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Original Article

## Job Stress and Burnout Syndrome among Critical Care Healthcare Workers

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## ABSTRACT

**Background:** Among healthcare professions, critical care healthcare workers (HCWs) have one of the most stressful jobs. This study was conducted to determine the relationship between job stress and burnout syndrome (BOS) among nurses and healthcare technicians at the surgical emergency department and intensive care unit of Critical Care department at the Alexandria University Hospital.

**Methods:** A cross-sectional approach was conducted from October 2014 to March 2015. Eighty-two nurses and healthcare technicians participated in the research (response rate = 80.39%). Data was collected by an interview questionnaire using selected subscales of NIOSH Generic job stress Questionnaire and Maslach Burnout Inventory of Health and human service Questionnaire. The relationship between BOS and job stress was examined using bivariate and multivariate analyses.

**Results:** Although majority of participants reported variation of workload (84.15%), quantitative overload (76.8%), responsibility for peoples' life (69.5%) and lack of perceived control (63.41%), yet, 85.4% were satisfied with their job. Moreover, high levels of emotional exhaustion was reported by the majority of participants (80%), while less than one third reported either high levels of depersonalization or low levels of personal accomplishment domains of BOS. In multiple regression analysis, skill underutilization, variation in workload, and intragroup conflicts were negatively associated with BOS domains. While, job satisfaction and responsibility for peoples' life were positively associated with personal accomplishment domain of BOS.

**Conclusion:** Critical care HCWs had high BOS. The study concluded that reducing intragroup conflict, improving skills utilization, and raising job satisfaction are crucial to reduce BOS among critical care HCWs. More attention and psychological support is recommended to critical care HCWs.

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## 1. Introduction

Burnout syndrome (BOS) has been defined as the experience of long-term exhaustion and diminished interest, usually in the work context. It comes across as the result of a period of expending too much effort at work while having too little recovery.<sup>1,2</sup> BOS may affect workers of any kind, however, high stress jobs can lead to more BOS than lower stress jobs.<sup>1</sup>

Healthcare workers (HCWs) are often prone to BOS, however, wide variations in the prevalence of BOS have been reported<sup>3,4</sup>; higher levels were reported among HCWs working in emergency department (ED)<sup>5</sup> and intensive care units (ICUs) as they are exposed to a high level of job stress<sup>6</sup>; a factor known to increase the risk of BOS,<sup>7</sup> which could be attributed to critical patient care, high mortality rates, improper working circumstances, and shortage of time to meet patients' needs, therefore, they experience stress levels beyond their coping capacities that may result in burnout.<sup>8,9</sup> BOS has been associated with decreased quality of care, and high rate of absenteeism and turnover among HCWs, all of which have consequences in the healthcare sector.<sup>1,7</sup>

Maslach Burnout Inventory (MBI) has been the gold standard for the diagnosis of BOS in clinical settings. MBI measures three dimensions of BOS; emotional exhaustion, depersonalization (negative or cynical attitudes toward patients), and reduced sense of

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personal accomplishment.<sup>10,11</sup> Emotional exhaustion has been identified as the hallmark of burnout. People who experience all three symptoms have the greatest degree of BOS.<sup>1</sup>

Despite the plenty of studies conducted globally to investigate job stress and BOS, only few have been carried out in the Middle East.<sup>12,13</sup> Moreover, the need to study BOS and job stress in the Middle-Eastern region has become more important with the new wave of Arabic Spring due to higher rates of trauma patients, increased healthcare demands and disturbed working conditions.<sup>14</sup>

Therefore, this research aimed at studying the relationship between BOS and job stress among nurses and healthcare technicians at the surgical ED and ICU of Critical Care department at the Alexandria University Hospital (AUH); one of the largest referral and trauma centers in the country.

## 2. Subjects and methods

A cross-sectional approach was conducted from the beginning of October 2014 to the end of March 2015 at the surgical ED and ICU of Critical Care department at the AUH. All registered nurses and medical technicians, who were practicing during the field work period of the study, were invited to participate. Those who had duration of employment of less than one year were excluded. The target population size was 102 healthcare workers (HCWs). An interview questionnaire was conducted at the workplace. The number of participants was 82; the response rate was 80.39%.

### 2.1. Study tool

Data were collected using an interview questionnaire composed of three sections;

- Section 1:** sociodemographic and work characteristics including age, marital status and level of education, duration of employment, working hours per week, and occupation.
- Section 2:** estimation of job stress using selected subscales of the National Institute for Occupational Safety and Health (NIOSH) Generic job stress Questionnaire (GJSQ),<sup>15</sup> which is considered as a valid and reliable questionnaire applied across occupational situations.<sup>16</sup> In the present study, 8 subscales were evaluated, each one was reported on 5-point Likert scale (Table 1); the percent score was calculated for each one.

