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RESEARCH ARTICLE

COMPARISON OF STRESSORS AND COPING STRATEGIES IN MEDICAL STUDENTS BEFORE AND DURING COVID 19 PANDEMIC- AN INTERNET- BASED STUDY

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ABSTRACT

High level of stress associated with learning of students in medical schools has been reported widely. Pandemic has resulted on issues of quality of life and stress in whole mankind. Medical students with drastically changing the place of stay, livelihood and mode of medical training also faced such adversity. The present internet based study was planned to assess the various factors which might lead to stress and the coping strategies used during the early years of medical course before and during the Covid-19 Pandemic. The most common stressor was vastness of curriculum before COVID-19 and lack of motivation to studies was the most common stressor during COVID-19. Moreover, coping strategy adopted by medical students are also altered. Although most commonly used coping strategy before the COVID-19 was looking at positive side of life, during COVID-19 was spending time on social media. In addition, source of stress and coping strategy varied depending upon gender, space of stay and parent's profession. As compared to previous studies and before and during Covid 19 pandemic, sources of stress and coping strategies shifted towards lack of motivation in students and use of social media more frequently. Such shift may lead to dire consequences both on academic performance and addiction to social media. This information may be useful for educational planners, administrators of medical institutes, psychiatrists, guardians of medical students and medical students themselves.

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INTRODUCTION

Stress has been described as an imbalance of several conditions giving rise to a particular state of the body with an altered homeostatic mechanism.^[1]Optimal amount of stress might encourage some students to study better^[2]but excessive stress negatively affects the physical and mental health, social well-being, and academic performance.^[3]It has been seen that medical students are stressed more^[1, 4-6] than their peers despite having better academic career before coming to the medical school.^[7] Studies across the world showed that the life of a medical student is quite stressful because of the vastness of the curriculum, long study hours, difficult examinations, and various other psychosocial factors.^[8-11] Studies done on Indian medical students showed similar findings.^[12-17]The students usually develop some or other coping strategies to overcome these.^[9,11]As an effect of the COVID 19 Pandemic and its related lockdown, the whole population was subjected to social isolation, boredom, worries about contracting infection by themselves and family, depression due to quarantine, economic instability etc.,^[18, 19]medical students were not exempt of that. Moreover, the medical students had to undergo drastic changes related to their teaching –learning processes as the regular traditional

classes have been either stopped or replaced by online sessions in most of the institutions and it affected the regular clinical classes too. During the COVID 19 pandemic, reports and literature has been published regarding the increased stress among doctors and other health care providers.^[20-22]There is limited number of published literatures comparing if this pandemic enhanced the stress inducing factors in the medical students of pre- and para-clinical years from basic medical sciences who are yet to get involved actively in clinics. The primary objective of this study was to assess medical students' (of various institutions of India) perception about various factors which might have contributed in their stress level before and during the COVID 19pandemic. In addition, we wanted to compare the coping up strategies of medical students during the early years of medical course before and during the Covid-19 Pandemic. We tried to assess if the COVID19 Pandemic and variables like gender, parents' profession, location of residence, the year of medical training, staying at hostel and the duration of functioning of their medical college contributed significantly in perception of stressors and the coping strategies in Indian medical students.

METHODOLOGY

The study was an internet based cross sectional survey conducted on medical students at various Indian medical colleges during July,2020- October, 2020. The medical students enrolled in Bachelor of Medicine Bachelor of Surgery course (MBBS) of pre and paraclinical years (medical students of first to fifth semester), willing to participate in the study were included in this study. The study was approved by Institutional Ethics Committee. The Google form-based self-administered, pre-validated questionnaire was used and the questionnaire link was shared to the students of various medical colleges via their peers and teachers. The form was accessible via computer or smart phone. Forms were circulated via text messages to individually and in different groups. The questionnaire had an introduction section describing the purpose of the study and assuring anonymity and confidentiality of the participants. The informed consent of the participants was taken in the googles form. Before the actual study, a brief pilot study was performed on randomly selected 25 medical students. The questionnaire was prepared and adopted from previous studies by literature search and discussion with external experts^[9,27].

