

## A DESCRIPTIVE CROSS-SECTIONAL STUDY OF THE ASSESSMENT OF DEPRESSION, ANXIETY, AND STRESS DURING PANDEMIC IN STUDENTS USING THE DASS-21 SCALE

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### ABSTRACT

**Background:** The corona virus epidemic is quickly spreading throughout the world and causing a great deal of dread among the populace, with students being the most severely afflicted. The study's objective is to gauge pupils' emotional states.

**AIM:** Using the DASS-21 scale, assess the prevalence of depressive, anxious, and stress-related symptoms among students during the pandemic.

**METHODS:** A cross-sectional analysis of 203 students' levels of psychological distress as determined by the Depression, Anxiety, and Stress scale (DASS-21).

**RESULTS:** We found a prevalence of depression (61.56%), anxiety (42.34%) and stress (36.92%) symptoms in our study population. Males presented more symptoms of depression and anxiety than females. Of our participants, 44.31% presented symptoms of two or more psychological disorders and up to 24.13% of our sample experienced symptoms of anxiety, depression and stress simultaneously.

**CONCLUSION:** The current study was able to estimate the prevalence of depression, anxiety and stress among students. Interventions aimed at promoting mental health among college students should be implemented.

**Keywords:** Depression, Anxiety, Stress, DASS-21, Pandemic

### INTRODUCTION

Late in December 2019, Wuhan, Hubei province, China, saw an outbreak of pneumonia, an illness with no recognized causes. As till the end of January 2020, the pandemic had infected 106 individuals in 19 other countries and had killed 213 people in China, where it had infected 9720 people. A few days later, many independent laboratories determined that a new corona virus (nCoV) was the cause of this unexplained pneumonia. According to the World Health Organization, the relevant infected disease has been given the temporary names coronavirus disease 2019 (COVID-19) and severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The majority of the patients ranged in age from 30 to 79. The range of the median age is 49 to 59 years. There were few cases in children below 15 years of age. More than half the patients were male. Nearly half the cases had one or more coexisting medical conditions, such as hypertension, diabetes, and cardiovascular disease. A large cases study indicated that the case-fatality rate was elevated among those patients with coexisting medical conditions. The spectrum of clinical presentations of COVID-19 has been reported ranging from asymptomatic infection to severe respiratory

failure.(Majumdar et al., 2020) Depression, anxiety and stress levels in the community are considered as important indicators for mental health. Anxiety, one of the main evaluated subjects, has been significantly increasing in society during this pandemic. It is characterized mainly by catastrophic misinterpretations of bodily sensations, dysfunctional beliefs about health and illness and maladaptive coping behaviors.

It is generally accepted that insufficient physical activity is a significant risk factor for Physical inactivity is the leading cause of mortality across the world. The extended home stay can lead to increased sedentary behavior,

such as spending too much time sitting down, reclining, lying down for screening habits, and often reducing physical activity. Identifying existing psychological issues is an important step; however, it is more important to deliver mental health care when it is needed. (Teh et al., 2015) It is necessary to investigate and understand the public's mental states during this tumultuous time. Accordingly, psychological and behavioural measurement and evaluation are essential. Psychological tests contribute to the identification of certain disorders, monitoring of disease, and make predictions in a way that reflects the variability in human behaviour. To estimate depression, anxiety and stress in an individual we conducted a mental health assessment based on DASS-21. The Depression Anxiety Stress Scale (DASS) was used to screen mental health problems among the population. The DASS 21 is a 21 item self report questionnaire devised to measure and assess the severity of a range of symptoms common to depression, anxiety and stress. It was designated for participants to specify their emotional level for each statement. In total, there are 7 items for each depression, anxiety and stress assessment. Each item is scored from 0 (did not apply to me at all over the last week) to 3 (applied to me very much or most of the time over the past one week). Because the DASS 21 is a short form version of the DASS (the Long Form has 42 items), the final score of each item groups (depression, anxiety and stress) must be multiplied by two ( $\times 2$ ). The minimum score is zero and the maximum score is 42. The essential function of the DASS is to assess the severity of the core symptoms of Depression, Anxiety and Stress. Accordingly, the DASS allows not only a way to measure the severity of a patient's symptoms but a means by which a patient's response to treatment can also be measured. The essential function of the DASS is to assess the severity of the core symptoms of Depression, Anxiety and Stress. Accordingly, the DASS allows not only a way to measure the severity of a patient's symptoms but a means by which a patient's response to treatment can also be measured. (Fernando et al., 2021) We investigated and analyzed the potential consequences of the COVID-19 pandemic on the life of student. Moreover, our study attempts to assess the mental situation of students of different age groups using DASS-21

## MATERIALS AND METHODOLOGY

**Study design:** A cross sectional study.

**Study site:** We conducted an online survey.

**Study duration:** The study duration is for three months.

**Ethical considerations:** The participants were made clear that their participation in this survey is completely voluntary and their consent of agree to take part in this survey was obtained.

