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# A Study on Prevalence of Depression, Anxiety and Stress in Student Populations During the COVID - 19

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## ABSTRACT

**Background:** The depression, anxiety and stress symptoms are increasing drastically among the student population due to COVID-19. These symptoms lead to change into life-threatening situations during COVID scenarios.

**Objectives:** We studied the distribution of depression, anxiety and stress in a cohort of 1000 students population, from different institutions in central India. They were divided into four clusters based on their age, i.e. 15 – 16 y, 17 – 18 y, and 19 – 20 y.

**Material and Method:** We administered the Depression Anxiety Stress Scale (DASS -21) to all student populations to determine their depression, anxiety and stress symptoms. Each student was classified either as mild or moderate or extreme type based on his/her performance.

**Result:** Prevalence of mild-moderate and extreme in the studied population was 30.9%, 64.2% and 4.9%, respectively. The Chi-square test of stress revealed a significant association between stress and gender ( $p < 0.001$ ) while it exhibited a non-significant association between anxiety and gender as well as depression and gender. The depression, anxiety and stress traits were compared using analysis of variance (ANOVA).

**Conclusion:** Result depict that the independent factor age produced significant effects on depression ( $p < 0.001$ ) anxiety ( $p < 0.001$ ) and stress ( $p < 0.001$ ) traits. In particular, irrespective of different age groups, the 19-20y age group exhibit more anxiety ( $p < 0.05$ ) than that of their counterparts. However, a significant difference could not be validated within the age groups of depression and stress. The depression, anxiety and stress symptoms lead to change in psychiatric morbidity over time.

**Key Words:** Anxiety, Depression, Stress, Student population

## INTRODUCTION

Depression, anxiety and stress symptoms are common among student population concerning mental health and psychosocial functions.<sup>1,2</sup> The prevalence of depression and anxiety symptoms are 4.4 per cent and 3.6 per cent respectively worldwide.<sup>3,4</sup> The depression, anxiety and stress symptoms are increasing drastically between the age group of 15-18 years.<sup>5-8</sup> Twenty per cent of the Indian population is made up of adolescents of which around 17-25 per cent are suffering from depression, anxiety and stress symptoms.<sup>9,10,11</sup> These symptoms can manifest in broad array of situations, ranging from life-threatening situations to school presentations and competitive examination. Depression, anxiety and stress symptoms can enhance the individual's ability to cope, both in dangerous situations and

in situations where the individual is facing a positive, yet challenging situation.<sup>15</sup> However, depression, anxiety and stress symptoms are hallmarks and predictors of depression, anxiety and stress disorders.<sup>10</sup> Depression, anxiety and stress disorders are disabling for the individual.<sup>12,13,14</sup> Now a day, depression, anxiety and stress disorders were among the three leading causes for disability in adolescents.<sup>16-19</sup> The depression, anxiety and stress are found to be statistically significant with mental health.<sup>20</sup> The mental health and psychosocial functions lead to change in psychiatric morbidity over time.<sup>20,21</sup> Authors stated that around twenty per cent of the total population experienced mental disorders during their lifetime.<sup>22,23</sup> In the developing country one in five adolescents suffers from mental health problems, while it is 12-29 per cent in developing countries. Several studies indicate that the prevalence rates of individual disorders: Depression, anxiety

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ety, and stress (DAS) are growing among adolescents.<sup>22</sup>

The symptoms of depression mood disorders are dysphoria, hopelessness, devaluation of life, self-deprecation, lack of involvement, anhedonia and inertia.<sup>24,25</sup> Such short-term emotional responses can lead to change in serious health issues associated with impaired daily functions.<sup>21</sup> Depression is a common mental health problem, which is moving towards *twenty-five per cent* of people worldwide.<sup>24</sup> Anxiety mental health problems can be defined as “*a group of mental disorders characterized by an unpleasant feeling with uneasiness or worry about future events or the fear of responding to current events. It can occur without an identifiable triggering stimulus*”.<sup>26</sup> Thus anxiety scale assesses skeletal muscular effects, autonomic arousal, situational anxiety and subjective performance of anxious effects. Around *ten percent* people are facing the anxiety health problem in the world.<sup>8</sup> Similarly stress can be defined as “*when the person is not able to cope up with environmental conditions due to lack of compliance leads to change in psychological and biological features called stress*”.<sup>6</sup> Because stress display judicious level of chronic non-specific arousal due to difficulty in relaxing, over reactivity, impatient and nervous arousal. Therefore, depression, anxiety and stress exhibit worldwide mental health problems.<sup>23,24</sup>

