A Crossectional Study of Occupational Stress among the Resident Doctors

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Research Article

Abstract: Job *or* occupational *stress* is something we all face as employees or employers and we all handle it differently. It is a mismatch between the individual capabilities and Organizational demands. Also it is a mismatch between the expectations of both individual and organization. In this study it was tried to evaluate and compare the stress among the resident / junior doctors of clinical and Pre- clinical departments. The study was carried out in 100 resident doctors, perceiving post graduation .The resident doctors were taken from two sides of medical fraternity i.e. (1) Clinical & (2) Pre- clinical. To evaluate the psychological stress, a professional stress test was selected from Managing stress, British psychological society & Routledge Ltd by DAVID FONTANA. The psychological test score was higher in the clinical resident doctors as compared to Pre- clinical resident doctors. From this study it can be suggested that the resident doctors should be trained to face the stress before they join the residency and need to follow up from time to time so that the resident doctors remain psychologically more stable while working in stressful situations during the treatment of the patients in hospital.

Introduction

Job *or* occupational *stress* is something we all face as employees or employers and we all handle it differently. It is a mismatch between the individual capabilities and Organizational demands. Also it is a mismatch between the expectations of both individual and organization. The National Institute for Occupational Safety and Health (NIOSH) [1], part of the U.S. Department of Health and Human Services, states that job stress, now more than ever, poses a threat to the health of workers– and the health of organizations than 20 years back. Occupational stress is the interaction of the worker and the conditions of work. Downsizing, increased workloads, high competition, growing population, etc are taking their toll. "Stress, in essence, is a feeling of doubt about being able to cope & a perception that the resources available do not match the demands made. When it persists, stress can cause physical and psychological ill-health and adversely affect social functioning." Occupational stress has become a common and costly problem, leaving few workers untouched. Not all stress is bad. Learning how to deal with and manage stress is critical to maximizing job performance, staying safe on the job, and maintaining physical and mental health. During stress, as a pre-programmed biological system, the brain activates hormone release, pulse, respiration, muscles etc. (which is called as flight response) to defend the alarming situation. Every person faces this situation, but repetition of the same in frequent intervals is a cause of concern. Continuing the body in such constant state of activation damages the biological systems. Such recurrent misbalance causes fatigue and curtails the bodily ability to defend. Stress is also known as a biological term which refers to the consequences of the failure of a human or animal body to respond appropriately to emotional or physical threats to the organism, whether actual or imagined. It includes a state of alarm and adrenaline production, short-term resistance as a coping mechanism, and exhaustion. It refers to the inability of a human or animal body to respond. Common stress symptoms include irritability, muscular tension, inability to concentrate and a variety of physical reactions, such as headache and accelerated heart rate. [2] In the present study, the health care industry had been given attention as there is increasing stress over this field, particularly on the doctors. In this study it was tried to evaluate and compare the stress among the resident / junior doctors of clinical and Pre- clinical departments.

Material and Methods:

The study was carried out in 100 resident doctors, perceiving post graduation .The resident doctors were enrolled from two sides of medical fraternity.

(1) Clinical (2) Pre- clinical

1. Clinical- The resident doctors/junior house officers working in hospital's clinical departments having responsibility in treating the patients and directly coming in contact with the patients & relatives.
2. Pre- clinical - The residents working in Pre-clinical departments not involved directly in treatment of patient.

The study was approved by the ethical committee.

Before calculating the stress score, detailed clinical examination of all participants was done, early morning in the basal conditions.

Following details were taken,

1) Age in years. 2) Sex. 3) Standing height in centimeters. 4) Weight in kilograms.

Body mass index (BMI) was calculated using standard formula i.e. Weight/ Height^2

Blood pressure was measured in sitting position with the help of sphygmomanometer.

Pulse rate, respiratory rate, were recorded by standard method.

Oral temperature was noted by mercury thermometer & categorized as febrile or a febrile.

In systemic examination all systems were examined for any disease or defect. Family history & habits were also noted.

Exclusion criteria:

Subjects giving history of:

- Hyperlipidaemia
- Hypertension
- Anti -psychotic treatment
- Epilepsy
- Diabetes

PROFESSIONAL LIFE STRESS TEST:

To evaluate the psychological stress, a professional stress test was selected from Managing stress, British psychological society & Routledge Ltd by DAVID FONTANA. [3] This test was earlier used to study the psychological stress in doctors of United Kingdom.

