A survey on anxiety and depression level among South Indian medical students during the COVID 19 pandemic

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ABSTRACT
The COVID-19 pandemic is being a global Health crisis. The rate of transmission of the disease is very high. At this time there is no specific vaccine or treatment. This widespread outbreak is also associated with psychological distress like depression and anxiety. The effect of COVID 19 on medical students is considerable. The medical students are in a transitory period which could be one of the most stressful times in a person’s life. The aim of this study is to assess the mental health of South Indian medical students during the COVID-19 pandemic and to see if there is any influence of gender on mental health. A cross sectional study was conducted using convenient sampling method. A total of 359 responses were analysed. Anxiety and depression symptoms were assessed based on four point Likert scale. GAD-7 (General Anxiety Disorder-7) scale and CES-D (Center for Epidemiology Studies for Depression) scale is used to assess anxiety and depression symptoms with a small modification respectively. Data analysis was performed using IBM SPSS statistics version 25. Out of 359 participants 50.4% of participants were male and 49.6% of them were females; majority of them (95.3%) were between the age group of 18-21. In total 75.5% and 74.6% of participants showed varying levels of anxiety and depression symptoms respectively. Anxiety and depression symptoms are found to have a mild association with gender. Symptoms are slightly higher among females than males.

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INTRODUCTION
Coronavirus disease is an infectious disease caused by a newly discovered coronavirus identified as ‘SARS-CoV-2’. SARS-CoV-2 is one of seven types of coronavirus, including the ones that cause severe diseases like the Middle East respiratory syndrome (MERS) and sudden acute respiratory syndrome (SARS). The other coronaviruses cause most of the colds that affect us during the year but aren't a severe threat to otherwise healthy people. The transmission rate is relatively high (Nemati et al., 2020); for instance, one person having the disease can spread it between 4.7 and 6.6 other people. On the other hand, one person who has seasonal flu will pass it between 1.1 and 2.3 others. Most people infected with the COVID-19 virus will experience mild to moderate respiratory illness. The COVID-19 virus spreads primarily through droplets of saliva or discharge from the nose when an infected person
coughs or sneezes. At this time, there are no specific vaccines or treatments for COVID-19. However, many ongoing clinical trials are evaluating potential therapies. More than 100 vaccine candidates are in various stages of development and testing, but this process usually takes years. They are speeding it up as much as they can, but it still might take 12 to 18 months to find a vaccine that works and is safe. The pandemic has caused severe global socioeconomic disruption. The COVID-19 pandemic is a worldwide health crisis, and it is the greatest challenge we have faced since World War Two. The outbreak was first identified in Wuhan, China, in December 2019 (Organization, 2020). Since then, coronavirus has rapidly spread to various countries. The World Health Organization declared it to be a Public Health Emergency of International Concern on 30 January 2020 and recognised as pandemic on 11 March 2020 (Organization, 2020).

Similarly, in Canada, the undergraduate medical students were not allowed into teaching hospitals and the students were frustrated (Clark, 2003). The shift to online classes may not be beneficial and convenient. Immediate response to the pandemic is well underway, and medical schools are turning their attention to minimising the disruption in the coming months for students not graduating this year. The response of individual medical schools and placement providers will depend on the local situation, and each school will likely need to make different adjustments.

This widespread outbreak is also associated with psychological distress. Depression is a combination of biological, psychological and social sources of distress causing impairment in daily life. Depression is common among university students, especially among medical students (Kebede et al., 2019; Sarokhani et al., 2013). Anxiety is characterised by a fear that is strong enough to interfere with one’s daily life. The medical students are in a transitory period in which they are going from adolescence to adulthood and can be one of the most stressful times in a person’s life (Nemati et al., 2020; Wahed and Hassan, 2017). This makes it necessary for us to identify the prevalence and risk factors of depression and anxiety among medical students. The depression and anxiety affect not only their health but also their academic achievements. COVID 19 is much more than a health crisis; by stressing everyone, it has the potential to create a devastating social, economic and political turmoil that will leave deep scars.

