



PREVALENCE OF STRESS AND ASSOCIATED FACTORS IN RESIDENT DOCTORS OF TERTIARY CARE TEACHING HOSPITAL IN SOUTH-EASTERN RAJASTHAN:

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ABSTRACT **Background:** Stress is an important part of human beings that affects all individuals, but particularly affecting resident doctors more than others as their job requires making balance between academic work and clinical activity.

Residency is a post graduate training in specialty after MBBS. Resident doctors are often face prolonged working hours, sleep deprivation, constant overloading of patient care and academic activity. Resident doctors are the back-bone of any tertiary care hospital who works round the clock 24x7.

Objectives: The aim of this study is to estimate the prevalence of stress and identify the associated risk factors of stress among resident doctors.

Methods: A cross-sectional study was conducted in department of Psychiatry, Government Medical College, Kota. Data was analysed by using SPSS version 21 software. Statistical analysis included chi-square-test, correlation, multivariate analysis, unpaired t test. **Results:** Overall prevalence of stress in resident doctors was 28.0%, out of them 22.5% were suffering from mild stress & 5.5% were suffering from moderate stress. Mean stress score was more in obstetrics- gynecology resident doctors, clinical speciality, surgical speciality, third year resident doctors and resident doctors who reported less sleeping hours and more working hours. **Conclusion:** This study throws some light on the psychological problems among resident doctors like stress. The associated factors with stress were female gender, younger age, unmarried marital status, living single, sleep deprivation and prolonged working hours and year of residency.

KEYWORDS : Stress, resident doctors, tertiary care hospital.

INTRODUCTION:

Stress is usually defined as an undue inappropriate or exaggerated response or reaction to a real or imagined threat, event or change. It is a normal physical reaction to an internal or external pressure situation occurs in usual part of our daily lives. Eu-stress or positive stress occurs when level of stress is high enough to motivate to move into action to get things accomplished. Distress or negative stress occurs when level of stress is too high and body and mind begin to respond negatively to the stressors. Extended periods of stress can cause many somatic symptoms like back pain, headaches, raised blood pressure, indigestion, and a variety of other problems. Stress in resident doctors is associated with reduced performance, increase in medical error. It affects the quality of care of patients, poor academic performance, memory impairment, fatigue, increased risk of psychiatric illness like mood swings, anger outburst, inability to relax, and drug misuse. **Rajan Pavithra et al' (2011)** conducted a study in a tertiary Municipal hospital Mumbai and revealed many stressor in resident doctors like inadequate hostel facilities (92.1%), and extra duties (80.0%), inadequate study (78.9%) and lack of break (81.2%), threat from deadly infections (74.6%), and overburdening with work (69.0%) were the other major stress causing factors. This study is aimed to evaluate stress and its associated factors among the resident doctors in a tertiary care teaching hospital in south-eastern part of Rajasthan.

MATERIAL & METHOD:

Study design

Cross-sectional study.

Study period

15 months (from from October 2017 to December 2018).

Study participants

The study participants consisted of consenting 200 resident doctors. The present study was conducted in department of Psychiatry, New Medical College Hospital, Kota. Before starting the study, permission & approval from ethical committee was taken.

INCLUSION CRITERIA:

Resident doctors who are doing 3 year post-graduate course in clinical, non-clinical and surgical departments in government medical college and ready to give their consent.

EXCLUSION CRITERIA:

resident doctors who are suffering from any major medical, surgical and psychiatric illness, resident doctors who are working on urgent temporary basis, resident doctors who are doing super-specialization and diploma.

All the resident doctors were evaluated on especially designed proforma that includes identification data, socio demographic details and factors associated with stress. Severity of stress was assessed by using Depression Anxiety Stress Scale (DASS).

RESULTS& DISCUSSION:

The age of resident doctors was found between 24 years to 42 years and majority (55.5 %) of residents were below 30 years of age. The mean age of resident doctors was 30-40 years. Among them 72.5% respondents were male and 27.5% were female. Majority of residents (59.5%) were married and out of them 52.94% had children, 40.5% were unmarried. Majority of resident doctors (68.0%) were living single and only 32% were living with spouse or family. None of the resident doctors were divorced or separated. Majority of resident doctors (95%) were from Hindu community whereas 4.5% belonged to Muslim community & only one (0.5%) resident doctor was from Sikh community. It was found that majority of resident doctors (77.0%) belonged to urban area and only 23 % belonged to rural area (**Table 1**).