It had three parts-Part 1: Demographic data and personal information, part 2: question on the factors inducing stress in a 5-point Likert scale (1- no contribution to stress, 5- highest contribution to stress) before and during the Pandemic, part 3: question on coping up strategies before and during the Pandemic in a 5- point Likert scale (1- not done at all, 5- done always). The forms submitted partially filled or without consent were not included in the study. Operational definition of considering a medical college as new was "year of establishment of Medical College should be 2010 or later." For statistical analysis, data were entered into a Microsoft excel spreadsheet and then analyzed by IBM SPSS (version 22.0). Data are summarized as median and Interquartile Range for numerical variables and count and percentages for categorical variables. For ordinal values Wilcoxon Signed Rank Sum test was used. p-value of ≤ 0.05 was considered as statistically significant.

RESULTS

Basic demographics: A total of 254 students (139 females, 54.7%) filled the complete survey form online. Majority (46.9%) of them were first year students being admitted in the year 2019 in the medical school. More than half (56.7%) of the study participants were from the medical college started in last decade only. The profession of father of the respondents were as follows-doctor (11.0%), other profession (78.8%), and currently not working or retired (10.2%). The corresponding figures in the profession of mother were-7.9%, 51.2%, and 40.9%. With respect to their house location, 48% were residing in big cities, 35.1% in the suburban or small town and 16.9% in rural area or villages. Whereas 180 out of 254 students were residing in the hostel before the nationwide lockdown started, only 9 out of 254 were residing in the hostel after the national lockdown was announced.

Educational stressors: Factors related to studies and educational issues leading to probable stress in students were

explored. The stress due to vastness of syllabus, lack of scope of group discussion, lack of guidance from seniors, lack of motivation to study, disturbance in surroundings while study, attitude behavior of teaching faculty, performance in examinations, non-availability of adequate learning materials, difficulty in reading textbooks and technical issues related to classes increased significantly during COVID-19 days (Table 1). Lack of motivation to studies was the most common stressor during COVID-19. Before COVID-19, the most common stressor was vastness of curriculum (Figure 1).

Psychological stressors: Similarly, among the psychosocial factors leading to stress, lack of time for recreation, lack of entertainment avenues, adjustment at place of stay, sleeping difficulties, feeling of loneliness, expectations from society being a medical student, worry about health issues and apprehension about the future caused significantly more stress during COVID-19 days (Table 2). Apprehension about the future was the most common cause of stress during and after the COVID-19 (Figure 2).

Coping strategies: Students were asked about their adoption of those coping strategies both before and during COVID-19 days. Students were more willing to accept challenges before the pandemic struck. They were significantly spending more time in hobbies / recreation/ extracurricular activity, reading articles / blogs related to the health issues and spending more time in social media and were more self-blaming or blaming others during the COVID-19 pandemic (Table 3). Most common coping strategies during COVID-19 was spending time on social media. It was looking at positive side before the COVID-19 (Figure 3).

Relationship between stressors and coping strategies with other variables: Gender was significantly associated with the stressor, relations with opposite sex during and before COVID-19, with more males being affected. Significantly more male students were reading articles/ blogs related to the COVID-19 during pandemic. Gender was also significantly associated with these stressors, worry about health issues during and before COVID-19, competition with peers before COVID-19, and apprehensions about the future before COVID-19 with more females being affected. Significantly more female students were using spiritual dependence or prayer before COVID-19 as coping strategy. Profession of parents were significantly associated with non-availability of adequate learning materials during COVID-19, with more students whose father or mother was currently not working or retired experiencing significant stress. Profession of mother was significantly associated with these stressors during COVID-19, adjustment in place of stay and relations with opposite sex, with more students whose mother was doctor experiencing significant stress. The place of residence was significantly associated with these stressors during COVID-19, long study hours, difficulty in reading textbook and issues related to class during COVID-19, with more students whose residence was in small town experiencing significant stress. The students residing in the rural areas were experiencing more stress due to non-availability of adequate learning materials and the thought of journey back home during COVID-19 pandemic. Students from big town or city were using these coping strategies more significantly before COVID-19, acceptance of challenge and venting. Before COVID-19, students residing in the hostel were more stressed due to adjustment in place of stay.