In this study the psychological stress is evaluated with the help of a questionnaire having 24 questions. Psychological stress is categorized according to the standard key provided with the questionnaire. The obtained score is calculated & categorized. The categories were divided into 4 groups depending on the psychological score obtained (David Fontana)

INTERPRETATIONS OF PSYCHOLOGICAL STRESS SCORE

Score = 15. Stress isn't a problem in your life. This doesn't mean that you have insufficient stress to keep yourself occupied and fulfilled. The scale is only designed to assess undesirable responses to stress.

Score = 16-30. This is a moderate range of stress for a busy professional person. It's nevertheless well worth looking at how it can reasonably be reduced.

Score = 31-45. Stress is clearly a problem, and the need for remedial action is apparent. The longer you work under this level of stress, the harder it often is to do something about it. There is a strong case for looking carefully at your professional life.

Score = 45-60. At these levels, stress is a major problem, and something must be done without delay. You may be nearing the stage of exhaustion in the general adaptability syndrome. The pressure must be eased.

Results:

Observations in Pre- Clinical Resident Doctors

Table 1: Sex Wise Distribution

Sex	Number of doctors	Percentage
Male	22	44 %
Female	28	56 %
Total	50	100 %

Table 2: Descriptive Statistics of Pre- Clinical Residents Doctors

Parameters	No.	Minimum	Maximum	Mean	SD
AGE (yrs)	50	24.00	42.00	29.2800	3.7853
HT (cm)	50	152.00	182.88	165.7996	9.1881
WT (kg)	50	43.00	84.00	62.0400	9.9282
BMI (kg/m^2)	50	17.40	27.00	22.5580	2.4117
PR (beats/min)	50	68.00	84.00	75.8600	3.9642
RR (breaths/min)	50	12.00	20.00	16.0800	1.6268
SBP (mm/Hg)	50	110.00	130.00	118.1200	5.6483
DBP (mm/Hg)	50	60.00	84.00	77.0800	4.6635
Psy. test score	50	3	23	10.08	4.5401

SD: Standard Deviation

Table 3: Psychological Stress Category among the Pre- Clinical Resident Doctors

Category of stress	Frequency	Percentage
Normal	42	84
Moderate	8	16
Total	50	100.0%

Table 4: Zero Order Correlation Coefficient (Pearson Correlation)

	BMI	PR	RR	SBP	DBP	PSY.TESTSCORE
BMI	1.000	.003	.014	.227	.251	-.002
P-Value	.	.981	.924	.113	.078	.989
PR	.003	1.000	.261	.345*	.150	.176
P-Value	.981	.	.067	.014	.300	.220
RR	.014	.261	1.000	.203	.096	-.048
P-Value	.924	.067	.	.157	.507	.743
SBP	.227	.345*	.203	1.000	.683**	.311*
P-Value	.113	.014	.157	.	.000	.028
DBP	.251	.150	.096	.683**	1.000	.103
P-Value	.078	.300	.507	.000	.	.477
PSY.TS	-.002	.176	-.048	.311*	.103	1.000
P-Value	.989	.220	.743	.028	.477	.

*** Correlation is significant at the 0.01 level (2-tailed)*

** Correlation is significant at the 0.05 level (2-tailed)*

Observations in Clinical Resident Doctors

Table 5: Sex Wise Distribution

Sex	Number of doctors	Percentage
Male	35	70%
Female	15	30%
Total	50	100%

Table 6: Descriptive Statistics of Clinical Residents

Parameters	No.	Minimum	Maximum	Mean	SD
AGE (yrs)	50	24.00	32.00	27.4000	2.0102
HT (cm)	50	152.00	185.00	169.5356	8.3992
WT (kg)	50	40.00	110.00	66.2800	13.3814
BMI (kg/m^2)	50	16.70	33.30	22.6800	3.2930
PR (beats/min)	50	70.00	90.00	78.1600	5.7547
RR (breaths/min)	50	12.00	22.00	17.4800	1.8097
SBP (mm/Hg)	50	100.00	146.00	121.4400	9.4072
DBP (mm/Hg)	50	60.00	94.00	78.0800	7.6019
PSY.TEST SCORE	50	7.00	25.00	13.8400	3.8299

SD: Standard Deviation

Table 7: Psychological Stress Category of Clinical Resident Doctors

Cat. of stress	Frequency	Percentage
Normal	31	62%
Moderate	19	38%
Total	50	100.0%

Table 8: Zero Order Correlation Coefficient (Pearson Correlation)

	BMI	PR	RR	SBP	DBP	PSY.TEST SCORE
BMI	1.000	.212	.267	.539**	.427**	.178
P-Value	.	.139	.061	.000	.002	.217
PR	.212	1.000	.322*	.133	.072	.242
P-Value	.139	.	.023	.358	.617	.091
RR	.267	.322*	1.000	.297*	.226	.309*
P-Value	.061	.023	.	.036	.115	.029
SBP	.539**	.133	.297*	1.000	.788**	.448**
P-Value	.000	.358	.036	.	.000	.001
DBP	.427**	.072	.226	.788**	1.000	.343*
P-Value	.002	.617	.115	.000	.	.015
PSY.TEST SCORE	.178	.242	.309*	.448**	.343*	1.000
P-Value	.217	.091	.029	.001	.015	.

