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Original Research Article

Examining mental health of medical students: a DASS21 scale assessment

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ABSTRACT

Background: Stress is a global phenomenon that affects nearly everyone. The medical curriculum is often regarded as one of the most difficult professional degree courses in the world, and so the prevalence of stress is clear. Because of this trend, the pupils' mental health must be evaluated. The purpose of this study was to gather information about stress levels among undergraduate medical students.

Methods: The research was carried out at the RUHS college of medical sciences. Data was acquired using Google Forms via a self-administered questionnaire that contained students' consent and semester information. The questionnaire consisted of 21 questions based on the Depression Anxiety and Stress Scale (DASS21).

Results: The response rate of this study was 91.02% (213/234). The study also revealed more active female participation than male respondents. Out of the total responses (n=234), 54.6% were females and 44.8% were male. The analysis showed that medical students had experienced higher levels of depression (55%), and anxiety (64%) relative to stress (34%). Female students were found more anxious and depressed.

Conclusions: The study found a high prevalence of stress, anxiety, and depression among medical students. Preventive approaches for improving student mental health are so required.

Keywords: Anxiety, DASS 21, Depression, Education, Medical undergraduate students, Stress

INTRODUCTION

Stress is a well-known phenomenon that is experienced by individuals in various social, academic, and workplace settings. In the 21st century, stress has become a common issue among medical students around the world. The curriculum of medical college is challenging, and students often struggle to adapt to the rigorous demands of the program. Living away from home, making the transition to a more independent and less supportive environment, and coping with the study demands of the program can be difficult for young people.¹ Apart from personal problems, major sources of stress among medical students are workload and feeling overwhelmed by the information that needs to be mastered. This comes with the fear of failing or falling behind. Stress is developed via self-cognition on interaction with one's environment. It affects an

individual's capabilities in positive and negative directions. Under stressful situations some perform better this is eustress, however, if it decreases then it is called distress.²

During their preclinical, paraclinical, and clinical years, the impacts of being a medical student have a long-lasting and complex impact on personal life, particularly in managing leisure activities, interactions with others, and adjusting to a new environment. Medical students face more psychological distress than the general population, which might have an impact on their academic performance.^{3-4,5} If ignored, this distress can lead to significant psychological illness, such as anxiety disorder and depression. A study was done to collect data and analyse the students' mental health state in order to measure the level of stress and anxiety among students of

a medical college in Jaipur.² According to the study, medical students had significant levels of stress and anxiety, which is consistent with past findings.¹⁻⁴ Medical students encounter a distinct type of stress that differs from that experienced by persons in other academic professions.³⁻⁴ Research has shown that high levels of stress can affect an individual's cognitive and learning abilities.³⁻⁴ Furthermore, stress can lead to burnout, which can result in decreased motivation and engagement, and even lead to dropping out of medical school.¹ It is also experienced by medical students emphasize the need for interventions that can help them cope with the demands of their program.

Several studies have explored the factors that contribute to stress among medical students. These studies have identified workload, academic pressure, financial stress, and poor social support as major contributors to stress.¹⁻⁴ In addition, studies have found that personal factors such as personality traits, coping strategies, and emotional intelligence also play a role in determining the level of stress experienced by medical students.³⁻⁴ The relationship between stress, anxiety, and depression forms a vicious cycle. Stress can trigger anxiety, and anxiety, in turn, can lead to depression. The symptoms of anxiety and depression can further exacerbate stress levels, creating a continuous loop that becomes increasingly difficult to break. The cycle intensifies if proper intervention and support are not sought, potentially leading to severe mental health challenges. Given the high levels of stress and anxiety experienced by medical students, there is a need for interventions that can help them cope with the demands of their program. Several interventions have been proposed and implemented to address this issue. These interventions include mindfulness-based stress reduction programs, cognitive-behavioural therapy, and relaxation techniques.²⁻⁴ Studies have shown that these interventions can be effective in reducing stress and anxiety. To evaluate the level of stress, anxiety and depression in students of a medical college, a study was conducted to collect the data to analyze the students' mental health status.

METHODS

Study population

The study was conducted among the medical students of the tertiary care teaching hospital of Jaipur, Rajasthan. MBBS students at Rajasthan University of Health and Sciences College of Medical Sciences (RUHS CMS), Jaipur (1 December 2022 to 15 March 2023) were included after receiving their informed consent.

