

## Original Research Article

# Prevalence of stress among postgraduate junior residents in Bangalore, Karnataka, India

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## ABSTRACT

**Background:** Post graduate residents in tertiary care teaching hospitals in metropolitan cities bear the overwhelming burden due to heavy workload, they are at high risk of developing burnout syndrome, which in turn may affect hospital outcomes such as the quality and safety of the provided care. This study was conducted to assess their perceived stress, stress induced somatic symptoms and coping strategies by postgraduates in Bangalore, India.

**Methods:** This cross-sectional study was conducted on all postgraduates willing to participate in the study, pursuing their post-graduation in various specialties in Six medical colleges in Bangalore, India. Stress was assessed by Perceived stress scale (PSS-10), Stress induced physical symptoms using selected items from self-reporting questionnaire (SRQ-20), coping strategies using selected items from BRIEF COPE. Descriptive and inferential statistical analysis has been carried out in the present study.

**Results:** The mean PSS score in present study was found to be 22.92 (moderate stress). Stress was associated with clinical specialty, higher workload, poor sleep quality due to more working hours, marital status, harmful ideations. In present study Post graduates of OBG, pediatrics, radiology demonstrated higher perceived stress score with a mean PSS Score of 25.57, 24.25, 24.22 respectively. Dermatology postgraduates reported lowest stress levels with a mean PSS score of 16.86.

**Conclusions:** In present study post graduates are facing moderate stress, affecting their physical and mental health resulting in dysfunctional coping strategies and harmful ideations like quitting, which has an impact on quality and safety of provided care.

**Keywords:** Postgraduate, PSS, Stress

## 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.<sup>1</sup> Work related stress is the response people may have when presented with work demands and pressures that are not matched to their knowledge and abilities and which challenge their ability

to cope.<sup>2</sup> A United nation report labelled stress as "The 20<sup>th</sup> century disease". World health organization called it a "Worldwide Epidemic".<sup>3</sup>

The beginning of postgraduate training program is a very stressful period. Young doctors begin to confront with the difficulties and responsibility of the medical practice.<sup>4</sup> Postgraduates are often subjected to prolonged working hours, prolonged sleep deprivation, uncontrolled schedules, high job demands and inadequate personal

time.<sup>5</sup> High job demands are combined with poor job resources in few hospitals, such as poor opportunities for professional development and these factors may cause burnout.<sup>6</sup> Different authors have tried to explain the concept of burnout using constellation of behavioral and somatic symptoms. The concept was first introduced by Freudenberg in his 1974 article “staff burnout”.<sup>7</sup> He described burnout as a consequence of excessive stress leading to chronic fatigue and lack of enthusiasm. Burnout is characterized by emotional exhaustion, depersonalization, and reduced personal accomplishment.<sup>8,9</sup>

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 24 hours at a time, 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 less stipend, 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.<sup>10</sup>

## METHODS

A cross sectional study was carried out among postgraduate residents, currently pursuing their postgraduation in different specialties in various medical colleges across Bengaluru, India. The duration of the study was 6 months (1<sup>st</sup> June to 30<sup>th</sup> November 2018). All the postgraduates who were willing to participate in the study were included those who were not willing to participate were excluded. After taking their informed consent, out of 410 postgraduates who were contacted only 239 responded and completed the questionnaire. Cohen's perceived stress scale (PSS-10) (1983) was used to assess the perceived stress of the students.

The 10 items in PSS-10 ask about feelings and thoughts in last month to be graded on Likert's scale. The scores range from 0 to 40.<sup>11</sup> Few items were taken from brief cope by carver (1997) to assess coping strategies especially negative coping mechanisms. Selected items from self-reporting questionnaire were taken to assess the prevalence of somatic symptoms among postgraduates

### Statistical analysis

Descriptive and inferential statistical analysis has been carried out in the present study. Results on continuous measurements are presented on Mean±SD (Min-Max) and results on categorical measurements are presented in number (%). Significance is assessed at 5 % level of significance.

