

Original Research Article**BURNOUT: A study on stress of Emergency Department (ED) staff and the need for investment in health care****ABSTRACT**

Aims: To identify the frequency of occupational stress and its contributing factors (stressors) existing among healthcare providers working in the Emergency Department (ED) of tertiary care hospitals of Karachi.

Study design: This is a descriptive cross sectional study.

Place and Duration of Study: Emergency Department of public and private tertiary care hospitals located in Karachi. The study was conducted for a period of five months from February to June 2013.

Methodology: A sample of 120 health care providers in Emergency Departments including doctors and nurses were included in the study (60 doctors, 60 nurses 30 each from public and private tertiary care hospitals). Self administered questionnaire with three parts was used to collect data. The first part pertained to demographics, the second part was adopted from Workplace Stress Scale (WSS) while the third part contained an inventory of Emergency Worker Stress. Statistical Package for the Social Sciences 16 (SPSS) and MS excel software 2010 were used for data analysis and presentation.

Results: Of the 120 participants including doctors and nurses, 35.8% had 'Moderate' level of occupational stress as per Work Stress Scale (WSS). 28.3% were found to have 'Severe' level of occupational stress. Significant association was found between levels of stress & hospital status (P- value 0.002) & Work hours in ER (P- value 0.0001). Among the association between occupational stress and ER related stressors, significant moderate association was found with overall stress score and work responsibility category ($r=0.697$ & $r=0.675$ respectively)

Conclusion: Health care providers from Emergency Department are under immense stress and

workload. This level of stress is likely to lead to more mistakes by the ED staff and general dissatisfaction at workplace. It is important to reassess the system's flaws and minimize workload and stress among Emergency care providers for a better health care experience.

8
9 *Keywords: Occupational Stress, Emergency Department, Healthcare providers, Public and Private*
10 *Hospitals*

11 **1. INTRODUCTION**

12
13
14 Doctors bear the responsibility of affecting their patients' life, health and well being with their decisions
15 and judgments. In this respect the profession of medicine carries a high level of physical as well as
16 psychological stress. A number of factors like long working hours, exhaustion, unpredictable workload
17 and critical decision making take a considerable toll on the well being of doctors.¹ Medical staff has been
18 documented to suffer from much higher levels of stress and anxiety than comparable populations^{2,3}.

19 Increased patient load is cited as one of the biggest factors contributing to stress of doctors.⁴ According to
20 a study conducted by UNICEF, doctors in underdeveloped countries can spend just 54 seconds/ patient
21 at district hospitals due to the enormous patient burden.⁴

22 Among healthcare providers those who work in intensive care units, emergency and pre-emergency
23 departments demonstrate higher level of occupational stress than other specialties⁵. Work in emergency
24 departments has the added stress of dealing with unpredictable workload, shift work, lack of proper rest,
25 critical patients and difficult attendants.⁶ The burden of patient visits to the ED is on the rise globally,^{7,8} in
26 the U.S the annual number of ED visits was shown to have increased over 32% in a period of 10 years.⁹
27 Developing countries in particular are susceptible to this increased load on ED since there is a lack of an
28 effective primary health care set up.¹⁰ In such circumstances of high pressure there is a greater likelihood
29 of fatal errors by doctors¹¹ and dissatisfaction among patients.¹²

30 In Pakistan, where the doctor to patient ratio is significantly below the required level, the patient influx at
31 the emergency departments is very high¹³. In a metropolitan city like Karachi with an ever increasing
32 population, traffic accidents, gunshot and bomb blast victims; there are very few hospitals equipped to
33 handle this high burden of emergency. Hence the workload on health care providers is staggering¹³. More

34 over recently due to poor safety measures in hospitals, emergency medical professionals are facing
35 threats and violence from attendants, political and media pressures that add to other work-related
36 stress.¹⁴ It has been documented that stressed and burnt out doctors are more likely to give sub optimal
37 patient care^{15, 16}. Hence it is in the benefit of both medical staff and patients that the stress on doctors be
38 reduced. In a country such as ours where the investment in health sector has never been sufficient it is
39 widely accepted that this sector is under performing,¹⁷ and there is considerable dissatisfaction with work
40 environment among health care workers.¹⁸ The human resource development departments play an
41 integral role in these circumstances to formulate policies to better distribute the workload among ED staff
42 and create a stress free environment for the workers to perform most efficiently.¹⁰

