

Stress levels of critical care doctors in India: A national survey

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Abstract

Background: Doctors working in critical care units are prone to higher stress due to various factors such as higher mortality and morbidity, demanding service conditions and need for higher knowledge and technical skill. **Aim:** The aim was to evaluate the stress level and the causative stressors in doctors working in critical care units in India.

Materials and Methods: A two modality questionnaire-based cross-sectional survey was conducted. In manual mode, randomly selected delegates attending the annual congress of Indian Society of Critical Care Medicine filled the questionnaire. In the electronic mode, the questionnaires were E-mailed to critical care doctors. These questionnaires were based on General Health Questionnaire-12 (GHQ-12). Completely filled 242 responses were utilized for comparative and correlation analysis. **Results:** Prevalence of moderate to severe stress level was 40% with a mean score of 2 on GHQ-12 scale. Too much responsibility at times and managing VIP patients ranked as the top two stressors studied, while the difficult relationship with colleagues and sexual harassment were the least. Intensivists were spending longest hours in the Intensive Care Unit (ICU) followed by pulmonologists and anesthesiologists. The mean number of ICU bed critical care doctors entrusted with was 13.2 ± 6.3 . Substance abuse to relieve stress was reported as alcohol (21%), anxiolytic or antidepressants (18%) and smoking (14%). **Conclusion:** Despite the higher workload, stress levels measured in our survey in Indian critical care doctors were lower compared to International data. Substantiation of this data through a wider study and broad-based measures to improve the quality of critical care units and quality of the lives of these doctors is the need of the hour.

Keywords: Critical care doctors, General Health Questionnaire-12 scale, stress levels, stressors

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Introduction

Critical care doctors routinely work in a highly demanding, technical environment where dying and death are common events, and errors can be dangerous.^[1] Doctors are particularly exposed to higher stress because the patients' lives are literally in their hands. The provision of critical care can lead to the health care provider's physical, psychological and emotional exhaustion, which may develop into a burnout. There

was a high rate of burnout among professionals working in Portuguese Intensive Care Units (ICUs), with 31% of them having a high level of burnout.^[2] Studies indicate stress levels to be ranging from 22% to 46% in the UK doctors working in ICU setup.^[3-9] A high level of burnout was also identified in 46.5% of the respondents working in ICU setup in French public hospitals.^[10] Compared with other clinicians, critical care trained anesthesiologists were reported to be at a higher risk of stress-related ill-health,^[11-14] and suicide.^[15,16] Studies to assess stress levels among critical care doctors in India are limited though such studies were done among anesthesiologists.^[17] This survey was contemplated to elicit stress levels and various factors associated with stress among those working in the critical care units of India.

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Aims and objectives of the survey

- To describe the demographic characteristics of critical care doctors in India
- To assess the workload borne by critical care doctors in India
- To evaluate stress levels and factors influencing the stress in critical care doctors in India.

Materials and Methods

A questionnaire-based cross-sectional study was designed to depict the prevalence of stress levels and associated risk factors among doctors working in the critical care settings in India. The questions in the questionnaire were closed-ended and self-explanatory. The questionnaire was planned and administered in two modes [Figure 1]. In the manual mode, a voluntary paper-based survey was conducted during one of the annual congresses of Indian Society of Critical Care Medicine (ISCCM). A total of 200 randomly selected cross-sectional delegates were requested to fill the

questionnaire and 110 delegates voluntarily participated in the survey. In the electronic mode, the same questionnaires were E-mailed to professionals working in critical care units across the country based on the database available with ISCCM. A total of 500 randomly selected ISCCM members were sent the questionnaire by E-mail, of which 291 members responded. Combining both modes of the survey, a total of 401 questionnaires were returned, of which 242 were completely filled. Data was captured from all 401 responses, but only the completely filled 242 responses were utilized for comparative and correlation analysis.