The DASS 21 is a widely used self-report questionnaire designed to measure the severity of symptoms related to depression, anxiety, and stress. It is a brief and easy-to-administer tool that can be used to screen for a range of emotional disorders, making it a valuable tool in clinical practice and research. The questionnaire has 21 items, each of which is rated on a 4-point scale ranging from 0 (did not

apply to me at all in the previous week) to 3 (applied to me very much or most of the time in the previous week). The questionnaire is divided into three subscales, each with seven items, to assess the intensity of depression, anxiety, and stress symptoms. Dysphoria, hopelessness, devaluation of life, self-deprecation, lack of interest and involvement, anhedonia, and lethargy are all measured by the depression subscale. The anxiety subscale assesses autonomic arousal, skeletal muscle effects, situational anxiety, and subjective anxious affect experience. The stress subscale measures difficulty relaxing, nervous arousal, being easily upset or agitated, and feeling irritable or over-reactive. The DASS-21 has been validated in multiple investigations and demonstrated good psychometric qualities in a variety of populations, including clinical and non-clinical samples. It has also been translated into other languages and used in a variety of cultural contexts. The DASS-21 is a popular tool for assessing emotional distress and is especially useful in screening for people who are at high risk of developing emotional disorders.

Table 1: Consent statement.

| Consent statement | Response |
|--|----------|
| This study is conducted by the department of pharmacology of RUHS CMS, Jaipur. Candidates participating in the study are assured that their data is secured and kept confidential and would be used for research purposes only. | Yes/no |

Table 2: Questions asked through the survey.

| Question number | Abbreviated forms of questions asked |
|-----------------|--------------------------------------|
| 1 | Hard to wind down |
| 2 | Dryness of my mouth |
| 3 | No positive feeling |
| 4 | Breathing difficulty |
| 5 | No initiative |
| 6 | Over-react. |
| 7 | Trembling (e.g., in the hands). |
| 8 | Nervous energy. |
| 9 | Panic and make a fool of myself |
| 10 | Nothing to look forward to |
| 11 | Agitated |
| 12 | Difficult to relax. |
| 13 | Down-hearted and blue. |
| 14 | Intolerant |
| 15 | Close to panic |
| 16 | Unable to become enthusiastic. |
| 17 | Not worth much |
| 18 | Touchy. |
| 19 | The action of the heart. |
| 20 | Scared without reason. |
| 21 | Life was meaningless. |

The DASS-21 has the advantage of providing a continuous measure of symptom severity, allowing for a more nuanced assessment of emotional distress. The questionnaire does not rely on arbitrary cut-off scores, which can occasionally lead to persons being disregarded who do not meet diagnostic criteria. Instead, it produces a score that represents the severity of symptoms along a scale, which can be helpful in identifying people who are at high risk of developing more serious emotional disorders. Overall, the DASS-21 is a useful tool for assessing emotional distress, providing clinicians and researchers with a quantifiable assessment of symptom severity. It is a brief and simple questionnaire with extensive validation and good psychometric qualities. Its application can aid in identifying those who are at high risk of developing mental problems, even if they do not fulfil diagnostic criteria.⁶

Sample size

The DASS 21 questionnaire was distributed to 234 medical students, and 213 participants submitted filled questionnaires. 20 questionnaires were incompletely filled and hence were excluded from the study. The response rate of this study was 91.02%.

Data collection procedure

The data on various mental health aspects including stress, anxiety and depression, was collected through DASS 21 scale, 21 items self-reported questionnaire. The participants were briefed about the study on the spot in order to retain the authenticity of their responses and avoid any kind of manipulation. After the participants gave their approval, the data was collected using Google Forms for future analysis. Individuals who refused to participate or who denied consent were not included.

Plan of analysis

Microsoft tools like Excel and Word were preferred for a better presentation of data in the form of tables, graphs, etc.

Confidentiality

The data collected was kept confidential and used for research purposes only. None of the personal information was disclosed in the study. Only the investigators involved in the study have the access to this data.

RESULTS

The response received showed female predominance with 54.6% participation over males at only 44.8%. The DASS -21 scale covers three aspects depression, anxiety, and stress through 21 questions. The (Table 3) summarizes a comparative gender-based analysis of the mean stress, anxiety, and depression scores of both female and male participants, which revealed that stress levels were

equivalent in both genders. Female students were slightly more anxious and depressed than male students. The (Figure 1) depicts the data graphically.

