

BURNOUT AMONG MEDICAL STUDENTS AND CORRELATION WITH ACADEMIC PERFORMANCE, SLEEP QUALITY DURING COVID19 PANDEMIC ONLINE CLASS IN ERODE DISTRICT

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Abstract

Medical students have found distance learning to be a difficult challenge as a result of the coronavirus disease 2019 (COVID-19) pandemic. This study investigated the correlation between academic performance, sleep quality, and burnout among Medical students who participated in distance learning during the COVID-19 pandemic. The study included 154 Medical students at Government Erode Medical College in Tamilnadu, data were collected in June 2021. The survey was conducted using a Google Forms containing informed consent along with Demographic Details, self-rated sleep quality, academic performance, and The Maslach Burnout Inventory-Student Survey burnout questionnaire. Correlation between academic performances, sleep quality, Emotional Exhaustion, Cynicism, and Academic Efficacy was analyzed using Karl Pearson correlation method. 18% of students experienced severe burnout during distance learning. 60% of students don't like online classes. More than 60 % internal mark scored students ($P=0.02$) are having significantly high Academic Efficacy Scores. Cronbach's Alpha is 0.7498. Distance learning was reported a significant negative impact on their academic performance. To develop a favourable learning environment for medical students, medical instructors should consider creative learning methodologies.

Keywords: *Distance learning*¹; *COVID-19*²; *Medical students*³; *Burnout*⁴; *Sleep quality*⁵; *academic performance*⁶

Introduction

Burnout is a well-recognized phenomenon that may manifest with feelings of stress, fatigue, or exhaustion. It is a common and emerging problem among healthcare workers. Medical students may be at increased risk of burnout given the rigorous nature of their training. However, there is a paucity of data on the burden of burnout among medical students during online distance education during Covid 19 pandemic.

Medical schools are known to be a stressful environment that often leads to a negative effect on the students' academic performance and physical and psychological health¹. Burnout is an increasingly recognised problem among medical professionals². Previous studies in medical students found 14.8–79.9% of them experience burnout during their medical training³. Its prevalence has been found to increase with medical school academic progression⁴.

However, clinical training has been cancelled, postponed, or transferred to online activities for students' safety in the context of the COVID-19 pandemic⁵.

Tight class schedules, assignments, and practice sessions are burdensome to students, independently of the pandemic-induced shift to online learning. Medical students are at high risk of depression and suicidal ideation⁶. Current literature supports a strong link between burnout in medical students and increased suicidality. Cross-sectional data from seven medical schools showed that students experiencing burnout are up to 3 times more likely to have considered suicide in the past⁷.

During the unprecedented era of the COVID-19 pandemic, the majority of countries worldwide have adopted very strong measures. Universities closed their doors, and education continued through digital learning lectures. Lockdown, quarantine measures, and social distancing have already had detrimental effects on the mental health of people as symptoms of depression, anxiety, and stress have dramatically increased⁸.

The aim of this ecological study was to investigate what the impact was of digital learning, which was implemented because of the COVID-19

pandemic, on the burnout and sleep quality of medical students at Government Erode Medical College.

Objectives:

1. To study the prevalence burnout among Medical students during Covid 19 pandemic online digital classes.

2. To investigated the correlation between academic performance, sleep quality, and burnout among Medical students who participated in distance learning during the COVID-19 pandemic.

Methods:

Study Design:

An online descriptive cross-sectional study was conducted June 2021, using a Google form.

Study Setting:

The study was carried out at Government Erode Medical College and Hospital (GEMC), Perundurai, Erode.

Study Sample:

Undergraduate MBBS students from first to final years were surveyed using in the official WhatsApp groups of the respective class years and voluntarily consenting to take part in the study. Students were recruited into the study through class representatives. The survey tool was then disseminated through class official WhatsApp groups. The 154 Medical students responded to questionnaire.

This research was approved by the Institutional ethical committee, GEMC. Participation was voluntary and written informed consent was obtained before filling the questionnaire.

Measurements:

The Maslach Burnout Inventory-Student Survey (MBI-SS) was used to measure burnout. The 16-item MBI-SS is a validated tool used to measure burnout in student populations⁹. The MBI-SS (Mind Garden Inc., Menlo Park, CA) consists of three subscales to evaluate the different domains of burnout: emotional exhaustion (EE) (i.e. the draining of emotional resources because of demanding interpersonal contacts with others),

cynicism (CY) (i.e. negative, callous, and cynical attitude towards the recipients of one's care or services), and academic efficacy (AE) (i.e. tendency to evaluate one's accomplishments with recipients negatively)¹⁰. Responses are provided on a 7-point Likert scale with higher values referencing more frequent occurrences. High scores on emotional exhaustion, cynicism, and low scores on academic efficacy are indicative of burnout (academic efficacy items are reverse scored so that low scores indicate low academic efficacy and thus a higher burnout). Elevated scores for emotional exhaustion and cynicism and low scores for academic efficacy indicate high levels of burnout. The three-dimensional criteria (high scores for emotional exhaustion and cynicism and low scores for academic efficacy) were used as the criteria for the diagnosis of burnout. Item 13 was deleted from the MBI-SS based on prior investigations finding it to be ambivalent and unsound¹¹.