The questionnaire had details regarding personal characteristics, professional status, hospital and ICU details, workload assessment, alcohol and substance abuse (currently indulging in abuse), stressors pertaining to ICU setup, job satisfaction and related issues. These questions were selected from General Health Questionnaire-12 (GHQ-12).^[18] The GHQ is a well-validated, self-administered questionnaire

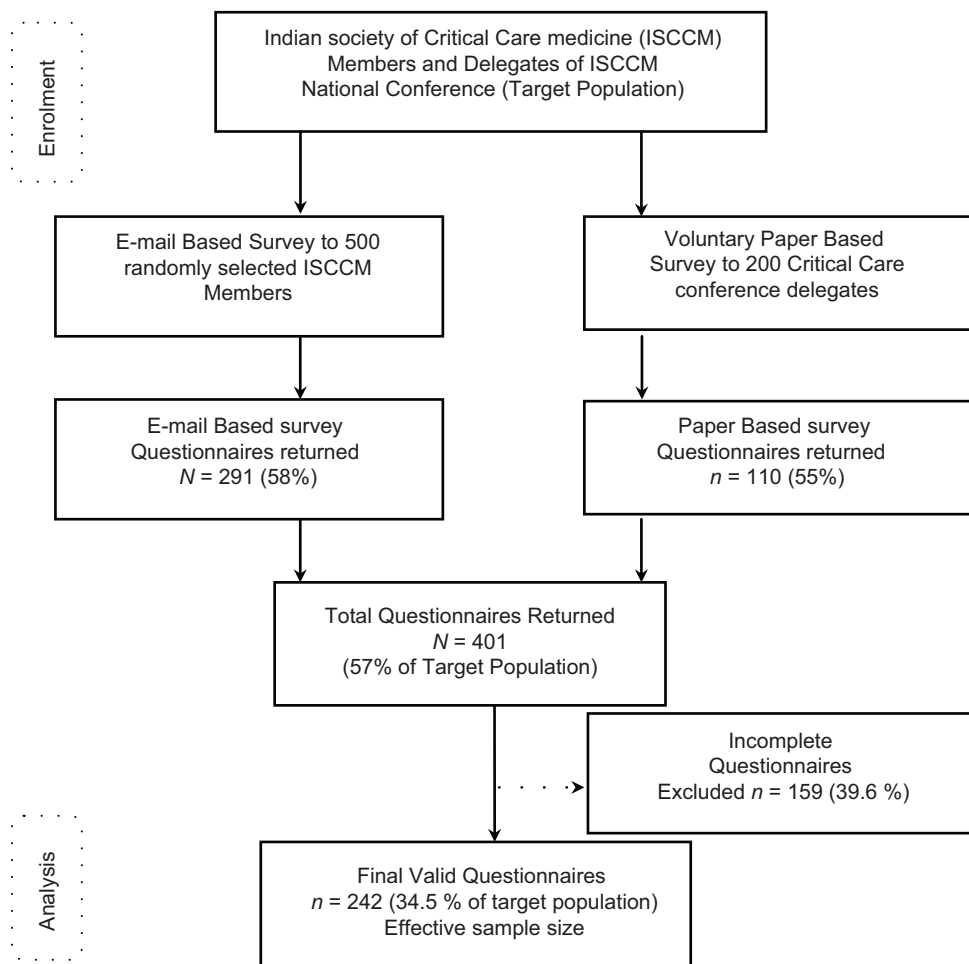


Figure 1: Study design - The flowchart describes the inclusion of professionals' questionnaires eligible to arrive to the final study population (questionnaires considered for analysis) *n* = numbers

commonly used to detect psychiatric risk and to conduct stress related assessment in different settings like workplace settings.^[19] The standard scoring used was on a 0–3 scale as “0” - not at all, “1” - slightly, “2” - moderately, and “3” - extremely.

The GHQ-12 scale was modified and standardized for assessing stress levels among Intensivists in UK study.^[20] This modified version was taken for our survey, which had 28 questions pertaining to stressors in ICU setup for evaluation of stress levels in critical care doctors in India.

