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Original Research Article

Perceived stressors and coping mechanisms among intern doctors and residents in a tertiary care hospital in South India

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ABSTRACT

Background: The high prevalence of stress amongst health care professionals is resulting in burnout and decline in quality of patient care. Intern doctors and residents are expected to adapt, improvise and overcome these stressors in an effective manner to optimize their productivity and ensure the best standard of care. This study aims to outline the stress profile as perceived by intern doctors and residents and to explore methods employed to cope with work place stress.
Methods: An analytical cross-sectional study was undertaken among 60 Intern doctors and 60 Residents in a Tertiary care teaching hospital in southern India in 2018. Socio-demographic details and perceived stress was evaluated by questionnaires and Cohen's perceived stress scale (PSS). Data obtained was entered and analysed with Statistical Package for the Social Sciences and results were presented using frequencies and percentages. Chi-square test was used to test significance of various factors and their relation to stress.
Results: Stress was reported by 78.3% and 75% of Intern and resident doctors respectively. The mean PSS score among intern doctors was 18.42±4.18 and 19±4 among residents. With the exception of sleep duration, no significant association was found between stress and socio-demographic or behavioral factors. Excessive workload was the leading cause of stress among intern and resident doctors. 33.3% of residents resorted to unhealthy coping mechanisms to stress as against 8% in Interns. 18.3% of intern doctors were unaware of means to cope with stress.
Conclusions: Effective stress management techniques and healthy sleep habits must be encouraged amongst Intern and Resident doctors to enable them to adapt to the dynamic and demanding lifestyle of the medical profession.

Keywords: Intern doctor, Residents, Stress, PSS, Coping mechanism

INTRODUCTION

Exogenous overwhelming factors coupled with endogenous personality traits and inadequate coping mechanisms lead to stress in an individual's life. High functioning professions, as that of the medical professional, requires one to be constantly alert, rapidly adaptive and receptive. Sometimes, the pursue of these characteristics along with poor job resources comes at the cost of inadequately managed stress leading to mental disorders, depersonalization, substance abuse, impairment in function, and burnout and suicide.[1] Cognitive impairment, chronic anger, cynicism, and family discord were found likely to occur in almost all house officers.[2] This has a negative impact on patient care and may result in frequent medical errors and sub-optimal care practices.[3-6]

The intern year refers to a period of 12 months of compulsory supervised hands-on training in various departments of a tertiary care hospital in order to obtain bachelor of medicine and bachelor of surgery degree in India. It is a year of tremendous change where information and knowledge acquired during medical school translates into a hands-on experience. This is a

stressful time for students as they adapt and learn about the practicalities in clinical medicine, which is demonstrated by high stress prevalence ranging between 33% to 73% among intern doctors in different clinical settings.[7,8] Similarly, resident doctors have been observed to have a high prevalence of stress as they learn to personalize patient health care and have increased responsibilities.[9]

This study was undertaken to evaluate the stress amongst intern doctors and residents in a tertiary care hospital using the PSS-10 (perceived stress scale-10) and subjectively analyse the result along with their coping mechanism. The study of residents and intern doctors in a common setting with observations relating to stressors and coping mechanisms is scarce as far as literature is concerned.

The identification of these elements may help us target the shortcomings of the administrative and educational culture in our system thereby improving the mental health of the practicing doctors and also guarantee the safety of their patients.

METHODS

An analytical, cross sectional study was undertaken in a tertiary care teaching hospital during October-December 2018. The objective of this study was to assess the level of stress amongst intern doctors and residents in various specialities using the Cohen's perceived stress scale and analyse its relationship with the participant's socio-demographic and behavioural factors.[10] Participants were chosen by random sampling from various specialities in the hospital, namely General medicine, Surgery, Paediatrics, Obstetrics and Gynaecology, and elective specialities.

Ethical clearance for this project was obtained from the institutional ethics committee. Intern doctors who had completed their twelve-month mandatory clinical rotations and resident doctors at their completion of their first foundation year were included in the study.

The sample size was calculated using OpenEpi software (v3.0). The prevalence of stress among intern and resident doctors was estimated at 73% with an absolute precision of 8% and with confidence interval of 95%; and a sample size of 120 was calculated. Sixty Intern doctors and sixty residents participated in this study after obtaining their written informed consent.[8]

Data collection and analysis

After explaining the details and purpose of the study to the participants, data was collected though personal interviews, using a semi-structured interview schedule. Data was collected on demographic variables such as age and gender, smoking and alcohol consumption, working patterns and an objective assessment of stress with the Cohen's perceived stress scale PSS-10 was conducted.

The perceived stress scale is an effective instrument to measure the perception of stress experienced by an individual. The formulated set of 10 questions can be awarded a range of 0-4 points based on how the applicant answers them. This test gauges the participants perception of their lives as to how stressed they have been during the last month. PSS-10 scores are obtained by reversing the scores on the four positively stated items and then summing across all scales.