The academic performance was measured using the students' average marks as expressed in their internal assessment. It is expressed on a scale from 0 (minimum) to 10 (maximum). The system is widely used and is one of the most stable indicators of academic performance¹². Similarly self-rated sleep quality expressed on scale from 1 (very poor) to 5 (very good sleep).

Data analysis:

All data was exported from Google Survey to Excel v365 (Microsoft Corporation, Redmond, WA). All analyses were performed using SPSS v25 (IBM Corporation, Armonk, NY). Descriptive summary statistics were calculated for all student demographics. Normality of data was evaluated using the Shapiro-Wilk test. A P-value less than 0.05 was considered significant.

MBI-SS score calculation:

Reverse scoring for the MBI-SS was performed as previously described. MBI-SS scores were calculated using each method to determine if self-perceived burnout differed using the Student's t-test for independent groups.

Internal consistency of MBI-SS using Cronbach's alpha:

Cronbach's alpha was used to calculate internal consistency of all MBI-SS items and subscales. Reliability scores of ≥ 0.5 were considered acceptable with higher scores indicating greater internal consistency¹³.

Multiple regression of MBI-SS:

The association between demographic factors, Average percentage of Internal Marks scored, Sleep quality, liking of online class and MBI-SS scores were examined using a series of linear regression models.

Results:

The survey was completed by 154 out of 418 (36.8%) GEMC students. Response rates by student demographics are shown in Table 1. Most respondents were women (59%), with an average age of 19.79 ± 1.26 years. 60% of students don't like online classes. A total of 28 (18.2%) students are having burnout. Internal reliability (Cronbach's alpha) coefficients of the MBI-SS subscales were 0.799 for EE, 0.801 for AE, and 0.611 for CY (Table 4). Minimum acceptable value for reliability coefficient was 0.5 with values greater than 0.75 being preferable [26]. Statistical significance (P-value < 0.001) was identified between self-perceived burnout and non-burnout students in all MBI-SS items, in addition to the three subscales. Mean \pm SD for all MBI-SS items and subscale scores with reliability coefficients are listed in Table 2

Student demographics as predictors of burnout:

MBI-SS subscale scores were calculated for student demographics. High EE, CY, and AE subscale scores were assessed to determine the percent of student demographics affected by high levels of burnout, using one SD above the mean for EE and CY and one SD below the mean for AE as indicators of severe burnout. Significance was identified Sleep quality rating (P-value = 0.04), and Average percentage of Internal Marks scored (P-value = 0.05) (Table 3). No significance was noted for type of family (P-value = 0.20), Income (P-value = 0.85).

Multivariate analysis logistic regression identifies: 21-24 years students, good sleepers and more than 60% marks scored students are having more burnout than others.

Discussion

Burnout among GMC medical students was slightly less than reported other studies averages. During lockdown, the highest prevalence of burnout was noted in the 2nd to 4th year of medical studies, whereas during the pre-COVID-19, which is the year when clinical training begins. Student demographics: more than 20 years Age, above first year of study, poor sleep quality and high percentage mark scorer may be used to identify at-risk groups susceptible to burnout. With regard to emotional exhaustion students who have self-reported poor sleep quality reported significantly increased emotional exhaustion scores during the COVID-19 period. Similarly, >60 % internal mark scored students (P=0.02) are having significantly high Academic Efficacy Scores.

Our population was comprised of both preclinical and clinical year medical students who had differing levels of experience interacting with patients. Year of study was found to be associated with burnout. Additionally, the rate of burnout increased with year of medical Course study. These findings are similar to previous studies looking at the association between year in medical school and perceived burnout^{14,15}. We hypothesize that this association for year medical students is related to their clinical exposure and increasing work burden. During Covid 19 Pandemic lockdown online classes made them fatigue exhausted, unable to learn clinical concept from patient bedside leaning and also all the University exams are postponed.

The implementation of effective wellness initiatives may be sufficient for ameliorating burnout among medical students. We recommend burnout be longitudinally assessed once a year in all medical students to determine the effectiveness of wellness initiatives and make modifications as appropriate. Burnout is a deleterious issue that can negatively impact the healthcare community. Early identification and resolution of the phenomenon can help improve the health outcomes of patients receiving care from medical students and residents progressing through their education.

