Original Research Article

Psychologicalassessment using modified DASS-21scale during COVID-19 pandemic.

ABSTRACT

Aims: To assess the levels of stress, anxiety, depression among the general population during COVID-19 pandemic and to compare the level of psychological morbidities ~~mental status of people~~ between two different geographical locations in India.
Study design: Cross-sectional observational study
Place and Duration of Study: Kerala and Tamil Nadu, between March 2021 and August 2021.
Methodology:A total of 522 participants got enrolled for the study. While 505 participantscomprising256 males and 249females were selected ~~for the study~~ based on the inclusion and exclusion criteria fixed. ~~In that 256 and 249 male and female participants were selected respectively~~. Depression, Anxiety and Stress Scale (DASS-21) was used to assess the level of distress experienced amongst the study population.
Results: The sample size was calculated to be around 385 fixing a 95% confidence interval, 5% margin of error with a population proportion of 50% and of unlimited population size.Depression level among male (38.21%) was slightly higher than female population (36.83%). Anxiety levels were similar among the male (41.58%) and female (41.78%). Stress level was found to be slightly higher in female (21.78%) than in male (19.40%). State wise comparison showed Tamil Nadu people had slightly higher level of depression (43.56%), anxiety (48.71%) and stress (25.74%) over Kerala people.
Conclusion:Anxiety level ~~as an individual~~ was higher, compared to depression and stress. 38% of the population had all the 3 mental conditions. 32% had at least 2 mental health related trouble. 11% had no mental health issue.COVID pandemic had definitely created a lot of psychological instability amongst the general public.

Comment [MD1]: Not detailed.

Comment [MD2]: Should be part of the result.

Keywords: DASS-21, COVID-19, DEPRESSION, ANXIETY, STRESS

1. INTRODUCTION

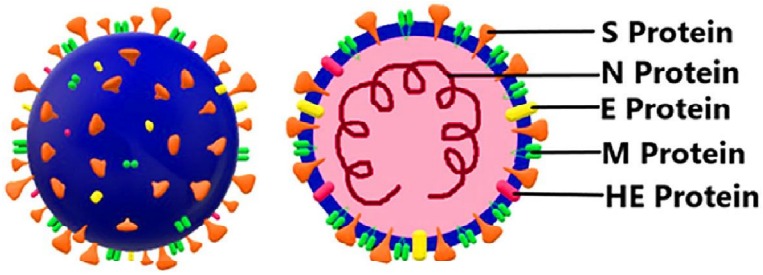
Coronavirus:

Coronavirus represents the large family of positive-sense ssRNA virus belonging to the order Nidovirales. These usually cause diseases of the upper respiratory tract in birds and mammals, including humans. SARS-CoV-2 is the cause of the ongoing pandemic. The COVID-19 infection is highly contagious due to its affinity for binding to the ACE2 receptors [1].

Origin and structure of SARS-CoV-2:

Human coronavirus was derived from bats. The first COVID-19 case was reported in ~~on~~ December 2019 in Wuhan, a city in Hubei province in China. Coronaviruses have a large genome, with size ranging from 26 to 32 kilobase. Corona, is a Latin word meaning the crown, with the spike on its surface.

Figure 1: Structure of SARS-CoV-2 and its cross-section [2].



Psychological crises due to COVID-19:

COVID-19 can have serious effect on the mental health. Anxiety and nervousness in a society affect everyone to a larger extent. Recent evidence suggested that people who were kept in isolation and quarantined experienced significant levels of anxiety, anger, confusion and stress [3]. Many studies reported that the affected individuals showed several symptoms of mental trauma, such as emotional distress, depression, stress, mood swings, irritability, insomnia, attention deficit hyperactivity disorder, post-traumatic stress and anger. Research has also shown that frequent media exposure may cause distress [4].

Depression is a mood disorder, characterized by short-term emotional responses to a serious health condition that is associated with impaired daily functioning accompanied by symptoms such as sadness, frustration, insensibility, feelings of guilt and loss of interest [5].

Anxiety could be defined as apprehension, tension or uneasiness that stems from the anticipation of danger, which may be internal or external [6].

Stress could be defined as a process in which environmental demands strain in one's adaptive capacity resulting in both psychological demands as well as biological changes [7].

A survey conducted by the Indian Psychiatry Society indicated a 20% rise in patients suffering from mental illness [8]. Reports of people emptying supermarkets and panic buying was indicative of how anxious people were in times of the pandemic [9]. Students all over the world also experienced distress because of the uncertainty of examinations in their schools and colleges and with regards to availability of jobs, etc. All students were not unable to afford online platform and smooth transition to online was not possible. This has caused anxiety among students during COVID-19 [10].