Questions 4, 5, 7, 8 are classified as positive questions and the remaining questions (question numbers 1, 2, 3, 6, 9, and 10), are classified as negative questions. Higher scores reveal higher levels of stress and lower scores reveal lesser levels of stress. This scale has been found to be a substantially reliable measurement tool (i.e., coefficient reliability=0.84, 0.85, and 0.86, in three test samples) with high internal reliability (a=0.78) and acceptable evidence of validity.[10]

Statistical analysis was performed using the IBM SPSS Statistics for Windows version 20.0. The results were presented using frequencies and percentages. Means and standard deviations were calculated for continuous variables. Chi square test was used to test the association and p value<0.05 was considered as statistically significant in the study.

RESULTS

Among the respondents, there were 51.66% (n=31) female intern doctors, and 55% (n=33) male resident doctors. Mean age of intern doctors was 24±2 years and the mean age of resident doctors was 26±1.6 years. Majority of the intern doctors were of 24 years accounting for 46.67% (n=28) and the majority of residents were 26 years of age accounting for 23.3% (n=14).

Duration of work

The average duration of work per day was 9 hours among intern doctors and 10.5 hours among the resident doctors. This amounted to an average of 63-hour work weeks for intern doctors and 73.5-hour work weeks for resident doctors.

Duration of sleep

Intern doctors reported an average of 6.4 hours of sleep per day. Resident doctors reported a lower, 5.9 hours, of sleep per day. The difference, however, was not found to be statistically significant (p=0.60; p>0.05). The majority of the intern and resident doctors reported to getting sound sleep (65%; N=39, 58.3%; N=35 respectively).

Table 1: Intern doctor stress profile (n=60).

Stress profile	Presence of stress	Absence of stress
Subjective reporting	78.33% (n=47)	25% (n=15)
Cohen's PSS	18.42±4.18	13.84±5.3
		(CI 95%; p=0.0017, p<0.05)
Stress profile		**Presence of stress**
Self-reported grading of stress (n=47)		Mild 44% (21)
		Moderate 49% (23)
		Severe 6.3% (3)
Individual stressors (n=60)		**Percentage (n)**
Excessive work load		63 (30)
Work fatigue		10.00 (5)
Preparation of future exams		6 (3)
Peer pressure		4.20 (2)
Long commute time		4.20 (2)
Family obligations		4.20 (2)
Pressure from senior consultants		4.20 (2)
Conflicts with colleagues		2.12 (1)
Coping mechanisms (n=60)		**Percentage (n)**
Listening or playing music		27 (16)
Meditation/Yoga practice		27 (16)
Unable to cope up with stress		18.3 (11)
Smoking		8 (5)
Playing sports		8 (5)
Reading		5 (3)
Movies		5 (3)
Shopping		3.3 (1)

Use of addictive substances

11.67% (n=7) of intern doctors and 16.67% (n=11) of the residents reported the usage of tobacco in the form of cigarettes. 21.66% (n=13) intern doctors and 31.66% (n=19) resident doctors reported the usage of alcohol. None of the participants reported using other recreational drugs including marijuana, cocaine, and amphetamines.

Stress profile of intern and resident doctors

On subjective questioning, 78.33% (n=47) intern doctors reported to have stress. Objective analysis of perceived stress by the cohen's PSS revealed that those who reported to not have stress scoring of 18.42±4.18, as against those who reported to not have stress, scoring 13.84±5.3 on the PSS. It was observed that the stress experienced by interns was statistically significant (CI 95%; P=0.0017, P<0.05). Majority of intern doctors reported moderate amount of stress (49%; n=23) (Table 1).

Similarly, on subjective questioning, 73.34% (n=44) of resident doctors reported to be stressed. Objective analysis of resident doctors revealed that those who reported to have stress observed a PSS score of 19±4, as against those who reported to not have stress, scoring 18±5.95 on the PSS. However, this finding was not statistically significant. (CI 95%; P=0.41, P>0.05) (Table 2). The majority of resident doctors reported to have moderate stress (57.8%; n=26).

Table 2: Intern doctor stress profile (n=60).

