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ORIGINAL ARTICLE

Post COVID-19 Stress and Anxiety Levels Among Undergraduates at a Tertiary Care Hospital, Pondicherry

Joe David Anton J,[1,*] Ramasamy R,[2] Manivarma R.K,[3] Karthick S,[4] and Sabaresh Pandiyan[5]

[1]*Associate Professor, Department of Forensic Medicine and Toxicology, Melmaruvathur Adhiparasakthi Institute of Medical Sciences and Research (MAPIMS), Tamilnadu*
[2]*Associate Professor, Department of Forensic Medicine and Toxicology, Vels Medical College and Hospital, VISTAS, Tamilnadu, India.*
[3]*Post Graduate, Department of Forensic Medicine and Toxicology, Melmaruvathur Adhiparasakthi Institute of Medical Sciences and Research (MAPIMS), Tamilnadu*
[4]*Associate Professor, Department of Psychiatry, Mahatma Gandhi Medical College and Research Institute (MGMCRI), Puducherry*
[5]*Assistant Professor, Department of Psychiatry, Mahatma Gandhi Medical College and Research Institute (MGMCRI), Puducherry*

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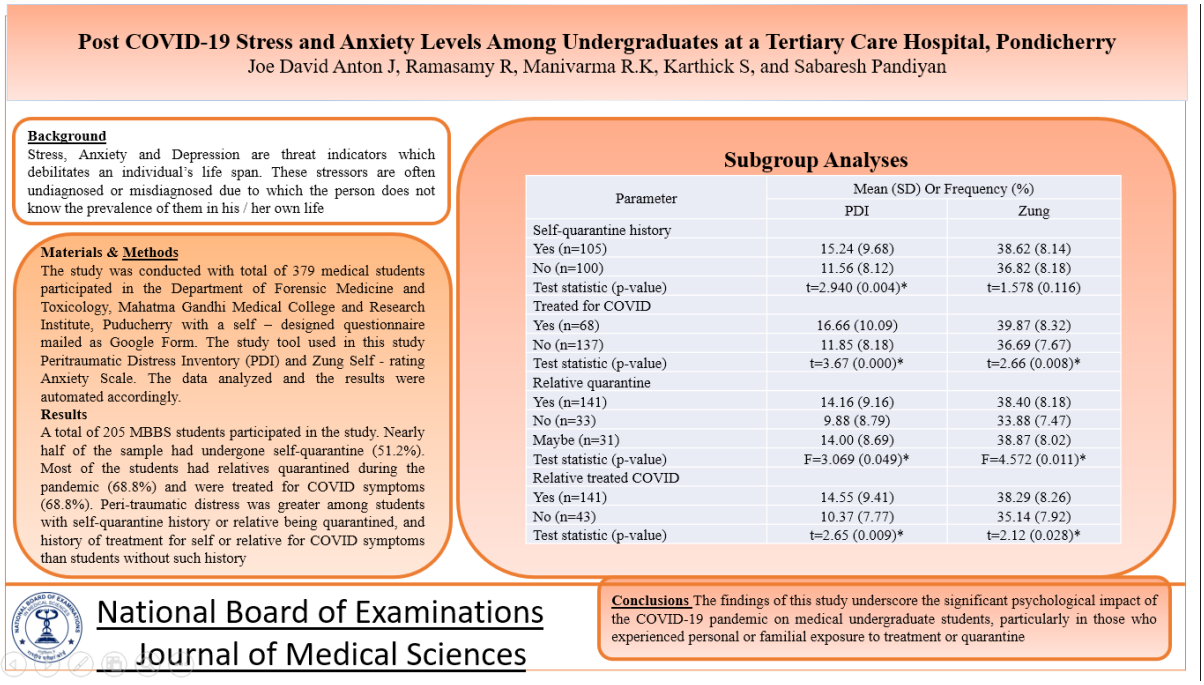
Abstract

Background: Stress, Anxiety and Depression are threat indicators which debilitates an individual's life span. These stressors are often undiagnosed or misdiagnosed due to which the person does not know the prevalence of them in his / her own life. **Materials & Methods:** The study was conducted with total of 379 medical students participated in the Department of Forensic Medicine and Toxicology, Mahatma Gandhi Medical College and Research Institute, Puducherry with a self – designed questionnaire mailed as Google Form. The study tool used in this study Peritraumatic Distress Inventory (PDI) and Zung Self - rating Anxiety Scale. The data analyzed and the results were automated accordingly. **Results:** A total of 205 MBBS students participated in the study. Nearly half of the sample had undergone self-quarantine (51.2%). Most of the students had relatives quarantined during the pandemic (68.8%) and were treated for COVID symptoms (68.8%). Peri-traumatic distress was greater among students with self-quarantine history or relative being quarantined, and history of treatment for self or relative for COVID symptoms than students without such history. **Conclusion:** The findings of this study underscore the significant psychological impact of the COVID-19 pandemic on medical undergraduate students, particularly in those who experienced personal or familial exposure to treatment or quarantine.