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Limitations:

The study had several limitations, which should be considered in future research. The study was conducted in only one medical college, further research should use a national approach

Conflict of interest:

No potential conflict of interest relevant to this article was reported.

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Table 1. shows the demographic information of medical students those who are participated in this study.

Demographic variables		Number of students	%
GENDER OF RESPONDENT	Male	63	40.91%
	Female	91	59.09%
Age of respondent	17 Years	2	1.30%
	18 Years	20	12.99%
	19 Years	45	29.22%
	20 Years	44	28.57%
	21 Years	32	20.78%
	22 Years	8	5.19%
	23 Years	1	0.65%
	24 Years	2	1.30%
Year of Study	First Year	93	60.39%
	Second Year	35	22.73%
	Third Year	16	10.39%
	Fourth Year	10	6.49%
Religion of Student	Hindu	129	83.77%
	Christian	15	9.74%
	Muslim	8	5.19%
	Others	2	1.30%
Type of family	Nuclear	128	83.12%
	Joint	26	16.88%
Place of Living	Rural	39	25.32%
	Semi-urban	56	36.36%
	Urban	59	38.31%
Monthly family income Rs:	Less than 10,000	14	9.09%
	11,000-20,000	17	11.04%
	21,000-40,000	37	24.03%
	41,000-60,000	40	25.97%
	61,000-75,000	14	9.09%
	76,000-90,000	11	7.14%
	More than 90,000	21	13.64%

Table 2. Medical student's burnout score.

	Burnout				Mean difference	Student independent t-test
	Non burnout		Burn out			
	Mean	SD	Mean	SD		
EE	20.48	6.07	9.71	5.37	10.74	t=8.05 p=0.001*** (S)
CY	16.60	4.65	9.04	3.79	7.56	t=9.14 p=0.001*** (S)
AE	29.25	5.27	16.89	8.99	12.36	t=7.01 p=0.001*** (S)

Table 3. Factors influencing for burnout score using Multivariate logistic regression.

		Reference variable	Burnout				n	OR(95%CI)	p-value
			Burn out		Non -Burn out				
			n	%	n	%			
Age	17-20 years	0	15	13.51%	96	86.49%	111	2.56(1.05-6.47)	0.02*
	21-24 years	1	13	30.23%	30	69.77%			
Year of Study	First Year	0	11	11.83%	82	88.17%	93	1.76(0.49-6.40)	0.36
	> First Year	1	17	27.87%	44	72.13%			
Type of family	Nuclear	0	21	16.41%	107	83.59%	128	1.73(0.56-5.31)	0.47
	Joint	1	7	26.92%	19	73.08%			
Place of Living	Rural	0	8	20.51%	31	79.49%	39	0.91(0.32-2.60)	0.70
	urban/semiurban	1	20	17.39%	95	82.61%			
Do you like online classes	No	0	16	17.39%	76	82.61%	92	0.95(0.39-2.33)	0.80
	Yes	1	12	19.35%	50	80.65%			
Sleep quality rating	Poor	0	6	8.82%	62	91.18%	68	2.98(1.09-8.18)	0.04*
	Good	1	22	25.58%	64	74.42%			
Average percentage of Internal Marks scored	<60% Marks	0	10	11.63%	76	88.37%	86	2.45(1.03-6.12)	0.05*
	>60% marks	1	18	26.47%	50	73.53%			

Table 4. Descriptive statistics of MBI-SS with internal consistency

	Burnout				Student independent t-test	Cronbach's Alpha
	Non burnout		Burn out			
	Mean	SD	Mean	SD		
Emotional Exhaustion 1Q	4.12	1.77	2.25	1.80	t=5.03 p=0.001***(S)	0.805
Emotional Exhaustion 2Q	4.44	1.67	1.89	1.40	t=8.40 p=0.001***(S)	0.847
Emotional Exhaustion 3Q	4.20	1.85	1.79	1.29	t=8.21 p=0.001***(S)	0.781
Emotional Exhaustion 4Q	3.69	1.68	1.96	1.40	t=5.67 p=0.001***(S)	0.799
Emotional Exhaustion 5Q	4.04	1.64	1.82	1.22	t=6.76 p=0.001***(S)	0.766
Cynicism 1Q	3.52	1.94	1.96	1.45	t=4.78 p=0.001***(S)	.602
Cynicism 2Q	3.91	1.84	2.32	1.85	t=4.14 p=0.001***(S)	.496
Cynicism 3Q	3.65	1.73	1.61	1.03	t=8.22 p=0.001***(S)	.571
Cynicism 4Q	5.52	1.37	3.14	1.96	t=6.09 p=0.001***(S)	.774
Academic Efficacy 1Q	4.79	1.59	3.00	2.07	t=4.30 p=0.001***(S)	.793
Academic Efficacy 2Q	4.59	1.52	2.82	1.79	t=5.37 p=0.001***(S)	.791
Academic Efficacy 3Q	4.06	1.56	2.11	1.42	t=6.10 p=0.001***(S)	.865
Academic Efficacy 4Q	5.40	1.35	3.11	1.93	t=5.96 p=0.001***(S)	.778
Academic Efficacy 5Q	5.50	1.36	3.11	2.10	t=5.78 p=0.001***(S)	.786
Academic Efficacy 6Q	4.91	1.51	2.75	1.92	t=6.50 p=0.001***(S)	.793