Table 1. Education related factors contributing to the stress during and before the COVID-19

S. No.	Factors	Before COVID-19 Median (IQR)	During COVID-19 Median (IQR)	p value (Wilcoxon signed rank test)
1	Vastness of academic curriculum/syllabus	3 (2)	4 (1)	.000*
2	Long study hours	3 (2)	3 (2)	.147
3	Lack of scope of group discussion	2 (2)	3 (2)	.000*
4	Frequency of examinations	3 (2)	3 (2)	.297
5	Lack of guidance from seniors	2 (2)	2 (3)	.000*
6	Lack of motivation to study	3 (2)	4 (2)	.000*
7	Disturbance in surroundings while study	2 (2)	3 (2)	.000*
8	Attitude/ behavior of teaching faculty	2 (2)	2 (2)	.000*
9	Performance in examinations	3 (2)	3 (2)	.040*
10	Non-availability of adequate learning materials	2 (2)	3 (2)	.000*
11	Difficulty in reading textbooks	2 (2)	3 (2)	.000*
12	Technical issues related to classes	2 (2)	3 (2)	.000*

* Statistically significant

Table 2. Psychosocial factors contributing to the stress during and before the COVID-19

S. No.	Factors	Before COVID-19 Median (IQR)	During COVID-19 Median (IQR)	p value (Wilcoxon signed rank test)
1	Lack of time for recreation	2 (2)	2 (3)	.003*
2	Lack of entertainment	2 (2)	3 (2)	.000*
3	Adjustment at place of stay	2 (2)	2 (2)	.006*
4	Difficulty in the journey back home	1 (1)	1 (1)	.525
5	Sleeping difficulties	2 (2)	2 (3)	.001*
6	Competition with peers	2 (2)	2 (2)	.145
7	Feeling of loneliness	2 (2)	3 (2)	.000*
8	Relations with the opposite sex	1 (1)	1 (1)	.074
9	High parental expectations	2 (2)	2 (3)	.050
10	Becoming a doctor	3 (2)	3 (2)	.001*
11	Worry about health issues	2 (2)	3 (2)	.001*
12	Apprehension about the future	3 (2)	4 (3)	.000*

* Statistically significant

Table 3. Coping strategies to handle stress during and before the COVID-19

S. No.	Coping strategies	Before COVID-19 Median (IQR)	During COVID-19 Median (IQR)	p value (Wilcoxon signed rank test)
1	Acceptance of challenge	3 (1)	3 (1)	.000*
2	Trying to adjust	4 (2)	4 (1)	.592
3	Planning	4 (2)	3 (1)	.000*
4	Venting	3 (2)	3 (2)	.088
5	Looking at positive aspects	4 (2)	4 (1)	.103
6	Spending time in hobbies/ recreation/extracurricular activity	3 (2)	3 (1)	.007*
7	Reading articles/ blogs related to this issue	2 (3)	3 (2)	.000*
8	Spending time in social media	3 (1)	4 (2)	.000*
9	Self-blaming/ blaming others	3 (3)	3 (3)	.000*
10	Talking to counselors/Psychiatrist	1 (0)	1 (0)	.297
11	Alcohol/drug use	1 (0)	1 (0)	.249
12	Spiritual dependence	3 (3)	3 (2)	.260