Keywords: Stress; Anxiety; Pandemic; Mental Health; Depression; Psychological

*Corresponding Author: Joe David Anton J
Email: joedavidanton@yahoo.com

Graphical Abstract



Background

Stressors have become a part of day-to-day lifestyle. The most common is the academic stress. The extent of the stress is directly proportion to a student's performance and health [1]. Research professionals stated, medical education is considered to be more stressful with the highest degree of psychological morbidity [2-7]. With varying stressor's each day and continuous stress responses, the effect of coping mechanisms by an individual are in doubt [8].

These stressors and stress responses creates an imbalance during adolescence, thus affecting the academic, personnel and social life [9]. Failure is adaptation to the environment leads to increased stressors, causing the student to engage in violent activities [10] as a result the students become law breakers at a very young age. This hinders the student to achieve the goals and objectives set by the NMC to be a competent medical profession [10].

Stress, Depression and Anxiety were terms confined to mental illness in old age reported by patients in psychiatric department, but in recent past, it prevails in all ages. Recent statistics on % of Stress, Depression and Anxiety globally and India increased within 5 years. Though some stressors are considered to be unfavorable (inhibition and suppression) for medical students, some are seen to be favorable (promotion and facilitation) in the process of medical education [11]. The process of managing stress and anxiety levels by a medical undergraduate, depends upon how he / she, perceives, responds and copes the stressors.

COVID 19 has surpassed its predecessors from its start in becoming a global threat [12]. The recent pandemic has placed a greater impact on the society by installing fear in everyone's mind. The pandemic (COVID'19) lockdown has made the medical profession to face a new dimension in terms of education and health of the students and the people. Fear has

escalated the stressors affecting the adolescence in their professional carrier each day.[8]

Considering to be a post pandemic (COVID'19) phase, with the rejoining of medical students, this study is conducted to assess the stress and anxiety levels currently experienced by the medical students post lockdown.

Aim and Objectives

- To estimate the burden of post-pandemic distress among medical undergraduate students.
- To estimate the burden of post-pandemic anxiety among medical undergraduate students.
- To identify the psychosocial factors contributing to post-pandemic distress and anxiety among medical undergraduate students.

Materials and Methods

The Institutional Ethical Committee clearance was obtained from the study centre's human ethics committee. The present study was conducted with Medical Students of Health Care Profession by the department of Forensic Medicine and Toxicology in collaboration with department of Psychiatry. It was a hospital-based cross-sectional study with convenient sampling method of 350 study participants (Male – 209 and Female – 141).

Based on the inclusion criteria, undergraduate medical, who were above 18 years, males and females, who were willing to participate were selected. Students who are not willing to participate were excluded. The purpose of the study was informed to the study participants and their participation was approved after receiving the written informed consent. Google Form questionnaire regarding the study was prepared and emailed to the study participants. The filled in answers were requested to send back on said date and time for evaluation.

Study Tool

The study tools used in the study are as follows. 1) Peritraumatic Distress Inventory (PDI) [13] is used for the variable Pandemic-associated distress with 13 items which are self reported and the rating scales are 0 – Not at All True; 1 – Slightly True; 2 – Somewhat True; 3 – Very True and 4 – Extremely True. 2) Zung Self - rating Anxiety Scale [14] used for the variable Anxiety with 20 items which are self reported and the rating scales are 0 – None or a little of the time; 1 – Some of the time; 2 – Good part of the time and 3 – Most or all of the time.

Statistical Analyses

The distribution of continuous variables was depicted using means and standard deviation, and that of categorical variables using frequency and percentages. Subgroup analyses were done within the sample based on gender, domicile, living with parents, quarantine history of self or relative, COVID-treatment history for self or relative, and exposure to social media. Comparison of means of normally distributed continuous variables was done using independent sample t-test and One-way ANOVA. The differences between categorical variables were computed using the Chi-Square test. Data analysis was performed using Statistical Package for Social Sciences (SPSS for Windows, Version 17.0). Statistical significance was set at $p \leq 0.05$.