43 Karachi is the largest city of Pakistan and our study was conducted in two of its Public and Private sector
44 tertiary care hospitals' in order to determine the level of occupational stress among ED doctors and
45 identify the contributing factors in this setting. This data will be important for Human resource
46 departments to better understand the sources of strain on the medical staff and improve their working
47 conditions.

48 **2. MATERIAL AND METHODS**

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50

51 This descriptive cross sectional study was carried out among doctors and nurses working in the
52 emergency departments of public and private tertiary care hospitals of Karachi for a period of five months
53 from February to June 2013. On the basis of 46% prevalence of psychological illness among health care
54 professionals and at 95% confidence level, the sample size was calculated to be 96; however adding
55 wastage it was taken as 120. Precision was taken as 0.1 due to maximum available number of healthcare
56 providers in two hospital settings. Both public and private hospitals were selected through non probability
57 convenience sampling technique however, purposive sampling technique was used for sample selection
58 and only those doctors and nurses who were working in emergency departments and had work
59 experience of more than 1 year were included in the study. Those doctors and nurses who were working
60 in any department other than emergency and those who had less than one year work experience or
61 refused to give consent were excluded. Out of the 120 respondents 60 were taken from Public and 60
62 from Private sector hospitals. Similarly the samples was equally divided among ED physicians and nurses

63 i.e. out of total of 120, 60 respondents were of doctors and 60 were of nurses, 30 of each selected from
64 public and private hospital respectively.

65 Data collection tool was a self administered questionnaire formulated by consulting recent relevant
66 literature. The questionnaire consisted of three parts; the first part was to ascertain demographics and
67 personal information. The second part consisted of 8 items rated on a five point scale adopted from
68 Workplace Stress Scale (WSS)¹¹ used to diagnose presence and intensity of occupational stress. The
69 scoring is on a likert scale for the first 5 questions and for the next 3 it is reverse scored. The
70 interpretation of WSS score is predetermined with 5 interpretation categories constructed as;

- 71 • 'No stress or Calm' with total score of 'less than 15'
- 72 • 'Fairly Low Stress' with total score of '16 to 20'
- 73 • 'Moderate Stress' with total score of '21 to 25'
- 74 • 'Sever Stress' with total score of '26 to 30'
- 75 • 'Dangerous Stress' with total score of '31 to 40'

76 The third part of the questionnaire consisted of 45 items (identified emergency department stressors)
77 scored on presence of stressors as adopted from Emergency Worker Stress Inventory (EWSI)
78 questionnaire utilized in similar studies.¹ Score ranged between a maximum of 45 to minimum 0. The
79 stressors were further grouped into 6 different categories for the purpose of isolating the areas of highest
80 prevalent stressors. These categories are:

- 81 1. 'Responsibilities at Work' comprising of 9 stressors with possible 9 maximum score
- 82 2. 'Intrinsic work pressure' comprising of 7 stressors with possible 7 maximum score
- 83 3. 'Support and motivation' comprising of 13 stressors with possible 13 maximum score
- 84 4. 'External pressures' comprising of 4 stressors with possible 4 maximum score
- 85 5. 'Availability of resources' comprising of 7 stressors with possible 7 maximum score
- 86 6. 'Threats at work' comprising of 5 stressors with possible 5 maximum score

87 The data was analyzed using SPSS version 16. Frequencies and percentages were calculated for
88 qualitative while mean and standard deviation for quantitative variables. Chi-square test and linear
89 regression were used to determine the association of occupational stress with the stressors; however

90 ANOVA was used to compare mean stressors scores for different categories of stress. P-value < 0.05
91 was taken as significant.

92 93 **3. RESULTS AND DISCUSSION**

94
95 Total 120 participants were taken in this study with the proportion of 50% each from public and private
96 hospital settings. Similarly 50% of each was doctors and nurses. Of them 44.2% (n=53) were males and
97 55.8% (n=67) were females.

