

Original Research Article

Unseen struggles in the white coat: predictors of stress among postgraduate medical students in India

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ABSTRACT

Background: Postgraduate medical training is highly demanding and often accompanied by psychosocial, academic, and workplace stressors. Understanding the predictors of stress in this group is essential to safeguard both trainee well-being and patient care. Objective was to assess the prevalence of perceived stress and its associated risk factors among postgraduate medical students in Lucknow, India.

Methods: A cross-sectional study was conducted from November 2019 to March 2020 among 205 postgraduate students (MD/MS) selected using multistage random sampling from government and private medical colleges. Perceived Stress was measured using the perceived stress scale-10 (PSS-10). Associated factors were assessed through structured questionnaires. Logistic regression was performed to identify independent predictors of stress.

Results: Overall, 91.2% of postgraduate students reported high perceived stress. Female students had significantly higher odds of stress (AOR 14.5). Residing in hostels (AOR 8.0), consuming alcohol (AOR 55.0), sleeping <8 hours/day (AOR 0.09), and perceiving the course curriculum as exhaustive (AOR 0.06) were significant predictors. Key stressors included excessive duty hours, lack of leisure time, academic pressure, harassment by faculty, and poor work environment.

Conclusions: Stress is alarmingly prevalent among postgraduate medical students in India, with female gender, hostel residence, alcohol consumption, inadequate sleep, and academic overload emerging as major predictors. Regular stress screening, enforcement of duty-hour limits, provision of mental health support, and promotion of positive coping strategies are urgently needed to protect trainee well-being and ensure safe medical practice.

Keywords: India, Mental health, Perceived stress, Postgraduate medical education, Predictors, Risk factors

INTRODUCTION

Stress is a state of an individual that results from the interaction with the surrounding environment that is perceived as threatening to the wellbeing. It is an external constraint which directly upsets the individual both mentally and physically.¹

Medical education promises a well-respected career, but brings along a lot of tough demands on aspiring students

which includes tight schedules and a vast course compacted in a short duration. This leads to an unenviable state of stress and anxiety among a lot of students.

A physically and emotionally demanding course can inadvertently lead to physical and psychological problems in students. Besides academic stressors, some students also face physical, social, emotional, and family problems which may affect their learning abilities and academic

performance. Prevalence of perceived stress was slightly higher (88.9%) among medical students than among nonmedical students (83.5%).²

Student's lifestyles play an important part in their wellbeing and ability to cope. Both constructive as well as harmful coping strategies are employed by the students. Spending time with friends, indulging in sports, music and social media are some of the common constructive coping strategies employed. The use of alcohol, cannabis and illicit drugs is reported to be on the increase among medical students which are negative coping strategies employed by them. Lifestyle changes like diminished leisure and recreational activity decreased physical activity and sleep deprivation has an impact on the emotional well-being of the medical student.³

The postgraduate junior residents play a crucial role in the medical care delivery of the multispecialty hospitals attached to the teaching medical colleges. Residents are often invariably assigned duties lasting for more than the prescribed 8 duty hours per day, which may impact the resident's quality of life and cause them to experience sleep disorders, family problems, and even psychiatric disorders. These stress symptoms may in turn negatively impact patient care and result in frequent medical errors and suboptimal care practices. Combined with other factors such as poor coordination between seniors and juniors, financial constraints and academic pressure faced at the workplace often affects their mental health and also has a profound impact while dealing with patients.

Few studies have assessed the perception of stress and its effect on mental health among students, and still fewer have been done on medical students, post graduate medical students are a further smaller niche. Taking into consideration of above factor this study was undertaken to assess the level of perceived stress and associated risk factors among postgraduate medical students.

METHODS

This cross-sectional study was done from November 2019 to March 2020 among post graduate medical students enrolled in degree courses of all branches (MD/MS). Sample size was calculated by stress prevalence rate of 86.0 percent, with a desired precision level of 5%, and non-response rate of 10%.²

Employing finite population correction, the sample size was determined to be 154, taking into account a total population of 781 postgraduate medical students in government medical colleges and 102 in private medical colleges. Application of population proportion sampling (PPS) for both government and private medical colleges yielded a final sample size of 205. Participants were recruited by using two stage random sampling.

During first stage of sampling a list of government and private colleges which were approved by the competent government authorities was prepared after thorough research on internet and websites of authorities and an institute was selected from each type of institute randomly. During second stage of sampling according to proportion of postgraduate medical students in each college, 181 postgraduate medical students from government medical college and 24 from private medical college selected randomly from each branch of MD/MS course by list of students obtained from institutes (using population proportionate sampling).