Therefore, using a cross-sectional study, we aimed to assess the anxiety and depression symptoms among South Indian medical students during the COVID-19 pandemic and to see if there is any influence of gender on the same.
Table 1: Distribution of South Indian Medical students according to gender, age, anxiety symptoms and depression symptoms.

| Variables          | Frequency (n) | Percentage (%) |
|--------------------|---------------|----------------|
| Gender             |               |                |
| Male               | 181           | 50.4%          |
| Female             | 178           | 49.6%          |
| Age                |               |                |
| 18-21              | 342           | 95.3%          |
| 22-24              | 13            | 3.6%           |
| 25 and above       | 4             | 1.1%           |
| Anxiety            |               |                |
| Yes                | 271           | 75.5%          |
| No                 | 88            | 24.5%          |
| Depression         |               |                |
| Yes                | 268           | 74.6%          |
| No                 | 91            | 25.4%          |

Table 2: Frequency and percentage of severity of anxiety among South Indian medical students.

| Severity of anxiety | Frequency (n) | Percentage (%) |
|---------------------|---------------|----------------|
| No or minimal anxiety (0-4) | 88           | 24.5%          |
| Mild anxiety (5-10)     | 122           | 34%            |
| Moderate anxiety (11-16) | 72           | 20%            |
| Moderately severe anxiety (17-22) | 53       | 14.8%          |
| Severe anxiety (23-30)  | 24            | 6.7%           |

Table 3: Severity of anxiety in relation with gender among South Indian medical students.

| Gender | No or minimal anxiety (0-4) (%) | Mild anxiety (5-10) (%) | Moderate anxiety (11-16) (%) | Moderately severe anxiety (17-22) (%) | Severe anxiety (23-30) (%) | Total |
|--------|---------------------------------|-------------------------|------------------------------|--------------------------------------|--------------------------|-------|
| Male   | 48 (26.5%)                      | 70 (38.7%)              | 32 (17.7%)                   | 21 (11.6%)                           | 10 (5.5%)                | 181   |
| Female | 40 (22.5%)                      | 52 (29.2%)              | 40 (22.5%)                   | 32 (17.9%)                           | 14 (7.9%)                | 178   |
| Total  | 88 (24.5%)                      | 122 (34%)               | 72 (20%)                     | 53 (14.8%)                           | 24 (6.7%)                | 359   |

MATERIALS AND METHODS

Study design, study setting and duration of the study

A cross-sectional study was conducted among the South Indian medical students using a convenient sampling method. Data were collected from 7 April 2020 to 7 June 2020 (two months).

Procedure

Soft copy of the questionnaire was sent to different South Indian medical students. The questionnaire contains twenty items out of which the first ten items are designed to assess anxiety level or symptoms, and the last ten items are designed to assess depression level or symptoms. The questions are arranged as Likert items graded from 0 to 3 [not at all (0), rarely (1), more than half the days (2), and nearly every day (3)]. Total score to assess anxiety level is 30, and the same score of 30 to determine depression level. In our study, a score of 0-4 is considered as minimal, 5-10 is considered as mild, 11-16 is considered as moderate, 17-22 is considered as moderately severe, and 23-30 is considered as severe.
Table 4: Frequency and percentage of severity of depression among South Indian medical students.

| Severity of depression                  | Frequency (n) | Percentage (%) |
|----------------------------------------|---------------|----------------|
| No or minimal depression (0-4)         | 91            | 25.4%          |
| Mild depression (5-10)                  | 108           | 30.1%          |
| Moderate depression (11-16)             | 73            | 20.3%          |
| Moderately severe depression (17-22)   | 55            | 15.3%          |
| Severe depression (23-30)               | 32            | 8.9%           |

Table 5: Severity of depression in relation with gender among South Indian medical students.

| Gender | No or minimal depression (0-4) n (%) | Mild depression (5-10) n (%) | Moderate depression (11-16) n (%) | Moderately severe depression (17-22) n (%) | Severe depression (23-30) n (%) | Total n |
|--------|--------------------------------------|-----------------------------|----------------------------------|--------------------------------------------|---------------------------------|---------|
| Male   | 49 (27.1%)                           | 57 (31.5%)                  | 34 (18.8%)                       | 28 (15.4%)                                 | 13 (7.2%)                       | 181     |
| Female | 42 (23.6%)                           | 51 (28.6%)                  | 39 (21.9%)                       | 27 (15.2%)                                 | 19 (10.7%)                      | 178     |
| Total  | 91 (25.4%)                           | 108 (30.1%)                 | 73 (20.3%)                       | 55 (15.3%)                                 | 32 (8.9%)                       | 359     |