Table 3: Gender analysis of DASS21 mean Depression (D), Anxiety (A), and Stress (S) scores.

| Gender | Stress | Anxiety | Depression |
|--------|-------------|-------------|-------------|
| Male | 11.59433962 | 10.72641509 | 11.16037736 |
| Female | 11.59615385 | 10.80769231 | 11.21153846 |

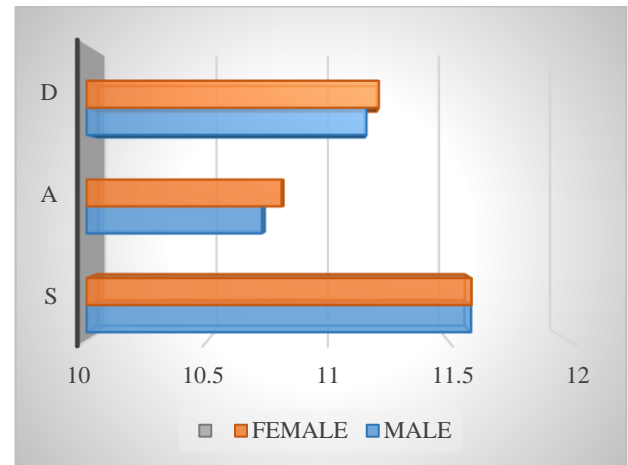


Figure 1: Representation of comparative gender-based analysis of Depression (D), Anxiety (A) and Stress (S).

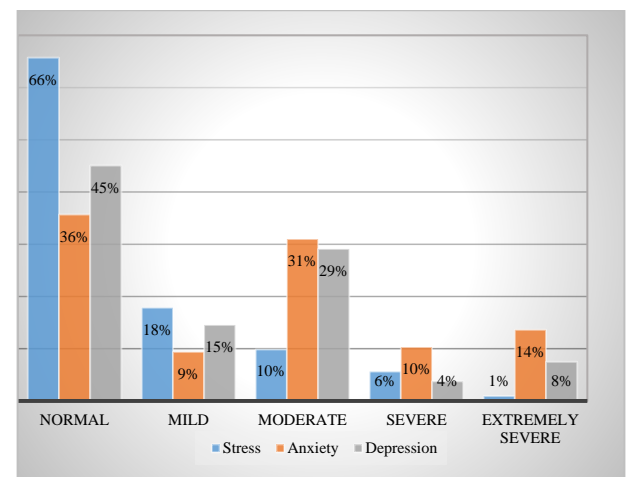


Figure 2: Representation of the severity distributions of DASS 21 scores.

According to the scale, the following results were obtained that are being summarised in (Table 4). DASS scale assess the three criteria over the period of the past few days or week and comes with the range to decide whether the person is experiencing stress, anxiety, or depression. The study conducted showed that all three factors were noticed among the students which are summarised in (Figure 2). Out of all 213 participants, 66% denied experiencing any

stress, 18% participant experienced mild stress and 10% of individuals showed up with moderate levels of stress, and however, 6% and 1% of individuals were under severe and extremely severe stress as shown in (Figure 3). Similarly, the anxiety results were calculated that surprisingly revealed that the majority of participants did face anxiety issues of varying degrees, 31% individuals claimed to be under moderate anxiety while 10% have severe anxiety and 14% were extremely anxious. Only 36% were normal, and the rest 9% still presented with mild anxiety as seen in (Figure 4).

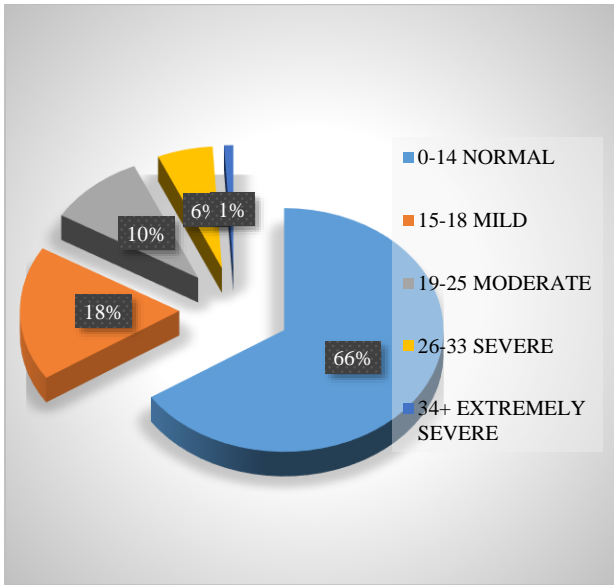


Figure 3: Stress level severity according to DASS 21 scale.