Post graduate medical students of all the three years, enrolled in degree courses of all branches (MD/MS), were included in the study. Students pursuing diploma courses and those not willing and consenting to participate in the study for their own reasons were excluded.

For data collection PSS-10 scale was used to assess the perceived stress and predesigned, pretested, self-administered, structured questionnaires were used for associated risk factor after taking written consent.

A pilot study was conducted to validate the PSS-10 scale and structured questionnaire and decided cut off of PSS-10 scale.

Ethical clearance was obtained from the institutional ethical committee before commencing of the study (Ref. code: 97th ECM II B-Thesis/P145).

The data obtained was coded, entered and analysed using the statistical software, Statistical Package for Social Sciences (SPSS version-26). Pearson's Chi square test was applied and p values have been quoted where applicable. Qualitative variables were presented in the form of frequency and percentages. Logistic regression analysis was done to find out various predictors of perceived stress.

RESULTS

Out of the total 205 participants, 118 (57.6%) were male, and 87 (42.4%) were female. On grouping the postgraduate medical students according to year of post-graduation, 78 (38.0%) were from 1st year, 64 (31.2%) from 2nd year and 63 (30.7%) from 3rd year. On grouping the postgraduate medical students according to age, <25 were 35 (17.1%), 25-30 years were 134 (65.4%) and >30 years were 36 (17.5%). Further distribution of study participant can be supplementary Table 1.

The prevalence of perceived stress among the postgraduate medical students was 91.2%. The distribution of perceived stress among government postgraduate medical students was 93.0 percent and 87.1 percent among private postgraduate medical students.

Table 1: Association of perceived stress with biosocial characteristics.

Biosocial characteristics		Perceived Stress		P value
		Present N (%)	Absent N (%)	
Age (in years)	<30	32 (88.8)	4 (11.2)	0.691
	>30	155 (91.7)	14 (8.3)	
Sex	Female	86 (96.9)	1 (1.1)	0.001
	Male	101 (85.6)	17 (14.4)	
Religion	Hindu	170 (90.4)	18 (9.6)	0.372
	Others	17 (100.0)	0 (0.0)	
Permanent residence	Urban	166 (91.7)	15 (8.3)	0.449
	Rural	21 (87.5)	3 (12.5)	
Current residence	Hostel	149 (93.7)	10 (6.3)	0.032
	Others	38 (82.2)	8 (17.8)	
Family income per month (₹)	<100000	129 (94.9)	7 (5.1)	0.017
	>100000	58 (84.1)	11 (15.9)	
Number of earning family members	1	47 (83.9)	9 (16.1)	0.048
	>1	140 (94.0)	9 (6.0)	
Satisfied with financial status	Very satisfied/satisfied	147 (89.1)	18 (10.9)	0.027
	Very unsatisfied/unsatisfied	40 (100.0)	0 (0.0)	
Satisfied with family life	Very satisfied/satisfied	139 (88.5)	18 (11.5)	0.008
	Very unsatisfied/unsatisfied	48 (100.0)	0 (0.0)	

Table 2: Association of perceived stress with work environment.

Work environment variables		Perceived stress		P value
		Present N (%)	Absent N (%)	
Branch	Clinical	127 (91.4)	12 (8.6)	0.551
	Non-clinical	60 (90.9)	6 (9.1)	
Extra work in the department other than prescribed work	Never	30 (71.4)	12 (28.6)	0.002
	Sometimes/always	157 (96.3)	6 (3.7)	
Difficulty in dealing with patients' relatives in death situation**	Never	11 (73.4)	4 (26.6)	0.041
	Sometimes/always	113 (91.1)	11 (8.9)	
Feel fear of assault/misbehaviour on duty by patients' relatives**	Never	11 (73.4)	4 (26.6)	0.009
	Sometimes/always	113 (91.1)	11 (8.9)	
Troubled by "uncalled for" demands of faculty	Never	100 (87.7)	14 (12.3)	<0.001
	Sometimes/always	91 (100.0)	0 (0.0)	
Troubled by "uncalled for" demands of seniors	Never	90 (84.1)	17 (15.9)	0.013
	Sometimes/always	96 (98.0)	2 (2.0)	
Duty off per week (hours)	Yes	72 (91.1)	7 (8.9)	0.974
	No	115 (91.3)	11 (8.7)	
Duty hours per week (hours)	≤48	85 (86.7)	13 (13.3)	0.006
	>48	102 (95.3)	5 (4.7)	
Extra duties apart from regular duties	Yes	138 (100.0)	0 (0.0)	0.001
	No	57 (85.1)	10 (4.9)	
Satisfied with work environment	Satisfied	89 (83.2)	18 (16.8)	<0.001
	Unsatisfied	98 (100.0)	0 (0.0)	
Emergency duty per week (hours)**	≤24	20 (57.1)	15 (42.9)	<0.001
	>24	104 (100.0)	0 (0.0)	

**Clinical duties (n=139).

Table 1 shows the association of perceived stress with biosocial characters in which female sex, and students residing in hostel, family income, no of earning family

members, and satisfaction level with financial condition, satisfaction with family condition were significantly associated with perceived stress.

