Depression, anxiety, stress, and sleep disturbances in doctors and general population during COVID-19 pandemic

A B S T R A C T

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Aim: The aim of the study is to assess and compare depression, anxiety, stress, and sleep disturbances among doctors and general population during COVID-19 pandemic. Material and Methods: This cross-sectional, analytical, case–control, web-based study was conducted during September 2020 to examine the impact of pandemic on mental health. The participants completed basic sociodemographic questionnaire, Depression Anxiety Stress Scale-21 (DASS-21), and Athens Insomnia Scale (AIS). Results: Of the 321 participants, 320 provided basic data, 22 were on psychotropics. Out of the 298, 286 were matched for age and sex and were included. On DASS-21, 41.27% of doctors and 30.76% of general population reported depression; 40.56% doctors and 26.57% general population had anxiety; 38.46% of the doctors and 24.48% of general population reported stress. Statistical analysis revealed that doctors had significantly higher levels of anxiety and stress as compared to general population. On the AIS, more doctors (48.25%) suffered from insomnia compared to the general population (37.06%), but the difference was not statistically significant. Conclusion: Physicians have significantly higher anxiety and stress while dealing with COVID-19 compared to general population.

Keywords: Anxiety, COVID-19, depression, insomnia, stress

Following the initial outbreak of Novel Coronavirus in Wuhan of Hubei province, China, and thereafter its spread in several countries in the world, the World Health Organization declared COVID-19 as pandemic on March 11, 2020.[1] To reduce transmission of the disease, the governments all around the world resorted to lockdowns and social distancing measures. It led to panic, loss of jobs, and closure of institutions. Its impact on economy and health infrastructure to tackle the onslaught of the virus was felt globally. The havoc created by the COVID-19 virus was unprecedented to date. The overwhelming stress on infrastructure of health establishments and impact on the health-care workers (HCWs) who were faced with developing protocols for managing the hitherto unknown virus was palpable.[2]

During the pandemic, doctors are faced with managing a myriad of patients and their problems. They also face ever-increasing worries of the patient’s relatives. In addition to the anxiety and stress among frontline workers regarding the risk of contracting the infection themselves,

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there is also the fear of infecting their families and loved ones.\[3,4\] It is no surprise, therefore, that health-care providers suffered from stress, anxiety, depression, and disturbances in sleep.\[5,6\] Studies on the psychological effects of pandemics revealed that the frontline HCWs showed significant increase in the levels of depression, anxiety, stress, and insomnia.\[7,8\]

The daily lives of general population, too, underwent a sea change. Major alterations brought on by sudden lockdowns has had a tell-tale effect on their daily lives and had an adverse impact on their mental health.\[9-11\] Being precipitously thrust into managing their homes, work, and schooling of their children led to a predictable increase in stress, anxiety, and depression.\[12-14\] It was in this background that the study was planned to focus on the impact of the current pandemic on the mental health of doctors and general population and also to compare the severity if any between these two groups.

**MATERIALS AND METHODS**

Institutional ethics clearance was obtained before the start of the study, and electronic informed consent was taken from the participants. Participation in the study was voluntary and anonymous, and participants could withdraw from the study at any time.

**Study design and participants**

A cross-sectional online survey was distributed through social media to the participants during September 2020. Of the 321 participants, 320 provided basic data and 22 were on psychotropics. Out of the remaining 298, 286 were matched for age and sex (143 HCWs and 143 general population), and hence, they were included.

**Inclusion criteria**

1. HCWs currently working at a tertiary care center during the COVID-19 pandemic
2. General population – age above 18 years
3. Willing to participate in the study.

**Exclusion criteria**

1. Known case of psychiatric illness or taking psychotropic medication.

**Measures**

The completion of the survey required approximately 10–12 min. Survey consisted of three modules.

**Basic sociodemographic data**

Age, gender, place of residence, educational level, income, and use of psychotropic medication.

**Depression, Anxiety, Stress Scale-21**

Depression, Anxiety, Stress Scale-21 (DASS-21) comprises 5 self-report scales intended to assess the emotional states of depression, anxiety, and stress. Each of the three DASS-21 scales contains 7 items, giving a total of 21 questions.\[15\]

**Athens Insomnia Scale**

Athens Insomnia Scale (AIS) is eight-item questionnaire which evaluates sleep onset, night and early-morning waking, sleep time, sleep quality, frequency and duration of complaints, distress caused by the experience of insomnia, and interference with daily functioning (a score of >6 indicates insomnia).\[16\]

**Statistical analysis**

The statistical analysis was done using Chi-square test, t-test, and Mann–Whitney U-test.