Stress profile	Presence of stress	Absence of stress
Subjective reporting	73.34% (n=44)	26.67% (n=16)
Cohen's PSS	19±4	18±5.95
		(CI 95%; P=0.41, p>0.05).
Stress profile		**Presence of stress**
Self-reported grading of stress (n=44)		Mild 31% (14)
		Moderate 57.8% (26)
		Severe 8.9% (4)
Individual stressors (n=60)		**Percentage (n)**
Excessive work load		74 (n=32)
Work fatigue		7.00 (n=3)
Pressure from senior consultants		4.60 (n=2)
Feelings of detachment or depressed moods		2 (n=1)
Peer pressure		2 (n=1)
Long commute time		2 (n=1)
Family obligations		2 (n=1)
Insufficient pay		2 (n=1)
Coping mechanisms (n=60)		**Percentage (n)**
Listening or playing music		18.3 (11)
Playing sports		16.7 (10)
Meditation/Yoga		13.33 (8)
Reading		10 (6)
Cooking		8.3 (5)
Smoking		11.7 (7)
Alcohol consumption		6.7 (4)
Unhealthy eating habits (binge eating/anorexia)		6.7 (4)

A statistically significant association was found between stress and number of hours of sleep per day (p value=0.005, p<0.05)). No significant association was found between gender and stress (P=0.70). There was no statistical significance between sound sleep and stress (P=0.57).

No association was established between smoking (P value=0.57) and alcohol consumption to stress (P value=0.834). No association was found between stress and the number of hours of work per day or the age of the participants.

Reasons for stress

Out of the 47 intern doctors who reported to have stress, the main reasons cited for stress were work load (63%; n=30), fatigue (10%; n=5), and exam pressure (6%, n=3). Other reported causes were family responsibilities, long commute times, senior doctor pressure and peer pressure. Of the 44 residents who reported to have stress, work load (74%; n=32) was the leading factor for stress. Fatigue (7%; n=3), depression (2%; n=1), pressure from senior consultants and lack of sleep were amongst others cited as causes of stress (Table 1 and 2)

Coping mechanisms

Amongst intern doctors, 27% (n=16) of the respondents resorted to listening to music and 27% (n=16) resorted to meditation in response to stress. 18.33% (n=11) of the respondents were unable to find a mean to cope with stress, while 8% (n=5) resorted to smoking in response to stress (Table 1).

Amongst the resident doctors, 66.67% (n=40) displayed healthy coping mechanisms. This included listening to music (18.33%; n=11), playing sports (16.67%; n=10), meditation (13.33%; n=8), reading and cooking (18.3%; n=11). The remaining 33.3% (n=20) displayed poor coping mechanisms including smoking (11.6%; n=7), consumption of alcohol (6.67%; n=4), and indulging in unhealthy eating habits (6.67%; n=4) (Table 2).

DISCUSSION

In our study, we evaluated the demographic details of intern doctors and residents and objectively assessed stress experienced by the respondents with the PSS scale.[10] Furthermore, we studied the precipitating causes of stress and coping mechanisms employed by the two study groups. Our study comprised of 120 doctors, which included 60 intern doctors and 60 resident doctors. Similar studies were conducted in India by Sathiya et al, Grover et al, Sahasrabuddhe et al and Chakraborthi et al.[11-14]

Demographic characteristics and stress correlation

In our study, we noted an almost equal proportion of male and female respondents. The gender of the participant did not affect the stress demographic of the population (p value=0.7; P>0.05). This observation was in congruence with findings in other studies conducted by Aboulghami et al, Sathiya et al, and Malek et al.[7,11,15]

However, in a study by Iqbal et al, female respondents were found to have a higher prevalence of psychological problems compared to their male counterparts.[16] In our study, we did not observe a statistically significant relation between stress, as reported by the respondent, and their age.

This observation was in congruence with other studies with similar social demographics.[11,17,18] However, in a study by Iqbal et al those with younger age group suffered from higher stress levels.[16]

Prevalence and severity of stress

The prevalence of stress among intern doctors in our study was 78.3% as determined by the perceived stress scale. This finding was similar to the prevalence of stress in intern doctors reported by Abdulghani et al in which stress was estimated to affect 73% of intern doctors of which 35% were affected by severe stress.[7] In a study by Chandramouleeswaran et al 45% of intern doctors reported high levels of stress.[19] In our study, we observed a substantially smaller proportion of intern doctor reporting severe stress at only 6.3%. The participants reporting to have stress, scored a PSS score of 18.42±4.18, as against 13.84±5.3 in those who reported to not have stress (95% CI 18.42±4.18; P=0.0017).

