Research Article

Psychological stress among post-graduate medical resident doctors: A cross-sectional study in a tertiary care hospital in Central India

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ABSTRACT

Background: Medical residents are exposed to numerous stressors during their post-graduate training which affects them both physically and emotionally. This stress can have a profound impact on the resident's ability to work and perform activities of daily living. **Objectives:** The goals of this study are to (1) estimate the psychological stress in medical post-graduate doctors and (2) study the sociodemographic factors associated with stress in post-graduate doctors. **Materials and Methods:** This was a cross-sectional study of resident doctors in a tertiary care hospital in Central India. A total of 130 medical residents at a tertiary hospital in Central India were surveyed anonymously using the Kessler psychological distress reporting scale questionnaire (K10) + self-reporting measure. Descriptive statistics as well as Pearson's Chi-square test (χ^2) and odds ratios were used to quantify the associations between categorical variables using SPSS v24.0 software. $P < 0.05$ was considered statistically significant. **Results:** A total of 131 (of 138, with a response rate of 95%) medical post-graduate residents were participated in this study. The mean age of study participants was 27 years. The results showed that there was no statistical gender difference when it came to reports of stress among the residents. Moderate amounts of stress were reported by the residents, with some of this stress requiring time off from the residency and/or medical care. **Conclusions:** This study has shown that post-graduate medical residents at a tertiary care hospital in Central India experience increased amounts of stress during their residency training.

KEY WORDS: Medical Residents; Stress; Psychosomatic symptoms; Work-related stress

INTRODUCTION

Medical resident doctors endure a great amount of stress during their training. The medical residency generally involves 3–5 years' additional training beyond medical school for physicians to gain additional knowledge within their specialization. The learning environment in which a resident physician works is generally fraught with high levels of stress as he fine tunes those skills that will make him a competent attending physician on completion. This often involves erratic hours and working long stretches of time around the clock, often without a break or food. Morgan and King defined stress as "an internal state that can be caused by physical demands on the body or by environmental and social situations, known stressors that are evaluated as potentially harmful, uncontrollable, or exceeding our resources for coping."[1]

While the sources of stress can be many, the three principal sources of stress are intrapersonal, interpersonal, and contextual or vocational stress.[2] Vocational stress, as the name suggests, is related to the tress arising from the

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nature of work and, more often, from the expectations and the outcomes from the work done. While this type of stress seems to be present in every workplace, the medical field is, especially, prone to this due to the nature of the medical treatment of others and interactions with the patient's family who may be under their own stress due to the illness or injury of their loved one.

Many studies have looked into the stress and burnout levels of medical personnel, and it has been seen that the levels of stress are extremely high in hospital nurses,[3] surgeons,[4] general practitioners,[5] and resident doctors.[6,7] However, there are very few studies from India, more so from Central India looking into psychological stress among post-graduate resident doctors. The goals of this study are to (1) estimate the prevalence of psychological stress in post-graduate resident medical doctors and (2) to study the sociodemographic factors associated with psychological stress in this population.

Medical resident stress is not a phenomenon unique to this cohort subset nor to India. Zamani and Zamani told us that "previous surveys performed on the Iranian resident trainees revealed the increased levels of psychological and emotional disorders such as depression, anxiety, and stress among them."[8] Stress among medical residents can come in the form of intense work demands, limited autonomy, perception of work as stressful, and work-home interference.[9] Stress incurred by medical residents can come at a great cost to their patients, causing impairment of the resident's "intellectual judgement and technical skill."[10] Lack of communication skills, due in part to the lack of training in communication at the medical school level, has often left residents unable to express their coping difficulties and, in turn, may have difficulty with communication with patients and families when dealing with reactions to bad news, especially in oncology.[11] In the United States, the incidence of physician suicide compared to the general population is 40% higher in male physicians and 130% higher in female physicians than their non-physician counterparts.[10]

MATERIALS AND METHODS

The study contained 131 participants (of 138 individuals' contact, 131 completed the survey for a 95% response rate) who completed an anonymous Kessler Psychological Distress Scale (K10) self-reported measure over a 2-month period of time. This instrument has been widely used in population-based epidemiological studies to measure the current (30 days) level of stress and severity associated with psychological symptoms in population surveys.[12-15] All residents who provided consent during the study duration are included in the study. The gender breakdown included 72 males and 59 females. The ages of the participants ranged from 20 years to 43 years, with an average age of 27 years. All of the participants are post-graduate medical doctors involved in a residency program at a tertiary hospital in Central India.

