



## STRESS AND COPING STRATEGIES IN POSTGRADUATE MEDICAL STUDENTS DURING COVID-19 PANDEMIC IN A DESIGNATED COVID-19 TREATING HOSPITAL: A CROSS SECTIONAL STUDY

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**ABSTRACT** **Introduction:** Since its inception in December 2019, the novel corona virus disease (COVID-19) has spread rapidly both locally and internationally. To an outside observer, health care workers look strong and resilient. But health care workers, particularly postgraduate students have long duty hours, clinical emergencies, financial stress, so suffer from stress and related disorders which have a negative impact on learning, performance, problem solving and patient care. Coping strategies such as positive reframing, acceptance, and planning affect the mental health outcome favorably whereas avoidant strategies such as denial, drug, or alcohol use worsen the situation.

**Methodology:** Data was collected from 96 postgraduate medical students working in SGT hospital, SGT University, Gurugram, India through questionnaires. Semi structured Performa, General Health Questionnaire 12, Perceived stress scale (PSS), Brief- COPE scale was distributed among the group after obtaining informed consent. Analysis of association was done using SPSS software.

**Results:** In our study the mean age was 27.91 ( $\pm 2.67$ ). 47.9 were males and 52.1 were females. Stress levels were seen to be more in postgraduates who used alcohol and had more avoidant coping strategies. Perceived stress levels were higher in clinical branch and avoidant coping strategies were also seen to be statistically significant in clinical branches.

**Conclusion:** Emphasis should be laid on mental health of resident doctors especially those in clinical branches.

**KEYWORDS :** postgraduate students, covid-19, stress, coping strategies, substance use

### INTRODUCTION

The rapid spread of COVID 19 have put severe pressure on health systems around the world.<sup>1</sup> The health care workers inspire us, as to keep others safe, they go to work every day at great personal risk. Underneath it, many health care workers are barely keeping it together. They are anxious and they are afraid. They are not sleeping and they find themselves crying more than usual. The risk of infection, especially if it is asymptomatic, instills fear of spreading the virus to their patients and families.<sup>2</sup> Health care workers, particularly post graduate students have various roles and responsibilities in professional and personal domains. They are expected to imbibe and master a large amount of knowledge, attitudes and skills for which they have to strive hard.<sup>3</sup> Any stress, if unattended, can predispose the individual to psychiatric disorders such as depression, anxiety, substance use, and even suicide.<sup>4</sup>

Stress is a normal and mostly beneficial part of our lives that can help one learn. It makes most of the people active, creative and productive.<sup>5</sup> But for many medical post graduates, stress arouses feelings of incompetence, uselessness, fear, anger and guilt and can be associated with both psychological and physical morbidities.<sup>6</sup> In residency years, post graduates have to learn to balance multiple demands in life such as taking responsibility of patients care, on call schedules, death of patients, financial hardships, need for never ending learning, updating one-self, tasks of teaching, requirements of collaborating with physicians and senior residents along with family/personal life.<sup>7</sup>

Coping refers to the thoughts and actions taken to deal with stress. It is a conscious effort to tolerate stress.<sup>8</sup> Coping strategies affect the mental health outcome whereas avoidant strategies worsen the situation.<sup>9</sup> Some common coping strategies employed are spending times with friends, indulging in sports, music and social media. The use of

alcohol, cannabis and illicit drugs are reported to be on the increase among medical students. Specially in times like COVID 19 pandemic it has been observed that post graduates are more in stress and due to that there is increased substance use.<sup>10</sup>

### MATERIALS AND METHODS

#### AIM AND OBJECTIVES

The review aims to study coping skills used by post graduate medical students during COVID-19 pandemic. The objectives of the current review were to assess stress in post graduate medical students working in designated COVID-19 treating centre and to determine coping methods used by post graduate medical students working in designated COVID-19 treating centre.