We used the GAD-7 (General Anxiety Disorder-7) scale (Spitzer et al., 2006) to assess anxiety symptoms of participants with a small modification. The modification is that three more items were added to the GAD-7 scale, which initially contained seven items making a total of ten. The scale assesses anxiety symptoms on a four-point Likert-scale ranging from 0 to 3. The total score ranged from 0 to 30. The severity of anxiety increases with an increase in score. Representation of anxiety level based on the score; (i) 0 to 4 – no or minimal anxiety; (ii) 5 to 10 – mild anxiety; (iii) 11 to 16 – moderate anxiety; (iv) 17 to 22 – moderately severe anxiety and (v) 23 to 30 – severe anxiety.

We used the CES-D (Center for Epidemiology Studies for Depression) scale (Radloff, 1977) to assess the depression symptoms of participants with a small modification. The scale initially contained 20 items out of which ten items were selected for our study. The scale assesses depression symptoms on a four-point Likert-scale ranging from 0 to 3. The total score ranged from 0 to 30. A higher score indicated severe depression symptoms. Representation of depression level based on the score; (i) 0 to 4 – no or minimal depression; (ii) 5 to 10 - mild depression; (iii) 11 to 16 - moderate depression; (iv) 17 to 22 - moderately severe depression and (v) 25 to 30 - severe depression.

Statistical analysis

Data analysis was performed using IBM SPSS statistics version 25. Gender, age, anxiety scores and depression scores were coded for analysing. Tables and bar charts were generated. The cut-off score for the presence of anxiety/depression symptoms (ranging from mild to severe anxiety/depression) was 5 or more. Mean and standard deviation values of anxiety and depression scores were calculated. Chi-square test was used to determine the association of anxiety and depression symptoms with gender. P-value of <0.05 was considered statistically significant.
RESULTS AND DISCUSSION

Description of all the variables

The description of all the variables is depicted in Table 1. A total of 359 students participated in the study. Out of 359 students, 181 (50.4%) students were males, and 178 (49.6%) were females. Based on age 342 (95.3%) of them were between the age group of 18-21, 13 (3.6%) of them were between the age group of 22-24 and 4 (1.1%) of them were 25 or above 25 years of age. In total, 271(75.5%) students showed a varying level of anxiety symptoms and 88 (24.5%) students showed no anxiety symptoms. Regarding depression, 268 (74.6%) students showed different levels of depression symptoms, and 91 (25.4%) students did not show any depression symptoms.

The severity of anxiety symptoms and its association with gender among medical students during the pandemic

Frequency and percentage of the severity of anxiety are shown in Table 2. A total of 75.5% (271) of students showed anxiety symptoms ranging from mild to severe anxiety; 34% (122) of students showed mild anxiety, 20% (72) of them showed moderate anxiety, 14.8% (53) of them showed moderately severe anxiety and 6.7% (24) of them showed severe anxiety symptoms. Majority of the participants (34%) showed mild anxiety. Figure 1 depicts the severity of anxiety percentage-wise.

Table 3 shows the severity of anxiety concerning gender. A total of 73.5% of males and 77.5% of females showed varying levels of anxiety symptoms. In total 38.7% of male students and 29.2% of female students showed mild anxiety symptoms; 17.7% of male students and 22.5% of female students showed moderate anxiety symptoms; 11.6% of male students and 17.9% of female students showed moderately severe anxiety symptoms; 5.5% of male students and 7.9% of female students showed severe anxiety symptoms. Anxiety is found to have a mild association with gender. Anxiety symptoms are slightly higher among females than males.

The severity of depression symptoms and its association with gender among South Indian medical students during the pandemic

Frequency and percentage of the severity of depression are shown in Table 4. A total of 74.6% (268) of students showed depression symptoms ranging from mild to severe depression; 30.1% (108) of students showed mild depression, 20.3% (73) of them showed moderate depression, 15.3% (55) of them showed moderately severe depression and 8.9% (32) of them showed severe depression symptoms. Majority of the participants (30.1%) showed mild depression. Figure 2 depicts the severity of depression percentage-wise.