Results

Socio-demographic, Family, and COVID characteristics

A total of 205 MBBS students participated in the study. Nearly half of the sample were females (52.2%), with majority of the sample hailed from urban domicile (82.4%) and belonged to nuclear families (73.2%). During the pandemic period, a significant majority of the students reported that they lived with parents (94.6%) and had steady income (92.7%). Nearly half of the sample had undergone self-quarantine (51.2%) and revealed that they had not required any treatment for COVID symptoms (66.8%). Most of the students had relatives quarantined during the pandemic (68.8%) and were treated for COVID symptoms (68.8%). Social media (37.6%) was the major source of information regarding COVID during the pandemic (Table 1).

Table 1. Socio-demographic, Family and COVID characteristics of the study sample (N=205)

Parameter	Mean (± SD) Or Frequency (%)
Age (in years)	19.91 (± 1.12)
Gender	
Male	98 (47.8%)
Female	107 (52.2%)
Domicile	
Rural	36 (17.6%)
Urban	169 (82.4%)
Family type	
Nuclear	150 (73.2%)
Joint	43 (21%)
Three generation	12 (5.9%)
Living with parents	
Yes	194 (94.6%)
No	11 (5.4%)
Steady income	
Yes	190 (92.7%)
No	15 (7.3%)
Self-quarantine history	
Yes	105 (51.2%)
No	100 (48.8%)
Treated for COVID	
Yes	68 (33.2%)
No	137 (66.8%)
Relative quarantine	
Yes	141 (68.8%)
No	33 (16.1%)
Maybe	31 (15.1%)

Relative treated COVID	
Yes	141 (68.8%)
No	43 (21%)
Maybe	21 (10.2%)
COVID source information	
Social media	77 (37.6%)
Internet	65 (31.7%)
TV	52 (25.4%)
Print media	3 (1.5%)
Others	8 (3.9%)
PDI Total	13.44 (±9.12)
ZungSelf-rated anxiety scale	37.74 (±8.19)

Subgroup Analyses

The group of MBBS students (N=205) were divided into various subgroups to assess the influence of various socio-demographic and COVID-related characteristics on peri-traumatic distress and anxiety. The analyses revealed that peri-traumatic distress was greater among students with self-quarantine history or relative being quarantined, and history of treatment for self or relative for COVID symptoms than students without such history. Age and gender did not have any effect on peritraumatic distress and anxiety (Table 2).

Table 2. Subgroup Analyses

Parameter	Mean (SD) Or Frequency (%)	
	PDI	**Zung**
Self-quarantine history		
Yes (n=105)	15.24 (9.68)	38.62 (8.14)
No (n=100)	11.56 (8.12)	36.82 (8.18)
Test statistic (p-value)	t=2.940 (0.004)*	t=1.578 (0.116)
Treated for COVID		
Yes (n=68)	16.66 (10.09)	39.87 (8.32)
No (n=137)	11.85 (8.18)	36.69 (7.67)
Test statistic (p-value)	t=3.67 (0.000)*	t=2.66 (0.008)*
Relative quarantine		
Yes (n=141)	14.16 (9.16)	38.40 (8.18)
No (n=33)	9.88 (8.79)	33.88 (7.47)
Maybe (n=31)	14.00 (8.69)	38.87 (8.02)
Test statistic (p-value)	F=3.069 (0.049)*	F=4.572 (0.011)*
Relative treated COVID		
Yes (n=141)	14.55 (9.41)	38.29 (8.26)
No (n=43)	10.37 (7.77)	35.14 (7.92)
Test statistic (p-value)	t=2.65 (0.009)*	t=2.12 (0.028)*

Discussion

Stress, anxiety and depression among medical students have been reported across the globe. It has been observed that stress levels in preclinical medical students vary widely depending on the context, ranging from 20.9% to over 90% [15]. Various factors such as the academic curriculum, high expectation of the parents, teachers and patients along with time constraints for exploring personal interests have been the most common causes for the psychological morbidity [16]. Meanwhile during COVID 19 pandemic, review of various studies has shown that even in general population, the prevalence of depression was around 20%, anxiety 35%, stress 53%, which was relatively higher [17]. It was also seen that younger age-groups were particularly more vulnerable during COVID 19 reporting greater stress, anxiety and distress compared to middle and older age groups due to loneliness, financial distress and poor resilience [18]. While COVID 19 pandemic led to significant changes in the medical education, including curricular restructuring, examination modifications, and shifts to online learning, all of which likely impacted medical students' health. Given that medical students already experience higher stress levels than general population, the pandemic exacerbated this issue [19]. Various studies have observed that the increase in stress levels among medical students specifically during COVID 19 was due to abrupt academic changes [20], anxiety related to asymptomatic transmission in the community [21].

