Implication of COVID-19 on the mental health of Egyptian dermatologists: A cross-sectional study

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Abstract

Background: Major epidemic outbreaks create an increased demand for healthcare workers (HCWs) and pose increased health risk and psychological distress to them as well.

Aim: The aim of this cross-sectional study was to find out the prevalence of depression, anxiety and stress among Egyptian dermatologists and their possible predictor factors.

Patients/Methods: A cross-sectional study was designed and data were collected using a structured self-administered online depression, anxiety, and stress scale (DASS-21).

Results: The depression scale of DASS was 18.98 ± 9.56 among which 38% of dermatologists had either severe or extremely severe depression and 34.2% complained of moderate depression. Meanwhile, the anxiety scale was 12.92 ± 7.75 and 35.4% of surveyed dermatologists had either severe or extremely severe anxiety. Thirty-three percent of dermatologists were normal on stress score. Female dermatologists possessed more significant depression and stress than males (19.70 ± 9.71 vs. 16.62 ± 8.68, p = 0.003; 21.42 ± 9.53 vs. 17.40 ± 8.49, p < 0.001 respectively). On the contrary, male dermatologists expressed more anxiety than female dermatologists however this was not statistically significant (13.26 ± 7.99 vs. 12.82 ± 7.69, p = 0.625).

Conclusion: To our knowledge, this is the first study to explore the differential impacts of the COVID-19 pandemic on Egyptian dermatologists. Mental health care and support are of extreme importance to physicians mid this pandemic.

KEYWORDS
COVID-19, DASS, depression, mental health, SARS-CoV-2

1 INTRODUCTION

Major epidemic outbreaks create an increased demand for healthcare workers (HCWs) and pose increased health risk to them as well. It is worth mentioning that during initial phase of COVID-19 outbreak, and 29% of all hospitalized patients were HCWs. The constant increasing of infected cases, newer waves of the virus, increase in death tolls among physicians and uncertainty and scarcity of vaccination in many parts of the world to date while devising this study, extensive media pressure and plethora of rumors had all contributed to increased mental burden and anxiety of physicians and medical teams.

Such mentally exhaustive situations may negatively impact mental and emotional health of physicians and healthcare workers as such. The number of Egyptian physicians infected by corona virus has increased alarmingly, and their death toll has reached 327 at the time of writing this study while only 1327 had received vaccination.
Despite the expanding literature on COVID-19’s implications on mental health, little information about mental health in dermatologists is available in literature and none is available regarding Egyptian dermatologists. The aim of this cross-sectional study was to find out the prevalence of depression, anxiety, and stress among Egyptian dermatologists and their possible predictor factors.

2 | PATIENTS AND METHODS

A cross-sectional web-based survey was conducted from December 15, 2020 to January 15, 2021. A Google form designed questionnaire was created and distributed to public sector Dermatologists through emails and social platforms (WhatsApp and Facebook). The questionnaire consisted of two main parts. Part one included socio-demographic and work-related information of the participants while part two measured mental health using the depression, anxiety, and stress scale (DASS-21).

2.1 | Depression, anxiety, and stress scale (DASS-21)

The Depression, Anxiety, and Stress Scale-21 Items (DASS-21) is a set of three self-report scales designed to measure the emotional states of depression, anxiety, and stress. Questions 3, 5, 10, 13, 16, 17, and 21 formed the depression subscale. According to the scores, depression was divided into either normal (0–9), mild (10–13), moderate (14–20), severe (21–27), or extremely severe (28–42). Questions 2, 4, 7, 9, 15, 19, and 20 formed the anxiety subscale. According to the scores, anxiety was divided into either normal (0–7), mild (8–9), moderate (10–14), severe (15–19), or extremely severe (20–42). Questions 1, 6, 8, 11, 12, 14, and 18 formed the stress subscale. According to the scores, stress was divided into either normal (0–14), mild (15–18), moderate (19–25), severe (26–33), or extremely severe (34–42). In the present study used the following cutoffs, depression ≥10; anxiety ≥7 and stress ≥14.