**Table 1**  
NIOSH-GJSQ subscales and MBI-HSS domains.

Subscales	Number of items	Total score
<b>NIOSH-GJSQ</b>		
Intergroup conflict subscale	8	40
Intragroup conflict subscale	8	40
Perceived control subscale	16	80
Quantitative overload subscale	11	55
Variation in workload subscale	3	15
Responsibility for people subscale	4	20
Skill underutilization subscale	3	15
Job satisfaction subscale	4	13
Domains	Number of items	Total score
<b>MBI-HSS</b>		
Emotional Exhaustion	9	54
Depersonalization	5	30
Personal Accomplishment	8	48

Abbreviations: NIOSH: National Institute of Occupational Safety and Health, GJSQ: Generic Job stress Questionnaire; MBE-HSS: Maslach Burnout Inventory of Health and human service.

- Section 3:** estimation of BOS was done using Maslach Burnout Inventory of Health and human service (MBI-HSS).<sup>10,11</sup> MBI comprises 22 items grouped into three domains; Emotional Exhaustion, Depersonalization, and Personal Accomplishment. Each item was answered on a 7-point Likert scale; “never” (0), “Few times per year” (1), “Ever month” (2), “Few times per month” (3), “Every week” (4), “Few times per week” (5) and “daily” (6) (Table 1). Maslach characterizes three levels of burnout: low, moderate and high. Burnout is defined by a high score of depersonalization subscale or a high score of emotional exhaustion domain.<sup>10</sup>

### 2.2. Statistical analysis

The collected data were coded, typed onto computer files, tabulated and analyzed using Stata statistical software-version (14).<sup>17</sup> Descriptive statistics including frequency, percentages, arithmetic mean ( $\bar{X}$ ) and standard deviation (SD) were used to describe study population. The relationship between each subscale of NIOSH-GJSQ and BOS was examined separately for each domain of BOS in MBI-HSS; emotional exhaustion score; depersonalization score; and personal accomplishment score using bivariate analysis. In addition, multiple regression analysis was done including all subscales of NIOSH-GJSQ, duration of employment and occupation in order to determine job stressors significantly associated with BOS. The level of significance selected for results was 5% ( $\alpha = 0.05$ ); results were considered statistically significant if  $p < 0.05$ .

### 2.3. Ethical clearance

The study was approved by the Research Ethics Committee at the Alexandria Faculty of Medicine. Objectives of the study, procedures, types of information to be obtained, and publication were explained to participants. An informed consent was obtained from each participant at the beginning of the study. Collected data were confidentially kept.

## 3. Results

### 3.1. Socio-demographic and work characteristics of the study population

Table 2 describes the study population. All participants were females with mean age of  $40.5 \pm 10.4$  years. The majority (76.8%,  $n = 63$ ) were married and received either secondary education (51.2%,  $n = 42$ ) or higher education (40.2%  $n = 33$ ). The mean duration of employment was  $18.5 \pm 10.8$  years with average working hours per week of  $35.8 \pm 13.6$  h. Half of participants ( $n = 41$ ) were nurses and the other half ( $n = 41$ ) were healthcare technicians.

### 3.2. BOS among the studied critical care HCWs

The majority of studied critical care HCWs (80.5%,  $n = 66$ ) had high levels of emotional exhaustion while low levels were only reported by 2.4% of them ( $n = 2$ ). On the other hand, 21.9% ( $n = 18$ ) had higher levels of depersonalization and 39% ( $n = 32$ ) reported either low or moderate levels. Regarding personal accomplishment, one third of participants (31.7%,  $n = 26$ ) had high levels, while those reported low and moderate levels of personal accomplishment were 24.3% ( $n = 20$ ) and 43.9% ( $n = 36$ ) respectively. (Data not shown).

**Table 2**  
Socio-demographic and work characteristics of the studied critical care HCWs (n = 82).

Socio-demographic and work characteristics		
<b>Age (years)</b>		
Min-Max	22–59	
Mean ± SD	40.5 ± 10.4	
<b>Marital status</b>		
	No.	%
Single	13	15.8
Married	63	76.8
Divorced/widow	6	7.3
<b>Level of education</b>		
Secondary	42	51.2
Post-secondary (Diplome)	7	8.5
University degree or higher	33	40.2
<b>Duration of employment (Years)</b>		
Mean ± SD	18.5 ± 10.8	
<b>Working hours per week (hours)</b>		
Mean ± SD	35.8 ± 13.6	
<b>Occupation</b>		
	No.	%
Nurse	41	50
Healthcare technician	41	50

Ab abbreviations: HCWs: healthcare workers; SD: standard deviation.

**Table 3**  
Job stress among the studied critical care HCWs according to subscales of NIOSH-GJSQ.

NIOSH-GJSQ subscales	Number	%
Intergroup conflict	22	26.83
Intragroup conflict	28	34.15
Lack of perceived control	52	63.41
Quantitative overload	63	76.83
Responsibility for people	57	69.51
Variation in workload	69	84.15
Skill underutilization	29	35.37
Job satisfaction	70	85.37

Abbreviations: HCWs: healthcare workers; NIOSH: National Institute of Occupational Safety and Health, GJSQ: Generic Job stress Questionnaire.