A similar kind of study was as carried by **Gobbur SB et al' (2016)** among post graduates in Mahadevappa Rampure Medical Kalaburagi, Karnataka, which includes 246 resident doctors, male (58.94%), female (41.06 %) married (33.58%), unmarried (30.06%), among married 86.27% were have children.

Table 1. Distribution of residents according to sociodemographic profile.

Variable	N	%	
Age	≤ 30	111	55.5
	>30	89	44.5
Sex	Male	143	72.5
	Female	55	27.5
Domicile	Urban	154	77.0
	Rural	46	23.0

Marital Status	Married	119	59.5
	Unmarried	81	40.5
Having Children	Yes	63	52.94
	No	56	47.06
Religion	Hindu	190	95.0
	Muslim	9	4.5
	Other	1	0.5
Living with spouse/ Family	YES	32	32
	NO	136	68

Resident doctors were evaluated on Depression Anxiety Stress Scale (DASS). It was found that prevalence of stress in resident doctors was 37.5%. If we further classify, it was found that 11.5% resident doctors were suffering from mild stress & 21.5% were suffering from moderate stress, 4.5% resident doctors were found to be suffering from severe stress and none of the resident doctors were extreme severely stressed (Figure 1).

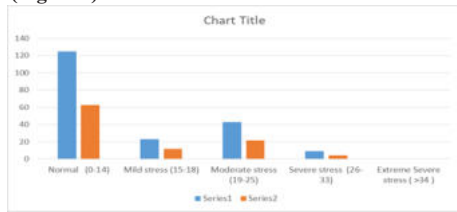


Figure 1. Distribution of resident doctors according to Severity of stress (Depression anxiety stress scale)

Similar finding was also reported by N. K. Saini et al³ (2010) who conducted a study in five medical colleges of Delhi among 930 resident doctors and revealed that prevalence of stress was 32.8% among resident doctors, out of them 17.7% had mild stress, 12.2% had moderate stress, and only 2.9% were severely stressed.

Similar to our study Swati Deshpande et al¹ (2017) conducted a study among resident of Seth GSMC & KEM Hospital Maharashtra and revealed that, among them 39.4% of resident doctors are suffering from some degree of stress, 16.1% suffered from mild degree of stress, 7.9% suffered from moderate degree of stress, the percentage of resident doctors suffering from severe and extremely severe degree of stress was 15.2% & 0.2% respectively.

Sarthak Dave et al⁵ (2018) who conducted a study at B.J. Medical College and Civil Hospital, Ahmedabad by using similar Depression Anxiety Stress scale (DASS) and reported that the prevalence of stress was 24.24% out of which 6.1% suffered from mild degree of stress, 7.9% suffered from moderate degree of stress while a fair percentage of severe (15.2%) and extremely severe (0.2%) degree of stress was reported.

If we correlate the stress with age it was found that stress was negatively correlated with age that means as per age advances, stress decreased and this correlation was statistically significant[®] = 0.190**. It was found that resident doctors of age group 30 years and more were having less stress than the resident doctors of age group less than 30 year (14.87 vs 15.98) and this difference was found statistically significant (p < 0.05) (Table 2a). Similarly the prevalence of stress was higher among the resident doctors of age group ≤30 years than age group >30 years (41.44% vs 31.46%) but this difference was not statistically significant (Table 2b). This finding can be explained by fact that older resident doctors had better tolerated the stress because of better emotional maturity, better coping mechanisms & skilled working experience. It may also be possible that resident doctors, who were older than 30 years, were usually married and living with a family and had good family and social support which is a protective factor against stress.