### Statistical software

The statistical software namely SPSS 18.0, and R environment ver.3.2.2 were used for the analysis of the data and Microsoft word and Excel have been used to generate graphs, tables etc.

### Significant figures

- Suggestive significance (P value: 0.05<P<0.10)
- Moderately significant (P value:0.01<P ± 0.05)
- Strongly significant (P value: P±0.01)

### The following assumptions on data is made, assumptions

- Dependent variables should be normally distributed, Samples drawn from the population should be random, cases of the samples should be independent.<sup>12,13</sup>

Analysis of variance (ANOVA) has been used to find the significance of study parameters between three or more groups of patients, student t test (two tailed, independent) has been used to find the significance of study parameters on continuous scale between two groups (Inter group analysis) on metric parameters.<sup>14,15</sup>

## RESULTS

Table 1 shows the socio-demographic characteristics of the study participants. 94.9% of postgraduates were in 20-30 age group, 57.6% were males, 23.7% were married. Mostly had an income that fell within INR 21,000 to INR 40,000 and 25% had no income. Of all the socio-demographic characteristics, marital status had significant mean PSS score which was statistically significant with a P value of 0.004.

There were 24% of the postgraduates had one or more major medical illness, such as bronchial asthma, hypothyroidism, type 1 diabetes etc., 4% had a personal history of psychiatric disorders. These disorders include anxiety, depression. 16.5% of responders were smokers, 16% of responders drank alcohol. 2.5% of responders reported both smoking and consumption of alcohol.

The upper textile of the PSS score is not significantly associated with the presence of major medical illnesses, personal or family history of psychiatric disorders, smoking or alcohol.

Table 2 shows the distribution of study subjects according the PSS score.

Table 3 shows stress related characteristics, aware of burnout phenomena 65.3% of postgraduates knew about burnout, only 5.5% of postgraduates had received education in stress management. 27.5% (65) of postgraduates reported to have harmful ideations, out of

65 postgraduates, 56 thought of quitting the course, 04 reported thoughts of suicide and 05 felt like running away from the institute for some time. Postgraduates who slept for less than <6 hours were 28% (66) had a statistically significant mean PSS score of 25.08 with a P value of

<0.001. The upper textile of the PSS score was significantly associated with poor job satisfaction, academic stressors and dissatisfaction with their relationship with colleagues and their professors.

**Table 1: Sociodemographic characteristics of study participants.**

Variables	No. of study subjects	Percentage	Perceived Stress Scale	
			Mean±SD	P value
Age				
20-30 years	224	94.9	22.68±5.31	0.798
31-40years	12	5.1	23.08±5.95	
Sex				
Male	136	57.6	22.145±5.27	0.060
Female	100	42.4	23.08±5.33	
Marital status				
Married	56	23.7	24.50 ± 5.41	0.004*
Unmarried	180	76.3	22.14 ± 5.19	
Year of residency				
First	67	28.4	23.18± 5.48	0.054
Second	87	36.9	23.40±5.74	
Third	82	34.7	21.56±4.57	
Monthly income				
Nil	59	25	22.00±5.24	0.139
5-10K	39	16.5	23.51±5.64	
21-30K	51	21.6	24.04±5.68	
31-40K	74	31.4	21.88±4.82	
>40K	13	5.5	22.85±5.47	

**Table 2: Distribution of study subjects according to pss score.**

Perceived stress scale score	Level of stress	No. of subjects	%
0-13	Low	10	4.2
14-26	Moderate	168	71.2
27-40	High	58	24.6
Total		236	100.0

**Table 3: Stress related characteristics of postgraduates.**

Characteristics	No. of subjects	Percentage	PSS	
			MEAN±SD	P value
Aware of burn out phenomena				
Yes	154	65.3	22.52±4.89	0.479
No	82	34.7	23.04±6.08	
Education in stress management				
Yes	13	5.5	19.69 ±3.12	0.036
No	223	94.5	22.87±5.38	
Harmful ideations				
Yes	65	27.5	25.65±4.50	<0.001
No	171	72.4	21.58±5.20	
Sleep duration				
<6 hours	66	28.0	25.08±4.93	<0.001
6-8 hours	98	41.5	23.04 ±5.25	
8-10 hours	72	30.5	20.57 ±5.16	