Figure 1. Simple bar with 2 standard error bar diagram compares the gender wise age distribution of medical students

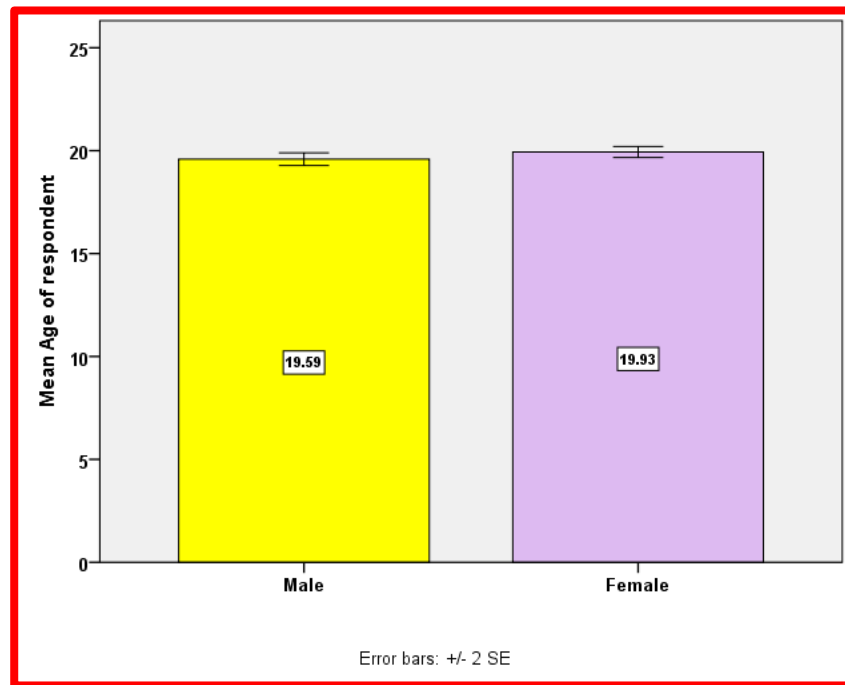


Figure2. Bar diagram compares percentage of burnout score between male and female students

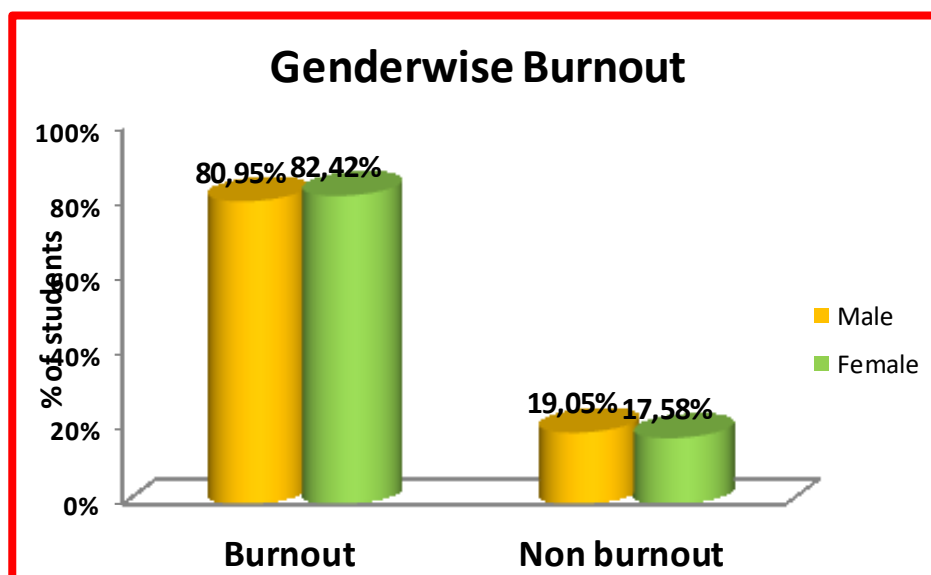


Figure3. Bar diagram compares percentage of burnout score between male and female students