98 Maximum number of participants 70% (n=84) were between 25 -35 years of age and 66.7% (n=80) of the
99 total participants were married. Only 1.7% (n=2) respondents had any pre-existing medical condition (co-
100 morbidity) at the time when the survey was conducted. Among the doctors 32.5% (n=39) were registered
101 medical officers while 10.8% (n=13) were postgraduate trainees and 6.7% (n=8) were house officers.
102 Only 10% (n=12) of the nurse respondents were critical care nurses, while 37.5% (n=45) were BSC
103 nurses and 2.5% (n=3) were student nurses. Majority of the respondents had experience of emergency
104 department (ED) between 1-5 years as 84.2%(n=101), while the rest had more than 6 years of
105 experience in ED. Of all 63.3% (n=76) of the participants worked in ED in shifts while only 36.7% (n=44)
106 had fixed working hours in the ED.

107 **Stress levels according to WSS Score:**

108 The Stress level of the participants was calculated by their WSS score and assigned into the respective
109 categories ranging between “Calm” to “Dangerous” levels of stress. On the basis of WSS items, majority
110 of participants were found to have “Moderate” levels of occupational stress, however there was a
111 noteworthy proportion of respondents who were found to have “Severe” or “Dangerous” levels of
112 occupational stress as shown in (Figure 1). Occupational stress as measured by using WSS was further
113 analyzed according to various demographic variables and significant association was found with type of
114 hospital ($P=0.002$) and work hour in ER ($P= 0.0001$). (Table. 1)

115 **Figure 1: Proportion of Occupational Stress among study participants on the basis of WSS (%)**

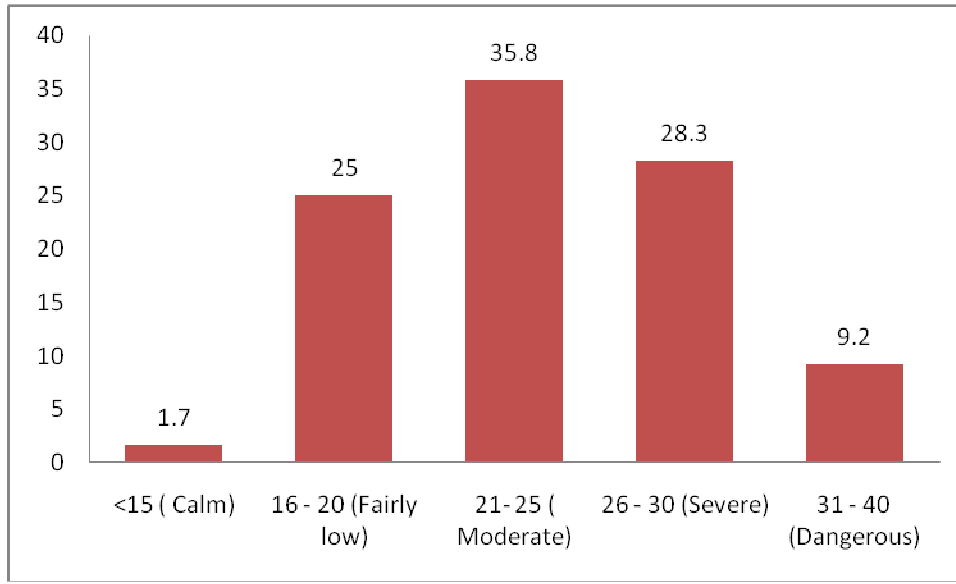


Table 1. Association of Occupational stress based on WSS with different demographic variables