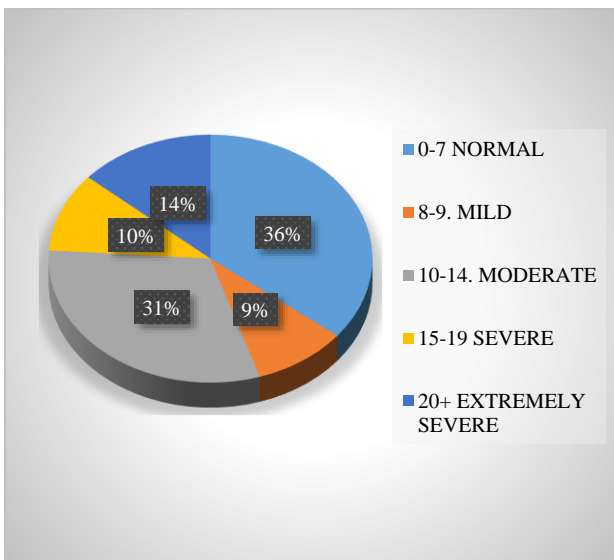


Figure 4: Anxiety level severity according to DASS 21 scale.

Lastly, depression was evaluated, which showed 45% is normal, 15% in mild depression, 29% in moderate levels of depression, around 4% of students are under severe

depression, and 8% at extremely severe depression as shown in (Figure 5).

Table 4: Responses of individuals to the DASS21 scale; (S=stress, A=anxiety=depression, 0=Did not apply to me at all, 1=Applied to me to some degree, or some of the time, 2=Applied to me to a considerable degree or a good part of the time, 3=This has occurred to me a lot or most of the time).

| Question | 0 | 1 | 2 | 3 |
|----------|-----|-----|----|----|
| DASS1 S | 85 | 88 | 31 | 9 |
| DASS2 A | 101 | 80 | 23 | 9 |
| DASS3 D | 82 | 89 | 36 | 6 |
| DASS4 A | 117 | 74 | 18 | 4 |
| DASS5 D | 66 | 104 | 33 | 10 |
| DASS6 S | 76 | 98 | 30 | 9 |
| DASS7 A | 110 | 79 | 20 | 4 |
| DASS8 S | 71 | 91 | 42 | 9 |
| DASS9 A | 63 | 103 | 31 | 16 |
| DASS10 D | 89 | 95 | 18 | 11 |
| DASS11 S | 73 | 108 | 30 | 2 |
| DASS12 S | 73 | 108 | 21 | 11 |
| DASS13 D | 89 | 85 | 26 | 13 |
| DASS14 S | 82 | 95 | 31 | 5 |
| DASS15 A | 76 | 95 | 31 | 11 |
| DASS16 D | 93 | 87 | 26 | 7 |
| DASS17 D | 98 | 79 | 22 | 14 |
| DASS18 S | 107 | 79 | 19 | 8 |
| DASS19 A | 89 | 94 | 21 | 9 |
| DASS20 A | 82 | 99 | 24 | 8 |
| DASS21 D | 112 | 68 | 20 | 13 |

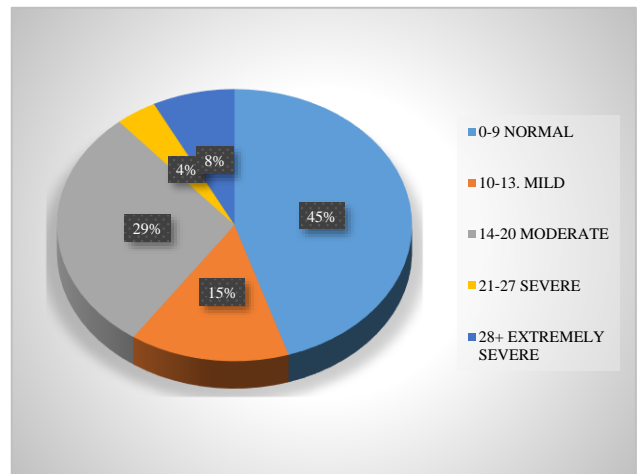


Figure 5: Depression severity level according to DASS 21 scale.