Descriptive statistics were used to summarize baseline characteristics of the study subjects using SPSS v24.0 software. The association between two categorical variables was analyzed using Chi-square test and odds ratios. $P < 0.05$ was considered statistically significant.

Approval for this study was provided by the Institutional Ethics Review Board at Government Medical College, Nagpur, India.

RESULTS

Participants completed a Likert-style scale ranging from a score of 1 (all of the time) to 5 (none of the time) for ten questions about their feelings over the past 30 days. The average of these results and the range are demonstrated in Table 1.

Gender

When asked about the pattern of these feelings and if they occurred more often in the past 30 days than prior, the average on a Likert-style scale ranging from 1 (a lot more than usual) to 7 (a lot less often than usual) was 2.07 (range 0–6), falling into the "some more often than usual" category. Respondents stated that, on average, 4.06 days (range 0–30 days) over the past month, they were totally unable to work or carry out normal activities due to the symptoms as outlined in Table 1. Excluding the days just discussed, on an average additional 4.56 days, respondents stated that they were able to complete half or less of what they normally do, because of these feelings. Respondents stated that they had visited a doctor from 0 to 9 times in the past 30 days, with an average of 2.90 doctors' visits during that time period. Physical symptoms were reported as the main cause of these feelings all of the time, with an average score of 0.91 on a Likert scale falling from 1 (all of the time) to 5 (none of the time). There was no significant difference in these values based on the resident's gender.

Age

To assess how age affects one's response to stress, the cohort was divided into three groups: Those over age 30 (range 30–43), age 25–29, and age 21–24. Each subcohort was examined independently using SPSS v24.0 software. The results of this analysis are presented in Table 2.

Medical Specialty

The cohort was once again divided to examine if one's medical specialty had an impact on the reported amount of

Table 1: Self-reported scores on symptoms over the past 30 days by gender

Question	Gender	Mean±Standard deviation	Minimum	Maximum
In the past 30 days, have you felt				
Tired out of no good reason	All	2.12±0.886	1	5
	Male	2.06±0.854	1	4
	Female	2.27±0.906	1	5
Nervous	All	2.44±0.904	1	4
	Male	2.38±0.911	1	4
	Female	2.34±0.940	1	4
So nervous that nothing could calm you down	All	3.16±0.959	1	4
	Male	3.17±0.949	1	4
	Female	3.02±1.025	1	4
Hopeless	All	2.93±1.061	1	4
	Male	2.94±1.086	1	4
	Female	2.76±1.040	1	4
Restless or fidgety	All	2.61±0.957	1	4
	Male	2.69±0.929	1	4
	Female	2.53±0.989	1	4
So restless that you could not sit still	All	3.20±1.011	1	4
	Male	3.15±0.988	1	4
	Female	3.20±1.030	1	4
Depressed	All	2.84±0.927	1	4
	Male	2.83±0.856	1	4
	Female	2.75±0.883	1	4
So depressed that nothing could cheer you up	All	3.30±0.942	1	4
	Male	3.25±0.915	1	4
	Female	3.36±0.943	1	4
That everything was an effort	All	2.59±1.029	1	5
	Male	2.60±1.109	1	5
	Female	2.61±0.983	1	5
Worthless	All	3.08±0.966	1	4
	Male	3.01±1.014	1	4
	Female	2.95±0.936	1	4

stress the resident felt. Medical specialties containing four or fewer members were excluded from this examination as the results could be wrongly influenced by such outliers. After these outliers were eliminated from the data set, the remaining subcohorts included anesthesia, ENT, medicine, OB/GYN, ophthalmology, orthopedics, pediatrics, radiology, and surgery.