Scores on the DASS-21 were multiplied by 2 to calculate the final score.

3 | RESULTS

After excluding all partially responded and incomplete questionnaires, a total of 415 answers were collected and analyzed. Of those completing the survey, 318 (76.6%) were females and 97 (23.4%) were males, and 272 (65.5%) dermatologists were in the 30–40 age group.

Majority of the dermatologists were either specialists 200 (48.2%), or residents 177 (42.7%) while only 38 (9.2%) were consultants. The majority of dermatologists responding to this survey 258 (62.2%) were within 0–5 years of completing their residency, 88 (21.2%) were within 6–10 years of completing residency, and only 69 (16.6%) were having >10 years of experience post-residency. Majority of dermatologists responding to the questionnaire 239 (57.6%) lived in urban districts while 176 (42.4%) lived in rural cities. More than half of participating dermatologists 232 (55.9%) worked for less 8 h daily, and the majority 202 (48.7%) worked for less than 5 days per week Table 1.

The depression scale of DASS was 18.98 ± 9.56 among which 38% of dermatologists had either severe or extremely severe depression and 34.2% complained of moderate depression. Meanwhile, the anxiety scale was 12.92 ± 7.75 and 35.4% of surveyed dermatologists had either severe or extremely severe anxiety. Thirty-three percent of dermatologists were normal on stress score. Female dermatologists possessed more significant depression and stress than males (19.70 ± 9.71 vs. 16.62 ± 8.68, p = 0.003; 21.42 ± 9.53 vs. 17.40 ± 8.49, p < 0.001 respectively). On the contrary, male dermatologists expressed more anxiety than female dermatologists; however, this was not statistically significant (13.26 ± 7.99 vs. 12.82 ± 7.69, p = 0.625) Table 2.

| TABLE 1 | Sociodemographic characteristics of the participants |
|----------|--------------------------------------------------|
| **Independent variables** | **Count** | **%** |
| Gender | | |
| Male | 97 | 23.4% |
| Female | 318 | 76.6% |
| Residence | | |
| Rural governorates | 176 | 42.4% |
| Cairo/urban governorates | 239 | 57.6% |
| Age group | | |
| <30 | 85 | 20.5% |
| 30–40 | 272 | 65.5% |
| 40–50 | 35 | 8.4% |
| >50 | 23 | 5.5% |
| Working hours per day | | |
| <8 h | 232 | 55.9% |
| 8 h | 113 | 27.2% |
| >8 h | 70 | 16.9% |
| Working days per week | | |
| <5 days per week | 202 | 48.7% |
| 5 days per week | 102 | 24.6% |
| >5 days per week | 111 | 26.7% |
| Current status | | |
| Resident | 177 | 42.7% |
| Consultant | 38 | 9.2% |
| Specialist | 200 | 48.2% |
| Length of practice (after residency) | | |
| 0–5 years | 258 | 62.2% |
| 6–10 years | 88 | 21.2% |
| >10 years | 69 | 16.6% |
# TABLE 2  Total DASS score among study population and relation to Gender

| DASS subscale | Mean | Standard deviation | Minimum | Maximum |
|---------------|------|--------------------|---------|---------|
| Depression    | 18.98| 9.56               | 0.00    | 42.00   |
| Anxiety       | 12.92| 7.75               | 0.00    | 42.00   |
| Stress        | 20.48| 9.44               | 0.00    | 42.00   |

| DASS subscale | Male Mean | SD | Female Mean | SD | p value |
|---------------|----------|----|-------------|----|---------|
| Depression    | 16.62    | 8.68| 19.70       | 9.71| 0.003   |
| Anxiety       | 13.26    | 7.99| 12.82       | 7.69| 0.625   |
| Stress        | 17.40    | 8.49| 21.42       | 9.53| <0.001  |

Note: Bold figures show $p < 0.05$.

Abbreviations: DASS, Depression, anxiety, stress scale; SD, standard deviation.