**Study participants:**

- **INCLUSION CRITERIA:**  
Both males and females were included in the study. Students of age group
  - 16-18
  - 19-21
  - 22-24
- **EXCLUSION CRITERIA:**  
Children Elderly  
Pregnant women

**Sampling technique:** Convenience sampling under the category of Non-Probability sampling was used as the sampling technique.

**Sample size:** Sample size is calculated by using the following formulae:

$$n = p(100-p) z^2/E^2$$

Where, n is the required sample size, P is the percentage occurrence of a state or a condition, E is the percentage maximum error required. Z is the value corresponding to level of confidence.

203 participants were included in the study.

**Studyinstruments:**

To measure the emotional states of depression, anxiety and stress, we used “The depression, anxiety and stress scale-21 items (DASS-21).

**THE DEPRESSION, ANXIETY AND STRESS SCALE-21 (DASS-21)**

DASS-21 is the shortened version of the DASS developed by Lovibond, S.H. & Lovibond, P.F., to assess symptoms of depression, anxiety and stress.

**Purpose:**To measure the emotional states of depression, anxiety and stress in our participants.

**Content:**DASS-21 is a set of three self-report scales. Each of the three scales contains 7 items, divided into subscales with similar content.

- The depression scale assessesdysphoria, hopelessness, deviation in life, self- deprecation, lack of interest or involvement, anhedonia and inertia.
- The anxiety scale assesses autonomic arousal, skeletal muscle effects, situational anxiety and subjective experience of anxious affect.
- The stress scale is sensitive to levels of chronic non-specific arousal. It assesses difficulty relaxing, nervous arousal and being easily upset/ agitated, irritable/ over- reactive and impatient.
- In the DASS-21, the participant is asked to think about their experiences in the past seven days and to judge how each statement applied to them. There are 21 items in this scale with four response options.

There are seven items in each of the subscales; the score of which ranges from 0-21

**Scoring:**Scoring for depression, anxiety and stress are calculated by summing the scores for relevant items.

The rating scale is as follows:

- 0- Did 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 (Often)
- 3- Applied to me very much or most of the time (Almost always)

Scores of each item of the three subscales will need to be multiplied by 2 to calculate the final score, because DASS-21 is a short form version of the DASS (42 items) and is evaluated according to its severity rating index.

Table 1: Interpretation

	<b>DEPRESSION</b>	<b>ANXIETY</b>	<b>STRESS</b>
Normal	0-9	0-7	0-14
Mild	10-13	8-9	15-18
Moderate	14-20	10-14	19-25
Severe	21-27	15-19	26-33
Extremely severe	28+	20+	34+

**Validity and reliability**

This tool has been previously validated in population of students showing high levels of consistency for the three sub-scales DASS-21 Convergent validity was confirmed with moderate correlation coefficients (-0.47 to -0.66) .The internal consistency reliability of the scale was acceptable to high, with a Cronbach Alpha of 0.72 for the depression, 0.77 for the anxiety, 0.70 for the stress subscale and 0.88 for the overall scale.

**Data collection:**

The data collection method used is the primary data collection method. The data collection was conducted using online questionnaires through the Google form. We have also collected the demographic data such as Name,

Age and Gender.

**Data analysis:**

Using this qualitative data, the results are represented in frequency and percentages. The association between the age groups, gender and the emotional states of depression, anxiety and stress were calculated using chi-square test. The level of significance  $P < 0.05$  is considered to be statistically significant.

A Venn diagram is constructed to represent the emotional states of overall student sample.

**RESULTS**

**Table-2**

**FREQUENCY AND PERCENTAGES OF DIFFERENT DOMAINS OF DASS-21 FOR DIFFERENT AGE GROUPS**

Age Groups	Emotional States	Normal	Mild	Moderate	Severe	Extremely Severe	P value
16-18	DEPRESSION	4(44.45%)	1(11.12%)	2(22.23%)	1(11.12%)	1(11.12%)	0.231
	ANXIETY	4(44.45%)	1(11.12%)	1(11.12%)	1(11.12%)	2(22.23%)	
	STRESS	4(44.45%)	3(33.34%)	0(0%)	1(11.12%)	1(11.12%)	
19-21	DEPRESSION	32(30.48%)	19(18.1%)	34(32.38%)	9(8.57%)	11(10.47%)	0.60
	ANXIETY	63(60%)	8(7.61%)	17(16.2%)	6(5.71%)	11(10.47%)	
	STRESS	64(61%)	12(11.4%)	11(10.47%)	11(10.47%)	7(6.67%)	
22-24	DEPRESSION	41(46.06%)	17(19.1%)	13(14.61%)	6(6.74%)	12(11.43%)	0.576
	ANXIETY	49(55.06%)	12(13.48%)	12(13.48%)	2(2.25%)	14(15.73%)	
	STRESS	59(66.3%)	8(9%)	8(9%)	7(7.87%)	7(7.87%)	