#### Methods

The study was a cross sectional, anonymous, non-interventional study conducted in the month of July 2020 on post graduate medical students working in a designated COVID 19 treating hospital (SGT Hospital, SGT University, Gurugram, India), using an anonymous online questionnaire.

#### Inclusion Criteria

Post graduate medical students willing to participate in the study.

#### Exclusion Criteria

NIL

#### Study Procedure

100 post graduate medical students working in a designated COVID19 treating hospital (SGT Hospital, SGT University, Gurugram) were briefed in small groups regarding the study. To minimize face to face interaction, they were asked to fill online questionnaires through an

online survey platform, Google Docs, the link for which was forwarded to their personal mobile numbers provided by them. Out of the 100 students, 97 responded back within 3 days. Expedited ethics approval was obtained from the Institutional Review Board of SGT Medical College, Hospital and Research Institute, SGT University, Gurugram, India. Socio demographic data was collected on gender, age, marital status, living arrangement, medical comorbidities, and substance use. Psychological evaluation was done using the following questionnaires:

1. The general health questionnaire-12 stress scale (GHQ-12 stress scale) is used to detect psychiatric disorder in general health population and within community. It assesses the respondent's current state and asks if that differs from his/her usual state.

2. The Perceived Stress Scale (PSS) is the most widely used psychological instrument for measuring the perception of stress. It is a measure of the degree to which situations in one's life are appraised as stressful. Items were designed to tap how unpredictable, uncontrollable, and overloaded respondents find their lives. The questions in the PSS ask about feelings and thoughts during the last month.

3. The Brief-COPE is a 28 item self-report questionnaire designed to measure effective and ineffective ways to cope with a stressful life event. The scale is often used in healthcare settings to ascertain how patients are responding to a serious diagnosis. The scale can determine someone's primary coping styles as either Approach Coping, or Avoidant Coping.

**Statistics**

Statistical analysis was performed using IBM, SPSS Statistics version 25 (IBM Inc.). Chi square test and fisher exact test were used to find association between parametric data. Mann-Whitney test was used to find association between non-parametric data.

**RESULTS**

Our study comprised of 96 participants of which 46 (47.9%) were male and 50 (52.1%) were female. The mean Age (Years) was 27.91 ± 2.67. Majority (63.5%) was from clinical branches as compared to non clinical branches (36.5%). 32.1% were married while the rest were unmarried. Majority of the participants (64.6%) live with roommates or companions, while the rest lived alone. 40.6% used alcohol, 7.3% used cannabis, 2.1% used opioids, 12.5% used tobacco and 2.1% used benzodiazepines. (Table 1a)

**Table 1a: Socio-Demographic Details**

Socio-Demographic Details		Mean ± SD    Median (IQR)    Min-Max    Frequency (%)
Age (Years)		27.91 ± 2.67    27.00 (26.75-29.00)    24.00 - 41.00
Gender	Male	46 (47.9%)
	Female	50 (52.1%)
Type of Specialty	Clinical	61 (63.5%)
	Non-Clinical	35 (36.5%)
Marital Status	Married	30 (31.2%)
	Unmarried	66 (68.8%)
Living Arrangement	Alone	34 (35.4%)
	With Others	62 (64.6%)
<b>Substance Use Frequency (%)</b>		
Alcohol Use	Present	39 (40.6%)
	Absent	57 (59.4%)
Cannabis Use	Present	7 (7.3%)
	Absent	89 (92.7%)
Opioid Use	Present	2 (2.1%)
	Absent	94 (97.9%)
Benzodiazepine Use	Present	2 (2.1%)
	Absent	94 (97.9%)
Tobacco Use	Present	12 (12.5%)
	Absent	84 (87.5%)

The PSS total score was 18.66 ± 7.95. 35 (36.5%) of the participants had low stress, 30 (31.2%) had moderate stress, and 31 (32.3%) had high stress. The mean GHQ score was 11.81 ± 5.97. 2 (2.1%) of the participants had GHQ ≤2 while the remainder (97.9%) had GHQ >2. The mean Brief Cope total score was 66.38 ± 19.21 and the mean Brief Cope Avoidant Score was 27.64 ± 13.24 and the mean Brief Cope Approach Score was 29.03 ± 9.54. 63(65.9%) of the participants used

approach coping strategies while 33 (34.1%) of the participants used avoidant coping strategies. (Table 1b)