Responses were obtained from critical care doctors, who include full-time intensivist and other specialist like anesthesiologist, pulmonologist, pediatricians, internal medicine, who are spending at least 50% of his professional time in critical care units and the rest of the time is spent in their base specialty. Since many practicing intensivists in Indian institutions are continuing to practice their base specialty as well, we tried to find out and compare the influence of such dual practice on the professional characters and ensuring the stress.

Statistical analysis

We have analyzed our data for both severe and moderate stress in critical care doctors. The data from the questionnaire was transferred to MS Excel 2007, and statistical data analysis was done using SPSS for windows version 17 (SPSS inc, Chicago, IL). The findings of the survey were tabulated, and results expressed in percentages, means and standard deviations (SD) (at 95% confidence interval [CI]). Mean stress level for each responder and mean scores for all perceived stressors based on 28 questions were calculated. The significance of differences in means and proportions was reported at a significance level of $P < 0.05$. Institutional Ethics Committee has approved the conduct of the survey.

Results

Demographic characteristics and professional status of the critical care doctors

Gender

Out of the 242 responses received, male doctors were in the majority ($n = 205$; 85%). 91% male doctors were married as compared to 84% female doctors. 2% of male doctors were divorcees. Around 65% of lady doctors were married to a doctor [Table 1].

Age

The mean ages of the responders were 37.9 ± 8.5 years. The mean age was highest in HODs' viz., 45.3 ± 12.1 years,

followed by consultants' 43.5 ± 9.2 , directors' 38.1 ± 6.6 and fellows' 32.1 ± 9.1 years [Table 1].

Work settings

Nearly 60% (143) of the responders were from corporate hospitals while 12% from government hospitals and 30% from other setups. A majority (31%) work in larger hospital of more than 400 beds, about 25% in <100 beds while the remaining in the 100–400 bed range hospitals. A majority of them worked in hospitals with 1 (22%) or 2 (25%) ICU's. The number of beds per ICU in the responders' unit were 10–20 beds in 46% of the responders, followed by 20–30 beds in 22% of them [Table 1].

Specialty distribution

Most of the responders (33%) were from the specialty of anesthesia, followed by intensivist (32%), internal medicine (19%), pulmonologists (7%) or pediatricians (3%). Marital separation was more in intensivist (4%) than in other sub-specialties. The distribution of married doctors in the survey was anesthesiologists (93%), internal medicine (91%), intensivist (90%), and pediatricians (86%). 47% of anesthesiologists and intensivists, and 67% of pulmonologists and internal medicine specialists were married to a doctor [Table 1].

Workload assessment

Weekly total workload in the hospital

In a week, the total number of hours of work was 62.4 ± 27.5 h. Male doctors were working nearly 4 h longer than female doctors (62.9 h vs. 59.3 h). Those from Internal medicine specialty spent longest hours (65.4 h) per week in the hospital, followed by Intensivist (62.3 h) and Anesthesiologists (61.4 h). Directors and HODs reportedly worked longer (65 h), followed by consultants (62.2 h) and fellows (60.2 h) [Table 2].

Weekly Intensive Care Unit workload

Out of the 62 h of work, nearly 49 h were being spent in ICU. Male doctors were spending 49 h in the ICU, which is 5 h more than female doctors (who spend 44 h in the ICU). Intensivists were spending longest hours in the ICU (57.7 h) followed by pulmonologists (51.4 h) and anesthesiologists (48 h). Registrars (fellows) spend longest hours in the ICU (52.9 h) followed by consultants, HODs and directors [Table 2].