In the study, we report the stress prevalence among resident doctors at 73.34%. The observed prevalence of stress was in congruence to other reports.[9] The mean PSS score among resident doctors was 18±5.95 which was substantially lower than the PSS scores reported in other studies in which the mean PSS score calculated for residents reporting stress was estimated to be 22.0±5.1.[1]

Influence of sleep on stress levels

In our study, Intern and resident doctors averaged 6.4 hours and 5.9 hours of sleep per 24 hours across shifts respectively. This was lower than the average number of hours of sleep obtained by intern and resident doctors reported by Basner et al in which the average hours of sleep an intern and resident obtained was 6.93 hours and 7.18 hours respectively. This reversal of the duration of sleep by both the study groups may be attributed to the difference in work demands by role in different hospital settings.[20]

The duration of sleep obtained has been found to directly impact the quality of life of an individual and his stress perception and management.[21] This observation was in congruent to the findings in our study where respondents reporting stress also reported significantly lower number of hours of sleep per day (P=0.005). Duration of sleep less than 6 hours had a significant impact on stress levels, however, if this cut-off was raised to 7 hours, the duration of sleep was not reported to impact stress levels.[11,13]

According to the American academy of sleep medicine (AASM) and sleep research society (SRS), 7-9 hours of sleep per a 24-hour day was advised as the minimum required in order to improve the quality of life in adults of age 18-64 years.[21] Improving sleep hygiene through employment of appropriate sleep schedules, availability of supportive and comfortable beds, avoidance of caffeinated beverages prior to sleep schedule and

disconnection from electronic devices, were observed to improve the quality and duration of sleep.

Stress aetiology

Among interns, the leading factors for stress in the study were high work-load (63%), and work fatigue (10%). This observation was similar to the stressors reported by resident doctors, where the majority of the participants reported high work-load and work fatigue as the leading causes of stress. High work-load and work fatigue contributed to almost 50% of the cited causes of stress in other studies.[1,13,14,22,23]

Duration of work

The average working hours clocked per week by an intern doctor was 63 hours. Resident doctors reported higher number of hours per week, with an average of 73.5 hours. The observation was well above the maximum work week of 48 hours as juridically allowed by the council of European but was less than the maximum work week of 80 hours allowed by the accreditation council for graduate medical education (ACGME) in the United States of America.[24,25] The duration of work was not found to be a significant contributor to stress in the study (P=0.92; P>0.05). However, in other studies, it was observed that a higher than 60-hour work week translated into a poorer psychosocial response.[26]

Coping mechanisms to stress

Coping mechanisms can be broadly divided into proactive and reactive coping strategies. Proactive mechanisms aim to prevent reaction to future stressors whilst reactive mechanisms include forming a reaction immediately after a stressor.[27] Proactive mechanisms have been shown to perform better in variable environments.[28] In the study, a majority of both intern doctors and resident doctors relied on emotion-focused coping mechanisms in the form of meditation, and music (54%; n=32 for interns; 58.3%, n=35 for resident doctors). Contrary to this observation, a study by Chakraborti et al found that a majority of respondents relied on social-coping mechanisms in the form of socialising with friends and family and relying on them for emotional support as a mean to cope with stress. Problem-focused coping, involving the confrontation approach to the stressor causing distress and resolution by means of planning, restraint coping and suppression of competing activities, has been shown to be the most beneficial approach to stress and the encouragement of this method may equip individuals to better handle stress.[14,29]

A large proportion of the residents (33.3%) failed to demonstrate healthy coping mechanisms to stress and observed a recourse to smoking, consumption of alcohol, adopting unhealthy food habits such as binge eating as a means to cope with stress. In a large study observing patterns of substance abuse in medical graduates, almost one-fifth of the students reported to using harmful substances, despite having awareness about the same and most of them attributed it to work-related stress.[29] These poor coping mechanisms fail to effectively manage stress and are detrimental to the physical and mental health of the physician and their patients.[30] These unhealthy mechanisms also may lead to frequent headaches, metabolic disorders, depressed mood and increased irritability.[31] In our study, we found that resident doctors had a higher prevalence of poor coping mechanisms (33.3%) as compared to intern doctors (8%). However, a substantial proportion of intern doctors (18.3%; n=11) reported that they were unaware of means to deal with stress as opposed to none of the resident doctors reporting this.

Stress, in the benign form enhances a person's ability to strive to reach higher standards of patient service and may help to perform competently as a clinician. The malignant forms of stress, however, can be detrimental to the health of the doctor, but can also jeopardize the life of his patient.[2]

Healthier coping mechanisms, in the form of problem-focused coping, should be encouraged and an environment to cultivate this must be brought as a change to the medical educational system. Educational and hospital organizational reforms to inculcate appropriate coping mechanisms to stress, along with a regular assessment of mental health of intern doctors and residents may help reducing stress and ultimately may improve physician and patient health care.

In the study, duration of sleep was found to be an independent risk factor for stress. Healthy sleep habits including the avoidance of caffeinated substances before sleep, availability of noise-free environments or doctor lounges with bedding facilities, and strict adherence to shift timings may help the junior doctors to relieve some of their stress and allow them to better serve their patients.

CONCLUSION

The promotion of healthy sleep habits and mature coping mechanisms to stress may help junior doctors to better handle stressful conditions in hospital settings without compromising personal and patient safety. Problem-focused coping mechanisms and a proactive approach to coping may aid junior doctors to handle current and future stressful scenarios effectively.

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