		Occupational stress based on Work Stress Scale					P- value
		n(%)					
		Calm (n=2)	Fairly Low (n=30)	Moderate (n=43)	Severe (n=34)	Dangerous (n=11)	
Hospital status	Private (n=60)	2 (3.3%)	23 (38.3%)	18 (30%)	15 (25%)	2 (3.3%)	0.002
	Public (n=60)	0 (0%)	7 (11.7%)	25 (41.7%)	19(31.7%)	9 (15%)	
Work hours in ED	Fixed (n=44)	2 (4.5%)	19 (43.2%)	17 (38.6%)	6 (13.6%)	0 (0%)	0.0001
	Shift (n=76)	0 (0%)	11 (14.5%)	26 (34.2%)	28(36.8%)	11(14.5%)	
Gender	Male (n=53)	1 (1.9%)	13 (24.5%)	21 (39.6%)	13(24.5%)	5 (9.4%)	0.923
	Female (n=67)	1 (1.5%)	17 (25.4%)	22 (32.8%)	21(31.3%)	6 (9%)	
Age in years	25 – 35 (n=84)	1 (1.2%)	21 (25%)	30 (35.7%)	25(29.8%)	7 (8.3%)	0.802
	36 – 45 (n=31)	1 (3.2%)	7 (22.6%)	10 (32.3%)	9 (29%)	4 (12.9%)	
	>45 (n= 5)	0 (0%)	2 (40%)	3 (60%)	0 (0%)	0 (0%)	

Marital status	Single (n=40)	0 (0%)	8 (20%)	16 (40%)	10 (25%)	6 (15%)	0.360
	Married (n=80)	2 (2.5%)	22 (27.5%)	27 (33.8%)	24 (30%)	5 (6.2%)	
Profession	Doctor (n=60)	1 (1.7%)	15 (25%)	16 (26.7%)	21 (35%)	7 (11.7%)	0.238
	Nurse (n=60)	1 (1.7%)	15 (25%)	27 (45%)	13(21.7%)	4 (6.7%)	
Designation	BSc Nurse (n=45)	1 (2.2%)	11 (24.4%)	21 (46.7%)	8 (17.8%)	4 (8.9%)	0.824
	Critical care Nurse (n=12)	0 (0%)	4 (33.3%)	5 (41.7%)	3 (25%)	0 (0%)	
	Student Nurse (n=3)	0 (0%)	0 (0%)	1 (33.3%)	2 (66.7%)	0 (0%)	
	House officer (n=8)	0 (0%)	2 (25%)	2 (25%)	2 (25%)	2 (25%)	
	Medical Officer (n=39)	1 (2.6%)	10 (25.6%)	9 (23.1%)	15(38.5%)	4 (30.8%)	
	PG Trainee (n=13)	0 (0%)	3 (23.1%)	5 (38.5%)	4 (30.8%)	1 (7.7%)	
Experience in Emergency Department	1 - 5 yrs (n=101)	2 (2%)	27 (26.7%)	37 (36.6%)	27(26.7%)	8 (7.9%)	0.572
	6 -10 yrs (n=19)	0 (0%)	3 (15.8%)	6 (31.6%)	7 (36.8%)	3 (15.8%)	

117 **Inventory of Emergency Worker Stress:**

118 Third part of the survey comprised of 45 stressors to investigate possible sources of stress in ER. These
 119 stressors were further classified into six categories. Total 14 out of 45 stressors showed significant (p
 120 value < 0.05) with occupational stress as shown in (Table 2). The mean score of ER related stressors
 121 (both Overall and Subcategories) compared according to different categories of occupational stress and
 122 presented in (Table 3). Regression analysis was performed to analyze association of occupational stress
 123 with ER related stressors and significant moderate association was found with the Overall stress score
 124 and work responsibility category with r= 0.697 and r=0.675 respectively (Table 4).

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Table 2. Association of Occupational stress based on WSS with different ER related Stressors

	Occupational stress based on Work Stress Scale					P- value
	n(%)					
	<15 (Calm)	16 – 20 (Fairly low)	21 – 25 (Moderate)	26 – 30 (Severe)	31 – 40 (Dangerous)	
Conflicts with other departments	0	10 (12.3%)	29 (35.8%)	31 (38.3%)	11 (13,6%)	0.001
Lengthy working hours	0	15 (16%)	37 (39.4%)	33 (35.1%)	9 (9.6%)	0.001
High patient volume	1 (0.9%)	21 (19.8%)	39 (36.8%)	34 (32.1%)	11 (10.4%)	0.001
Poor Physical Environment	0	10 (13.5%)	27 (36.5%)	26 (35.1%)	11 (14.9%)	0.001
High workload	0	22 (20.2%)	42 (38.5%)	34 (31.2%)	11 (10.1%)	0.001
Difficult/Critical patients	2 (2.7%)	11 (15.1%)	23 (31.5%)	27 (37%)	10 (13.7%)	0.001