If we compare mean stress score of male & female resident doctors, it was found higher in female than male residents (14.93 vs 16.96) and this correlation was statistically significant (r = 0.191**) (Tables 2a). Likewise the prevalence of stress was more in female resident doctors (49.09%) than male (32.41%) but this difference was not statistically significant (Tables 2b). Similar finding was also reported by Aarti G Sahasrabudhe et al⁶ (2015) who conducted a study in a tertiary care hospital by using perceived stress scale (PSS) in Mumbai and revealed that female resident doctors were more stressed than males (40% vs 27%).

Table 2a. Correlation between various factors with stress.

Factors		N=200	%	Mean stress ± SD	Correlation
Age	≤ 30	111	41.44	15.98 ± 4.71	-0.190**
	> 30	89	31.46	14.87 ± 4.78	
Sex	Male	145	32.41	14.93±4.67	0.191**
	Female	55	49.09	16.96±4.73	
Marital status.	Married	119	29.41	15.17 ± 4.80	0.082**
	Unmarried	81	48.14	15.96 ± 4.69	
With family	YES	64	32.81	15.09 ± 5.03	0.057
	NO	136	38.97	15.68 ± 4.63	
Speciality	Clinical	180	38.33	15.92 ± 4.58	0.273**
	Non-clinical	20	20.00	11.60 ± 4.68	
speciality	Medical	136	32.35	14.82 ± 4.65	0.205**
	Surgical	64	46.87	16.90 ± 4.70	
Alcohol intake	YES	53	41.50	16.26 ± 4.91	0.098
	NO	147	35.37	15.21 ± 4.69	
Smoking Habit	YES	21	34.78	16.90 ± 4.59	0.102
	NO	179	37.28	15.32 ± 4.76	
Sleeping hours	< 6	54	48.14	16.54 ± 4.29	-0.116*
	6 – 8	112	34.82	15.19 ± 4.77	
	> 8	34	26.47	14.82 ± 5.28	
Working hours	< 8	36	13.89	12.50 ± 4.20	0.121
	8 – 12	106	34.90	15.55 ± 4.73	
	> 12	58	55.17	17.22 ± 4.28	
Year or residency	1st yr.	80	40.0	16.08 ± 4.49	-0.009
	2nd yr.	58	29.0	13.96 ± 3.55	
	3rd yr.	62	31.0	16.14 ± 5.73	

This finding is also supported by a western study by Cohen et al⁷ (2005) who conducted a study in Canada and reported that female resident doctors were more stressed than males (43.1% vs. 34.5%, p < 0.02). The prevalence of stress was slightly higher in female resident doctors than male resident, as they have responsibilities of family, child care, and societal norms as well as of hospital work.

If we compare mean stress score of married and unmarried resident doctors, it was found that unmarried had higher mean stress score than married (15.96 vs 15.17) and this correlation was found statistically significant (r = 0.082**) (Table 2a).

Likewise in our study the prevalence of stress in unmarried was 48.14% while in married it was 29.41% and this difference was also statistically significant (X² = 7.258, p < 0.05) (Table 2b). Similar to our findings Collier et al⁸ (2004) revealed that prevalence of stress in unmarried resident doctors was higher than married residents (OR = 1.60).

Table 2b. Distribution of resident doctors according to various factors.

		Stressed		Non-Stressed			
		N	%	N	%		
Age	≤ 30	111	46	41.44	65	58.56	X ² = 2.111 p = >0.05
	> 30	89	28	31.46	61	69.54	
Sex	Male	145	47	32.41	98	67.59	X ² = 4.758 p = <0.05
	Female	55	27	49.09	28	51.91	
Marital status.	Married	119	35	29.41	84	70.59	X ² = 7.258 p = <0.05
	Unmarried	81	39	48.14	42	51.86	
With family	YES	64	21	32.81	43	67.19	X ² = 0.708 p = >0.05
	NO	136	53	38.97	83	61.13	
Speciality	Clinical	180	69	38.33	111	61.67	X ² = 1.373 p = >0.05
	Non-clinical	20	5	20.00	15	80.00	
speciality	Medical	136	44	32.35	92	67.65	X ² = 3.937 p = <0.05
	Surgical	64	30	46.87	34	53.13	
Alcohol intake	YES	53	22	41.50	31	58.49	X ² = 0.629 p >0.05
	NO	147	52	35.37	95	64.63	
Smoking Habit	YES	21	8	21.73	18	78.27	X ² = 1.186 p = >0.05
	NO	179	48	28.81	126	71.19	
Sleeping hours	< 6	54	19	35.18	35	64.62	X ² = 3.196 p = >0.05
	6 – 8	112	31	27.68	81	72.22	
	> 8	34	6	17.64	28	82.36	
Working hours	< 8	36	5	13.88	31	86.12	X ² = 4.846 p = >0.05
	8 - 12	106	31	29.24	75	61.66	

