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A cross-sectional study to determine factors causing stress among medical students at Shantabaa Medical College, Gujarat, India using Medical Students' Stressor Questionnaire (MSSQ)

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ABSTRACT

Background

Stress is defined as the body's non-specific response or reaction to demands made on it, or to disturbing events in the environment. It has been observed that medical school environments in India are extremely stressful and that this stress has led to suicide attempts by students. At the present time, the COVID-19 pandemic and its consequences are affecting everyone's day-to-day life, making medical students more stressed than ever. This study aimed to determine levels of stress in medical students during 2021.

Methods

A web-based cross-sectional study was conducted on first and second year MBBS students of Shantabaa Medical College, Amreli, Gujarat, India, using MSSQ-40, a standardized test for determining medical student stress levels. The data was entered and analysed using MS Excel 2019 and significance was determined using the Mann Whitney U Test.

Results

All students enrolled in the study scored between 1 and 2 in all six domains of the MSSQ, suggestive of a moderate degree of stress. The second-year students' scores were higher than those of the first-year students across all domains (1.36, 1.04, 1.10, 1.13 and 1.03 in first years, indicative of mild stress, compared with 2.29, 2.06, 1.93, 1.93, 1.87 for second years, indicative of moderate to high stress). The difference was statistically significant in all six domains. Academic-related stress (ARS) received the highest score (1.36 for first years, and 2.29 for second years) followed by intrapersonal and interpersonal-related stressors (IRS) and group activities related stressors (GARS). The scores recorded in this study were comparable with those recorded in pre-pandemic studies, however, suggesting that COVID-19 is not a significant cause of the stress.

Conclusion

Second year students were more stressed in all domains compared to first year students. We recommend reducing the number of exams; moving from a marking to a grading system of assessment to ease competition; introducing more ordered timetabling; targeting learning to focus on essential subjects only; and providing better training for group activities.

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INTRODUCTION

Stress is defined as the body's nonspecific response or reaction to demands made on it, or to disturbing events in the environment.[1,2] Personal and environmental events that causes stress are known as stressors.[3,4] Among all academic curricula, medical education is considered to be one of the most stressful,[5,6] affecting the physical and mental health of medical students.[5-8] Many factors contribute to creating a stressful environment for medical students, including examination fear, high parental expectations, peer pressure, lack of leisure time, financial challenges, relationship disharmony and high aspirations.[5]

High levels of suicide attempts by students have been observed in non-western countries, with ranges from 1.8–53.6%[6-9] of students who report considering suicide during their studies, and medical schools in India have been identified as particularly stressful environments. Stress that inhibits and suppresses learning is known as unfavourable stress. Such stress hampers students' academic performance,[7] in contrast to positive stress, or eustress, which motivates and energizes the student. Thus, early identification of students who are exhibiting signs and symptoms of unfavourable stress is important to enable interventions, before the stress leads to more serious consequences.[8]

Various studies have been carried out to investigate stressors among medical students across the world.[1,5,6,12–16] These studies show great variations in the prevalence of stress in students, from 37.3–97%. The differences have been attributed to demographic variation in the samples; students in different studies being in different academic years; varying case definitions, and a lack of uniformity in measuring tools.[10] To enhance uniformity, Muhamad et al (2011) characterized six principal domains of stressors: academic related stressors (ARS); intra- and interpersonal related stressors (IRS); teaching and learning related stressors (TLRS); social related stressors (SRS); drive and desire related stressors (DDRS); and group activity related stressors (GARS), and created the Medical Students' Stressor Questionnaire (MSSQ-40)[11] to record these. The instrument has been validated in a number of countries including Malaysia,[12] the Netherlands,[13] Romania,[14] Nepal[15] and India.[1,16] At the time of our study, the consequences of the COVID-19 pandemic were affecting everyone's day-to-day lives. Medical students were no exception: they were under more stress than ever. This study planned to quantify this level of stress using the MSSQ-40.