As regards the relationship between age and depression, anxiety and stress the conclusions are still not consistent. Several authors reported that people of advancing adolescent age tend to show greater depression, anxiety and stress.<sup>18,19,20</sup> Mirzaei and coauthors<sup>19</sup> stated that the prevalence of depression anxiety and stress is greater in older people than that of the younger population. Before that authors also stated that these symptoms commonly begin under the age of twelve and it extends up to eighteen.<sup>3,18,24</sup> However, it has not yet been confirmed if age-associated depression, anxiety and stress could be imputed to the parallel changes in the central nervous system or the changes in work and/or hormonal environment.<sup>11,27</sup>

Further, in some studies, no significant differences in the distribution of depression, anxiety and stress were found between females and males.<sup>12,17,18</sup> In contrast, many reports suggest that females tend to score significantly more towards depression, anxiety and stress than males.<sup>19,24,27</sup> The rate of anxiety is just double in females than that of males (female 4.6%; male 2.6%) at the same time the symptoms of depression reveal around 5.1% in females and 3.6% in males worldwide. It has also been reported that the gender differences in depression, anxiety and stress could be explained as a by-product of socio-cultural influences and hormonal changes. The male-female divide in many distinct cultural and ethnic groups could influence the distribution pattern of depression, anxiety and stress as a function of gender. Physiologically, females that possess menstrual

cycles, exhibit internal de-synchronization which lead to exhibit depression, anxiety, sleep problems and appetite disturbances.<sup>3</sup> Psychologists still have difficulty in giving an exhaustive explanation for the relationship between depression, anxiety and stress preferences and gender. Therefore, a consensus is yet to emerge.<sup>21-27</sup>

The depression anxiety stress scale has been developed by several psychologists<sup>16,26</sup> which can assess general distress or negative affect, physiological hyperarousal, and low levels of positive affect. Hence, Lovibond and Lovibond<sup>16</sup> developed the 42-item Depression, Anxiety, and Stress Scales (DASS-42), a self-report instrument with three dimensions. Further, the DASS-21 was developed from the original DASS-42 by selecting 7 of 14 items for each subscale with the highest loadings.<sup>16</sup> DASS-21 were designed to maximize measurement of the distinct features of depression, anxiety and stress, which typically co-occur in adults and to minimize measurement of what these states have in common. The original principal component analysis of DASS items revealed that a stable three-factor solution of depression, anxiety and stress was the optimal fit<sup>16</sup> Recent research has applied the self-report version of the DASS to children and adolescents between the ages of 7 and 15.<sup>28,29</sup> Therefore DASS-21 is suitable for adolescent and young population.<sup>27</sup> Give background and then aim of the study here. Make the introduction slight shorter.

## MATERIALS AND METHODS

### Subjects

One thousand student population aged between 15 to 20 years (Median age = 17 y), including male and female volunteered to participate in this study (Table 1). The study was designed in such a way that it neither interferes nor disturbs the normal routine of the subjects. The DASS-21 inventory was administered to each subject belonging to each institution. They maintained dignity and confidentiality while responding to the different inventories. The subjects were interviewed invariably after the end of their study sessions. The time of the interview session varied generally as they were functioning at different institutions characterized by schedules of Schools or colleges.

All subjects signed an informed consent form before they participated in the study. They were assured that the responses obtained on the inventory would be kept firmly secret and under no circumstances would be made public or used for profit-making. Subjects were told to remain frank and give trustworthy answers and that their participation is for a noble cause, i.e., for science and society. The protocol of the study complied with the ethical standards of the journal.

## Instrument/Inventory

The DASS-21 inventory was administered under standard conditions. A good “rapport” was established with the respondents both at individual and group levels.

Subjects were supplied with a personnel information sheet along with DASS-21 inventories. They were instructed to fill up the biographical data sheet first before proceeding to register their responses on the inventories. The biographic data sheet included different fields, such as name, fathers name, mothers name, date of birth, class, age, address, mobile number. They were told not to read the inventories unless asked for. The respondents were reminded not to ponder on each question, but to give the first response that occurs to them spontaneously as fast as possible. After the completion of the session, they were advised to check back and make sure that they have not missed any field of query on any one of the utensils.

## Characteristics of the DASS-21 inventories and Determination of Scores

The DASS-21 inventory is widely used by researchers around the world. This is designed for assessing depression, anxiety and stress levels. The inventories consist of 21 questions each having four options. Each subject has the freedom to choose an answer, which he/she thinks to be the most appropriate for him/her, by putting a tick-mark inside the boxes drawn for each choice. Depression, anxiety and stress have seven items each. The original DASS-21 is in English,<sup>16</sup> while in this study a modified Hindi version was used, as the participant were from Hindi speaking population.