Availability of resources	0 (0.9%)	10 (13.9%)	29 (40.3%)	24 (33.3%)	9 (12.5%)	0.002
Insufficient personnel to handle workload	1 (0.9%)	20 (19.2%)	38 (36.5%)	34 (32.7%)	11 (10.6%)	0.001
Threats of violence	0 (0%)	16 (17%)	37 (39.4%)	30 (31.9%)	11 (11.7%)	0.001
Inadequate salary	1 (0.9%)	22 (20%)	42 (38.2%)	34 (30.9%)	11 (11.7%)	0.001
Effects of working hours on personal life	0	21 (20.2%)	38 (36.5%)	34 (32.7%)	11 (11.7%)	0.001
Effect of stress on personal life	0	16 (17%)	36 (38.3%)	31 (33%)	11 (11.7%)	0.001
Performing tasks not in job description	0	3 (4.1%)	26 (35.1%)	34 (45.9%)	11 (11.7%)	0.001
Performing duties in dangerous situations	0	18 (18.6%)	37 (38.1%)	31 (32%)	11 (11.7%)	0.001

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Table 3. ER Overall and Subcategory Stressors Score in different categories of Occupational Stress (WSS)

Stressors Categories	Total Score (Mean ± Sd.)	Occupational stress based on Work Stress Scale (Mean ± Sd.)					P- Value
		Calm	Fairly Low	Moderate	Severe	Dangerous	
		Responsibilities at Work	5.3 ± 1.7	3.0 ± 0.0	3.9 ± 1.2	5.0 ± 1.4	
Intrinsic Work Pressure	2.5 ± 1.4	2.0 ± 1.4	2.1 ± 1.3	2.6 ± 1.4	2.8 ± 1.3	2.6 ± 1.4	0.272
Support and Motivation	6.6 ± 1.9	1.5 ± 0.7	5.8 ± 1.9	6.6 ± 1.8	7.1 ± 1.7	7.6 ± 1.0	0.0001
External Pressure	1.7 ± 0.9	2.0 ± 0.0	1.3 ± 0.7	1.5 ± 0.9	2.2 ± 0.9	2.3 ± 1.2	0.0001
Availability of Resources	3.9 ± 1.5	2.0 ± 1.4	3.1 ± 1.2	4.0 ± 1.4	4.4 ± 1.5	5.3 ± 1.2	0.0001

Threats at Work	2.9 ± 1.2	1.5 ± 0.7	2.1 ± 1.3	3.0 ± 0.9	3.4 ± 1.1	3.5 ± 0.8	0.0001
OVERALL SCORE	22.2 ± 5.1	10.5 ± 0.7	17.9 ± 4.3	22.1 ± 3.7	25.1 ± 4.1	27.2 ± 2.9	0.0001

Table 4. Association of Occupational Stress Score with ER related Stressors Score

Stressors	R	R ²	P-value
Responsibilities at Work	0.675	0.456	0.0001
Intrinsic Work Pressure	0.180	0.032	0.0001
Support and Motivation	0.437	0.191	0.0001
External Pressure	0.388	0.151	0.0001
Availability of Resources	0.461	0.212	0.0001
Threats at Work	0.443	0.197	0.0001
OVERALL SCORE	0.697	0.481	0.0001