Table 3: Association of perceived stress with lifestyle habits and addiction habits.

Lifestyle and addiction habits		Perceived Stress		P value
		Present N (%)	Absent N (%)	
Daily Leisure Activity	Yes	76 (80.9)	18 (19.1)	<0.001
	No	111 (100.0)	0 (0.0)	
Sleep Duration (hours per day)	< 8	177 (95.2)	9 (4.8)	<0.001
	> 8	10 (52.6)	9 (47.4)	
Perception of Sleep Duration	Adequate	97 (87.4)	14 (12.6)	0.029
	Not adequate	90 (95.7)	4 (4.3)	
Alcohol Consumption	Yes	96 (98.0)	2 (2.0)	0.001
	No	91 (85.0)	16 (15.0)	
Smoking Cigarette/Bidi	Yes	51 (100.0)	0 (0.0)	0.004
	No	136 (88.3)	18 (11.7)	
Chewing Tobacco/Khaini	Yes	28 (96.6)	1 (3.4)	0.241
	No	159 (90.3)	17 (9.7)	
Internet Addiction	Yes	44 (97.8)	1 (2.2)	0.045
	No	143 (89.4)	17 (10.6)	

Table 4: Multilogistic regression analysis of predictors for perceived stress among postgraduate medical students.

Predictors for perceived stress	Univariate analysis				Multivariate analysis			
	OR*	95% CI		P value	AOR**	95% CI		P value
		Lower limit	Upper limit			Lower limit	Upper limit	
Gender								
Female	14.48	1.89	11.01	0.010	-	-	-	-
Male	Reference							
Current residence								
Hostel	3.22	1.19	8.73	0.021	8.03	1.23	52.29	0.029
Others	Reference							
Number of earning family members								
>1	2.98	1.12	7.95	0.029	-	-	-	-
1	Reference							
Family income per month								
<1 lakh	0.29	0.11	0.78	0.014	-	-	-	-
>1 lakh	Reference							
Exhaustive course curriculum								
No	0.10	0.01	0.74	0.024	0.063	0.004	0.891	0.041
Yes	Reference							
Satisfied with academic performance								
No	0.06	0.01	0.46	0.007	-	-	-	-
Yes	Reference							
Duty hours per week (hours)								
<24	0.194	0.05	0.69	0.011	-	-	-	-
>24	Reference							
Sleep duration hours/day)								
>8	0.06	0.02	0.17	0.00	0.093	0.01	0.65	0.016
<8	Reference							
Alcohol consumption								
Yes	8.44	1.89	37.73	0.005	55.04	5.03	601.9	0.001
No	Reference							

Figure 1 shows distribution of perceived stress among postgraduate medical students.

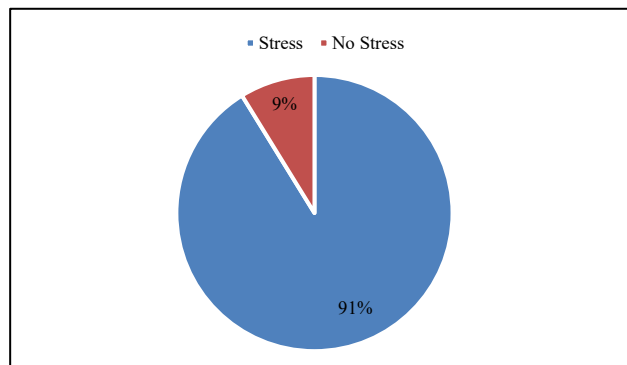


Figure 1: distribution of perceived stress among postgraduate medical students.

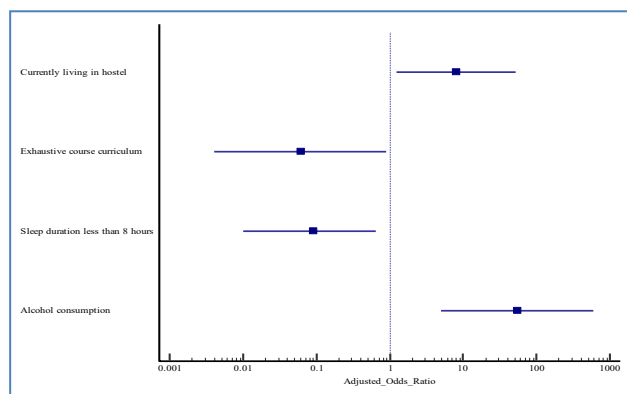


Figure 2: Predictors of perceived stress in postgraduate medical students.

