



## PERCEIVED STRESS LEVELS AND ITS SOURCES AMONG DOCTORS AND NURSES WORKING IN A TERTIARY CARE TEACHING HOSPITAL, KANCHEEPURAM, TAMIL NADU

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## ABSTRACT

**Introduction:** Stress and emotional disturbances among doctors and nurses are relatively common, and seemingly, this is a world-wide problem. Recently studies have reported high levels of stress among health care professionals. This study was done to assess prevalence of perceived stress and its sources among doctors and nurses.

**Methodology:** Cross-sectional study was conducted among 200 study subjects (84 doctors & 116 nursing staff) by simple random sampling. Perceived stress scale (PSS 10) questionnaire was used to assess stress scores. Work environment, health related and psycho-social stressors were assessed using a 16 items questionnaire. MS Excel sheet and SPSS were used for data entering and statistical analysis.

**Results:** Prevalence of stress among study participants was found to be 39.5% (79). Mean PSS score among doctors was found to be 18.35 ( $\pm 4.7$ ) and the same among nurses was 17.16 ( $\pm 5.5$ ). Inadequacy of staff and resources, sleep deprivation, confronting constant emotional smoking physical suffering were found as important stressors.

**Conclusions:** This study identified that doctors and nurses do face considerable amount of stress at workplace. Appropriate coping strategies must be adopted by them to cope up with this stress.

**Keywords:** Doctors, Nurses, Stress scores, Sources of stress

## INTRODUCTION

Stress is a feeling of tension or pressure that people experience when demands placed on them exceed the resources they have to meet these demands<sup>1</sup>. It is defined as "the pattern of specific and non-specific responses an organism makes to stimulus events that disturbs its equilibrium and exceeds its ability to cope"<sup>2</sup>.

Hospital workers must deal with life-threatening injuries and illnesses complicated by overwork, under-staffing, tight schedules, paper-work, intricate or malfunctioning equipment, complex hierarchies of authority and skills, dependent and de-

manding patients, and patient deaths, all of which are significant contributors to stress<sup>3</sup>. Furthermore, stressful aspects of the job such as overstretched bed allocation, long hours of work, stress of personal and family life and compromising standards when resources are short have been associated with psychological distress or depression among health care staff<sup>4</sup>.

High exposure to stressful events among medical personnel may manifest itself in several different outcomes including depression, anxiety, self-doubt, post traumatic stress disorder, loss of sleep, impairing immune function, elevation of cardiovascular risk factors, burn out and disturbed rela-

tionships with family<sup>5,6,7</sup>. Knowledge about presence of stress is therefore important, and if found, should be given attention for timely intervention.

Stress among health care professionals depends on the type of job (i.e. the type of medical practice, specialty etc), the organization, the personality of the doctor, the interpersonal relationships within and outside the health care fraternity and work-life balance<sup>8</sup>. In the Western countries there is a greater awareness and sensitivity to the problems that are faced by healthcare professionals. Several studies have shown high level of stress among medical practitioners in United Kingdom as a result of their work which directly hampers their ability to provide high quality care to patients<sup>9-13</sup>.

In India more studies have been done among medical students<sup>14-19</sup> than among doctors, nurses and other health care professionals<sup>20-22</sup>. Hence, this study was designed with an objective of assessing perceived stress among doctors and nurses and to identify factors associated with stress in them in a tertiary care teaching hospital in India.

## SUBJECTS AND METHODS

A Cross sectional study was conducted in SRM Medical College Hospital, Chennai from 01/06/2015 to 15/12/2015. Doctors and nurses between the age of 18 and 65 years who had worked at least 3 months in this hospital were included in the study. Visiting consultants and individuals not consenting to participate in the study were excluded from the list.