Number of Intensive Care Unit night duties per month

The mean numbers of ICU night duties are 5.9 ± 2 . Men were doing one-night duty more than women in a month in the ICU. Pulmonologists were doing more night duties in a month (6.7 ± 1.6), followed by intensivist

Table 1: Characteristics of survey responders

	Total	Gender		Speciality						Designation			
		Male	Female	Anesthesia	Intensivist	Internal medicine	Pediatrics	Pulmonologist	Other	Consultant	Director	H.O.D	Register or fellow
Total													
n	242	205	37	81	78	46	7	18	12	123	20	34	65
%	100	85	15	33	32	19	3	7	5	51	8	14	27
Age													
\bar{x}	37.9	37.9	38.2	39.7	36.7	38.5	36.4	37.2	34.2	43.5	38.1	45.3	32.1
SD	8.5	8.2	10.3	8.8	7.2	8.4	13.6	7.2	11.8	9.2	6.6	12.1	9.1
Married													
n	218	187	31	75	70	42	6	18	7	116	19	33	50
%	90	91	84	93	90	91	86	100	58	94	95	97	77
Separated													
n	5	5	0	1	3	1	0	0	0	1	1	1	2
%	2	2	0	1	4	2	0	0	0	1	5	3	3
Single													
n	19	13	6	5	5	3	1	0	5	6	0	0	13
%	8	6	16	6	6	7	14	0	42	5	0	0	20
Partner is doctor													
n	126	102	24	38	37	31	4	12	4	66	15	16	29
%	52	50	65	47	47	67	57	67	33	54	75	47	45

n: Number; \bar{x} : Mean; SD: Standard deviation**Table 2: Workload indicators reported by responders**

	Total	Gender		Speciality						Designation			
		Male	Female	Anesthesia	Intensivist	Internal medicine	Pediatrics	Pulmonologist	Other	Consultant	Director	H.O.D	Register or fellow
Total													
n	242	205	37	81	78	46	7	18	12	123	20	34	65
%	100	85	15	33	32	19	3	7	5	51	8	14	27
Total working h/week													
\bar{x}	62.4	62.9	59.3	61.4	62.3	65.4	59.3	59.4	63.3	62.2	65.5	65.3	60.2
SD	27.5	28.0	25.1	26.2	27.4	30.1	23.8	25.6	30.2	27.3	29.8	30.1	25.5
Total ICU h/week													
\bar{x}	48.6	49.3	44.3	48.0	57.7	36.4	37.5	51.4	41.7	47.5	43.8	47.1	52.9
SD	24.4	24.7	23.1	24.7	28.7	18.1	23.1	23.3	14.3	24.0	16.6	26.6	26.0
Number of ICU night duties/month													
\bar{x}	5.9	6.1	5.1	5.8	6.3	5.3	6.3	6.7	5.8	5.4	5.4	5.6	6.7
SD	2.0	2.0	1.7	1.9	2.0	1.9	2.3	1.6	2.0	1.7	1.9	2.1	1.8
Responsible number of ICU beds													
\bar{x}	13.2	13.2	12.9	13.7	14.7	10.9	11.8	12.8	10.4	13.1	13.5	14.4	12.7
SD	6.3	6.2	6.5	6.2	6.4	5.6	6.7	5.3	6.6	6.0	6.8	6.7	6.4
Postnight shift day off													
n	125	106	19	45	48	16	2	8	6	60	8	11	46
%	52	52	51	56	62	35	29	44	50	49	40	32	71
Compensation for over time													
n	65	58	7	22	20	17	0	2	4	25	5	12	23
%	27	28	19	27	26	37	0	11	33	20	25	35	35

n: Number; \bar{x} : Mean; SD: Standard deviation; ICU: Intensive care unit

and pediatricians (6.3 ± 2) and anesthesiologists (5.8 ± 1.9). Registrars are doing more night duties (6.7 ± 1.8) than the consultant, HODs and directors.

Responsibility of Intensive Care Unit beds

The mean number of ICU beds each person entrusted were 13.2 ± 6.3 . Intensivist (14.7 ± 6.4) and

anesthetists (13.7 ± 6.2) were entrusted with more beds in comparison to others specialty doctors [Table 2].

Postnight shift day off

Nearly 50% of the critical care doctors were claiming or getting a postnight shift day off in both the genders. Those from pediatrics (29%) and internal medicine (35%) were getting lesser postnight shift day off than intensivists (62%), anesthetists (56%) or others [Table 2].