**Table -3**

**FREQUENCY AND PERCENTAGES OF DIFFERENT DOMAINS OF DASS-21 FOR EACH GENDER**

EMOTIONAL STATES	MALE					FEMALE					P Value
	Normal	Mild	Mod*	Sev**	E.Sev***	Normal	Mild	Mod*	Sev**	E.Sev***	
DEPRESSION	18 29.5%	14 23%	17 27.9%	3 5%	9 14.8%	59 41.55%	23 16.2%	32 22.53%	13 9.15%	15 10.56%	0.307

<b>ANXIETY</b>	32 52.5%	7 11.5%	8 13.11%	3 5%	11 18.03%	84 59.15%	14 9.86%	22 15.5%	6 4.23%	16 11.26%	0.713
<b>STRESS</b>	39 64%	7 11.5%	4 6.56%	5 8.2%	6 9.83%	88 62%	16 11.26%	15 10.56%	14 9.86%	9 6.34%	0.810

\* Moderate;                      \*\* Severe; \*\*\*Extremely Severe

Table -3

**FREQUENCY AND PERCENTAGES OF DIFFERENT DOMAINS OF DASS-21 FOR EACH GENDER**

EMOTIONAL STATES	MALE					FEMALE					P Value
	Normal	Mild	Mod*	Sev**	E.Sev***	Normal	Mild	Mod*	Sev**	E.Sev***	
<b>DEPRESSION</b>	18 29.5%	14 23%	17 27.9%	3 5%	9 14.8%	59 41.55%	23 16.2%	32 22.53%	13 9.15%	15 10.56%	0.307
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\* Moderate;                      \*\* Severe; \*\*\*Extremely Severe

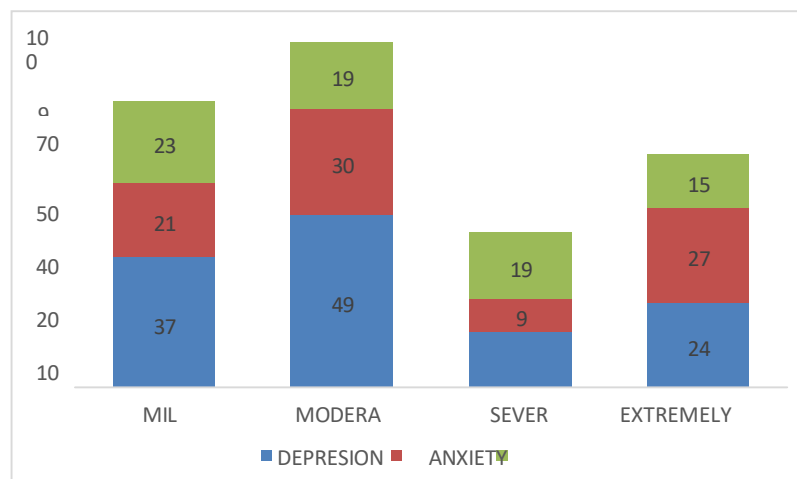


Fig.1: Severity of Depression, Anxiety, and Stress among the study population

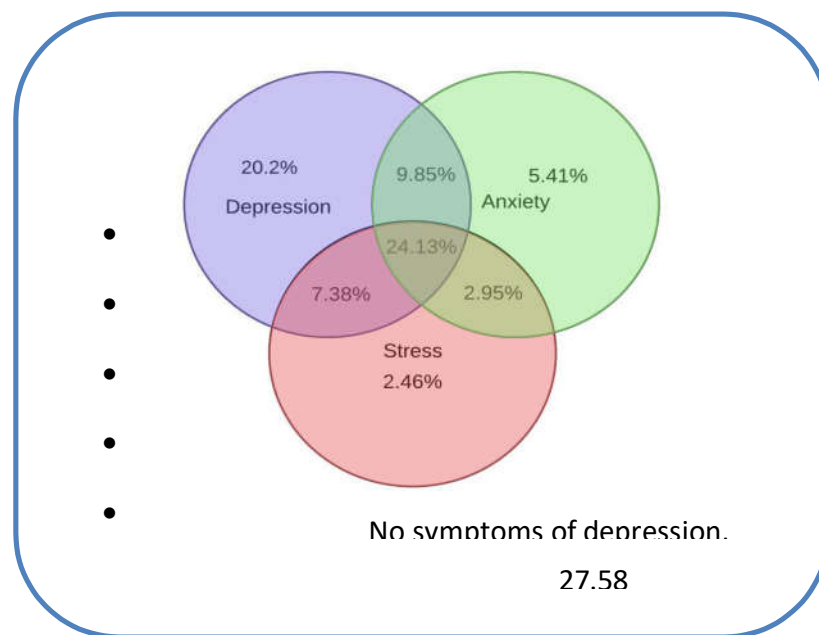


Fig.2: Coexistence of symptoms of Depression, anxiety and stress among the study population (n=203)