	> 12	58	20	34.48	38	65.52	
Year or residency	1st yr.	80	37	46.25	53	53.75	$X^2=2.980$ $p=>0.05$
	2nd yr.	58	12	20.69	46	79.31	
	3rd yr.	62	25	40.32	37	59.67	

If we compare mean stress score, the study revealed that resident doctors who were living with family reported less stress score than those who were living single (15.09 vs 15.68) but this correlation was not statistically significant ($r = 0.057$) (Table 2a). Likewise resident doctors who were living with family members reported less prevalence (32.81%) of stress than those who were living single (38.97%) but this difference was not statistically significant ($X^2 = 0.708$, $p > 0.05$) (Table 2b). This finding also indicates that the family support may be a protective factor against stress. This also reflects the importance of a social support system in our lives.

In this study, 10% resident doctors were from non-clinical specialties & other 90% belong to clinical specialties (Table 2a). When we compared mean stress score among clinical and non-clinical specialties, clinical specialties had more stress score (clinical: 15.92 vs non-clinical 11.60) and this correlation ($r = 0.273$) was statistically significant (Tables 2a). Likewise the prevalence of stress was higher (38.33%) among clinical specialties than non-clinical (20.00%) but this difference was not statistically significant ($X^2 = 1.86$, $p > 0.05$) (Tables 2b). Similar finding was also reported by Swati Deshpande et al¹ (2017) who revealed that prevalence of stress among clinical specialties was more (29.2%) as compared to non-clinical (13.9%).

This finding is supported by Sarthakdave et al⁵ (2018) who revealed that prevalence of stress was higher among clinical specialties. (Clinical: 26.7%; non-clinical: 15.5%).

N. K. Saini et al³ (2010) revealed that, the prevalence of stress among clinical specialties was higher (34.6%) than non-clinical (27.5%).

It may be explained by the fact that due to extended duty hours, increased workload, and dealing with patient and managing relatives of patients in emergency situations like trauma, road traffic accidents, poisoning, and deaths in clinical branches leads to higher stress.

In this study, majority (68%) of resident doctors were from medical specialty and 32% of all resident doctors were from surgical specialty (Table 3a). When we compared mean score of stress between surgical & medical specialties, although surgical specialty had higher score (surgical: 16.90 vs medical 14.82), this correlation was found to be statistically significant ($r=0.205$) (Tables 3a). Likewise the prevalence of stress was found higher among surgical specialties (46.87%) than medical-specialties (32.35%), & this difference was not statistically significant ($X^2 = 3.937$, $p < 0.05$) (Table 3b). This could be because of the fact that surgical residents have to do many pre-operative preparations including getting clearances from various other departments to get the patients fit for surgery, operative procedures, post-operative managements and also to deal with emergency scenarios.

If we classify resident doctors according to habit of substance abuse, 26% of resident doctors had alcohol abuse, and only 12.5 % resident doctors were smokers (Table 2a). When we compared mean score of stress, resident doctors who had alcohol abuse, reported higher stress score, than who did not have alcohol abuse (16.25 vs. 15.21) and this correlation was not statistically significant ($r = 0.098$) (Table 2a). Similarly, resident doctors who had alcohol abuse reported higher (41.50%) prevalence of stress than who did not have alcohol abuse (35.37%) and this difference was not statistically significant ($X^2 = 0.629$ $p > 0.05$) (Table 2b).