**RESULTS**

**Participants characteristics**

Demographic characteristics of doctors and general population are as given in Table 1. There was no significant difference between the two groups.

**Depression Anxiety Stress Scale**

On the DASS-21 questionnaire, there were significantly higher levels of anxiety and stress among doctors as compared to general population [Table 2]. Depression was also higher in doctors, but the difference did not reach statistical significance. Sleep disturbances as per AIS score were far more common in HCWs than in general population but were not statistically significant [Table 2].

Of the 143 physicians, a total of 41.27% cases reported depression. Among the general population, 30.76% reported depression. The difference was not statistically significant (Chi-square = 3.414; P = 0.064). The subscale for anxiety showed that 40.56% of doctors had anxiety compared to 26.57% of general population. The difference was statistically significant (Chi-square = 6.271; P = 0.012). Distribution of anxiety in different age groups is given in Figure 1.

On the stress subscale, 38.46% of doctors were under stress compared to 24.48% of the general population. The difference was statistically significant (Chi-square = 6.485; P = 0.0108).

**Athens Insomnia Scale**

Analysis revealed that out of 143 participants, 48.25% (AIS >6 points) suffered from insomnia, while 51.75% (AIS <6 points) reported normal sleep.
DISCUSSION

The ongoing pandemic created uncertainty and fear across the globe. With lockdowns and restrictions in movements except for those involved in its care, the impact on the mental well-being of the individuals was not fully comprehended. The pandemic was described as war against humanity, everyone joining the fight, and health-care professionals being particularly on the front. HCWs are particularly vulnerable to higher levels of stress and anxiety while dealing with COVID-19 pandemic situation as they are front-line workers in fighting against it. HCWs have to deal with COVID-19 patients directly and hence more vulnerable to infection than general population. Furthermore, in pandemic situations, increased workload and emergencies has caused them extra stress and increased

Table 1: Demographic characteristics of participants

|                      | Doctors | General population | T-test/χ² | P     |
|----------------------|---------|--------------------|-----------|-------|
| **Age**              |         |                    |           |       |
| Mean±SD              | 39.59±12.35 | 39.51±12.80       | T=0.065   | 0.955 (NS) |
| Range                | 22-71   | 20-65              |           |       |
| **Age distribution** |         |                    |           |       |
| 21-30                | 54      | 52                 | 1.467     | 0.832 (NS) |
| 31-40                | 16      | 19                 |           |       |
| 41-50                | 45      | 38                 |           |       |
| 51-60                | 23      | 28                 |           |       |
| 61-70                | 5       | 6                  |           |       |
| **Sex**              |         |                    |           |       |
| Males                | 60      | 57                 | 0.130     | 0.728 (NS) |
| Females              | 83      | 86                 |           |       |
| **Monthly income**   |         |                    |           |       |
| <60,000              | 54      | 63                 | 6.836     | 0.077 (NS) |
| 60,000-<90,000       | 12      | 22                 |           |       |
| 90,000-<120,000      | 22      | 20                 |           |       |
| 120,000 and above    | 55      | 38                 |           |       |

SD – Standard deviation; NS – Not significant

Table 2: Comparison of scores of doctors and general population on the Depression Anxiety Stress Scale and the Athens Insomnia Scale

| DASS-21 and AIS scores | Doctors (%) | General population (%) | Mann-Whitney U/χ² | P     |
|------------------------|-------------|------------------------|-------------------|-------|
| **Depression score, mean±SD** |             |                        |                   |       |
| Mild                   | 18 (12.6)   | 10 (6.99)              | 4.967             | 0.174 (NS) |
| Moderate               | 17 (11.89)  | 14 (9.79)              |                   |       |
| Severe                 | 6 (4.19)    | 11 (7.69)              |                   |       |
| Extremely severe       | 18 (12.59)  | 9 (6.29)               |                   |       |
| **Anxiety score, mean±SD** |     |                       |                   |       |
| Mild                   | 6 (4.20)    | 10 (6.99)              | 5.386             | 1.456 (NS) |
| Moderate               | 26 (18.18)  | 11 (7.69)              |                   |       |
| Severe                 | 10 (6.99)   | 5 (3.5)                |                   |       |
| Extremely severe       | 16 (11.19)  | 12 (8.39)              |                   |       |
| **Stress score, mean±SD** |             |                        |                   |       |
| Mild                   | 16 (11.19)  | 12 (8.39)              | 2.69              | 0.441 (NS) |
| Moderate               | 14 (9.79)   | 11 (7.69)              |                   |       |
| Severe                 | 18 (12.59)  | 6 (4.19)               |                   |       |
| Extremely severe       | 7 (4.89)    | 6 (4.19)               |                   |       |
| **AIS score, mean±SD** |             |                        |                   |       |
| Insomnia               | 6.18±5.53   | 5.16±4.79              | 9194.5            | 0.139 (NS) |
| Yes                    | 69 (48.25)  | 53 (37.06)             |                   |       |
| No                     | 74 (51.75)  | 90 (62.94)             |                   |       |