METHODS AND MATERIALS

The study was designed as a cross-sectional web-based survey to be conducted on first and second year MBBS students enrolled at Shantabaa Medical College, Amreli, Gujarat, India. All students from the 2019 intake (second year) and 2020 intake (first year) were included. There were 150 students in each intake, 300 students in total. Nine students from the 2019 intake and five students from the 2020 intake did not give consent to participate and so are excluded from the study, giving a final sample size of 286.

The study tool used was the MSSQ-40. This consists of 40 items addressing six stress domains (see Box 1):

BOX 1: Stress domains of the MSSQ-40

Academic-related stressors (ARS): including items such as 'tests/examinations', 'getting poor marks', 'large amount of content to be learned', and 'having difficulty understanding the content'.

Intrapersonal and interpersonal-related stressors (IRS): with items such as 'conflicts with other students', 'verbal or physical abuse by teachers', and 'conflict with personnel';

Teaching and learning-related stressors (TLRS): with items such as 'lack of guidance from the teacher', 'uncertainty of what is expected of me', and 'lack of recognition for work done';

Social-related stressors (SRS): with items such as 'facing illness or death of patients', 'talking to patients about personal problems', and 'being unable to answer questions.

Drive and desire related stressors (DDRS): with items such as 'unwillingness to study medicine', 'parental wish for you to study medicine', and 'family responsibilities'.

Group activities related stressors (GARS): with items such as 'participation in class discussion', 'need to do well (imposed by others)', and 'feeling of incompetence'.

Participants responded to each item using a five-point Likert scale (0–4) reflecting an increasing level of severity in stress from no stress (0) to severe stress (4). All items encompassing the six stressor domains were collated to measure the overall stress experienced by the medical students. The mean score (after summation of scores from all the items and division by 40) is taken as the indicator of overall stress. Mean item scores for individual students were calculated and graded into categories of no stress (0), mild stress (0.01–1), moderate stress (1.01–2), high stress (2.01–3), and severe stress (3.01–4). Mild stress is considered unlikely to have a significant impact on the student. Moderate stress signifies a level of stress it is reasonable to assume the student will cope with. Severe and high indicate reasonably significant emotional disturbances with (severe) and without (high) impact on daily activities respectively.

Data was entered and analyzed using MS Excel 2019. The mean score of all stressors is presented with 95% confidence intervals and the significance of difference for various stressors between 1st and 2nd year students was calculated by Mann-Whitney U Test. A p-value of less than or equal to 0.05 was considered to be statistically significant.

RESULTS

Shown in Table 1, 145 first year students and 141 second year students consented to be included in the study (286 in total) of whom students 156 (55%) were male and 130 (45%) were female.

Table 2 shows that the highest score was obtained for the academic related stressor (ARS) – this score was more than 2, indicative of a high level of stress. All other stressor values were between 1–2, indicating a moderate level of stress. When comparing the stressor values between the first year and second year students, values are higher in second year students for all stressors. The p-value found using Mann Whitney U test is <0.05 in every stressor.

Table 1 Number of medical students

Year	Male	Female	Total
1st	82	63	145
2nd	74	67	141
Total	156	130	286

Table 2 Mean value of stressors: comparison between first year and second year students

No	Stressor (domain)	Mean value (95% confidence interval)			p-value
		First year	Second year	combined	
1	Academic-related stressors (ARS)	1.3638 ±0.0771	2.2923 ±0.073	2.0046 ±0.0646	<0.00002*
2	Intrapersonal and interpersonal-related stressors (IRS)	1.04 ±0.0713	2.0557 ±0.105	1.7357 ±0.0816	0.00212*
3	Teaching and learning-related stressors (TLRS)	1.10±0.0767	1.9338 ±0.0944	1.6771 ±0.0958	0.00211*
4	Social-related stressors (SRS)	1.13 ±0.151	1.925 ±0.245	1.6767 ±0.215	0.00217*
5	Drive and desire related stressors (DDRS)	1.03 ±0.0599	1.87 ±0.297	1.6133 ±0.218	<0.000001*
6	Group activities related stressors (GARS)	1.1525 ±0.0441	2.045 ±0.126	1.7675 ±0.0903	0.02940*

**** Indicates statistical significance by Mann Whitney U Test <0.05***

Table 3 shows the factors that score highest in each domain. The stressors that have the highest values are ARS, IRS and GARS: and within those the specific stressors are: large amount of content to be learned; frequent examinations; conflicts with other students and teachers; lack of guidance from teacher(s); feelings of incompetence; and a need to do well imposed by others.