The present study was done to assess the presence of stress and anxiety among medical undergraduate students during COVID 19 particularly in those who themselves or their close family members were treated or quarantined in view of COVID 19 and the role of psychosocial factors related to the same. The findings indicate that distress levels were notably higher among students who were quarantined or treated for COVID-19 or had relatives undergoing quarantine or treatment. Additionally, anxiety levels were observed to be elevated in students when they themselves were treated for COVID-19 or when their relatives were quarantined or treated.

These findings also align with recent study by Son et al. 2020 [22], which highlighted in 71 % of the students had increase in depressive thoughts, stress and anxiety levels, the most significant effects of the pandemic identified were concerns about personal health and the health of loved ones, followed by problems in concentration, sleep disturbances and decrease in social interaction due to social distancing and concerns about their academic performance. Difficulty concentrating, frequently reported by participants, has been previously linked to reduced self-confidence in students, a factor known to correlate with heightened stress and adverse mental health outcomes. In contrast, review by Lasheras et al. (2020) [23] suggested that anxiety levels among medical students did not rise significantly during the pandemic, possibly due to resilience, effective coping mechanisms, reduced academic pressures, and supportive family environments. So, the impact of COVID-19 pandemic on the prevalence of anxiety and depression remains a debated issue. The extend of psychological distress would depend on an individual's adaptive or maladaptive coping strategy [24]. In our current study, the coping strategies of students has not

been evaluated, but it is observed that medical students who engage in active coping strategies, such as planning and accepting reality, tend to achieve more favourable outcomes compared to those who rely on avoidance based approaches like denial, disengagement or substance use [25]. In short, adaptive coping methods supports better mental health, whereas maladaptive strategies are associated with a higher risk of depression in young adults. Individuals employ various coping mechanisms when faced with challenging situations, and medical students, often unprepared for such demands, may find stress management particularly difficult. Previous studies also highlight the critical role of coping strategies in managing stress, particularly when supported by social factors such as family support and emotional resilience [26]. This would explain the increased levels of anxiety and distress observed in the current student population may, in part, be attributed to disruptions in these supportive factors.

Conclusion

The findings of this study underscore the significant psychological impact of the COVID-19 pandemic on medical undergraduate students, particularly in those who experienced personal or familial exposure to treatment or quarantine. Elevated levels of stress and anxiety were notably prevalent, consistent with global trends observed during the pandemic. Key contributors include concerns about personal and familial health, academic disruptions, and decreased social interactions, all compounded by pre-existing stressors inherent to medical education.

Statements and Declarations

Conflicts of interest

The authors declare that they do not have conflict of interest.

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References

1. Michaela C. Pascoe, Sarah E. Hetrick & Alexandra G. Parker (2020) The impact of stress on students in secondary school and higher education, International Journal of Adolescence and Youth, 25:1, 104-112, DOI: 10.1080/02673843.2019.1596823
2. M. Aktekin, T. Karaman, Y. Y. Senol, S. Erdem, H. Erengin, and M. Akaydin, “Anxiety, depression and stressful life events among medical students: a prospective study in Antalya, Turkey,” Medical Education, vol. 35, no. 1, pp. 12–17, 2001.
3. H. Abdulghani, “Stress and depression among medical students: a cross sectional study at a medical college in Saudi Arabia,” Pak J Med Sci, vol. 24, pp. 12–17, 2008.
4. S. Stewart, T. Lam, C. Betson, C. Wong, and A. Wong, “A prospective analysis of stress and academic performance in the first two years of medical school,” Medical Education, vol. 33, no. 4, pp. 243–250, 1999.
5. L. N. Dyrbye, M. R. &omas, and T. D. Shanafelt, “Systematic review of depression, anxiety, and other indicators of psychological distress among U.S. And Canadian medical students,” Academic Medicine, vol. 81, no. 4, pp. 354–373, 2006.