Table 2 shows the association of perceived stress with academic characteristics and working environment

Table 3 shows the association of perceived stress with lifestyle habits and addictive habits in which absence of daily leisure activity, <8 hour sleep duration, not adequate perception of sleep duration, alcohol consumption, smoking cigarette/bidi, and internet smoking were significantly associated with perceived stress.

Table 4 shows that nine predictors for perceived stress among postgraduate medical students were found to be statistically significant ($p < 0.05$) in univariate analysis and out of them, four predictors were found to be statistically significant in multivariate analysis.

Figure 2 shows the predictors of perceived stress in postgraduate medical students.

DISCUSSION

In the present study, female postgraduate medical students exhibited higher perceived stress compared to their male counterparts, likely due to the additional

physical, familial, and societal responsibilities they face, especially in the Indian context. This added burden increases their overall stress levels.

Postgraduate medical students residing in hostels reported higher levels of perceived stress, which can be attributed to the lack of comfortable and personal space in hostel's environments. The absence of a familiar and private space can significantly contribute to feelings of stress.

The study found a significant association between perceived stress and biosocial characteristics such as family income, the number of earning family members, and satisfaction with financial and family life. Students from families with lower income, fewer earning members, or dissatisfaction with financial conditions and family life may experience higher stress levels due to added financial and emotional pressures. This finding is consistent with Seedhom et al, who also identified financial problems as a major stressor for postgraduate medical students.³

There was no significant association between perceived stress and whether students were in clinical or non-clinical branches, as both fields present unique challenges and stressors leading to similar levels of perceived stress. However, academic characteristics such as lack of time to review learned skills, an exhaustive course curriculum, pressures of thesis work, and concerns about future employment were significantly associated with perceived stress. The demanding nature of postgraduate medical education significantly contributes to stress, aligning with findings from Yousuf et al, and Rajan et al, who reported high levels of dissatisfaction with the academic environment among students.^{4,5}

The work environment also played a significant role in perceived stress. Extra work, difficult interactions with patients' relatives, fear of assault or misbehaviour by patients' relatives, long duty hours, and uncalled-for demands from faculty and seniors create a stressful work environment. The workload and working conditions are major contributors to stress, as noted by Rajan et al, who identified extra duties, non-conducive clinical training environments, and work overburden as significant stressors.⁵

Perceived stress was present in 57.1% of postgraduate medical students with less than 24 hours of emergency duty per week and in all students with more than 24 hours, a difference found to be highly significant ($p < 0.001$). Excessive duty hours, particularly more than 24 hours of emergency duty per week, lead to severe physical and mental exhaustion, significantly increasing stress levels. This finding aligns with Yousuf et al, who also reported high stress levels among students with extensive duty hours.⁴

Finally, students who slept less than 8 hours per day reported higher stress levels compared to those who slept

more than 8 hours, a finding that was statistically significant. Adequate sleep is essential for mental and physical health, and students experiencing sleep deprivation are more likely to experience stress. This finding is supported by Sahasrabuddhe et al, Joshi et al, and Guruprakash, Mehta et al, who reported high stress levels associated with insufficient sleep and shifting sleep timings.⁶⁻⁸

This study's cross-sectional design limits causal inferences and generalizability beyond the specific region and timeframe. Self-reported data may introduce response biases.

CONCLUSION

To conclude, it has been found that postgraduate medical students have higher level of perceived stress. And main stressors were less personal time, long working hours with no adequate breaks, no time for academic work, harassment by the faculty, high patient load, critical patients assigned, night duty, less sleep duration, and poor work environment. Addressing these factors through targeted interventions is crucial to improving student well-being.

Perceived stress has higher association of morbidity both physical and mental therefore to overcome stress and its consequences among postgraduate medical students a monthly or quarterly assessment of their wellbeing is a must. Also, a confidential mutual reporting system should be included for feedback without disparity. Implementation of prescribed duty hours is required and there is a need to include positive coping strategies for stress management such as meditation practices, yoga and mindfulness. Accommodation facilities should be improved for the better so that the post graduate medical students are able to adjust better.

This study is highly relevant as it identifies key stressors affecting postgraduate medical students, a group that plays a crucial role in healthcare. By highlighting factors such as gender, living conditions, financial instability, academic pressures, and work environment, the research provides actionable insights for institutions to implement targeted interventions. Addressing these stressors is essential for improving the well-being, performance, and retention of medical students, ultimately leading to better healthcare outcomes.

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