- The students of age group 19-21 presented with higher levels of depression whereas, students of age group 16-18 presented with higher levels of anxiety and stress.
- Males presented higher levels of depression and anxiety than females.
- Females presented higher levels of stress when compared to males.
- We found the prevalence of depression (61.56%), anxiety (42.34%) and stress (36.92%) symptoms in our study population.
- Of our participants, 44.31% presented symptoms of two or more psychological disorders and up to 24.13% of our sample experienced symptoms of anxiety, depression and stress simultaneously.

**DISCUSSION**

The results have shown that majority of the students appeared to have psychological symptoms. 62.07% students reported mild to extremely severe depression levels, 42.85% students reported mild to extremely severe anxiety levels and 37.44% students reported mild to extremely severe stress levels.

When compared with the study of home quarantined students 46.92% reported mild to extremely severe depression levels, 33.28% reported mild to extremely severe anxiety levels and 28.5% reported mild to extremely severe stress levels. The difference in these results is due to the association of related social stressors on mentalhealth impact in home quarantined students like prolonged quarantine, financial uncertainty, fear of infection and exposure to covid-19 news on social and mass media.(Khan et al., 2020)

The survey was short, written in plain English and easy to complete the DASS-21 questionnaire cannot be considered as a tool for diagnosis of psychological pathology, it is useful to identify the symptoms of anxiety, depression and stress.

Prevalence of anxiety and depression of 41.7% and 55.6% respectively using Goldberg Anxiety and Depression scale. Unfortunately, the use of different screening tools does limit the comparability of findings. (Simonelli-

Muñoz et al., 2018)

A systematic review of 24 studies estimated an average prevalence of depression of 30.5% with results ranging between 10.4 and 80.5%. (Ibrahim et al., 2013)

The same level of variation was observed in previous studies which used the DASS questionnaire to assess psychological distress. This may be explained by differences in the selection criteria, as well as the presence of confounding factors such as influence of the environment on the mental health of our participants, modulating both the individual's subjective perception and expression of symptoms of psychological discomfort.

Of our participants, 44.3% presented symptoms of two or more psychological disorders. This association has been previously described in college students. (Lun et al., 2018)

(Long et al., 2018) suggests that there is a bidirectional, systematic pattern between the development of depressive and anxious syndromes in young adults

It is possible that college students perceive vital events associated with college life as threatening to them, thus negatively affecting their mental health. For example, being under 21 was significantly associated with symptoms of depression, anxiety and stress. (Farrer et al., 2016)

This is interesting finding, which may suggest that younger students are more likely to experience uncertainty related to their studies than more mature students. This observation is supported by previous studies which reported higher levels of anxiety in the initial years of study.

The study has some limitations that are needed to be acknowledged firstly, the DASS-21 questionnaire is a suitable tool to screen for anxiety, depression and stress disorders, and may be useful to identify the patients who are at risk of being affected by these conditions. However, additional tools should be used to establish a format diagnosis as these data are not diagnostic. They are estimates from self-report measures and not clinical interviews.

Secondly, online surveys are less accessible to people who lack internet access, computer proficiency and lower socio-economic status. Thirdly, the results of our study cannot be generalized to a wider range of population as we've used convenience sampling technique. Fourthly, the study design employed does not allow for the establishment of a causality relationship.

Future investigations in this area should attempt to address these limitations. In any cases, we proclaim that our results bring to light the need to implement strategies to protect and improve the mental health and well-being of students.

## CONCLUSION

Using the data from the cross-sectional survey, the current study was able to estimate the prevalence of symptoms of depression, anxiety and stress among students. We found that the prevalence of these symptoms in some cases, do not occur in isolation, but co-exist.

Our findings confirm that the pandemic and the implementation of lockdown had great impact on the psychological state and quality of life of the students.

The psychological impact of fear and anxiety induced by the rapid spread of pandemic needs to be clearly recognized as a public health priority by both authorities and policy makers. They should design strategies for the early identification of mental health disorders, as well as psychological and other interventions leading to mental health promotion and well-being in the population of students thereby, reducing the dramatic mental health consequences of this outbreak.

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