**Sample size estimation:** A study conducted among private medical practitioners in Vellore District, Tamil Nadu, revealed that the prevalence of high job stress was 35.5%<sup>21</sup>. Based on this, the sample size for the present study was calculated using the formula  $n = (Z^2pq)/d^2$ , where  $n$  = sample size;  $Z = 1.96$ , a constant;  $p$  = prevalence, 35.5%;  $q = 1 - p$ , 64.5%;  $d$  = relative precision, 20% of prevalence i.e. 7%. The sample size was estimated to be 180. Allowing 10% for non-response, the sample size was found to be 198 rounded off to 200. Hence, the final sample size for this study was fixed at 200.

Simple random sampling technique was used to select the study subjects from among the pool of doctors and nurses. A list of doctors and nurses fulfilling the inclusion and exclusion criteria was prepared. From this list, 200 people were selected through a simple random sampling technique using a computer generated random list. Each of these 200 study subjects were approached by the investigator. The investigator explained the aims and objectives of the study and obtained a written

informed consent (See annexure 1) from the study subject.

Relevant data were collected from the study sample of 200 doctors and nurses on a case record form (CRF; See Annexure 2). The first section of CRF was used to record relevant socio demographic data while the second section comprised of the Perceived Stress Scale (PSS). The PSS - 10 Questionnaire<sup>23</sup> had 10 questions/statements and the respondents were asked to indicate their level of agreement with a given statement by way of an ordinal scale (0 = Never; 1 = Almost; 2 = Sometimes; 3 = Fairly Often 4 = Very Often). The advantage of PSS is that it can be applied to a wide range of settings, to different subject types and includes items measuring reactions to stressful situations as well as measures of stress<sup>23</sup>. Information pertaining to 16 selected stressors (factors related to stress) was collected in the third section. The stressors were divided in to those that were related to health, those that were psychosocial in nature and those that were related to work environment. Responses were either Yes or No. The study was approved by the institutional ethical committee (See annexure 3). Confidentiality was maintained throughout the conduct of the study.

### Statistical Analysis

The information thus collected was entered on a Microsoft Excel spread sheet. Statistical analysis of the data was done using SPSS. Descriptive statistics were used to describe the data initially. Chi square test was used to compare proportions while unpaired 't' test and one way ANOVA were used to compare means. Logistic regression analysis was done to find out determinants of stressed subjects.

## RESULTS

### General Characteristics of the Study Population (Refer table 1)

A total of 200 subjects were studied in the present study of whom 84 (42%) were doctors and 116 (58%) were nursing staff. The mean age of the study population was 31.73 ( $\pm$  11.53 SD) years. Mean age of doctors in the present study was 40.67 ( $\pm$  12.12 SD) years and for nurses it was 25.25 ( $\pm$  4.84 SD) years. More than 2/3<sup>rd</sup>s of the study subjects were females (140, 70%). Almost 3/5<sup>ths</sup> of the subjects were in the age group of 18 to 30 years (59.5%). And a similar proportion of the subjects worked for less than or equal to 7 hours (60.5%). A total of 22 people reported having one or more chronic illness. Diabetes was reported by 7.0% of the population while hypertension was reported by 3.0% of the population and other chronic illnesses such as respiratory illnesses and heart disease was reported by 3% of the population.

**Perceived Stress Score (PSS) (Refer table 1)**

In the present study, the mean PSS score was found to be 17.66 (± 5.25 SD) while the median was found to be 19.00 (IQR<sub>25-75</sub> = 15.25, 21.0). The association between the various study variables and the mean PSS Score was studied using unpaired 't' test and one way analysis of variance test (ANOVA) and the same is shown in table I. The mean PSS score for doctors was 18.35 (± 4.7 SD) while the median was 19.00 (IQR<sub>25-75</sub> = 15.25 - 21.0). The mean PSS score for nurses was 17.16 (± 5.5 SD) while the median was 18.00 (IQR<sub>25-75</sub> = 14.0 - 21.0). Doctors, thus, had a higher perceived stress score compared to nurses but this was not statistically significant. Gender, Age, Travel time, specialization among doctors, presence of chronic illness and number of working hours per day did not have a statistically significant association with the perceived stress scale scores.