# TABLE 3  Prevalence and association of depressive symptoms by logistic regression analysis

|                | Depression | Normal score | Elevated score | 95% CI     |
|----------------|------------|--------------|----------------|------------|
|                |            | Count | %    | Count | %    | p value | OR  | Lower | Upper |
| Gender         |            |       |      |       |      |         |     |       |       |
| Male           | 18         | 32.7% | 79   | 21.9% | 0.949 | 1.026   | 0.469| 2.243 |
| Female         | 37         | 67.3% | 281  | 78.1% | Reference |         |     |       |       |
| Residence      |            |       |      |       |      |         |     |       |       |
| Rural          | 27         | 49.1% | 149  | 41.4% | 0.710 | 0.886   | 0.469| 1.676 |
| Urban          | 28         | 50.9% | 211  | 58.6% | Reference |         |     |       |       |
| Age group      |            |       |      |       |      |         |     |       |       |
| <30            | 4          | 7.3%  | 81   | 22.5% | <0.001| 87.789  | 11.194| 688.470|
| 30–40          | 31         | 56.4% | 241  | 66.9% | <0.001| 27.077  | 4.769 | 153.743|
| 40–50          | 8          | 14.5% | 27   | 7.5%  | 0.027 | 5.824   | 1.227 | 27.650 |
| >50            | 12         | 21.8% | 11   | 3.1%  | Reference |         |     |       |       |
| Working hours per day | | | | | | |
| <8 h           | 32         | 58.2% | 200  | 55.6% | 0.685 | 0.806   | 0.284| 2.287 |
| 8 h            | 16         | 29.1% | 97   | 26.9% | 0.425 | 0.650   | 0.226| 1.870 |
| >8 h           | 7          | 12.7% | 63   | 17.5% | Reference |         |     |       |       |
| Working days per week | | | | | | |
| <5 days/week   | 32         | 58.2% | 170  | 47.2% | 0.194 | 0.547   | 0.220| 1.360 |
| 5 days/week    | 14         | 25.5% | 88   | 24.4% | 0.328 | 0.623   | 0.241| 1.610 |
| >5 days/week   | 9          | 16.4% | 102  | 28.3% | Reference |         |     |       |       |
| Current status |            |       |      |       |      |         |     |       |       |
| Resident       | 17         | 30.9% | 160  | 44.4% | 0.767 | 1.124   | 0.520| 2.431 |
| Consultant     | 11         | 20.0% | 27   | 7.5%  | 0.428 | 1.884   | 0.394| 9.011 |
| Specialist     | 27         | 49.1% | 173  | 48.1% | Reference |         |     |       |       |
| Length of practice | | | | | | |
| 0–5 years      | 31         | 56.4% | 227  | 63.1% | 0.143 | 0.362   | 0.093| 1.412 |
| 6–10 years     | 8          | 14.5% | 80   | 22.2% | 0.839 | 0.869   | 0.223| 3.382 |
| >10 years      | 16         | 29.1% | 53   | 14.7% | Reference |         |     |       |       |

Note: Bold figures show $p < 0.05$

Abbreviation: DASS, Depression, anxiety, stress scale.
Of all respondents, 360 (86.7%) complained of elevated depressive symptoms which was significantly associated with age (OR, 87.789; 95% CI, 11.194–688.470; \( p < 0.001 \)). Higher depressive symptoms were more prevalent among female dermatologists living in urban districts and with less years of practical experience (residents and specialists compared to consultants) Table 3.

### 3.2 | Anxiety

Multivariable logistic regression analysis and its association with independent variables revealed prevalence of anxiety among 321 (77.3%) of all respondents and its association with (30–40 years) age group (OR, 3.766; 95% CI, 0.781–16.61). Higher anxiety symptoms were more prevalent among female dermatologists living in urban districts and with less years of practical experience (residents and specialists compared to consultants) Table 4.