6. Eller T, Aluoja A, Vasar V, Veldi M. Symptoms of anxiety and depression in Estonian medical students with sleep problems. Depress Anxiety 2006;23:250-6.
7. Shah M, Hasan S, Malik S, Sreeramareddy CT. Perceived stress, sources and severity of stress among medical undergraduates in a Pakistani medical school. BMC Med Educ 2010;10:2.
8. Neil Schneiderman, Gail Ironson, and Scott D. Siegel (2005) STRESS AND HEALTH: Psychological, Behavioral, and Biological, Published in final edited form as: Annu Rev Clin Psychol. 2005 ; 1: 607–628. doi:10.1146/annurev.clinpsy.1.102803.144141.
9. Kumar KS, Akoijam BS. Depression, anxiety and stress among higher secondary school students of Imphal, Manipur. Indian J Community Med 2017;42:94-6.
10. Leta Melaku, Guta Bulcha, and Deressa Worku (2021) Stress, Anxiety, and Depression among Medical Undergraduate Students and Their Coping Strategies, Education Research International, Volume 2021, Article ID 9880309, 13 pages, https://doi.org/10.1155/2021/9880309
11. Linn, B. S. & Zeppa, R. Stress in junior medical students: relationship to personality and performance. J Med Educ, 1984; 59(1): 7-12.
12. Nader Salari, Amin Hosseinian-Far, Rostam Jalali, Aliakbar Vaisi-Raygani, Shna Rasoulpoor, Masoud Mohammadi, Shabnam Rasoulpoor and Behnam Khaledi-Paveh (2020) Prevalence of stress, anxiety, depression among the general population during the COVID-19 pandemic: a systematic review and meta-analysis, Salari et al. Globalization and Health (2020) 16:57, https://doi.org/10.1186/s12992-020-00589
13. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5879025/#:~:text=1%20Peritraumatic%20Distress%20Inventory,shortly%20after%20a%20traumatic%20event.
14. https://www.centrahealth.com/sites/default/files/documents/zung_self-rating_anxiety_scale.pdf
15. Fares J, Al Tabosh H, Saadeddin Z, El Mouhayyar C, Aridi H. Stress, burnout and coping strategies in preclinical medical students. North American journal of medical sciences. 2016 ;8:75.
16. Sarkar S, Gupta R, Menon V. A systematic review of depression, anxiety, and stress among medical students in India. Journal of Mental Health and Human Behaviour. 2017;22:88-96.
17. Lakhan R, Agrawal A, Sharma M. Prevalence of depression, anxiety, and stress during COVID-19 pandemic. Journal of neurosciences in rural practice. 2020;11:519.
18. Varma P, Junge M, Meaklim H, Jackson ML. Younger people are more vulnerable to stress, anxiety and depression during COVID-19 pandemic: A global cross-sectional survey. Progress in Neuro-Psychopharmacology and Biological Psychiatry. 2021;109:110236.
19. Loda T, Löffler T, Erschens R, Zipfel S, Herrmann-Werner A. Medical education in times of

COVID-19: German students' expectations–A cross-sectional study. Plos one. 2020 ;15:e0241660.
20. O'Byrne L, Gavin B, Adamis D, Lim YX, McNicholas F. Levels of stress in medical students due to COVID-19. Journal of medical ethics. 2021;47:383-8.
21. Lee CM, Juarez M, Rae G, Jones L, Rodriguez RM, Davis JA, Boysen-Osborn M, Kashima KJ, Krane NK, Kman N, Langsfeld JM. Anxiety, PTSD, and stressors in medical students during the initial peak of the COVID-19 pandemic. PLoS One. 2021;16:e0255013.
22. Son C, Hegde S, Smith A, Wang X, Sasangohar F. Effects of COVID-19 on college students' mental health in the United States: Interview survey study. Journal of medical internet research. 2020;22:e21279.
23. Lasheras I, Gracia-García P, Lipnicki DM, Bueno-Notivol J, López-Antón R, de La Cámara C, Lobo A, Santabárbara J. Prevalence of anxiety in medical students during the COVID-19 pandemic: a rapid systematic review with meta-analysis. International journal of environmental research and public health. 2020;17:6603.
24. Avila-Carrasco L, Díaz-Avila DL, Reyes-López A, Monarrez-Espino J, Garza-Veloz I, Velasco-Elizondo P, Vázquez-Reyes S, Mauricio-González A, Solís-Galván JA, Martinez-Fierro ML. Anxiety, depression, and academic stress among medical students during the COVID-19 pandemic. Frontiers in Psychology. 2023;13:1066673.
25. Abouammoh N, Irfan F, AlFaris E. Stress coping strategies among medical students and trainees in Saudi Arabia: a qualitative study. BMC medical education. 2020;20:1-8.
26. Abdulghani HM, Sattar K, Ahmad T, Akram A. Association of COVID-19 pandemic with undergraduate medical students' perceived stress and coping. Psychology research and behavior management. 2020:871-81.