The World Health Organization (WHO) has also expressed its concern over the pandemic's mental health and psycho-social consequences. It speculated that new measures such as self-isolation and quarantine could have affected usual activities, routine and livelihood of people that may lead to an increase in loneliness, insomnia, anxiety, depression, harmful alcohol use, drug use and self-harm or suicidal behavior [11].

Mental health issues of home quarantine or isolation includes health-related anxiety, depression, low mood, fear, nervousness, irritability, anger, frustration, boredom, emotional exhaustion, feeling stressed, numbness and insomnia, substance withdrawal, end-of-life crisis, etc[12].

The purpose of the study was to find the extent of psychological variation during COVID-19 pandemic among the general population.

Comment [MD3]: State specific objectives

2. MATERIAL AND METHODS

A cross-sectional web-based online survey was conducted using modified DASS-21 questionnaire. A specially designed Google form containing all the relevant information was designed to collect data from the participants. Willingness to participate in the survey was obtained through the Informed consent. The Google forms which were designed for the survey purpose were ~~was~~ circulated through WhatsApp media platform. The forms were initially distributed to all the phone contacts and then got randomly distributed to general population. The time period given to the participants for providing response was, within 24-48 hours. The response was collected from the Google forms. All the responses were downloaded to a 'Google Sheet'.A total of 522 participants got enrolled for the study. 505 participants were selected for the study based on the inclusion and exclusion criteria fixed.

Comment [MD4]: How?

Inclusion criteria:

1. Age - 18 to 65 years, which includes both male and female.
2. Study site - Kerala and Tamil Nadu
3. Language - English

Exclusion criteria:

1. Age - Below 18 and above 65
2. Language - regional languages
3. People with mental illness, pregnant women, Asthma, Hypertension, Diabetes Mellitus, Cancer.

Comment [MD5]: Please give reasons for excluding these people

The online survey form had five sections in which the first section contained the Consent form, the second section included the Socio-demographic details, third section contained 7 depression related questions, fourth section contained 7 anxiety related questions and the fifth section contained 7 stress related questions. The questionnaire was designed with closed-ended questions. All the 21 questions in the survey form contained the same options (Sometimes, Frequently, Always, Never).

DASS-21:

The Depression, Anxiety and Stress Scale (DASS-21) is a set of three self-reporting scales designed to measure the emotional states of a person like depression, anxiety and stress. Modified DASS-21 scale has questions or statements on the depression, anxiety and stress. Each of the three DASS-21 scales contains 7 questions each for depression, anxiety and stress.

Scoring of the scale:

0 - Do not apply to me at all (Never)
1 - Applied to me to some degree, or some of the time (Sometimes)
2 - Applied to me to a considerable degree or a good part of time (Frequently)
3 - Applied to me very much or most of the time (Always)

DEVELOPMENT OF QUESTIONNAIRE

The modified DASS-21 questionnaire was made by modifying the original DASS-21 questionnaire. The questionnaire was designed by changing or altering some of the DASS-21 questions with respect to the DASS-21 scale. These modified questions specify the depression, anxiety, stress during a COVID-19 pandemic point of view.

Similar to the original DASS-21 questionnaire, modified DASS-21 questionnaire has questions or statements on the stress, anxiety and depression. The modified DASS-21 questionnaire was developed by converting the 21 questions that can measure variables such as whether people have lost their jobs or lost a close friend or relative and correlate these variables with DASS scores.

Pilot study was conducted with a total of 20 participants. As per the response collected from the pilot study participants, the forms were adequate and understandable.

STATISTICAL ANALYSIS

The sample size was calculated to be around 385 fixing a 95% Confidence interval, 5% Margin of error with a Population proportion of 50% and of unlimited Population size. Snowball sampling technique was applied for selecting the individuals for the study. After receiving the response from each of the participant, data was entered in the MS Excel work sheet and statistical analysis was done. The response for the 21 questions from individual participant was converted into scores as per the rating scale. Then sum of these scores were calculated for depression, anxiety and stress. Scores on the DASS-21 was multiplied by 2 to calculate the final score. These final scores were compared with DASS severity ratings scale to assess the stress, anxiety and depression levels among the study participants. Data was expressed in percentage as a response to each question. After collecting the response from the participants, e-pamphlets were distributed to them to the email address provided by the participant at the time of data collection. The e-pamphlet was designed specifically for providing awareness to the general population about stress, anxiety and depression during COVID pandemic to provide information on self-management of depression, anxiety and stress related symptoms during COVID-19 pandemic.