### 3.3 | Stress

Of all emotional states, stress symptoms were the least frequently reported by all respondents (7.3%). Stress was significantly associated with the lower age groups (OR, 7.107; 95% CI, 1.645–30.700; \( p = 0.009 \); OR, 5.180; 95% CI, 1.373–19.547; \( p = 0.015 \), respectively) and surprisingly with those working less than 8 h per day (OR, 0.416; 95% CI, 0.204–0.849; \( p = 0.016 \)). Higher stress symptoms were more prevalent among female dermatologists living in urban districts and with less years of practical experience (residents and specialists compared to consultants) Table 5.
Predictors of depression, anxiety, and stress

Among all of the demographic variables, age was a common predictor of DAS with and without adjusting predictor variables. Gender of the respondents significantly associated and predicted higher depression and stress while predictors of anxiety with and without adjusting variables were residence and number of work hours Table 6.

In the present study, the percentage of severe and extremely severe depression among dermatologists was 38% which significantly associated with younger ages and was more common among females. The overall depression rates in dermatologists from our study were comparable to the studies from Singapore8 (8.9%), India9 (12.6%) [9], Switzerland10 (20.7%), Italy11 (19.85), Vietnam12 (20.2%), China13 (13.6%), and Pakistan14 (10.11%). Two Middle Eastern studies from Egypt and Turkey estimated the prevalence rate of depression among physicians amid the COVID-19 pandemic to be 63% and 64.7%, respectively.15,16 While other major studies from China found

| TABLE 5 Prevalence and association of stress symptoms by logistic regression analysis |
|---------------------------------|-----------------|-----------------|--------|-----------------|--------|
|                                 | Normal score    | Elevated score  | p value | OR               | 95% CI  |
|                                 | Count | %    | Count | %    |        |        |        |        |        |        |
| Gender                          |        |      |        |      |        |        |        |        |        |        |
| Male                            | 40    | 29.2%| 57    | 20.5%| 0.450  | 0.808  | 0.465  | 1.404  |
| Female                          | 97    | 70.8%| 221   | 79.5%| Reference|        |        |        |        |
| Residence                       |        |      |        |      |        |        |        |        |        |        |
| Rural                           | 63    | 46.0%| 113   | 40.6%| 0.433  | 0.837  | 0.536  | 1.307  |
| Cairo/urban                     | 74    | 54.0%| 165   | 59.4%| Reference|        |        |        |        |
| Age group                       |        |      |        |      |        |        |        |        |        |        |
| <30                             | 20    | 14.6%| 65    | 23.4%| 0.009  | 7.107  | 1.645  | 30.700 |
| 30–40                           | 84    | 61.3%| 188   | 67.6%| 0.015  | 5.180  | 1.373  | 19.547 |
| 40–50                           | 17    | 12.4%| 18    | 6.5% | 0.115  | 2.818  | 0.776  | 10.229 |
| >50                             | 16    | 11.7%| 7     | 2.5% | Reference|        |        |        |        |
| Working hours per day           |        |      |        |      |        |        |        |        |        |        |
| <8 h                            | 85    | 62.0%| 147   | 52.9%| 0.016  | 0.416  | 0.204  | 0.849  |
| 8 h                             | 37    | 27.0%| 76    | 27.3%| 0.103  | 0.540  | 0.258  | 1.132  |
| >8 h                            | 15    | 10.9%| 55    | 19.8%| Reference|        |        |        |        |
| Working days per week           |        |      |        |      |        |        |        |        |        |        |
| <5 days/week                    | 67    | 48.9%| 135   | 48.6%| 0.816  | 1.071  | 0.599  | 1.915  |
| 5 days/week                     | 38    | 27.7%| 64    | 23.0%| 0.304  | 0.725  | 0.393  | 1.338  |
| >5 days/week                    | 32    | 23.4%| 79    | 28.4%| Reference|        |        |        |        |
| Current status                  |        |      |        |      |        |        |        |        |        |        |
| Resident                        | 47    | 34.3%| 130   | 46.8%| 0.694  | 1.118  | 0.641  | 1.950  |
| Consultant                      | 19    | 13.9%| 19    | 6.8% | 0.214  | 2.036  | 0.664  | 6.247  |
| Specialist                      | 71    | 51.8%| 129   | 46.4%| Reference|        |        |        |        |
| Length of practice              |        |      |        |      |        |        |        |        |        |        |
| 0–5 years                       | 74    | 54.0%| 184   | 66.2%| 0.263  | 1.619  | 0.696  | 3.763  |
| 6–10 years                      | 27    | 19.7%| 61    | 21.9%| 0.146  | 1.875  | 0.804  | 4.375  |
| >10 years                       | 36    | 26.3%| 33    | 11.9%| Reference|        |        |        |        |

