandemic among participants

History of psychiatric disorders	*n* (%)
Post-Traumatic Stress Disorder	775 (3)
Depression	3804 (13)
Sleep disorder	5125 (18)
Anxiety	4966 (17)
Addiction	608 (2)
Schizophrenia	295 (1)
Bipolar disorder	385 (1)

Note. All data are presented as frequency (percentage)

Appendix Table 2: Description of DASS among participants during the COVID-19 pandemic

Degree of DASS	Stress	Depression	Anxiety
Normal	14469 (50)	9837 (34)	15155 (53)
Mild	3871 (13)	4408 (15)	4566 (16)
Moderate	4199 (15)	6733 (23)	3281 (11)
Severe	3789 (13)	3212 (11)	2208 (8)
Extremely severe	2515 (9)	4653 (16)	3633 (13)
Mean±SD	5.2±5.3	7.5±5.4	4.3±4.1
Median (IQR)	7 (4,12)	7 (3,11)	3 (1,7)

Note. All data are presented as frequency (percentage)

Appendix Table 3: Description of IES-R-13 subscales and presence of PTSD among participants during the COVID-19 pandemic

Subscale	Median (IQR)
Intrusion	7 (3-12)
Avoidance	8 (3-13)
Arousal	10 (6-15)
Total score	26 (16-36)

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SUPPLEMENTARY MATERIAL

The study Collaborators Group includes:

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