Resident doctors who were smokers, reported higher mean score stress than non-smokers (16.90 vs 15.32), and this correlation ($r=0.102$) was not statistically significant (Table 2a). Likewise, resident doctors who were smokers reported higher prevalence of stress and then non-smokers (37.28 % vs 34.78 %) and this correlation was not significant ($X^2 = 0.345$, $p > 0.05$) (Table 2b).

When we classify resident doctors according to sleeping hours, majority (56.0%) of resident doctors reported sleep duration between 6 to 8 hours/day whereas 22.0% reported less than 6 hours/day & 17.0 % of resident doctors had sleep duration more than 8 hours/day (Table

2a). The average duration of sleep was 6.70 hours per day. If we compare mean stress score according to sleeping hours, it was maximum (16.54) in those who reported sleeping hours less than 6 hr./day followed by 6 to 8hr./day (15.19) & least (14.82) in those with sleeping hours more than 8 hr./day (Table 2a). If we correlate the stress with sleeping hour, it was found that stress was negatively correlated ($r = -0.116$) with sleeping hour that means as sleeping hours decrease, stress score increases and this correlation was statistically significant (Table 2a). Stress is negatively correlated with duration of sleep which denotes who had higher stress were able to sleep for less hours Likewise prevalence of stress was highest in those with sleeping hour < 6 hr (48.14 %) followed by 6 to 8 hrs /day (34.82%) & least in those with > 8 hrs/day (26.47 %) (Table 2b).

If we classify resident doctors according to working hours, most (55.17%) of the resident doctors reported working hours more than 12 hours hours/day followed by 34.90% between 8 to 12 & only 13.89% reported with less than 8 hours per day (Table 2a). The average working duration was 11.15 hours per day. If we compare mean stress score, it was seen maximum in those with working hours more than 12 hr./day (17.22) followed by 8 to 12hr./day (15.55) & least was in resident doctors who reported working less than 8 hr./day (12.50). If we correlate the stress with working hour, it was found that stress was positively correlated ($r = 0.121$) with working hours that means as working hours increase, stress score also increases and this correlation was statistically significant (Table 2a). Similarly prevalence of stress was maximum in those with working hours more than 12 hrs /day (55.17%) followed by 8 to 12hrs /day (34.90%) & least was in resident doctors who reported working less than 8 hrs /day (13.89%) (Table 2b). This may be because those having longer duty hours got less time for rest, relaxation and recreational activities. Sohng Bhadania et al⁹ (2011) reported 55% of resident doctors who were in stress worked more than 80 hours per week ($p=0.002$). Both the findings suggest that more working hours significantly associated with stress.

If we classify resident doctors according to year of residency, majority (40%) of respondents were from 1st year, whereas 29.0% & 31.0% were from 2nd year & 3rd year respectively. If we compare mean stress score according to year of residency, it was maximum in 3rd year (16.14) resident doctors followed by (16.08) in first year & 2nd year (13.96) resident doctors. (Tables 2a). Maximum mean stress was observed in 3rd year resident doctors, it may be due to all third year resident had pressure of examination, thesis work, routine duties, study and higher responsibilities than juniors which was present in all resident doctors of third year and it may lead to higher mean score in 3rd year residency.

Likewise, prevalence of stress was seen maximum in 1st year (46.25%) followed by 3rd year resident (40.32%) then 2nd year (20.69%) resident doctors (Table 3b). It may be explained by the fact that 1st year students have less experience and ability to handle the clinical work. The prevalence was highest among first year; it may be due to the first year residents bear the burden of all the ward work and the responsibility of investigations of all patients and to carry out the instructions given by consultants. They have to deal with critical patients in the wards and emergency rooms. They have to attend all on call patients and report to the seniors and take orders from them. Similar finding was also reported by Aarti G Sahasrabudhe et al⁶ (2015) who revealed that, prevalence of stress was maximum (46.20%) in first year followed by third year (36.2%) and second year (29.2%).

On Contrary to our findings N. K. Saini, et al³ (2010) conducted a study in Delhi and revealed that prevalence of stress was maximum (54.6%) in first year followed by second year (24.2%) and third year (24.1%).