Note: Bold figures show p < 0.05.
Abbreviations: CI, confidence interval; DASS, Depression, anxiety, and stress scale.

3.4 Predictors of depression, anxiety, and stress

Among all of the demographic variables, age was a common predictor of DAS with and without adjusting predictor variables. Gender of the respondents significantly associated and predicted higher depression and stress while predictors of anxiety with and without adjusting variables were residence and number of work hours Table 6.

4 DISCUSSION

To the best of our knowledge, it is the first study to assess the psychological impact of the COVID-19 pandemic on the mental health of Egyptian dermatologists using the validated DASS-21 scale. The prevalence of DAS among dermatologists was found to be 86.7%, 77.3%, and 67%, respectively. Notably, higher levels of psychological manifestations of DAS (depression, anxiety, and stress) significantly correlated with age and gender in multivariate logistic regression analysis.

In the present study, the percentage of severe and extremely severe depression among dermatologists was 38% which significantly associated with younger ages and was more common among females. The overall depression rates in dermatologists from our study were comparable to the studies from Singapore8 (8.9%), India9 (12.6%) [9], Switzerland10 (20.7%), Italy11 (19.85), Vietnam12 (20.2%), China13 (13.6%), and Pakistan14 (10.11%). Two Middle Eastern studies from Egypt and Turkey estimated the prevalence rate of depression among physicians amid the COVID-19 pandemic to be 63% and 64.7%, respectively.15,16 While other major studies from China found
higher rates of depression among physicians, however this could be attributed to China being the epicenter of the pandemic and time around which these studies were conducted which correlated with early waves of COVID-19.17,18

We reported the frequency of severe and extremely severe anxiety among the dermatologists to be (35.4%). This high rate of anxiety was comparable to other studies from Pakistan (25.4%), Singapore and India (15.7%), China (16.0% and 12.5%),17,18 Oman (34.1%), Switzerland (25.9%), and Italy (44.7%).19 An Egyptian study15 reported an extreme high rate of anxiety (77.6%) which was comparable to high rates of anxiety (67.5%) reported among HCWs in Spain.20 In Wuhan, China, the overall prevalence of psychological disturbance in HCWs affected 63% of healthcare workers throughout different waves of the pandemic.21 These higher anxiety levels in the presented study and across the globe may be due to the fact that majority of HCWs worldwide had no experience in managing similar pandemics in the past.14