Compensation for overtime

Only 27% of the critical care doctors were claiming compensation for overtime. Women were claiming less (19%) compensation for overtime than men (28%). While pediatricians were not claiming any compensation, those from internal medicine were claiming the most (37%). Both HOD and registrars claimed compensation for overtime, most often (35%) [Table 2].

Prevalence of stress levels

The overall prevalence of moderate to severe stress level in critical care doctors was 40% (a mean score of 2 on the GHQ scale). That means 40% of critical care doctors had moderate to severe stress while working in ICU setups in India. Keeping in view of higher level of moderate stress in our study population, and with differences in social, economic, cultural, professional conditions prevalent in our study population, we took the moderate level of stress as a representative indicator for our study (i.e. mean score of 2 on GHQ Scale). We have calculated mean stress level for each individual based on 28 questions (stressors pertaining to ICU setup). The score value of 28 questions of the individual responder was added up and divided by 28 to derive mean stress score of that individual responder. The total responders (242) were divided into two groups viz, mean score <2 and mean score ≥ 2 . Stress was more in women (46%) compared to men (40%) ($P = 0.46$), and highest in

pediatricians (57%), followed by anesthetists (44%), pulmonologists (39%), intensivists (38%) and internal medicine (37%) ($P = 0.85$). Stress levels were highest in HODs (50%), followed by directors (45%), consultants (41%) and fellows (34%) ($P = 0.45$) [Table 3].

Analysis of individual stressors

Using GHQ scores each stressor was scaled with "0" as not at all, "1" as slightly, "2" as moderate and "3" as very stressful, as perceived by the responders. For every question (stressors) the score of 242 responses was added and divided by 242 to derive a mean score for each of the stressors, and were ranked from 1 to 28 based on the mean scores in descending order of value and a rank assigned in ascending order [Table 4].

"Too much responsibility at times" ranked highest with a mean score of 1.98 ± 0.73 . "Managing VIP patients" ranked second with a mean score of 1.87 ± 0.85 . "Being overstretched at times" ranked third with a mean score of 1.84 ± 0.81 .

Lack of professional satisfaction as a critical care doctor (4th), talking to distressed relatives (5th), working with inexperienced juniors (6th), keeping up to date with knowledge (7th), making the right decision alone (8th), informing relatives about patient's death (9th), and compromising standards when resources are short (10th) were in the top ten ranks of stress. Threat of violence, difficult relations with nursing staff and sexual harassment ranked lowest in the list.

Use of substance abuse as a stress reliever

While occasional use of alcohol was reported by 51 (21%) of the ICU doctors, 134 of them (55%) never used alcohol. While 196 (80%) of the physicians never smoked, 12 (5%) were daily smokers and 21 (9%) rarely smoked. While 208 (86%) ICU doctors never used anxiolytics, 32 of

Table 3: GHQ-12 score by gender, specialty and designation

Category	Stress score	Mean score 2 or more than 2 (n)	Percentage	Mean score less than 2 (n)	Percentage	Total
Gender	Male	81	40	124	60	205
	Female	17	46	20	54	37
Specialty	Anesthesia	36	44	45	56	81
	Intensivist	30	38	48	62	78
	Internal medicine	17	37	29	63	46
	Pediatrics	4	57	3	43	7
	Pulmonologist	7	39	11	61	18
	Other	4	33	8	67	12
Designation	Consultant	50	41	73	59	123
	Director	9	45	11	55	20
	H.O.D	17	50	17	50	34
	Register or fellow	22	34	43	66	65
	Total	98	40	144	60	242