Table 4 shows that 22% of study participants were Pediatric postgraduates followed by medicine postgraduates constituting 17.4%, least representation was by ENT and emergency medicine postgraduates both constituting 1.7% of total study participants. OBG post graduates experienced more stress with a mean PSS score of 25.57 followed by pediatric postgraduates with a mean PSS score of 24.25 with a P value of <0.001 which is statistically significant. Pathology postgraduates reported a mean PSS score of 18, while dermatology postgraduates were least stressed with a mean PSS score of 16.86.

Table 4 shows that among all the specialties, OBG post graduates experienced more stress followed by pediatric postgraduates with a mean PSS of  $24.25 \pm 4.89$  with a P value of <0.001 which is statistically significant. Dermatology postgraduates were least stressed with a mean PSS of  $16.86 \pm 6.62$ .

Table 5 shows 35.2% of postgraduates either smoke or drank alcohol or both. 26 postgraduates started drinking alcohol after joining residency, while 13 subjects started smoking after joining residency. Six residents started both after joining residency.

**Table 4: Distribution of study subjects according to specialties.**

Speciality	No. of subjects	Percentage	PSS Mean $\pm$ SD	P value
Pediatrics	52	22	$24.25 \pm 4.89$	<0.001**
Medicine	41	17.4	$21.83 \pm 4.02$	
OBG	37	15.7	$25.57 \pm 4.83$	
Surgery	28	11.9	$22.96 \pm 6.08$	
Orthopaedics	21	8.9	$23.19 \pm 5.08$	
Radiology	09	3.8	$24.22 \pm 6.26$	
Anaesthesiology	14	5.9	$20.50 \pm 4.29$	
Ophthalmology	08	3.4	$18.25 \pm 5.18$	
Dermatology	07	3.0	$16.86 \pm 6.62$	
Emergency Med	04	1.7	$20.25 \pm 3.30$	
ENT	04	1.7	$19.25 \pm 3.59$	
Pathology	11	4.7	$18.00 \pm 3.22$	
Total	236	100		

**Table 5: Prevalence of smoking and alcohol among post graduates.**

S/A/D	No. of patients (n=236)	%
Nil	153	64.8
Yes	83	35.2
Smoking before joining residency	26	11.01
Alcohol before joining residency	12	5.08
Alcohol after joining residency	26	11.01
Alcohol smoking after joining residency	6	2.5
Smoking after joining residency	13	5.5

## DISCUSSION

In present study majority were in 20-30 age group and more stress levels seen in 31-40 age group, this is not statistically significant. Similar results were found in a study done by Jamsiah M et al, we covered residents of various specialties.<sup>16</sup> The perceived stress among post graduates in the current study appeared to be comparable to the perceived stress reported among residents in other parts of the world, the mean PSS score was 22.92. Whereas the PSS score was estimated as 21.7 in 106

cardiology residents in Argentina.<sup>17</sup> 19.9 in 159 Anesthesia residents in Turkey, 16.1 in 168 family medicine residents in the United States of America (USA), 22 in 938 residents in Saudi Arabia.<sup>18-20</sup> The perceived stress among the post graduates in the current study was considerably higher than that of the general population.

In present study medical specialty, duration of sleep, marital status and harmful ideations were associated with increased stress level. Authors did not detect any

significant association between stress and personal characteristics (age, gender, income), medical history and year of residency. Post graduates who worked for long hour (>24 hours), dealing with more patients and who slept for few hours (<6 hours) were at higher risk of stress. The practice of scheduling resident physicians to more than 16 hours of duty in a day impairs performance similar to alcohol intoxication and is hazardous to both the patient and the physician. WHO has added night shift work to its list of carcinogens.<sup>21</sup>

In present study OBG post graduates reported highest stress with a mean PSS score of 25.57 followed by pediatric postgraduates with a mean PSS of 24.25 followed by radiology post graduates with a mean PSS score of 24.22. Least stress was reported by dermatology residents with a mean PSS score of 16.86.