**Table 1b: Summary Of Scales**

PSS: Total Score	18.66 ± 7.95    20.00 (11.00-27.00)    6.00 - 30.00
PSS: Category	
Low Stress	35 (36.5%)
Moderate Stress	30 (31.2%)
High Stress	31 (32.3%)
GHQ: Total	11.81 ± 5.97    11.00 (9.00-13.00)    0.00 - 34.00
GHQ: Category	
≤2	2 (2.1%)
>2	94 (97.9%)
Brief Cope Total Score	66.38 ± 19.21    65.00 (47.00-87.25)    39.00 - 99.00
Brief Cope Avoidant Score	27.64 ± 13.24    25.00 (13.00-42.00)    12.00 - 56.00
Brief Cope Approach Score	29.03 ± 9.54    28.50 (19.75-37.25)    14.00 - 48.00
Brief Cope Impression	
Approach	63 (65.9%)
Avoidant	33 (34.1%)

The PSS scores were found to be significantly associated with the type of specialty and alcohol use, with scores being higher in residents in clinical branches and in residents using alcohol. The GHQ scores were not found to be significantly associated with any parameter. The BRIEF COPE avoidant as well as approach scores were found to be significantly associated with the type of specialty as well as alcohol use. (Table 2)

**Table 2: Association Of Scales With All The Parameters**

Parameters	PSS	p value	GHQ	p value	BRIEF COPE Approach (n = 63)	BRIEF COPE Avoidant (n = 33)	p value
Gender	Male	20.02 ± 0.09 7.75	11.13 ± 0.10 6.35	0.10 9 <sup>2</sup>	29 (46.0%)	17 (51.5%)	0.60 9 <sup>2</sup>
	Female	17.40 ± 8.00	12.44 ± 5.58		34 (54.0%)	16 (48.5%)	
Type of specialty	Clinical	23.89 ± 4.67 <0.01 <sup>2</sup>	12.72 ± 7.11 0.17 8 <sup>2</sup>	0.17 8 <sup>2</sup>	29 (46.0%)	32 (96.9%)	<0.01 <sup>2</sup>
	Non-clinical	9.54 ± 1.92	10.23 ± 2.51		34 (64.0%)	1 (3.1%)	
Marital status	Married	17.47 ± 8.28 0.33 3 <sup>2</sup>	11.13 ± 4.14 0.95 9 <sup>2</sup>	0.95 9 <sup>2</sup>	24 (38.1%)	6 (18.2%)	0.04 6 <sup>2</sup>
	Unmarried	19.20 ± 7.80	12.12 ± 6.64		39 (61.9%)	27 (81.8%)	
Living Arrangement	Alone	18.00 ± 8.61 0.59 5 <sup>2</sup>	11.62 ± 6.21 0.91 1 <sup>2</sup>	0.91 1 <sup>2</sup>	23 (36.5%)	11 (33.3%)	0.75 7 <sup>2</sup>
	With Others	19.02 ± 7.62	11.92 ± 5.88		40 (63.5%)	22 (66.7%)	
Alcohol Use	Present	22.26 ± 6.90 0.00 1 <sup>2</sup>	13.46 ± 7.49 0.18 8 <sup>2</sup>	0.18 8 <sup>2</sup>	18 (28.6%)	21 (63.6%)	0.00 7 <sup>2</sup>
	Absent	16.19 ± 7.73	10.68 ± 4.38				
Cannabis Use	Present	21.86 ± 6.04 0.26 3 <sup>2</sup>	14.43 ± 10.67 0.75 0 <sup>2</sup>	0.75 0 <sup>2</sup>	2 (3.2%)	5 (15.2%)	0.11 3 <sup>3</sup>
	Absent	18.40 ± 8.06	11.61 ± 5.49				
Opioid Use	Present	22.50 ± 10.61 0.36 7 <sup>2</sup>	7.50 ± 2.12 0.12 5 <sup>2</sup>	0.12 5 <sup>2</sup>	1 (1.6%)	1 (3.0%)	0.34 1 <sup>3</sup>
	Absent	18.57 ± 7.94	11.90 ± 5.99				
Benzodiazepine Use	Present	20.00 ± 2.83 0.91 8 <sup>2</sup>	16.50 ± 9.19 0.37 4 <sup>2</sup>	0.37 4 <sup>2</sup>	1 (1.6%)	1 (3.0%)	0.34 1 <sup>3</sup>
	Absent	18.63 ± 8.03	11.71 ± 5.92				