* Statistically significant

Table 4. Factors causing significant stress in medical students

Factor	Before / During COVID -19 pandemic	Chi square statistic	p value
<i>A. Gender</i>			
Relations with opposite sex	Both before and during COVID - 19 pandemic	10.118 10.250	.038 .036
Worry about health issues	Both before and during COVID - 19 pandemic	18.604 10.975	.001 .027
Competition with peers	Before COVID - 19	10.839	.028
Apprehensions about the future	Before COVID-19	16.663	.002
<i>B. Profession of parents</i>			
Non-availability of adequate learning materials	During COVID-19	16.749	.033
<i>C. Profession of mother</i>			
Adjustment in place of stay	During COVID-19	16.826	.032
Relations with opposite sex	During COVID-19	19.114	.017
<i>D. Place of residence</i>			
Long study hours	During COVID-19	18.900	.015
Difficulty in reading textbook	During COVID-19	18.448	.018
Issues related to class	During COVID-19	17.726	.023
Non-availability of adequate learning materials	During COVID-19	24.475	.002
Thought of journey back home	During COVID-19	19.704	.012
<i>E. Residing in hostel before COVID-19</i>			
Lack of guidance from seniors	During COVID-19	10.381	.034
Non-availability of adequate learning materials	During COVID-19	11.062	.026
Difficulty in journey back home	During COVID-19	10.400	.034
Adjustment in place of stay	Before COVID-19	10.188	.037
<i>F. Seniority</i>			
Adjustment in place of stay	During COVID-19	22.518	.032
Competition with peers	During COVID-19	25.507	.013