**Sources of Stress**

The responses to stressors related to health, psychosocial and work environment have been depicted in table 2. More than 2/3<sup>rd</sup>s of the respondents (70.5%) found inadequacy of resources and staff as an important stressor. Inability to manage time efficiently was found to be an important stressor as 109 (54.5%) of the respondents had responded positively.

**Proportion of Study Subjects with Stress**

All the study subjects were classified based on their PSS scores using quartiles and those in the top two quartiles were considered stressed, for the purpose of this study. So, a score of more than or equal to 20 indicated the presence of stress and a score of below 20 indicated absence of stress. Out

of the 200 subjects, 79 subjects had a PSS Score ≥ 20 and hence were considered to 'stressed'. Thus the prevalence of stress in this study population was 39.5%. Among those who were stressed, 41 (51.9%) were nurses, 53 (67.1%) were females, 45 (57%) belonged to 18 - 30 years age group and 9% suffered from a chronic illness. (Refer table 3).

**Table 1: General Characteristics and Association between the variables and mean PSS Score among study subjects (n=200)**

Variables	Frequency	Mean ± S.D	'P' value*
<b>Age Groups (n = 200) #</b>			
18 - 30 years	119 (59.5)	17.16 ± 5.5	0.147
31 - 60 years	69 (34.5)	18.65 ± 4.6	
61 years and above	12 (6)	16.83 ± 5.2	
<b>Gender (n = 200) §</b>			
Males	60 (30)	18.10 ± 4.2	0.381
Females	140 (70)	17.46 ± 5.6	
<b>Professional Stream (n = 200) §</b>			
Doctors	84 (42)	18.35 ± 4.7	0.106
Nurses	116 (58)	17.16 ± 5.5	
<b>Specialization among Doctors (n = 84) §</b>			
Surgical Specialty	44 (52.4)	18.55 ± 4.6	0.692
Medical Specialty	40 (47.6)	18.13 ± 5.0	
<b>Chronic Illness (n = 200) §</b>			
Present	22 (11)	18.64 ± 4.9	0.333
Absent	178 (89)	17.53 ± 5.2	
<b>Travel time per day (n = 200) §</b>			
< 1 hour	107 (53.5)	17.07 ± 5.7	0.089
≥ 1 hour	93 (46.5)	18.32 ± 4.6	
<b>Working hours per day (n = 200) §</b>			
≤ 7 hours	121 (60.5)	17.73 ± 5.2	0.811
>7 hours	79 (39.5)	17.54 ± 5.3	

\* Significant if p < 0.05; # One way ANOVA test for statistical significance; § Unpaired 't' test for statistical significance; figure in parenthesis indicate percentage

**Table 2: Proportion of Population with the various stressors (n = 200)**

Sources of Stress	Yes (%)	No (%)
<b>Health Related Stressors</b>		
Sleep Deprivation	66 (33)	134 (67)
Frequently missing meals	87 (43.5)	113 (56.5)
Smoking	06 (3)	194 (97)
Regular consumption of alcohol	03 (1.5)	197 (98.5)
<b>Work Environment Stressors</b>		
Ability to cope with work	191 (95.5)	09 (4.5)
Inadequacy of resources and staff in the organization	141 (70.5)	53 (26.5)
Conflict among colleagues affecting performance	57 (28.5)	143 (71.5)
<b>Psycho-Social Stressors</b>		
Fearing committing an offence while treating a patient	44 (22)	156 (78)
Climatic condition as a stressor	85 (42.5)	115 (57.5)
Dealing with death	78 (39)	122 (61)
Confronting constant emotional and physical suffering	90 (45)	110 (55)
High expectations from patients	60 (30)	140 (70)
Adequate support from friends and family	185 (92.5)	15 (7.5)
Ability to balance between work and social life	161 (80.5)	39 (19.5)
Time for Exercise or other leisure activities	104 (52)	96 (48)
Inability to manage time efficiently	109 (54.5)	91 (45.5)