n: Number; GHQ: General health questionnaire

Table 4: Rank wise mean scores for perceived stressors

Rank	Stressor	Mean	SD
1	Too much responsibility at times	1.94	0.73
2	Managing VIP patients	1.87	0.85
3	Being over stretched at times	1.84	0.81
4	Lack of professional satisfaction as a critical care doctor	1.81	0.64
5	Talking to distressed relatives	1.76	0.91
6	To work with inexperienced juniors	1.76	0.91
7	Keeping up to date with knowledge	1.74	0.85
8	Making the right decision alone	1.73	0.86
9	Informing relative about patient's death	1.73	0.96
10	Compromising standards when resources are short	1.64	0.84
11	Bed allocation when ICU is full	1.63	0.93
12	Discussing treatment withdrawal or end of life	1.59	0.89
13	Sleep deprivation	1.50	0.80
14	Lack of recognition of your contribution	1.50	0.94
15	Making the right decision as a team	1.47	0.90
16	Effects of stress on personal or family life	1.37	0.77
17	Dealing with management in general	1.23	0.90
18	Fear of making mistakes	1.16	0.80
19	Dealing with individual managers	1.11	0.78
20	Making time for research	1.10	0.90
21	Appropriate salary or remuneration	1.10	0.89
22	Feeling under utilized	1.06	0.95
23	Having to do menial or repetitive tasks	1.03	0.80
24	Difficult relations with senior colleagues	0.86	0.88
25	Overzealous/inappropriate treatment	0.85	0.77
26	Threat of violence	0.84	0.84
27	Difficult relations with nursing staff	0.76	0.78
28	Sexual harassment	0.06	0.27

SD: Standard deviation; ICU: Intensive care unit; VIP: Very important person

them (13%) used occasionally or rarely. Eight of the ICU doctors (3%) used antidepressants occasionally to rarely.

Discussion

Among the critical care doctors, 90% were married, 52% of whom had a doctor as a spouse, 8% were unmarried while 2% were separated. The marriage rate was marginally more in doctors working in Indian ICU setups, compared to UK ICU setup (86%),^[20] separation rate was lesser (2% vs. 4%), and higher percent of critical care doctors had doctor as a spouse (52% vs. 27%). The higher marital status, the lower divorce rate and having a doctor as a spouse may be a possible explanation for lesser incidence (Indian 40% vs. UK 50.5%) of stress levels as exhibited in our survey. The mean age of critical care doctors in India was 38 years as against 42 years in UK.^[20] With an average age of 37–40 years, our critical care doctors have another 20–25 years of career ahead, and if stress levels remain at the level we surveyed, it can result in health issues leading to decreased work efficiency and sub-optimal care of critically ill patients.

In our survey, the total number of hours of hospital work per week is 62.4 ± 27.5 and weekly ICU workload is 49 h. The mean number of ICU night duties is 5.9 ± 2 . The mean number of beds each doctor entrusted were

13.2 ± 6.3 , nearly double as compared to UK ICU setup (7.3%).^[20] Only 52% of critical care doctors were claiming or getting a postnight shift day off. Only 27% of the critical care doctors were claiming compensation for overtime. Mean reported NHS hospital hours at work were 49.1 (SD ± 16.9) per week.^[20] The critical care doctors in India work nearly 12 h/week more than their NHS counterparts. Long working hours and higher number of ICU beds that each doctor is entrusted with, can directly have an impact on mortality and morbidity of patients in ICU settings.^[21]

International Labor Organization set the general standard of working hours at 48 regular hours of the total work/week/person, with a maximum of 8 h/day.^[22] While such standards are not implementable in countries with limited resources, optimizing the work hours is required and should be sincerely attempted. ISCCM in its "Quality indicators for ICU-2009" mentions that "Efficient, motivated and trained manpower is the backbone of any critical care unit."^[23] These three qualities depend on the workload borne by the personal of ICU setup including the doctors. Encouragement to utilize postnight shifts day off by the administrators can prevent over exhaustion among critical care doctors.