Tobacco Use	Present	21.92 ± 5.79	0.17 <sup>8</sup>	14.25 ± 9.83	0.51 <sup>5</sup>	6 (9.5%)	6 (18.2%)	0.29 <sup>8</sup>
	Absent	18.19 ± 8.14		11.46 ± 5.20				

The variable Brief Coping Total Score was not normally distributed in 3 subgroups of the variable PSS: Category. Thus, non-parametric tests (Kruskal Wallis Test) were used to make group comparisons.

The mean (SD) of Brief Coping Total Score in the low stress group was 45.91 (4.02), 65.40 (7.22) in the moderate stress group and 90.42 (3.66) in the high stress group. The median (IQR) of Brief Coping Total Score was 46 (44-48.5), 67 (59-69) and 90 (88-93) in the low stress group, moderate stress group and high stress group, respectively. The Brief Coping Total Score in the low stress group ranged from 39-56 and 56-84 and 83-99 in the moderate stress and high stress groups respectively. There was a significant difference between the 3 groups in terms of Brief Coping Total Score ( $\chi^2 = 84.143$ ,  $p < 0.001$ ), with the median Brief Coping Total Score being highest in the high stress group. (Table 3)

**Table 3: Comparison Of The 3 Subgroups Of The Variable PSS: Category In Terms Of Brief Coping Total Score (n = 96)**

Brief Coping Total Score	PSS: Category			Kruskal Wallis Test	
	Low Stress	Moderate Stress	High Stress	$\chi^2$	p value
Mean (SD)	45.91 (4.02)	65.40 (7.22)	90.42 (3.66)	84.143	<0.001
Median (IQR)	46 (44-48.5)	67 (59-69)	90 (88-93)		
Range	39 - 56	56 - 84	83 - 99		

Approach mechanism was higher with low stress and avoidant scores were found to be higher in high stress categories. Significant correlation was seen between the category of PSS and Brief Coping parameters, where the higher scores of approach coping mechanism was seen in low stress category and more avoidant coping strategies was found in the high stress group. (Table 4)

**Table 4: Association Between PSS: Category And Brief Coping Parameters**

Parameters	PSS: Category			p value
	Low Stress (n = 35)	Moderate Stress (n = 30)	High Stress (n = 31)	
Approach	34 (97.1%)	21 (69.6%)	7 (22.2%)	<0.001
Avoidant	1 (2.9%)	9 (30.4%)	24 (77.8%)	

## DISCUSSION

Out of the 96 participants in the study, moderate to severe stress was identified in 63.5% of the resident doctors. The remaining doctors reported either having no stress or almost negligible stress. This finding was in sync with a study done on doctors in West Bengal, during the COVID-19 pandemic, which revealed that more than 70% doctors were suffering from stress and anxiety symptoms.<sup>11</sup> Similarly, another study conducted on more than 1200 healthcare workers in 34 hospitals across China, during the COVID-19 pandemic revealed that more than 70% healthcare workers showed distress.<sup>12</sup> However, the stress levels were quite high when compared to other studies which were done before the COVID-19 pandemic.<sup>13,14,15,16</sup> The possible reason could be that our study was done during COVID-19 pandemic in a designated COVID-19 treating hospital, unlike the previous studies. This possibly contributed to a lot of uncertainty leading to stress. The mean PSS scores were 18.66. This was comparable to the findings of another study conducted in Pune.<sup>17</sup>