The reliability of the DASS-21 scale in terms of internal consistencies was ascertained. The Cronbach’s alpha values of the entire scale were 0.83, and for depression, anxiety and stress were 0.83, 0.85, and 0.80 respectively.

The DASS-21 scores were computed from the response sheet obtained from each subject. Concerning depression, anxiety and stress dimensions each subject was classified either as mild (score between 1 and 7), or moderate (score between 8 and 14) or extreme (score between 15 and 21).

## Statistical Analysis

All data were stored in the form of records in database files. Descriptive statistics and *Chi*-square test was employed to analyze independence of attributes, such as depression, anxiety and stress dimension and student population (elaborate this, such as the function of gender: male vs female or age). The depression, anxiety and stress scores were subjected to ANOVA for multiple comparisons. Data were analyzed using software, namely SPSS (Version 20.0).

## RESULTS

The prevalence profile of the distribution of depression, anxiety and stress (DASS) traits, namely mild, moderate and extreme, among the student population is summarized in **Table 1**. Out of 1000 subjects, 309 (30.9%) were mild, 642 (64.2%) were moderate and 49 (4.9%) were extreme. The DASS score range of total subjects was 2 – 60 (mean  $\pm$  SE: 26.5 $\pm$ 0.30; N = 1000). However, the range for male was 5 – 60 (26.32 $\pm$ 0.43; N = 468) and for females it was 2 – 55 (26.7 $\pm$ 0.41; N = 532). Out of 468 (46.8%) male subjects, 148 (31.6%) were mild, 299 (63.9%) were moderate and 21 (4.5%) were extreme. Similarly, out of 532 (53.2%) female subjects, 161 (30.3%) were mild, 343 (64.5%) were moderate and 28 (5.2%) were extreme (**Table 1**).

Furthermore, a significant relationship was observed between different age groups and depression, anxiety and stress. In particular, irrespective of different age groups, the 19-20y age group exhibit more anxiety ( $p < 0.05$ ) than that of their counterparts. However, a significant difference could not be validated within age groups of depression ( $p < 0.682$ ) and stress ( $p < 0.815$ ).

## Distribution of depression traits

The prevalence profile of depression traits, namely mild, moderate and extreme, among the student population is summarized in **Figures 1 and 4**. Out of 1000 subjects, 390 (39.0%) were mild, 519 (51.9%) were moderate and 91 (9.1%) were extreme (**Figure 1**). The depression score range of the total subjects was 0 – 21 (mean  $\pm$  SE: 8.93 $\pm$ 0.13; N = 1000). However, the range for males was 1 – 21 (mean 9.01 $\pm$ 0.18; N = 468) and for females it was 0 – 19 (mean 8.86 $\pm$ 0.17; N = 532). Results of the *Chi*-square test indicated a statistically non-significant ( $p < 0.904$ ) relationship between depression and gender (**Figure 4**). The depression traits were compared using an analysis of variance (ANOVA). Results depict that the independent factor produced significant effects on depression ( $p < 0.001$ ) traits. Furthermore, a significant relationship was observed between different age groups and depression. In particular, irrespective of different age groups, the 15-16y age group exhibit more and 17-18 y group exhibit less depression ( $p < 0.682$ ) than that of their counterparts.

## Distribution of anxiety traits

The prevalence profile of anxiety traits, namely mild, moderate and extreme, among the student population is summarized in **Figures 2 and 5**. Out of 1000 subjects, 449 (44.9%) were mild, 498 (49.8%) were moderate and 53 (5.3%) were extreme (**Figure 1**). The anxiety score range of the total subjects was 1 – 20 (mean  $\pm$  SE: 8.16 $\pm$ 0.12; N = 1000). However, the range for males was 1 – 20 (mean 8.19 $\pm$ 0.17; N = 468) and for females it was 1 – 19 (mean 8.12 $\pm$ 0.16; N =

532). Results of the *Chi*-square test indicated a statistically significant ( $p < 0.805$ ) relationship between anxiety and gender (**Figure 5**). The anxiety traits were compared using an analysis of variance (ANOVA). Results depict that the independent factor age produced significant effects on anxiety ( $p < 0.001$ ) traits. Furthermore, a significant relationship was observed between different age groups and anxiety. In particular, irrespective of different age groups, the 19-20y age group exhibit more and 15-16 y group exhibit less anxiety ( $p < 0.05$ ) than that of their counterparts.