| TABLE 6 Predictors of depression, anxiety, and stress by the linear regression model |
|-----------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Predictors                             | Unadjusted    | Adjusted       | Unadjusted    | Adjusted       | Unadjusted    | Adjusted       |
|                                        | B             | Std. error     | Beta          | t              | p value       | B             | Std. error     | Beta          | t              | p value       |
| Depression                             |               |                |               |                |               |               |                |               |                |               |
| Gender                                 | 3.080         | 1.100          | 0.137         | 2.800          | 0.005         | 2.521         | 1.146          | 0.112         | 2.199          | 0.028         |
| Residence                              | 0.314         | 0.951          | 0.016         | 0.330          | 0.741         | 0.487         | 0.947          | 0.025         | 0.514          | 0.607         |
| Age group                              | 2.061         | 0.441          | 0.224         | 4.675          | 0.000         | 1.577         | 0.552          | 0.172         | 2.856          | 0.005         |
| Work hours                             | 0.554         | 0.382          | 0.071         | 1.449          | 0.148         | 0.579         | 0.414          | 0.074         | 1.400          | 0.162         |
| Work days                              | 0.139         | 0.359          | 0.019         | 0.386          | 0.699         | 0.122         | 0.391          | 0.017         | 0.312          | 0.755         |
| Status                                 | 0.987         | 0.323          | 0.149         | 3.054          | 0.002         | 0.507         | 0.347          | 0.076         | 1.460          | 0.145         |
| Length of practice                     | 1.764         | 0.610          | 0.141         | 2.890          | 0.004         | 0.015         | 0.732          | 0.001         | 0.020          | 0.984         |
| Anxiety                                |               |                |               |                |               |               |                |               |                |               |
| Gender                                 | 0.440         | 0.900          | 0.024         | 0.489          | 0.625         | 0.295         | 0.929          | 0.016         | 0.318          | 0.751         |
| Residence                              | 1.855         | 0.765          | 0.118         | 2.424          | 0.016         | 1.697         | 0.768          | 0.108         | 2.210          | 0.028         |
| Age group                              | 1.317         | 0.361          | 0.177         | 3.651          | 0.000         | 1.448         | 0.448          | 0.194         | 3.235          | 0.001         |
| Work hours                             | 0.972         | 0.307          | 0.154         | 3.168          | 0.002         | 0.851         | 0.336          | 0.135         | 2.525          | 0.012         |
| Work days                              | 0.446         | 0.290          | 0.076         | 1.539          | 0.125         | 0.184         | 0.317          | 0.031         | 0.581          | 0.562         |
| Status                                 | 0.529         | 0.264          | 0.098         | 2.005          | 0.046         | 0.193         | 0.282          | 0.036         | 0.686          | 0.493         |
| Length of practice                     | 0.656         | 0.499          | 0.065         | 1.315          | 0.189         | 0.568         | 0.593          | 0.056         | 0.956          | 0.339         |
| Stress                                 |               |                |               |                |               |               |                |               |                |               |
| Gender                                 | 4.013         | 1.078          | 0.180         | 3.721          | 0.000         | 3.541         | 1.123          | 0.159         | 3.153          | 0.002         |
| Residence                              | 0.315         | 0.939          | 0.017         | 0.336          | 0.737         | 0.109         | 0.928          | 0.006         | 0.118          | 0.906         |
| Age group                              | 2.031         | 0.435          | 0.224         | 4.665          | 0.000         | 1.414         | 0.541          | 0.156         | 2.614          | 0.009         |
| Work hours                             | 0.657         | 0.377          | 0.085         | 1.743          | 0.082         | 0.573         | 0.405          | 0.074         | 1.413          | 0.158         |
| Work days                              | 0.480         | 0.353          | 0.067         | 1.358          | 0.175         | 0.495         | 0.383          | 0.069         | 1.292          | 0.197         |
| Status                                 | 0.866         | 0.320          | 0.132         | 2.707          | 0.007         | 0.409         | 0.340          | 0.062         | 1.201          | 0.230         |
| Length of practice                     | 1.909         | 0.602          | 0.154         | 3.172          | 0.002         | 0.254         | 0.717          | 0.021         | 0.354          | 0.724         |

Note: Bold figures show \( p < 0.05 \); \( B \) beta coefficient

Abbreviation: DASS, Depression, anxiety, and stress scale.

The frequency of stress among dermatologists in this study was 67% which was comparable to values reported in Chinese HCWs (71.5%).18 Other studies reported rates of stress among HCWs to be (6.6%) in Singapore,9 (23.8%) in Oman,19 (7.3%) in Pakistan,14 while Wang et al.23 reported that 35% of HCWs endorsed experienced depressive symptoms amid COVID-19 pandemic. A recent study reported a stress rate of (72%) among Egyptian physicians with a higher scale among females.15 Amid this COVID-19 pandemic, the rates stress-related burnout among Egyptian dermatologists have climbed due to increased emotional demands including increased patient deaths, lack of feelings of control, personal blame for inability to do more for patients, increased work hours, and increased emotional stress within their support system.24 With no exact figures to report, increased rates of social isolation, anxiety, and stress-related burnout are predicted to increase amid this global pandemic to affect general population and physicians in particular.25

In the current study, DAS manifestations positively correlated with one another, shedding an important role of the sympathetic...
system in regulating the triad. Limitations include the study sample size and unavailability of pre-COVID-19 data to differentiate if psychological distress existed before wise and/or if such distress only exaggerated during the pandemic. Besides, for better understanding of predictors and different risk factors of mental health affection, more longitudinal studies with larger study population are required for further verification of the findings.