Table 5 shows the severity of depression concerning gender. A total of 72.9% of males and 76.4% of females showed varying levels of depression symptoms. 31.5% of male students and 28.6% of female students showed mild depression symptoms, 18.8% of male students and 21.9% of female students showed moderate depression symptoms, 15.4% of male students and 15.2% of female students showed moderately severe depression symptoms and 7.2% of male students and 10.7% of female students showed severe depression symptoms. Depression is also found to have a mild association with gender. Depression symptoms are slightly higher among females than males.

In this study, the prevalence of depression and anxiety symptoms among medical students and their possible association with gender was assessed. The results from the current survey revealed that a remarkable proportion of medical students had depression and anxiety symptoms. The medical college has been known in involving stressors which might affect the well-being of students (Khan et al., 2006) such as academics load, having to face a challenging environment, examining stress, etc (Adhikari et al., 2017). Medical students find themselves in a frustrating position, wanting to take a role in addressing the pandemic but not yet ready to take to the front-lines of care. The mental health of medical students is just as important as their physical health. Unfortunately, the profession which promotes the health and wellness of people falls behind in addressing the needs of its students (Komer, 2020). Medical students worldwide are known to experience depression than others (Puthran et al., 2016).

This study indicated that about 75.5% of South Indian medical students experienced anxiety ranging from mild to severe anxiety symptoms and about 74.6% of them experienced depression ranging from mild to severe depression symptoms.

Compared to the previous study in India among medical students the prevalence of anxiety symptoms in the present study was higher (66.9% vs 75.5%) (Venkatarao et al., 2015) and the prevalence of depression symptoms was also higher (51.3% vs 74.6%) (Venkatarao et al., 2015).

In the global context, the prevalence of anxiety in the present study is similar to that of studies among medical students in different areas of Egypt which
were 73% and 78.4% (Fawzy and Hamed, 2017; Gabr and Abdallah, 2014). Compared to the previous studies, the prevalence of anxiety symptoms in the present study was higher than that of in the studies among medical students in Nepal which was 10.8% (Adhikari et al., 2017), in Ethiopia which was 30.10% (Kebede et al., 2019), in Bahrain which was 51% (Mahroon et al., 2018), in Pakistan which was 70% (Khan et al., 2006), in Bangladesh which was 61% (Islam et al., 2020), in Egypt which was 64.3% (Wahed and Hassan, 2017), in Pakistan which was 43.89% (Jadoon et al., 2010) and in Lebanon which was 69% (Mehanna and Richa, 2006). The prevalence of anxiety symptoms in the present study was lower than that of in survey among medical students in Malaysia which was 84.5% (Radeef et al., 2014).

The prevalence of depressive symptoms in the present study is similar to that of the study among medical students in Pakistan which was 70% (Khan et al., 2006). Compared to the previous studies, the prevalence of depressive symptoms in the present study was higher than that of studies among medical students in India which was 49.1% (Singh et al., 2010), in different areas of Ethiopia which were 27.7% and 40.9% (Berhanu, 2015; Dachew et al., 2015), in various regions of Egypt which were 57.9% and 60.8% (Ibrahim and Abdelreheem, 2015; Wahed and Hassan, 2017), in Iran which was 62.7% (Safiri et al., 2009), in Malaysia which was 64.4% (Radeef et al., 2014), in Bangladesh which was 69.5% Islam et al. (2020) and in Pakistan which was 43.89% (Jadoon et al., 2010); the prevalence of depression symptoms in the present study was lower than that of study among medical students in Saudi Arabia which was 83.4% (Alharbi et al., 2018).

In the present study, there is an increased prevalence of depression and anxiety symptoms among females than males. Various studies show similarities with this study in reporting higher levels of depression symptoms and anxiety symptoms among females than males (Bayram and Bilgel, 2008; Franko et al., 2005). This is probably due to the facts that; (i) Comparatively females complain more about the volume and complexity of the medical curriculum, (ii) females are more likely to report stress often than males due to lack of competence and self-expectation and (iii) females are more liable to over complaint about their medical and psychological symptoms than males (Ibrahim and Abdelreheem, 2015). However, some studies show no difference in anxiety and depression symptoms between genders (Chew-Graham et al., 2003; SNB et al., 2003).

CONCLUSIONS

This study reveals considerably higher levels of prevalence of anxiety (75.5%) and depression (74.6%) among South Indian Medical students. Both anxiety and depression symptoms are found to have a mild association with gender. Females showed an increased incidence of anxiety and depression than males.

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Conflict Of Interest

The authors declare that they have no conflict of interest for this study.

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