INTERPRETATION OF RESULTS

Scores for depression, anxiety and stress are calculated by summing the scores for the relevant items.
The score interpretation is as follows:

1. DEPRESSION

0-9 = Normal
10-13 = Mild Depression
14-20 = Moderate Depression
21-27 = Severe Depression
28+ = Extremely Severe Depression

2. ANXIETY

0-7 = Normal
8-9 = Mild Anxiety
10-14 = Moderate Anxiety
15-19 = Severe Anxiety
20+ = Extremely Severe Anxiety

3. STRESS

0-14 = Normal
15-18 = Mild Stress
19-25 = Moderate Stress
26-33 = Severe Stress
34+ = Extremely Severe Stress [13]

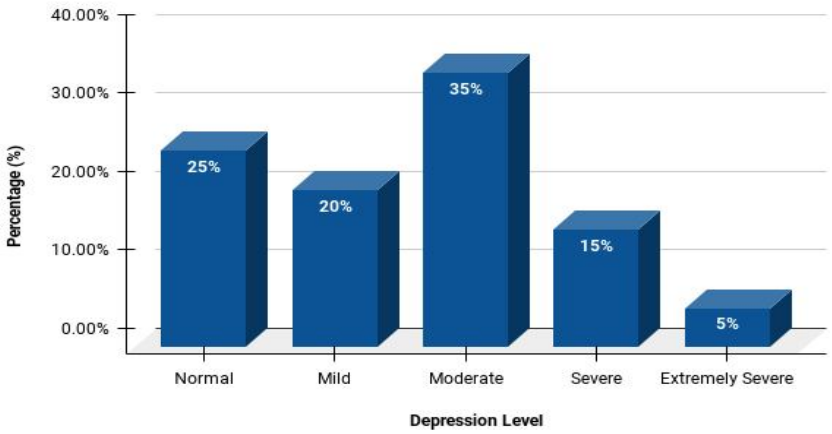
3. RESULTS AND DISCUSSION

A total of 505 participants enrolled for the study of which 51% and 49% were male and female respectively. 57% of Kerala population and 43% of Tamil Nadu population got enrolled in the study. The study population included people of age 18 to 65. Those between 20-26yrs accounted for the highest percentage of participants (…%)~~The maximum number~~

Comment [MD6]: ??? or you mean %7% of the participants were from Keral

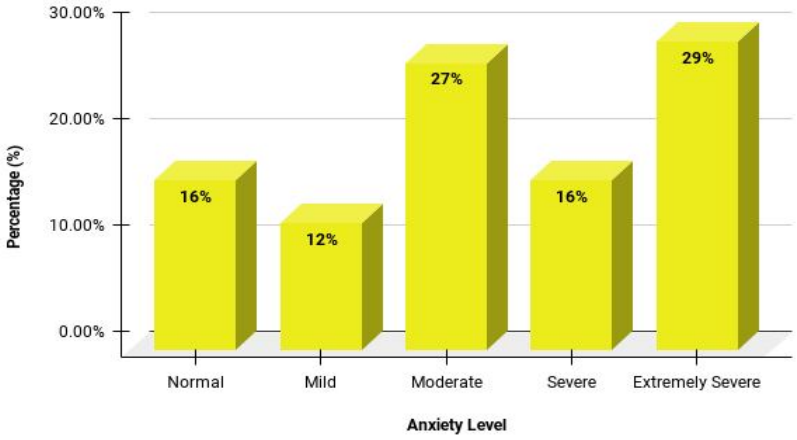
~~of people were between the age 20 to 26.~~ The social history showed that the majority of the population had no history of smoking or alcohol consumption. Only a very small percentage (…%) reported~~had~~ lifetime use of tobacco or alcohol.~~smoking and drinking habi~~t.
The survey conducted in these two different ethnic groups indicated a mild variation in the degree of the mental status. The depression scale evaluated the state of depression, the data interpretation showed 35% had moderate depression amongst the study population (Figure 2).

Figure 2. Depression level (n = 505)



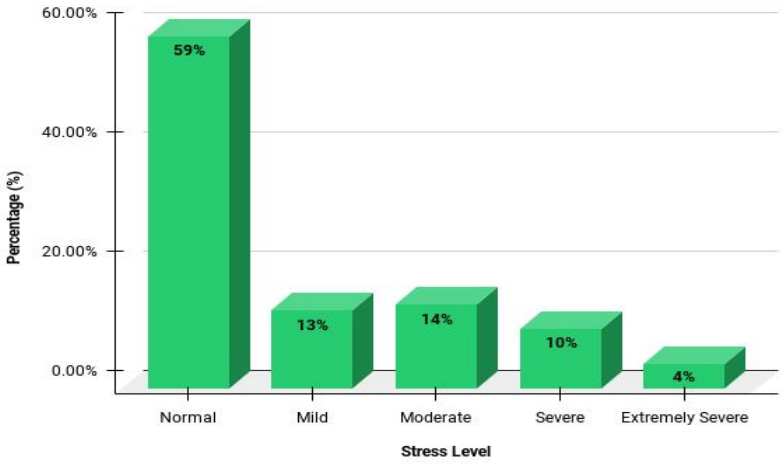
The anxiety scale had 7 different questions, based on the response obtained, 29% of the selected population had extremely severe anxiety and 27% exhibited moderate anxiety levels (Figure 3).