In conclusion and as psychological outcomes are increasingly recognized to emerge as a consequence of COVID-19 and it is of paramount importance to self-recognize psychological distress among dermatologists to guarantee their mental health and prosperity.

CONFLICT OF INTEREST
No conflict of interest.

AUTHOR CONTRIBUTIONS
M.E, M.H., M.Z, S.M, A.K and A.O performed the research. M.E, M.H., M.Z, S.M, A.K and A.O designed the research study. M.E, M.H., M.Z, S.M, A.K and A.O performed the work. M.E, M.H., M.Z, S.M, A.K and A.O analyzed the data.

ETHICS STATEMENT
The study had received ethical committee permits.

DATA AVAILABILITY STATEMENT
Data are available upon request from corresponding author.

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REFERENCES
1. Chen Q, Liang M, Li Y, et al. Mental health care for medical staff in China during the COVID-19 outbreak. Lancet Psychiatry. 2020;7(4):e15-e16.
2. Zhu Z, Xu S, Wang H, et al. COVID-19 in Wuhan: immediate psychological impact on 5062 health workers. medRxiv. 2020. https://doi.org/10.1101/2020.02.20.20025338. [Epub ahead of print].
3. Vizheh M, Qorbani M, Arzaghi SM, Muhidin S, Javanmard Z, Esmaeili M. The mental health of healthcare workers in the COVID-19 pandemic: a systematic review. J Diabetes Metab Disord. 2020;19(2):1-12.
4. Schwartz J, King CC, Yen MY. Protecting Healthcare Workers during the coronavirus disease 2019 (COVID-19) outbreak: lessons from Taiwan’s severe acute respiratory syndrome epidemic. Clin Infect Dis. 2020;71(15):858-860.
5. Daily News Egypt. COVID-19 related occupancy rate decline at university hospitals: Higher Education Ministry; 2021. https://dailynewseygpt.com/2021/02/03/covid-19-related-occupancy-rate-decline-at-university-hospitals-higher-education-ministry. Accessed February 14, 2021.
6. Osman A, Wong JL, Bagge CL, Freedenthal S, Gutierrez PM, Lozano G. The depression anxiety stress Scales-21 (DASS-21): further examination of dimensions, scale reliability, and correlates. J Clin Psychol. 2012;68(12):1322-1338.
7. Lee J, Lee EH, Moon SH. Systematic review of the measurement properties of the depression anxiety stress scales-21 by applying updated COSMIN methodology. Qual Life Res. 2019;28(9):2325-2339.
8. Tan BY, Chew NW, Lee GK, et al. Psychological Impact of the COVID-19 pandemic on health care workers in Singapore. Ann Intern Med. 2020;173:317-320. https://doi.org/10.7326/M20-1083.
9. Chew NW, Lee GK, Tan BY, et al. A multinational, multicentre study on the psychological outcomes and associated physical symptoms amongst healthcare workers during COVID-19 outbreak. Brain Behav Immun. 2020;88:559-565.
10. Weillenmann S, Ernst J, Petry H, et al. Health care workers mental health during the first weeks of the SARS-CoV-2 Pandemic in Switzerland: a cross-sectional study. medRxiv. 2020. https://doi.org/10.2147/RMHP.S5280749.
11. Rossi R, Socci V, Pacitti F, et al. Mental health outcomes among frontline and second-line health care workers during the coronavirus disease 2019 (COVID-19) pandemic in Italy. JAMA Netw Open. 2020;3(5):e2010185. https://doi.org/10.1001/jamanetworkopen.2020.10185.