AIS – Athens Insomnia Scale; S – Significant; NS – Not significant; SD – Standard deviation; DASS-21 – Depression Anxiety Stress Scale-21
Anxiety. Dealing directly with human sufferings and loss of lives is another cause for stress for HCWs.

**Depression**

Our study found that of 41.27% physicians suffered from depression as compared to 30.76% of general population among participants. The difference between the two groups was statistically insignificant. This finding is comparable with a study among 1257 HCWs working in different hospitals in China, who reported 50.4% prevalence of depression. Another online survey of 442 participants found that 286 (64.7%) had symptoms of depression on DASS-21. A meta analysis of 10 studies found a calculated pooled prevalence of depression 22.8% (95% confidence interval [CI]: 15.1–31.51, I² = 99.62) whereas one study using DASS found the prevalence of depression 12% which was very low as compared to other studies.

**Anxiety**

Our study found anxiety in 40.56% of doctors and 26.57% of general population. Doctors had significantly higher level of anxiety as compared to general population (P < 0.0017). Anxiety was more common in younger age group. The higher anxiety in younger HCWs probably reflects their higher risk of exposure to COVID-19 relative to older colleagues. In agreement with our findings, Elbay et al. in an online survey of 442 participants found that 224 (51.6%) had symptoms of anxiety on DASS-21. In a systematic review and meta-analysis of 12 studies, pooled prevalence of anxiety was 23.21% (95% CI: 17.77–29.13, I² = 99%). Low risk of bias studies (n = 9) revealed a total pooled anxiety prevalence of 24.06% (95% CI: 16.84–32.09, I² = 99%). A study from Pakistan found 43% of the prevalence in anxiety/depression among frontline physicians while actively combating the virus. Our study found that of 40.56% physicians suffered from anxiety as compared to 26.57% of general population among participants. Doctors had significantly higher level of anxiety as compared to general population (P < 0.0017). The prevalence of anxiety in medical students is similar to that before the pandemic but correlates with several specific COVID-related stressors. The stress due to COVID indeed could be responsible for increased anxiety symptoms. Moderate-to-severe anxiety was reported by 36.36% doctors and 19.42% of general population in our study. This is comparable to Badahdah et al. who found that the mental health of HCWs has been harshly affected and also predicted that it will continue for the foreseeable future in varying degrees. In their study, Badahdah et al. found that the largest proportion of HCWs (74.1%) experienced minimal to mild anxiety (35.5% and 38.7%, respectively) on GAD 7 scale. About 25.9% reported moderate-to-severe anxiety (17.7% and 8.3%, respectively). A significantly greater proportion of females than males scored 10 or higher and was statistically significant (χ² = 5.28, P = 0.01).

**Stress**

Doctors had significantly higher level of stress as compared to general population in the present study (38.46% in doctors and 24.48% of general population; P < 0.001). Our study findings are comparable to other studies. Lai et al. found 71.5% reported distress. Elbay et al. in an online survey of 442 participants found that 182 (41.2%) had symptoms of stress on DASS-21.

**Insomnia**

Insomnia was reported by 48.25% of doctors and 37.06% of general population on AIS >6. The pooled prevalence of insomnia in five studies was 34.32% (95% CI: 27.45–41.54, I² = 98%). A survey of insomnia and related social psychological factors among medical staff involved in COVID-19 disease outbreak revealed that the prevalence rate of insomnia was 36.1% among medical staff.

**Limitations**

The study was web based, and self-report measures were used to screen depression, anxiety, stress, and insomnia among the participants.

**Conclusion**

COVID-19 has had a huge impact on mental health. Physicians dealing with COVID-19 have significantly higher levels of anxiety and stress compared to general population. Sleep disturbances were present in both the groups.

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Conflicts of interest

There are no conflicts of interest.

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