The overall prevalence of moderate to severe stress level was 40% (mean score of 2 for perceived stressors on GHQ scale) in our survey. Studies reported stress levels ranging from 22% to 46% of UK doctors working in ICU setup.^[3-9] In a study by Coomber *et al.*,^[20] stress levels in UK critical care doctors were 50.5% on GHQ scale for mean score of 3 (28.5%, 95% CI: 24.9 ± 32.1) or more than 3 (22%, 95% CI: 19.0 ± 25.6). Stress in lady doctors (46%) was more than men (40%) because lady doctors in Indian scenario had to balance workload between hospital and household responsibility. Too much responsibility at times ranked highest among the individual factors contributing to this stress, which also resulted in higher stress levels according to seniority. Managing VIP patients ranked second and being overstretched at times the third. All the above factors point toward increased responsibility of individual critical care doctors in the absence of optimum number of qualified professionals (doctors, nursing and paramedical staff) and resource limitations in Indian setup. Advanced health care, mainly delivered by corporate and referral hospitals, are either funded by private investment institutions or influenced by socio-politically important individuals leads to VIP syndromes and increases stress on critical care doctors. In our survey alcohol (21%), smoking (5%) and

antidepressants (3%) use was less as compared to UK studies (53%, 14%, 12%) respectively; possible reasons being strong family support, interpersonal relationship and cultural values, which help to reduce levels of stress of professional life and its effect on personal life. Surprisingly threat of violence, sexual harassment and difficult relationship with nursing staff and colleagues were infrequent stressors as compared to previous studies,^[10,20,21] possibly due to cordial interprofessional relationships and a culture of mutual respect in Indian social structure.

Studies reported high rate of burnout (31%) among professionals working in Portuguese ICU's^[2] and French public hospitals (46.5%).^[10,24] Australian and New Zealand Intensive Care Society^[25] estimated prevalence of burnout syndrome by modified Maslach Burnout Inventory-General Survey,^[26] in which respondents exhibited psychological stress and discomfort (80%), emotional exhaustion (42%), negative feelings and cynicism (32%), sense of underachievement (37%), and 62.3% of responders suffered burnout in this study. Sources of chronic stress included not only competence-related factors, production pressures, long working hours, night call and fatigue, but also associated with problems like fear of litigation, economic uncertainty and interpersonal relationships.^[27-29]

The most important limitation of our survey was poor response rate (35%) as compared to previous studies,^[10,20,21] due to which, we could not reach out the target population leading to high chance of selection bias like high incidence of stress level in pediatricians than other specialties. There is a need that national critical care society should carry out such survey on a larger scale and try to aggregate appropriate data to have a clear picture of workload and stress level in critical care doctors in India. In our survey, no association was evaluated between stress level and mortality in ICU patients.

Consideration needs to be given by national health authorities to identify and modify the occupational stress in ICU doctors that can be potentially changed at an early stage. Since there is a need for a large number of critical care specialists in Indian setup, it's logical to address the factors contributing to attrition and stressful condition of ICU doctors. However, reducing stress in the ICU may be difficult, but strategies should be formulated to reduce frequency and intensity of these stresses, early detection of problems (by National stress counseling service for doctors) and provide an optimum employment environment in which doctors can practice effectively without compromising their own health.

Conclusion

The moderate to severe stress levels in critical care doctors of India were lower than comparable international studies, despite the higher workload as discovered in our survey. With stress levels of moderate magnitude as reported by studies across the globe, including our survey, it is time to make appropriate interventions like improving inter-professional relationships, changes in work environment, modifying off duty time, streamlining decision making such as end of life care and breaking bad news to mitigate the effect of stress on the critical care doctors. The individual factors contributing to the stress levels varied widely across the studies, and so did the pattern of substance use. A wider survey conducted by societies like the ISCCM can give a thorough understanding of the problem across India. Uniform standards and guidelines have to be developed by the National level societies of critical care and efforts have to be made to implement the same at the institutional level. An institutional level committee monitoring stress level in critical care doctors can serve as an early warning system to ward off burnout and underperformance in this subset of professionals. This is vital to the quality of care provided not only to the patients but also to the quality of the lives of the critical care doctors and their families for whom they ultimately work.

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