12. Manh Than H, Minh Nong V, Trung Nguyen C, et al. Mental Health and health-related quality-of-life outcomes among frontline health workers during the peak of COVID-19 outbreak in Vietnam: a cross-sectional study. Risk Manag Healthc Policy. 2020;13:2927-2936. https://doi.org/10.2147/RMHP.S5280749.
13. Lai J, Ma S, Wang Y, et al. Factors associated with mental health outcomes among health care workers exposed to coronavirus disease 2019. JAMA Network Open. 2020;3(3):e2003976.
14. Arshad MS, Hussain I, Nafees M, et al. Assessing the impact of COVID-19 on the mental health of healthcare workers in three Metropolitan Cities of Pakistan. Psychol Res Behav Manag. 2020;20(1):1047-1055.
15. Khalaf OO, Khalil MA, Abdelmaksoud R. Coping with depression and anxiety in Egyptian physicians during COVID-19 pandemic. Middle East Curr Psychiatry. 2020;27(1):63. https://doi.org/10.1186/s43045-020-00070-9. Epub 2020 Nov 11. PMCID: PMC7656200.
16. Elbay R, Kurtulmus A, Arpacıoğlu Ş, Karadere E. Depression, anxiety, stress levels of physicians and associated factors in Covid-19 pandemics. Psychiatry Res. 2020;290:113130. https://doi. org/10.1016/j.psychres.2020.113130. Epub 2020 May 27.
17. Chung JPY, Yeung W-S. Staff mental health self-assessment during the COVID-19 outbreak. East Asian Psychiatry. 2020;30(1):34. https://doi.org/10.12809/eaap2014.
18. Liu Z, Han B, Jiang R, et al. Mental health status of doctors and nurses during COVID-19 epidemic in China. SSRN Electronic J. 2020. https://doi.org/10.2139/ssrn.3551329.
19. Alshekaili M, Hassan W, Al Said N, et al. Factors associated with mental health outcomes across healthcare settings in Oman during COVID-19: frontline versus non frontline healthcare workers. BMJ Open. 2020;10(10):e042030. https://doi.org/10.1136/bmjopen-2020-042030. PMID: 33040019; PMCID: PMC7549438.
20. Sani G, Janiri D, Di Nicola M, Janiri L, Ferretti S, Chieffo D. Mental health during and after the COVID-19 emergency in Italy. Psychiatry Clin Neurosci. 2020;74(6):372.
21. Odriozola-González P, Planchuelo-Gómez Á, Irurtia MJ, de Luis-García R. Psychological symptoms of the outbreak of the COVID-19 confinement in Spain. J Health Psychol. 2020;30:1359105320976086. https://doi.org/10.1177/1359105320976086.
22. Kang L, Ma S, Chen M, et al. Impact on mental health and perceptions of psychological care among medical and nursing staff in Wuhan during the 2019 novel coronavirus disease outbreak: a cross-sectional study. Brain Behav Immun. 2020;87:11-17. https://doi.org/10.1016/j.bbi.2020.03.028.
23. Wang W, Song W, Xia Z, et al. Sleep disturbance and psychological profiles of medical staff and non-medical staff during the early outbreak of COVID-19 in Hubei Province, China. Front Psychiatry. 2020;22(11):733. https://doi.org/10.3389/fpsyt.2020.00733.
24. Elsaie ML, Hussein SM, Zaky MS, Hanafy NS, Jafferany M. Therapeutic implications of prevalence and predictor risk factors for burn out syndrome in Egyptian dermatologists: a cross sectional study. *Dermatol Ther*. 2020;33(6):e14327. https://doi.org/10.1111/dth.14327

25. Kingston AM. Break the silence: physician suicide in the time of COVID-19. *Mo Med*. 2020;117(5):426-429. PMID: 33311744; PMCID: PMC7723130.

26. Altemus M. Sex differences in depression and anxiety disorders: potential biological determinants. *Horm Behav*. 2006;50(4):534.

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