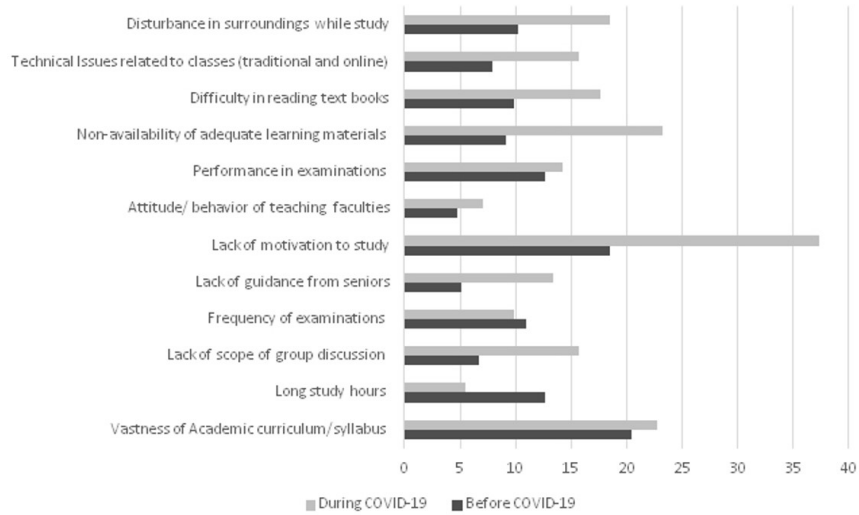


Figure 1. Factors related to studies contributing to stress

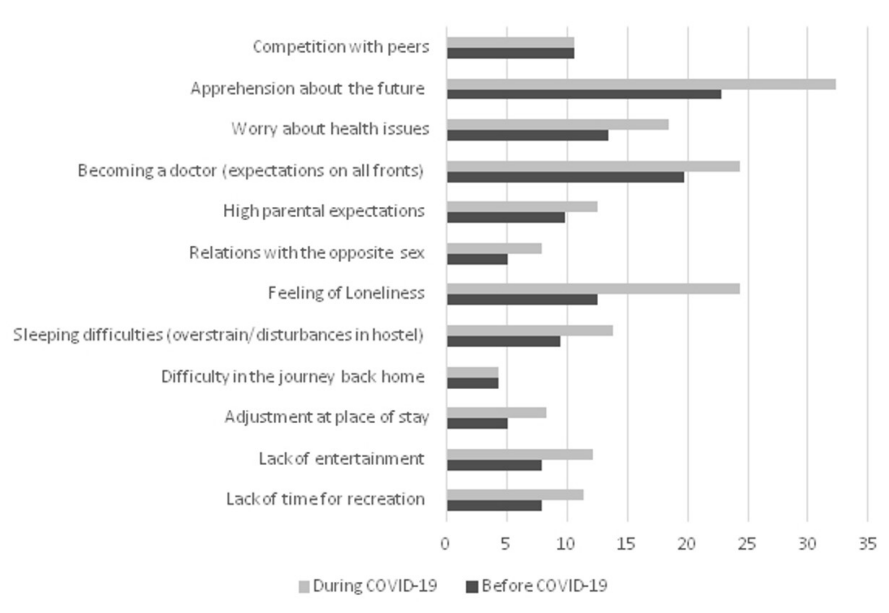


Figure 2. Psychosocial factors contributing to stress

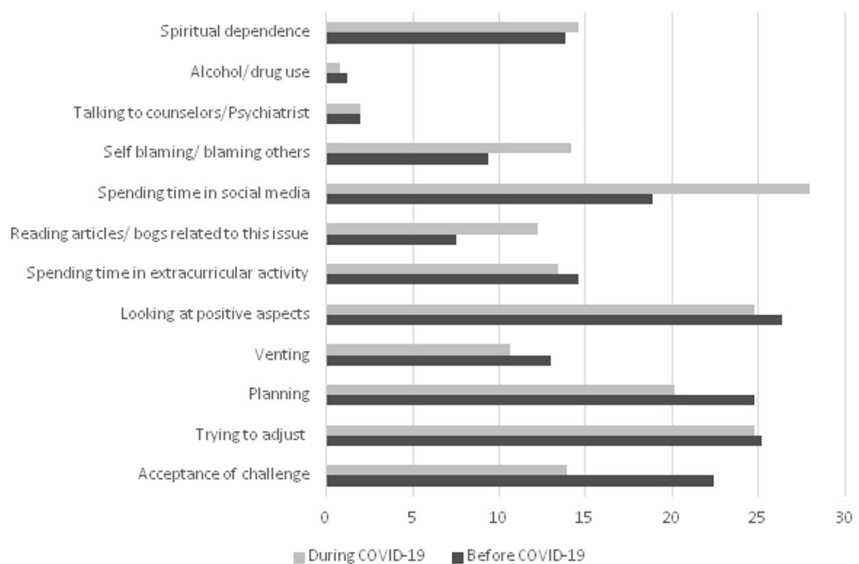


Figure 3. Most common coping strategies used by students

Significantly more senior students were having difficulty in adjustment in place of stay and competition with peers during COVID-19. They were either blaming themselves or others during COVID-19 to cope with the stress.

DISCUSSION

In present study the factors causing stress in medical students of pre and para clinical years across India before and during the COVID 19 Pandemic were compared. The coping strategies of the students before and during the Pandemic were also compared. The published literature has revealed that medical students have much higher level of stress due to several stressors.^[1,3-6,8,9,11-17,23] Academic stressors including vastness of curriculum, difficulty in time management, performance anxiety, difficult exams, lack of time for recreation etc. were the most common contributing factors^[9,11, 15, 17, 24] to cause stress in most of the studies whereas some studies emphasized on psychosocial and emotional factors including inter-personal relation, expectation from parents/all fronts as contributors to stress^[4, 9, 15, 25]. In a study conducted by Nechita F et al^[1], it was evident that stressors were multiple, which supported our study.