On further examination of the data, trends among specialties began to emerge. Orthopedics ($n = 5$) scored the most severely with a mean score of 1.80 (standard deviation [SD] 0.447) on "tired out of no good reason," 2.00 (SD 1.000) on "nervous," 2.80 (1.304) on "so nervous that nothing could calm you down," 2.00 (.707) on "hopeless," 2.60 (0.894) on "restless or fidgety," 2.60 (0.548) on "so restless you could not sit still," 1.80 (SD 0.837) on "depressed," 2.80 (SD 1.304) on "so depressed that nothing could cheer you up," 2.40 (SD 1.140) on "that everything was an effort," and 2.80 (SD 1.304) on "worthless." All other subcohorts had at least one score of 3 or higher.

The specialty with the highest scores, all above 3.00 except for one, was ophthalmology. The only area where they rated <3 was under "nervous" with a score of 2.50 with a standard deviation of 0.548. These scores were based on six individuals identifying with this subcohort.

DISCUSSION

Post-graduate doctoral medical residents undergo a tremendous amount of stress during their training, affecting both their personal and professional lives. There was no statistically significant difference in the amount of stress between males and females, corresponding with the findings from previous studies.[12] In a professional capacity, this stress

Table 2: Self-reported scores on symptoms over the past 30 days by age grouping

Question	Age	Mean±Standard deviation	Minimum	Maximum
In the past 30 days, have you felt				
Tired out of no good reason	30+	2.11±0.875	1	4
	25−29	2.10±0.908	1	4
	21−24	2.19±0.849	1	5
Nervous	30+	2.63±0.761	1	4
	25−29	2.44±0.928	1	4
	21−24	2.27±0.919	1	4
So nervous that nothing could calm you down	30+	3.37±0.761	2	4
	25−29	3.19±0.939	1	4
	21−24	2.92±1.129	1	4
Hopeless	30+	3.42±0.961	1	4
	25−29	2.91±1.059	1	4
	21−24	2.65±1.056	1	4
Restless or fidgety	30+	2.37±0.895	1	4
	25−29	2.65±1.003	1	4
	21−24	2.65±0.846	1	4
So restless that you could not sit still	30+	3.37±0.955	1	4
	25−29	3.16±1.027	1	4
	21−24	3.19±1.021	1	4
Depressed	30+	3.00±0.745	1	4
	25−29	2.90±0.946	1	4
	21−24	2.54±0.948	1	4
So depressed that nothing could cheer you up	30+	3.53±0.772	2	4
	25−29	3.30±0.869	1	4
	21−24	3.12±1.243	1	4
That everything was an effort	30+	2.68±1.003	1	5
	25−29	2.55±1.113	1	5
	21−24	2.65±0.745	1	4
Worthless	30+	3.53±0.697	2	4
	25−29	3.01±0.988	1	4
	21−24	2.96±0.999	1	4

can impact the resident's judgment and skill, as outlined in previous studies.[10]

This study examined the presence of stress but did not address the root cause of stress in medical residents nor did it address the coping strategies attempted by the residents. Further studies to elicit these responses would be appropriate in gaining a greater understanding of this phenomenon. A 2014 study by Hoopongsimanont *et al*. on resident emergency medicine doctors revealed that residents were sometimes found to engage in detrimental coping strategies which, in turn, could have adverse effects on patient and self care.[16]

Limitations of the Study

This study was limited to a single tertiary hospital in central India. The reader should not generalize these findings to post-graduate doctoral residents outside of this facility. Another limitation is that the study was dependent on self-reporting on the part of the participants. While every measure was taken to ensure participant confidentiality, some participants may have scored higher or lower depending on the question and their self-perception.

CONCLUSION

This study has shown that post-graduate medical residents at a tertiary care hospital in Central India experience increased amounts of stress during their residency training. As stress and job dissatisfaction can be predictors of burnout in one's career, we suggest that further studies to assess both non-work factors of stress and preventative strategies should be explored. Taking the findings from this study as baseline data, further study for intervention and corrective measures is planned by the author.

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