*** Correlation is significant at the 0.01 level (2-tailed)*

** Correlation is significant at the 0.05 level (2-tailed)*

Comparison between Data of Clinical and Pre- Clinical Resident Doctors

Table 9: Test of Significance for Physiological Parameters of Clinical and Pre- Clinical Resident Doctors

Clinical Vs Pre- clinical	T test (pooled)	df	P-value
SBP	2.14*	98	0.0349
DBP	0.79	98	0.4298
BMI	0.22	98	0.8250
PULSE RATE	2.33*	98	0.0220
RES. RATE	4.07*	98	0.000
PSYCHOLOGICAL TEST SCORE	3.62*	98	0.0005

Statistically significant at 5% level i.e., $p < 0.05$

Table 10: Comparison between Blood Pressure of Clinical and Pre- Clinical Resident Doctors

Chi- Square Test

Clinical Vs Pre- Clinical	N	Correlation	P-Value
SBP	50	0.104	*0.471
DBP	50	-0.088	0.545

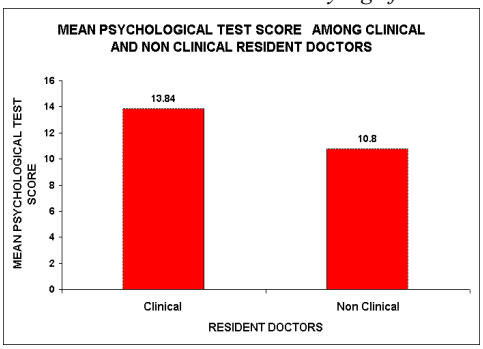
**Statistically highly significant at 5% level i.e., $p < 0.05$*

Table 11: Sex Wise Comparison with Category of Stress of Clinical and Pre- Clinical Resident Doctors:

Chi Square Test

Clinical and Pre- clinical	Female	Male	Total
Moderate	7	20	27
Normal	36	37	73
Total	43	57	100

p – Value = 0.0360 . It is statistically significant at 5% level



Graph 1:

Discussion

Stress research has evolved & continues to evolve with the changing demands of work place settings. The health care arena is one of many areas that have undergone major levels of change during the last decade. Whilst stress can be product of working and caring for people, it is still an occupational hazard that can be controlled & managed like any other stress. Through the identification of risk factors and the introduction of appropriate measures, the stress and ill health in the work place can be distinctly relieved. Especially in case of health industry where the expectations are very high from a medical professional / doctor in adverse conditions the psychological stress is becoming important part of doctors / medical professionals' life which is affecting their physical, mental, personal & social life. The psychological test score was calculated and categorized, the mean psychological test score in Pre- clinical doctors was 10.08. The category of stress was also calculated based on the psychological test score. There were 8 doctors (16%) found to be under moderate stress & rest 42 (84%) were under normal category in Pre- clinical group. No resident doctor was found to be under severe or very severe psychological stress in this group. In this study, in Pre- clinical group we have applied a "Zero order correlation co-efficient test" by Pearson method, to evaluate that how the physiological parameters are related with each other especially with the psychological test score within the same group. It was found that the systolic blood pressure was positively co-related with the psychological test score, which means that systolic blood pressure is increasing simultaneously with the psychological test score. It was significant statistically as