In the present study, among the perceived educational stressors (Table 1), the most common stressor was vastness of curriculum before the pandemic, whereas, the most common stressor during COVID 19 was lack of motivation to study (Figure 1). Among the **psychosocial stressors** leading to significantly more stress during COVID-19 days, (table 2), apprehension about the future was the most common cause of stress during and after the COVID-19 (Figure 2). The stress was detected most in first year medical students in some of the studies^[1, 5, 6], whereas, it was highest in transitional year from pre-clinical to clinical year or at the final year in some other studies.^[13] In the present study, significantly more senior students who were admitted in 2018 or earlier had difficulty in adjustment in place of stay and competition with peers during COVID-19. In some studies, it was seen that stress was perceived more by female medical students.^[13, 17, 26] In a study on medical students of Saudi Arabia^[27] showed that, the stress related to COVID 19 Pandemic was statistically significantly high in female students and in those who disliked the online mode of education. In the present study, significantly more male students were affected with the stressor, relations with opposite sex during and before COVID-19. More female students were significantly stressed by worry about health issues during and before COVID-19. Before COVID-19, competition with peers and apprehensions about the future were the stressors experienced by female students more.

In a study conducted on undergraduate medical students^[19], it was seen that the prevalence and levels of anxiety and stress was significantly increased during COVID 19 irrespective of gender, year of study, place of residence and family income though the level of depression was not much altered. In the present study, during COVID-19, the place of residence and profession of parents was significantly associated with stressors (Table 4). COVID 19 pandemic has affected connectivity from one place to another. Internet facility also is a major issue in pandemic era with online teaching.

Hence, the students residing in the rural areas experienced more stress due to non-availability of adequate learning materials and the thought of journey back home during COVID-19 pandemic. Those students who were residing in hostel before COVID-19 were more stressed due to lack of guidance from seniors, non-availability of adequate learning materials, difficulty in journey back home during COVID-19. As most students went back home from hostels, the comfort zone and the sharing of same material in the hostel was missed by the students. Most of the stressors were statistically significantly higher in contributing stress during COVID 19 period in comparison to before COVID era. The present study showed that the effect of most of the stressors statistically significantly increased during COVID-19 era. Perception of stress was variable in students depending on the year of study, gender, parents' profession, and place of stay. Most of these factors could happen while studying at home during COVID related lockdown period. In that uncertain situation, people were more stressed than usual which overall increased the perception of stressors. In a previous study, the most common coping strategies among medical students were planning, acceptance, positive reframing, and active coping which supported our findings.^[9] Another study^[8] revealed that recreational activities (sports, music, hanging out with friends), and sleeping were the common coping strategies.

A study during COVID, by Abdulghani et al, showed common coping strategies were doing regular exercise, watching online movies, playing online games, having online fun with family, religious activities, and accepting to live in a COVID scenario. It also found out religious meditation reduced COVID-related anxiety and stress.^[27] It supported our study finding that COVID Pandemic increased time spent in social media. In the present study, the coping strategies differed to some extent before and during the COVID era (Table 3). Although before the pandemic struck most common coping strategy was looking at the positive side, during the COVID-19 era, the most used strategy was spending time on social media (Figure 3). Several factors not only affect the perception of stress, but the coping strategies also are detected to be used differently depending upon the seniority of students, gender, and place of residence before and during COVID-19 to cope with the stress. The present study was conducted across various medical colleges in India, so the opinion of students from various parts of India was gathered rather than students of a single institution. Moreover, it directly compared the factors causing stress before and during the Pandemic which was limited in published literature. This study may establish preliminary data, based on which in the future, a more detailed study with the recruitment of different subgroups of students could be planned across India. Since this was an internet-based study, the authenticity of respondents could not be verified. This study was conducted during COVID-19 pandemic, therefore, there may be chance of recall bias for questions related to pre COVID era.

CONCLUSION

The present study found that COVID-19 statistically significantly increased most of the stressors among medical students. The coping strategies did not differ much, but spending time online and on social media statistically significantly increased.

The such shift may lead to dreadful outcomes both in academic performance and addiction to social media. This information may be valuable not only for educational planners, administrators of medical institutes, psychiatrists, and guardians of medical students but also for medical students themselves. Preventive action may be taken against stress in medical students as the present study has found out that the COVID-19 pandemic has increased stress in them, in case any other pandemic break out in future.

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