**Table 3: Association between the variables and PSS Score among study subjects (n=200)**

Variables	PSS ≥20	PSS <20	Total
Total	79 (39.5)	121 (60.5)	200 (100)
Age Groups			
18-30 years	45 (57)	74 (61.2)	119 (59.5)
31 – 60 years	32 (40.5)	37 (30.6)	69 (34.5)
61 years and above	02 (2.5)	10 (8.3)	12 (6)
Gender			
Males	26 (32.9)	34 (28.1)	60 (30)
Females	53 (67.1)	87 (71.9)	140 (70)
Professional Stream			
Surgical Doctors	22 (27.8)	22 (18.2)	44 (22)
Medical Doctors	16 (20.3)	24 (19.8)	40 (20)
Nurses	41 (51.9)	75 (62)	116 (58)
Chronic Illness			
Chronic illness present	09 (11.4)	13 (10.7)	22 (11)
Chronic illness absent	70 (88.6)	108 (89.3)	178 (89)
Travel time per day			
< 1 hour	40 (50.6)	67 (55.4)	107 (53.5)
≥ 1 hour	39 (49.4)	54 (44.6)	93 (46.5)
Working hours per day			
≤ 7 hours	47 (59.5)	74 (61.2)	121 (60.5)
>7 hours	32 (40.5)	47 (38.8)	79 (39.5)

**Table 4: Determinants of stress by Logistic Regression**

Variable	P Value	Risk Ratio	95% CI
Sleep deprivation	0.033	2.26	1.07-4.77
Confronting emotional and physical suffering constantly disturbing	0.032	2.17	1.07-4.42
Smoking	0.050	10.13	1.00-102.3

CI: confidence interval

**Determinants of Stress (Refer table 4)**

On carrying out a multiple logistic regression analysis with the stressors as independent variables and the presence or absence of stress as a dependent variable, it was found that sleep deprivation, confronting constant emotional & physical suffering and smoking were statistically significantly associated with stress with a risk ratio of 2.25 (95% CI = 1.06 – 4.77), 2.17 (95% CI = 1.06 – 4.41) and 10.12 (95% CI = 1.002 – 102.35) respectively.

**DISCUSSION**

The lives of healthcare professionals are often stressful. This study evaluated perceived stress and also determined the sources of stress among two important groups of health care professionals i.e. doctors and nurses.

We chose the perceived stress scale (PSS-10) for evaluating stress, since this instrument has been documented for its reliability and validity<sup>23-25</sup>. An

important limitation of other reviewed stress scales for health professionals is that it focuses only on academic stressors, and lack of inclusion of personal issues or reactions to stressful situations (psychosocial issues), and poor applicability to broader settings.

The mean (± S.D) PSS score among the study subjects was 17.66 (± 5.25 SD). Among doctors it was 18.35 (± 4.7 SD) while the same for nurses was 17.16 (± 5.5 SD). Mean age of doctors in the present study was 40.67 (± 12.12 SD) years and for nurses it was 25.25 (± 4.84 SD) years. Hence, difference in mean scores between doctors and nurses could be due to variation in mean age. Studies done in other countries and in other states of India have reported higher prevalence of stress among health care workers. A study in Bangalore among 1<sup>st</sup> year medical undergraduates revealed mean perceived stress score to be 20.29 (± 6.24 SD)<sup>14</sup>. Another study done in Jodhpur, also among first year medical undergraduates revealed that the males had a mean perceived stress score of 15.96 (± 5.10 SD) and females had a mean PSS score of 17.3 (± 5.95 SD)<sup>15</sup>. A Study in Pune among Physiotherapy students found that the mean PSS score was 20.50 (± 5.96 SD)<sup>17</sup>. A Study in the United States among nurses found that the mean perceived stress was 25.5 (± 5.98 SD)<sup>26</sup>.