### Distribution of stress traits

Prevalence profile of stress traits, namely mild, moderate and extreme, among student population is summarized in **Figures 3 and 6**. Out of 1000 subjects, 337 (33.7%) were mild, 596 (59.6%) were moderate and 67 (6.7%) were extreme (**Figure 3**). The stress score range of the total subjects was 0 – 21 (mean  $9.51 \pm 0.12$ ;  $N = 1000$ ). However, the range for males was 0 – 21 (mean  $9.20 \pm 0.18$ ;  $N = 468$ ) and for females it was 1 – 19 (mean  $9.77 \pm 0.16$ ;  $N = 532$ ). Results of the *Chi*-square test indicated a statistically significant ( $p < 0.001$ ) relationship between stress and gender (**Figure 6**). The stress traits were compared using an analysis of variance (ANOVA). Results depict that the independent factor age produced significant effects on stress ( $p < 0.001$ ) traits. Furthermore, a significant relationship was observed between different age groups and stress. In particular, irrespective of different age groups, the 15-16y age group exhibit more and the 19-20 y group exhibit less depression ( $p < 0.815$ ) than that of their counterparts.

## DISCUSSION

The results of the present study exhibited predominantly more moderate traits (64.2%) among the student population, irrespective of gender and age. The prevalence of depression (51.9%), anxiety (49.8%) and stress (59.6%) among the student population are greater than that of mild and extreme traits. This study also reported that the percentage of extreme (4.9%) student population [depression (9.1%), anxiety (5.3%) and stress (6.7%)] is very less due to high ability to cope with syllabus and pattern of examination. Nonetheless, the results of the present study contradict the results of an earlier study conducted in a different country in that the prevalence of the extreme traits was the highest in the adult medical student population of the northern part of the Indian subcontinent.<sup>24,26</sup> The present results further contradict the findings of Szabó and Bhasin<sup>3,24</sup> with respect to the distribution of extreme types. These authors reported a higher percentage of extreme traits than that of the present study. i.e. the frequency of the mild trait was conspicuously higher than the extreme trait. They were also stated that higher socio-economic background, qualified mothers, nuclear families

and well-developed institutions of the students is also exhibited extreme traits of depression, anxiety and stress.<sup>3,15,24</sup>

In the present study, although the females had a higher mean score (52.2) as compared to the males, the results of the *Chi*-square test did not reveal a statistically significant association between gender and depression and anxiety. Only stress exhibit a statistically significant association with gender. The present results are not in agreement with those published earlier.<sup>4,18,19,24</sup> These authors reported that females had higher depression, anxiety and stress scores than males. Moreover, in this study females exhibited more extreme traits (5.2%) as compared to the males (4.5%) and it was the opposite for the mild trait (females: 30.3%; males: 31.6%). However, our results based on gender-wise distribution are in agreement with those reported earlier.<sup>34</sup>

Furthermore, a significant relationship was observed between age and depression, anxiety and stress scores. Although this study was large concerning sample size, the higher percentage of depression, anxiety and stress scores in comparable age groups could not be documented as has been reported in past studies.<sup>3,19</sup> The depression, anxiety and stress symptoms are elevating between the age group of 15-18 years.<sup>15,18,24</sup> Around 25 per cent of adolescent and young people use to exhibit depression, anxiety and stress symptoms.<sup>15,23</sup> It has also been reported that the females who experienced depression, anxiety and stress symptoms attributed to hormonal fluctuations during the menstrual cycle; females tend to experience depression than that of males.<sup>25,26</sup> Authors reported that rather than biological factors, environmental factors might also play an important role in the transcription of depression, anxiety and stress symptoms at an early age.<sup>25,26</sup>

## CONCLUSION

Although the results of the present study corroborate with most of the earlier findings in terms of the prevalence of depression, anxiety and stress symptoms, it contradicts the same findings as regards prevalence of depression, anxiety and stress scale concerning lower extreme traits among the student population of government institutions. Certainly, the image of life without stress is not possible in the COVID-19 scenario to develop a personality. Nevertheless, consistent stress may translate into anxiety which may lead to change into depression. Depression may lead to change into anxiety; therefore consistent positivity towards lifestyle is a prerequisite.