the correlation is significant at the 0.05 level (2-tailed). It was noted that the diastolic blood pressure was not significantly increased with that of the psychological test score because the p-value was 0.477 which is not significant statistically. The psychological test score was calculated and categorized, the mean psychological test score in clinical doctors was13.84. The category of stress was also calculated based on the psychological test score in the clinical group in which 19 doctors (38%) were under moderate stress & 31 (62%) were under normal category. No resident doctor was found to be under severe or very severe psychological stress in this group. A "Zero order correlation co-efficient test" by Pearson method, in clinical group of resident doctor shows that the psychological test score is positively correlated with all the physiological parameters. The systolic blood pressure is positively correlated with the psychological test score. It was highly significant statistically as the correlation is significant at the 0.01 level (2-tailed). The diastolic blood pressure was significantly correlated with that of the psychological test score because the p-value was 0.015 which is significant at the 0.05 level (2-tailed). The pulse rate and the respiratory rate were also positively correlated with the psychological test score. The psychological test score was higher in the clinical resident doctors than in Pre- clinical (Graph.1) which was statistically proved with the help of "POOLED T – TEST". The p- value was 0.0005 which is highly significant. Clinical & Pre- clinical group of resident doctors were also compared according to their category of stress, it was found that there were more number of clinical resident doctors in the moderate category as compared to Pre- clinical resident doctors. This explains that the clinical resident doctors are more stressed, because while treating the patient, they are dealing with the life of a patient, the anxiety of relatives, etc. The other reasons may be unavailability of time for personal care& work load more than that can be handled by them. These stressors may initiate the "stress response" of sympathetic nervous system. In response to the stressors, corticotrophin releasing hormone, (CRH), Arginine-vasopressin (AVP) and adrenal medullar hormones are released at higher concentration and it probably changes the ratio of acetylcholine, adrenaline and serotonin which gives more psychological test score. This suggests that these residents need training to reduce the levels to bring ratio to normal. Though we call it as "Fight or Flight response" being a doctor, one has to fight and can't fly away. Hence there is change in above ratio as the residents are not trained.

Similar findings was also noted by Sally hardy et al [2]in their book on stress management that the expectation from a health professional regarding treatment of patient ,overwork are the important reasons for stress in health professionals. J Firth [4] also found that, overwork was the most stressful aspect of their jobs, though the number of hours worked was not related to stress levels, unlike diet and sleep. The more stressed they were the more unfavorably they viewed aspects of their jobs. The incidence of distress is unacceptably high in junior house officers, and both they and the hospitals need to deal with the causes of the distress. Our study findings indicate that the psychological stress is associated with increased values of blood pressure in clinical resident. Similarly, a study by Dr .Bakhtiyar Chaudhary et al [5] noted in his study that prolonged exposure to work stress without correct coping strategies, may emerge as a potential risk factor for hypertension and coronary artery disease. In our study, the Pulse rate and Respiratory rate is significantly higher in clinical resident doctors than in Pre- clinical which again shows association with psychological stress and was proved statistically. The reason may again be the sympathetic drive. The psychological test score was compared sex wise according to the category of stress without considering their departments in which it was found that out of total 57 males, 20 were under moderate category of stress while the number in female was 7 out of 43. "The chi square test" was applied and it was found that the difference was statistically significant .i.e. p value =0.036. This concludes that in this study the males were having more psychological stress than females. This effect is influenced by hormone estrogen which helps female in coping with the stress more efficiently than males who lack this hormone. Anne Marie Berg et al [6] in their study states that males showed more depressive symptoms than females. The considerable amount of psychological stress found in this study among the resident doctors should trigger further work or research in this topic. The hormonal levels also can be done in the stressed residents or those who have a higher psychological test score. From this study it can be suggested that, the resident doctors should be trained to face the stress before they join the residency and need to follow up from time to time so that the residents become psychologically more stable while working in hospital. They should be provided balanced diet. They should have a fixed schedule and properly distributed job responsibilities. They should have regular physical exercise & meditation to cope up with the upcoming challenges in the medical field.

Bibliography

1. Parikh P, Taukari A, Bhattacharya T. Occupational Stress and Coping among Nurses. Journal of Health Management. October 2004 vol. 6 no. 2 115-127.
2. The Stress of Life, Hans Selye, New York: McGraw-Hill, 1956.
3. David Fontana. Professional stress test scale UK. Managing Stress, The British Psychological Society and Routledge Ltd., 1989.
4. J .Firth-Cozens. Emotional distress in junior house officers Br Med J (Clin Res Ed). 1987 August 29; 295(6597): 533–536.
5. Choudhary BS, Rao V, Suneetha S. ardiovascular Reactivity During Teaching: An Emerging Occupational Stress in School Teachers. Indian Journal Of Occupational And Environmental Medicine. Vol.8,NO.1, JAN-APRIL 2004. Pg 22-24.
6. Anne Marie Berg, Erlend H, Bjørn L and Øivind E. An exploration of job stress and health in the Norwegian police service: A cross sectional study. Journal of Occupational Medicine and Toxicology 2006, 1:26 doi:10.1186/1745-6673-1-26.