GHQ scores were >2 in almost 98% residents. This can be understood as increase in stress levels can lead to increase psychological distress.<sup>18</sup> Brief coping scores showed that 66% doctors used approach as a coping method, in comparison to 29% resident doctors who used avoidance as a coping method. In a similar study done in residents doctor of a clinical specialty it was seen that more approach coping mechanism was used in comparison to avoidance coping strategies.<sup>19</sup>

There was no statistical difference between stress levels with gender. This was similar to the findings in a study done on post graduate medical students in a medical college in Pune.<sup>17</sup> Another study done in Mumbai showed similar findings.<sup>13</sup> Our study did not find any gender difference in avoidant coping, however, it was observed that approach

coping strategies were used significantly more in the male residents. However previous studies have reported that male students used more dysfunctional coping strategies to deal with stress than their female counterparts.<sup>20,21,22</sup> But evidence supports the idea that when faced with stress women are more likely to cope by modifying their emotional responses to stress, whereas men more often use problem solving approach. It is assumed that emotion focused coping is maladaptive and inferior to approach or problem oriented strategies.<sup>23</sup>

Stress levels were seen to be significantly higher in residents pursuing clinical specialty. This was similar to other studies conducted in India.<sup>13,14</sup> Analysis between coping strategies and specialties showed that residents belonging to clinical branches used more avoidant coping strategies while residents of non clinical branches used more approach coping strategies. In one of the studies done on Korean medical students it was identified that medical students using avoidant coping strategies experienced higher levels of stress.<sup>24</sup>

Stress levels were seen to be more in unmarried residents compared to married, but it was not statistically significant. This was similar to a study conducted amongst PG students in a medical college in Karnataka.<sup>14</sup> Married people often report less stress in comparison to unmarried and marital separated people.<sup>25</sup> This finding can be interpreted in the light of stress-buffering hypothesis that state that the presence of spouse reduces emotional reaction to stress.<sup>26</sup>

PSS scores were more in residents who used alcohol and this was statistically significant. A cross sectional study among university students in France revealed that perceived stress was associated with risks like alcohol misuse.<sup>27</sup> Coping strategies showed that avoidant scores were higher and statistically significant in alcohol users. Social learning theory models and social cognitive models of relapse suggest that drinking alcohol may occur specifically for individuals with deficits in adaptive modes of coping when they have the desire to reduce negative affect.<sup>28</sup>

There was a positive and highly significant correlation seen between PSS scores and Brief Coping scores. On further analysis it was seen that residents with higher levels of perceived stress used more of avoidant coping strategies. Similar findings were seen in another study conducted on post graduate medical students in Pune. Other studies also report similar findings that use of avoidant coping strategies lead to high levels of perceived stress.<sup>29,30,31,24</sup>

## Limitations

One of the limitations of our study was that the association between year of residency with the stress level, GHQ and BRIEF COPE could not be studied as the sample size was not evenly distributed between the years, primarily due to the fact that the first year residents had not yet joined their courses. Another limitation was that residents from only a single centre were studied and it was cross sectional, hence, findings cannot be generalized over a period. Also, we did not assess the possible psychiatric outcomes of excessive stress such as suicidal ideation, depression and anxiety.

## CONCLUSION

The period of post graduates medical education is a stressful phase. Over and above the current COVID pandemic situation has further added onto the stress levels due to heighten work as well as uncertainty. The findings of our study indicate need for regular stress management programs for resident doctors, especially those pursuing clinical branches. Special focus should be laid on inculcating healthy coping strategies.

## Contributors

All the contributors equally participated in the selection, assessment and analysis of the patient's data. And all the authors have approved the final article.

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