128

129 **DISCUSSION:**

130 The objective of the study was to determine the presence of occupational stress and the factors
 131 contributing to occupational stress among emergency department (ED) healthcare providers in tertiary
 132 care hospitals in Karachi. The crucial findings of this study were high prevalence of occupational stress
 133 among emergency healthcare providers. Occupational stress was found in almost 100% of the
 134 population, with various degrees of severity. Highest percentage of ED healthcare providers' were found
 135 to be moderately (35.8%) or severely (28.3%) stressed. The most concerning finding was that almost
 136 10% of ED healthcare providers were found having occupational stress level in dangerous zone. Similar
 137 results were seen in another study in Peshawar, Pakistan where the level of stress among nurses in
 138 tertiary care hospitals was assessed.¹⁹ Milan et al also found comparable levels of stress in their study in

139 the field of acute medicine.⁷ Emotional stress and burnout among nurses of ICU has also been
140 documented in various other studies.^{20,21,22}

141 In our study we found a significant association between the operational status of hospital, whether it was
142 a public set up or private, and the level of stress. Public hospitals are recognized for overcrowding, short
143 staffing and meager funds⁴, in this respect it is not surprising that the stress on the doctors of public
144 sector is much higher than private sector staff as similarly stated in other studies.⁷ We found no significant
145 association between socio-demographic characteristics and stress scores, similar findings were reported
146 from a study conducted in Brazil.^{23,1} There was, however, a highly significant association between working
147 in shifts in the ED and level of stress as noted in a study in Canada.²⁴ Ann E et al in their study on
148 working hours at the hospital and patient safety highlighted that almost 80% nurses had to stay overtime
149 after their shifts had ended, and that it had a significant effect on the likelihood of making an error due to
150 increased stress.²⁵ The same was reported during assessing potential stressors as most our respondents
151 declared lengthy working hours as a very important contributor to stress.² Research identified 14
152 stressors contributing to occupational stress among ED healthcare providers. For the sake of
153 understanding the stressors better they were divided in to six sub-categories. The areas where most
154 stressors were found were considered most affected with possibility to affect the health and wellbeing of
155 ED healthcare providers.

156 Responsibilities at work was one such sub-category that showed highest number of stressors which
157 showed strong association with stress like; lengthy working hours, dealing with high patient volume,
158 dealing with critical patients, demanding nature of job, performing tasks not part of job description. The
159 second area was availability of resources like; working in poor physical environment, inadequate
160 availability of resources and facilities, insufficient personnel to handle work that showed strong
161 association with occupational stress. Aslam H et al similarly found workload and work
162 environment/hospital conditions to be the greatest contributors to stress among healthcare providers.²⁶ In
163 the area of support and motivation result indicated that ED healthcare providers are overall motivated but
164 factors like; inadequate salary, effect of working hours on family and personal life, effect of stress on
165 personal or/and family life, conflict with other departments/healthcare providers were contributing to their
166 occupational stress. Other major stressors were in the area of threats at work which showed performing

167 duties under dangerous situation, and threat of violence as contributing to ED healthcare providers stress.
168 Heyworth J et al reported threats of malpractice and acquired infections as major potential sources of
169 stress however in our study these were found as minor stressors.²⁷

170
171 The findings of this study revealed a number of implications for emergency department healthcare
172 providers, which have serious consequences on the health and wellbeing of healthcare providers. As
173 many of the factors highlighted are administrative issues it will particularly help ED managers in better
174 planning. The identification of occupational stress and stressors will assist hospitals to understand the
175 flaws in their organizational structure, and take actions to improve their work facilities, physical
176 environment and eliminate the factors contributing to stress. It has been proposed that active errors at
177 work place occur as a result of latent failures by the administration i.e. failure to provide the optimal work
178 conditions.²⁸ In this regard Human Resources (HR) play an imperative role in optimizing work conditions
179 and enhancing productivity of the employees.

180

181 **4. CONCLUSION**

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183 The results of this study have supported the conclusion of previous studies that health care providers in
184 ED suffer from great levels of stress leading to physician burnout and more likelihood of committing
185 errors. High patient volume, work load and dissatisfaction with work environment are the important
186 sources of stress highlighted. In this regard the onus lies on the hospital administration and HR to ensure
187 the well being of the ED staff by minimizing their stress, which in turn will maximize patient satisfaction as
188 well.

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190 **ETHICAL APPROVAL (WHERE EVER APPLICABLE)**

191

192 Approved by the University ethical board.

193

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