Figure 3. Anxiety level (n = 505)



The stress scale also had 7 questions and response obtained from the survey indicated that maximum (59%) had no stress. A small proportion has mild to moderate stress levels as indicated in the (Figure 4).

Figure 4. Stress level (n = 505)



A comparison was made amongst the 2 different ethnic groups in the south Indian states of Kerala and Tamil Nadu. Both the states did not show much of a notable variation in the level of depression, anxiety and stress. Only mild variation in terms of depression was noted

amongst the two groups. Severe and extremely severe depression levels were slightly higher amongst the people belonging to the state of Tamil Nadu. Mild and moderate depression was slightly higher amongst Kerala participants compared with Tamil Nadu participants (Table 1).

Table 1. Comparison of depression level between Kerala & Tamil Nadu participants

Based on the comparison made between Tamil Nadu and Kerala, moderate anxiety levels were high amongst Kerala people while severe anxiety levels were greater in Tamil Nadu group. Not much of a significant variation in extreme severe anxiety status amongst both the study population (Table 2).

Table 2. Comparison of anxiety level between Kerala & Tamil Nadu participants

Stress levels were identified to be more amongst the Tamil Nadu group compared with the Kerala group. More cases of moderate and sever stress was observed amongst Tamil Nadu group. Mild stress was noticed more amongst the Kerala population. Majority of them did not show any stress in both the groups (Table 3).

Table 3. Comparison of stress level between Kerala & Tamil Nadu participants

While making a comparison between male and female, much significant variation was not observed in depression and anxiety level, but the stress level was significantly high amongst female (Table 4).

Table 4. Comparison of depression, anxiety and stress between male & female

Mental status	**Gender**	
	Male	Female
Depression		
No depression	25%	25%
Mild	21%	18%
Moderate	33%	37%
Severe	15%	15%
Extremely Severe	6%	5%
Anxiety		
No anxiety	18%	15%
Mild	11%	13%
Moderate	28%	26%
Severe	18%	14%
Extremely Severe	25%	32%
Stress		
No stress	62%	56%
Mild	13%	12%
Moderate	12%	17%

Severe	10%	10%
Extremely Severe	3%	5%

Over all mental health indicated that 38% of the study population had all 3 conditions, 32% had at least depression and anxiety together. Only 11% were normal. (Figure 5)

Figure 5. Overall mental health

DISCUSSION

In our study, both male and female had moderate depression level, anxiety level in female was slightly higher than male and stress level in female was higher than male. Similar reports had been observed in the study conducted by ***Usama Rehman et al.,*** showed that

male and female did not differ significantly on stress, anxiety and depression. Both male and female reported mild stress, moderate anxiety, mild depression in their study [8].
In our study, age group of 22-24 was mostly affected with depression, anxiety and stress. Similarly, ***Mark Shevlin et al.,*** reported that age group of 18-24 was mostly affected with anxiety and depression [14].
We conducted our study in two states of India (Kerala and Tamil Nadu). The study revealed that anxiety and depression were highest in Tamil Nadu. Similarly, ***Catherine Porter et al.,*** conducted their study in four countries Ethiopia, India (Andhra Pradesh and Telangana), Peru and Vietnam. Their study revealed that anxiety and depression were highest in Peru[15].

4. CONCLUSION

Out of 505 participants, 256 (51%) participants were male and 249 (49%) participants were female. The study was in two states of India (Kerala and Tamil Nadu) in which 218 (43%) participants were from Kerala and 287 (57%) participants were from Tamil Nadu.
Individual anxiety level was higher, followed by depression and stress. Majority of the population had all the 3 conditions depression, anxiety and stress which accounted to about 38% of the population followed by depression and anxiety which was 32%. 11% of the total population was considered to be normal. 5% had depression, 11% had anxiety, 1% and stress, 1% had depression and stress, 2% had anxiety and stress. This indicated that COVID pandemic had created a lot of psychological instability among the people.
The depression level among male (38%) was slightly higher than female population (37%). Anxiety level among male (42%) and female (42%) was equal. Stress level in female (22%) slightly higher than male population (19%).
Tamil Nadu participants had higher level of depression (44%), anxiety (49%) and stress (26%) than Kerala participants, which was (31%), (35%), (15%) respectively.

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