In present study 56 (23.7%) post graduates were married whereas 180 (76.3%) were unmarried. Stress was present more among married post graduates with a mean PSS score of 24.5 as compared to unmarried with a mean PSS score of 22.14 and was found statistically significant with a P value of 0.004, similar results were observed in a study conducted by Sahasrabudhe AG et al, at a tertiary care hospital in Mumbai and found not statistically significant.<sup>22</sup>

In present study, postgraduates who were sleeping for less than 6 hours per day reported more stress as compared to those who slept for more than 6 hours. It's found statistically significant. While in a study done by Sahasrabudhe AG et al, showed that 47.8% were present in resident doctors who were sleeping for more than 6 hours per day as compared to resident doctors who were sleeping less than 6 hours per day 29.4% and it's found statistically highly significant.<sup>22</sup>

The current findings replicate those from previous studies that used various stress measurement tools to identify the parameters associated with higher stress in residents, such as prolonged working hours, high patient load, critical patients assigned, night duty, less sleep duration, and poor work environment. The stressors associated with stress in the current study include less personal time, long working hours with no adequate breaks, no time for academic work, harassment by the faculty. Another study has shown that prolonged working hours may be responsible for both stress and decreased job satisfaction among residents.<sup>23</sup> Additionally, authors noted an association between stress and harmful ideations, with PSS score being high among postgraduates with harmful ideations. Experiencing stress without conflict resolution may lead to burnout, which may lead to increased risk of suicide.<sup>24</sup> even though most of the residents were aware of burnout phenomena many are not educated in stress management, which indicates a need for stress management programs during postgraduation.

**Table 6: Somatic symptoms reported by post-graduates.**

SRQ-5	No. of patients (n=236)	%
Nil	44	18.6
Do you often have headaches	125	53.0
Is your appetite poor	61	28.8
Do your hand shakes	63	26.7
Do you have uncomfortable feelings in your stomach	66	28.0
Are you unable to play a useful part in life?	7	3.0
Are you easily tired?	116	49.2

The study was conducted to identify stressors, the perceived stress, coping strategies and physical morbidity in terms of somatic symptoms affecting postgraduate residents. This study assesses the domains of stressors and correlates psychiatric morbidity to perceived stress levels in postgraduate junior residents. This study is an attempt to increase the awareness about stress faced by postgraduate junior residents and their ways of dealing with it.

**Table 7: Prevalence of various negative coping mechanisms adopted by postgraduates.**

Negative cope	No. of patients (n=236)	%
Nil	101	42.8
I have been using alcohol or other drugs to make myself feel better	35	14.8
I have been giving up trying to deal with it	16	6.8
I have been using alcohol or other drugs to help me get through it	28	11.9
I have been criticizing myself	25	10.6
I have been blaming myself for things that happened	93	39.4

Table 7 shows the prevalence of negative coping mechanisms among study subjects, where the mechanisms employed are harmful, unhealthy and damaging. The problem with using negative coping mechanisms is that although they mask or stop someone from feeling awful, they actually increase the dysfunction by strengthening and maintaining it. In present study alarmingly high i.e., 39.4% of subjects (93) reported to have been blaming oneself for things that happened. 14.8% of them were using alcohol to overcome the stress.



## CONCLUSION

In present study it has been found that postgraduates junior residents are suffering from moderate stress affecting their physical and mental health resulting in dysfunctional coping strategies and harmful ideations like quitting the course. Management of stress comprises primarily of preventive measures such as skill education, improving time management, and coping skills to optimize the balance between professional and social commitments. Creating a healthy environment in the department, appreciation of efforts and motivation is very much essential. Policies and Regulations in Post graduate medical education which can reduce risk and stress in residents like increasing the number of PG seats, decreasing number of working hours, is the need of the hour.

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