If we classify resident doctors according to their specialization, maximum respondents (16.5%) were from General Medicine department followed by 14% from Anaesthesia and 11% from Orthopaedic department. Biochemistry had least (1.5%) number of respondents (Table 4). In our study maximum mean stress score was present in obstetrics-gynecology (17.64), followed by Anesthesia (17.25), & orthopedics (17.05) respectively. Minimum mean stress scores was present in resident doctors of microbiology (7.20) (Table 4). This can be explained by the fact that the Obstetrics-gynecology residents have to deal a lot of clinical works and emergency situation compared to microbiology residents.

Table 4. Comparison of mean stress score according to speciality.

BRANCH	N=200	%	Mean stress
ANESTHESIA	28	14.0	17.25
BIOCHEMISTRY	3	1.5	9.33
GENERAL –MEDICINE	33	16.5	16.82
GENERAL – SURGERY	18	9	15.49
MICROBIOLOGY	5	2.5	7.20
OBS.&GYANECOLOGY	11	5.5	17.64
OPHTHALMOLOGY	6	3	16.50
ORTHOPAEDIC	22	11	15.14
OTORINO-LARINGOLOGY	7	3.5	17.05
PAEDIATRICS	10	5	16.70
PATHOLOGY	12	6	14.25
PSYCHIATRY	12	6	13.00
RADIOLOGY	12	6.0	11.50
RESPIRATORY MEDICINE	11	5.5	13.73
SKIN & VD	10	5	13.20

CONCLUSION:

Factors associated with more stress were younger age, female gender, unmarried, living single, year of residency, less sleeping hours, more working hours, specialities like Obs.-gynecology, anesthesia. The stress may adversely affect health and working capacity of resident doctors. There should be adequate breaks between working hours, fixed duty hours, better hostel and mess facilities, proper academics, counseling and regular mental health check up with workshops for stress management. Well being of these resident doctors, who are an integral part of the health care system.

Limitations: Sample size was small enough and from a single medical college giving questionable generalization of the study. Other influencing factors for stress were not suitable for multicentre study. Longitudinal design and educational intervention, if possible would have been better future option.

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REFERENCES:

1. Rajan Pavithra, Bellare Bellare. Work related stress and its anticipated solutions among post-graduate medical resident doctors: a cross-sectional survey conducted at a tertiary municipal hospital in Mumbai, India. *Indian j med sci* 2011 Mr 65(3).
2. Gobbur SB, Nigudgi SR. Prevalence of stress among post graduate doctors at Mahadevappa Rampure medical college Kalaburagi, Karnataka. *Int Journal Community Med Public Health*. 2016 Feb; 3(2):576-580.
3. Saini N K, Agrawal Sandeep, Bhasin S K, Bhatia M S, Sharma A K. Prevalence of stress among resident doctors working in medical colleges in Delhi. *Indian Journal of Psychiatry* 2010; 54(4):219-223.
4. Sahoo S, Khess CR. Prevalence of depression, anxiety, and stress among young male adults in India: A dimensional and categorical diagnoses based study. *J Nerv Ment Dis* 2010; 198: 901-4.
5. Sarthak Dave, Minakshi Parikh, Ganpat Vankar. Stress, Anxiety, and Stress among Resident Doctors of a Teaching Hospital. *Indian Journal of Social Psychiatry*, September 9, 2018, IP: 14.139.120.41.
6. Sahasrabudhe AG, Suryawanshi SR, Bhandari SR. Stress among doctors doing residency: a cross sectional study at a tertiary care hospital in the city of Mumbai. *National Journal of Community Medicine* 2015; 6(1):21-4.
7. Cohen JS, Patten S. Well being in residency training: A survey examining resident physician satisfaction both within and outside of residency training and mental health in Alberta. *BMC Med Educ* 2005; 5:21.
8. Collier VU, McCue JD, Markus A, Smith L. Stress in medical residency: Status quo after a decade of reform? *Ann Intern Med*. 2002; 136(5): 384-90.
9. Sohag Bhadania, Minakshi Parikh, G.K. Vankar. Stress and Coping among Resident Doctors. *Archives of Indian Psychiatry* 13(2) October 2011.