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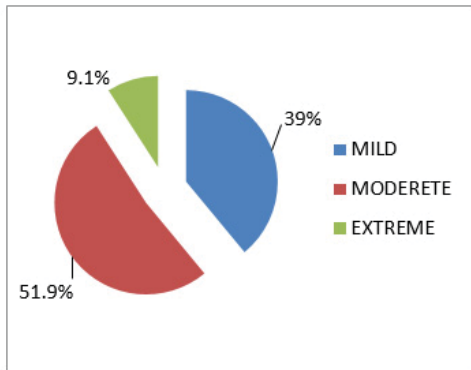
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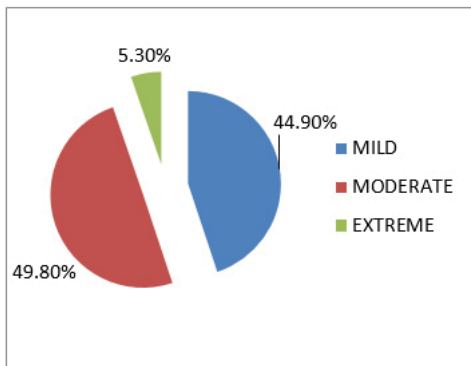
**Table 1: Distribution of depression, anxiety and stress as a function of gender**

Traits	Female	Male	Total
Mild	161 (30.3)	148 (31.6%)	309 (30.9%)
Moderate	343 (64.5%)	299 (63.9%)	642 (64.2%)
Extreme	28 (5.2%)	21 (4.5%)	49 (4.9%)
Total	532 (53.2%)	468 (46.8%)	1000 (100%)

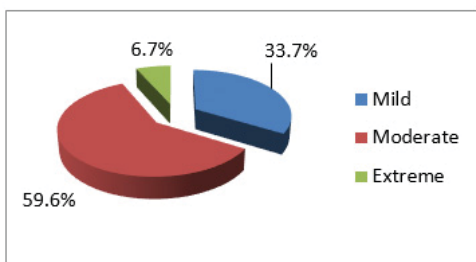
Chi-square test indicated a statistically significant ( $p < 0.001$ ) relationship between stress and gender



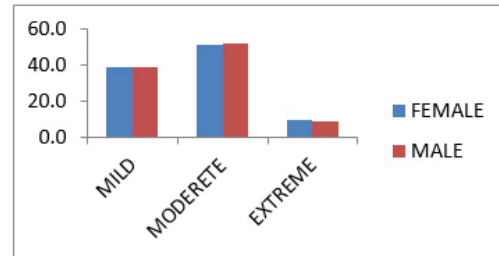
**Figure 1:** Percentile of depression (DASS-21) among the student population, irrespective of gender. (ANOVA result: depression ( $p < 0.001$ )).



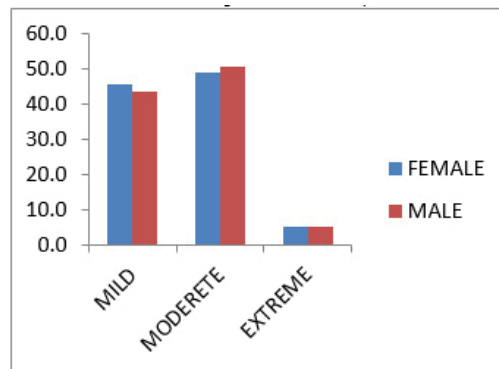
**Figure 2:** Percentile of anxiety (DASS-21) among the student population, irrespective of gender. (ANOVA result: anxiety ( $p < 0.001$ )).



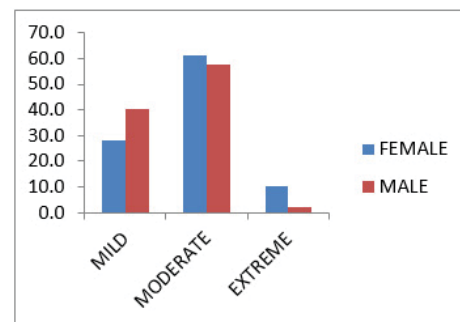
**Figure 3:** Percentile of stress (DASS-21) among the student population irrespective of gender. (Chi square result of stress traits  $p < 0.904$ ; ANOVA result: Stress  $p < 0.001$  traits)



**Figure 4:** Percentile of depression (DASS-21) among the student population concerning gender. (ANOVA result: Depression  $p < 0.001$  traits)



**Figure 5:** Percentile of anxiety (DASS-21) among the student population concerning gender. (ANOVA result: Anxiety  $p < 0.001$  traits)



**Figure 6:** Percentile of stress (DASS-21) among the student population concerning gender. (Chi-square test indicated a statistically significant ( $p < 0.001$ ) relationship between stress and gender: ANOVA result: Stress  $p < 0.001$  traits)