Table 3 factors scoring highest within the stressor categories

No.	Stressor	Factors with highest score	Mean score
1	Academic-related stressors (ARS)	Large amounts of content to be learned	2.41*
		frequent examinations	2.32*
2	Intrapersonal and interpersonal-related stressors (IRS)	Conflicts with other students	2.15*
		Conflicts with teachers	1.89
3	Teaching and learning-related stressors (TLRS)	Lack of guidance from teacher (s)	1.98
		Uncertainty of what is expected from him/her	1.87
4	Social-related stressors (SRS)	Frequent interruption of my work by others	1.86
		Lack of time for family and friends	1.82
5	Drive and desire related stressors (DDRS)	Parental wish for you to study medicine	1.76
6	Group activities related stressors (GARS)	Feeling of incompetence	2.12*
		Need to do well (imposed by others)	1.96

A score above 2.0 indicates high stress likely to induce emotional disturbance that interferes with students' daily lives.

DISCUSSION

Our study recorded that the academic related stressor (ARS) received the highest score among all the stressors for medical students. This result is similar to that found in other studies conducted in pre-COVID-19 times, however, including ones by Gupta et al (2015),[3] Siraj et al (2013),[7] Supe et al (1998),[17] Ghosal et al (2018)[18] and Eva et al (2015).[19] Factors such as poor marks in examinations, the need to do well in examinations, large amounts of content to be learned, not understanding what to learn first, poor timetabling and unskilled teachers have been identified as being among the causes of this stress.

Academic stress was found to be significantly higher in second year medical students compared with those in the first year. Studies by other authors including Ghosal et al (2018),[18] Kumarswamy et al (1989),[20] Sathidevi et al (2017)[21] and Patil et al (2016)[22] show a similar result. Starting clinical postings, learning second and third year subjects simultaneously and the frequent number of examinations (at end of every clinical posting) are amongst the causes suggested in these studies.

After ARS, IRS was the second highest scoring stressor, with GARS third. These scores are moderate in first year students but significantly higher among second year students. The main reason for this is that students start their clinical postings at this time, which requires good communication skills to deal with patients, group activities and group learning to avoid conflicts with others. A similar result was found by Panchu et al (2017)[23] but in contrast, Ghosal et al (2018)[18] did not find second year medical students to be more highly stressed than first years.

CONCLUSION

The study participants recorded similar stress patterns to those recorded in earlier studies.[18–23] This suggests that COVID-19 did not significantly affect the stress levels of first and second year medical students but that medical training is inherently stressful. It should be noted, however, that the students enrolled in this study were not taking care of any COVID-19 patients in wards or attending to them in out-patient departments; scores may have been different for those more acutely impacted by the pandemic.

Moderate to high degrees of stress were found in all domains and the study revealed that among the study participants, second year students suffer from more stress than first years. The highest score, found for ARS in second year students, may be due to the large amount of study content during this period, as the students need to learn second year and third year subjects simultaneously at a time when they are also undertaking frequent examinations at the end of each clinical posting. IRS and GARS scores also suggest higher level stress in second year students. This may be due to starting clinical postings, which requires more group activities and interpersonal relationships.

Large amounts of content to be learned and frequent examinations are one of the main causes of academic related stress. We recommend reducing the number of examinations and introducing grading instead of marks at the end of clinical examinations to avoid the unnecessary stress of worrying over who will get the highest mark; in India, students' abilities are compared according to marks and a difference of just one mark is taken very seriously. If grading is introduced so that students will get grades instead of a total mark, a difference of 1–2 marks will not matter so much and should help to reduce stress. We also recommend creating a precise monthly teaching timetable and dividing content into most important, good to know and nice to know. This will be helpful in reducing the burden of study on students. To reduce IRS and GARS, training related to communication skills should be introduced.

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