DISCUSSION

Negative stress is the root cause of all psychological or pathological problems. Henceforth, it is advisable to acknowledge it at the earliest to avoid other co-morbidities including anxiety or depression. A similar study by Iqbal et al showed almost similar results proving that major

respondents were affected by depression (51.3%), anxiety (66.9%), and stress (53%).⁶ These results were slightly different in our study we found our respondents had depression (55%), anxiety (64%), and stress (34%). Our study found the presence of lower stress levels in our respondents and slightly more levels of depression. The data also showed the presence of almost double the percentage of respondents suffering from extremely severe depression (8%) in our study as compared to the previous study (4.8%). Similarly, extremely severe stress levels in our study were 1% in contrast to their study showing 2.3%. The levels of extremely severe anxiety were almost similar with our responses having 0.4% more difference. Another study by Nandi et al showed 52.56% of individuals being stressed however our study showed fewer stress levels i.e., 35%.⁷ A study by Moutinho et al observed 34.6% depression, 37.2% anxiety symptoms, and 47.1% stress, indicating that our study predicted higher levels of depression (55%), anxiety (64%), and slightly lower levels of stress (34%).⁸ This reveals that medical students are stressed, anxious, and melancholy. Depression and anxiety are frequently preceded by stress. When we are stressed, our bodies release stress chemicals such as cortisol, provoking a fight-or-flight reaction. While this response is required in some circumstances, continuous activation of this stress response can disturb brain chemistry, leading to anxiety disorders or depressive symptoms.

Interestingly, we found that male and female students perceived similar stress levels, which contrasts with studies conducted by Saxena et al, who found that male students experienced more stress (82.2%) than female students (62%), and Madhyastha et al, who conducted a different study that revealed a higher prevalence of stress in females.^{9,10} Another study by Ramadianto et al found that female students had higher anxiety levels.¹¹ Female students had a rate of 16.1%, while male students had a rate of 8.1%. Raja et al noted the higher prevalence of depression and anxiety among female students, while our study found the same thing but with a smaller difference in mean scores.¹² Chronic stress can exacerbate anxiety. Excessive worry, agitation, impatience, and a continuous sense of anxiety set in. The body's ability to control stress hormones deteriorates when an individual's stress level rises, making them more sensitive to anxiety disorders such as generalized anxiety disorder (GAD), panic disorder, or social anxiety disorder. Constant tension and concern may result in the development of depression. Over time, neurotransmitter levels in the brain, such as serotonin and dopamine, can become imbalanced. Because they influence mood regulation, motivation, and overall emotional well-being, these abnormalities are associated to depression. Chronic stress can lead to depression symptoms such as chronic melancholy, loss of interest in activities, changes in eating or sleeping patterns, and gloomy thoughts.^{13,14}

The World Health Organization actively promotes positive mental health as a universal goal. Medical students, as an important part of the health care system, face the need for a better and stress-free environment, as stress can have

negative effects on empathy, ethical conduct, and professionalism, as well as personal consequences such as substance abuse, burnout, broken relationships, and suicidal ideation.^{14,15} As previously noted, the many aspects of stress are highlighted through the study that even under the same curriculum, students showed up with diverse mental states, concluding that it depends on the person's coping capacities.

Limitations

The study has several limitations that need to be considered to assess the scope and applicability of its findings. Firstly, the study's sample size was relatively small, consisting of only 234 participants who expressed interest in participating. While it was sufficient for the study's specific objectives, it may not represent larger populations. Additionally, the majority of participants were medical students in their first and second years, which could have biased the results due to increased academic pressure in recent years. The study was also conducted at a single medical college, limiting the generalizability of its conclusions to the broader population of medical students in the city. Moreover, the study exclusively focused on medical students, and its findings may not be applicable to students in other academic disciplines. Therefore, it is essential to acknowledge these limitations and conduct future research with larger and more diverse samples to validate and extend the current findings, especially when investigating the mental health of students from different academic backgrounds.

CONCLUSION

The study reveals a concerning prevalence of depression (55%) and anxiety (64%) compared to stress (34%) among medical students, with slightly higher rates in females. The DASS 21 is an effective tool for assessing these issues. Early identification of stress is vital to prevent complications. This underscores the need for increased mental health support for medical students, including stress management, mindfulness, and physical activity. Prioritizing mental health education and reducing stigma is crucial for fostering empathetic and professional healthcare providers. In conclusion, addressing medical students' mental health through education, support, and stigma reduction is essential for a more empathetic and resilient society.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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