In the present study, majority (70%) of the participants were females. But, the difference in mean PSS scores between females and males was not statistically significant. In a study conducted in Mangalore among medical undergraduates, the mean PSS score among females was found to be significantly higher than that of the males<sup>16</sup>. Another study in Pakistan, among medical students showed that perceived stress was significantly higher among female students<sup>27</sup>.

In the present study, PSS – 10 score was used to determine stress levels. PSS – 10 has a possible range of scores from 0 to 40. The range of PSS scores were also divided into quartiles. The upper two and lower two quartiles were combined (20 being the operational cut off value for the upper bound) and were labeled as stressed and not stressed respectively. In a study done by Brahmbhatt et al<sup>16</sup> PSS - 14 scale was used and similarly a score of 28 was considered as operational cut off.

By considering 20 as cut off score in the present study, the overall prevalence of stress was found to be 39.5%. Studies done in other countries and in other states of India, have reported higher prevalence of stress. A study from Saudi Arabia reported that 57% of the population was stressed<sup>28</sup> and a survey conducted among students in a Medical school in Thailand, revealed that 61.4% of students had some degree of stress during their training pe-



riod<sup>29</sup>. Another study assessing the relationship between emotional intelligence, perceived stress and burn out among resident doctors showed a positive correlation of burnout with perceived stress<sup>20</sup>.

Out of the 79 people who were stressed, 41 (51.9%) were nurses. This finding is consistent with the findings of other similar studies. A study in Tehran, conducted among doctors and nurses revealed that more nurses than doctors suffered from stress<sup>30</sup>. Also, among those who were stressed, most of them (67.1%) were females. A study done in the UK among undergraduate pharmacy students found that female students reported a significantly higher levels of perceived stress than their male counterparts<sup>31</sup>.

Multiple Logistic regression analysis showed sleep deprivation, confronting constant emotional and physical suffering and smoking were the three main determinants of stress. A majority (70.5%) of respondents found inadequacy of resources and staff as an important stressor but it was not found to be statistically significant. A study of relationship between job stress, quality of working life and turnover intention among hospital employees identified staff shortage as a major source of stress<sup>32</sup>. A study in Zambia, Africa found doctors to be highly stressed. Lack of resources to carry out their job, the workload, the low level of reward and the long working hours were most frequently identified as stressors<sup>33</sup>. Another study assessing relationships among stress, positive affectivity and work engagement among nurses revealed that work stressors experienced by most nurses were workload, time pressure, inadequate reward, inadequate patient interaction, and unmanageable emotional demands of job<sup>34</sup>.

A study from Turkey among healthcare professionals reported that programs directed towards reducing job stress and enhancing motivation and job satisfaction were recently considered by health institutions<sup>35</sup>. Another study in Andhra Pradesh suggested that hard working and committed employees should be benefitted from financial rewards, holidays or career progression to keep their morale high. A dedicated department should operate in the hospital to promote healthy eating, exercise and recreation in individuals. E.g. gym and other recreation should be available for staff in the hospital campus. The practice of yoga, meditation and other similar exercise regimen is highly advised to manage and prevent stress<sup>22</sup>.

## CONCLUSION

The present study identified that doctors and nurses do face considerable amount of stress at workplace. Inadequacy of staff and resources,

sleep deprivation and confronting constant emotional and physical suffering were found to be important stressors. We recommend appropriate work place interventions to cope with the stress.

## Strengths

One of the widely used and reliable Psychological instruments (i.e. 10-item Perceived Stress Scale-10) has been used for measuring perception of stress in this study. The present study was done amongst doctors and nurses while most of the similar studies done in India had medical undergraduate students as their study population

## Limitations

Few respondents were busy during the time of interview, so it was not possible to get their fullest co-operation which in turn might have had an effect on the outcome. Working environment and job responsibilities are discrete for every kind of hospital in India. Hence, the results of this study done in private tertiary care medical college hospital cannot be generalized to the entire community of doctors and nurses in our country

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