### 3.3. Job stress among the studied critical care HCWs

Regarding work stress, the majority of the studied critical care HCWs suffered from variation of workload (84.15%, n = 69), quantitative overload (76.8%, n = 63), responsibility for peoples' life (69.5%, n = 57) and lack of perceived control (63.41%, n=52). Despite the reported results, 85.4% of them (n = 70) were satisfied with their job. On the other hand, 26.83% (n = 22), 34.15% (n = 28), and 35.37% (n = 29) had intergroup conflict, intragroup conflict and skill underutilization respectively (Table 3).

**Table 4**  
Relationship between NIOSH-GJSQ subscales and Emotional Exhaustion score using bivariate and multivariate analyses (n = 82).

NIOSH-GJSQ subscales	Bivariate analysis			Multivariate analysis <sup>a</sup>		
	Coefficient	95% CI	P value	Coefficient	95% CI	P value
Intergroup conflict	4.85	(−0.03 to 9.74)	0.05	−1.05	(−7.60 to 5.51)	0.75
Intragroup conflict	5.14	(0.61–9.67)	0.02	5.17	(−1.10 to 11.44)	0.10
Perceived control	−6.20	(−10.5 to 1.82)	<0.01	−4.79	(−9.70 to 0.11)	0.05
Quantitative overload	3.37	(−1.839 to 8.57)	0.20	1.96	(−4.36 to 8.27)	0.53
Responsibility for people	−2.56	(−7.34 to 2.22)	0.29	−3.77	(−9.46 to 1.93)	0.19
Variation in Workload	−1.67	(−7.72 to 4.38)	0.58	−2.10	(−8.35 to 4.15)	0.50
Skill underutilization	−3.96	(−8.51 to 0.59)	0.08	−5.51	(−10.17 to 0.85)	0.02
Job satisfaction	−5.39	(−11.53 to 0.78)	0.08	−3.43	(−9.40 to 3.07)	0.29

Abbreviations: NIOSH: National Institute of Occupational Safety and Health; GJSQ: Generic Job Stress Questionnaire; CI: confidence interval.

<sup>a</sup> Using multiple regression; results were adjusted to intergroup conflict, intragroup conflict, perceived control, quantitative overload responsibility for people, variation in workload, skill underutilization, job satisfaction, duration of employment and occupation. The regression model was significant (F = 2.13, p = 0.03).

### 3.4. Relationship between NIOSH-GJSQ subscales and the emotional exhaustion score

According to bivariate analysis, critical care HCWs who suffered from intragroup conflict reported significantly higher scores of emotional exhaustion compared with those who didn't [diff = 5.14; 95% CI (0.61–9.67), p = 0.02]. In addition, those who had high job control at work reported significantly lower scores of emotional exhaustion compared with those who lacked perceived control [diff = −6.20, 95%CI (−10.59 to 1.82), p < 0.01]. However; such association became statistically insignificant after adjustment for other covariates in multiple regression. On the other hand, multiple regression analysis revealed significant negative association between skill underutilization and emotional exhaustion score [diff = −5.51, 95%CI (−10.17 to 0.85), p = 0.02]. Multiple regression revealed no significant association between emotional exhaustion score and the remaining NIOSH\_GJSQ subscales; intergroup conflict, intragroup conflict, perceived control, quantitative overload, responsibility for people, variation in workload an job satisfaction (Table 4).

### 3.5. Relationship between NIOSH-GJSQ subscales and the depersonalization score

Bivariate analysis revealed significant negative association between variation in workload and depersonalization score [diff = −3.89, 95%CI (−7.40 to 0.39), P = 0.03]; such association remained significant after adjusting other covariates in multiple regression [diff = −4.19, 95%CI (−7.80 to 0.57), P = 0.02]. On the other hand, bivariate and multivariate analyses showed no significant association between depersonalization score and the remaining NIOSH\_GJSQ subscales; intergroup conflict, intragroup conflict, perceived control, quantitative overload, responsibility for people, skill underutilization an job satisfaction (Table 5).

### 3.6. Relationship between NIOSH-GJSQ subscales and the personal accomplishment score

According to bivariate analysis, significant positive association was revealed between personal accomplishment score and each of the following NOISH GJSQ subscales; responsibility for peoples' life, job satisfaction, and perceived control [diff = 7.94, 95%CI (4.81–11.07), p < 0.001], [diff = 6.54, 95%CI (2.09–10.99), p = <0.01], and [diff = 5.05, 95%CI (1.81–8.29), p < 0.001] respectively. On the other hand, intergroup conflict was negatively associated with personal accomplishment score [diff = −5.71, 95%CI (−9.23 to 2.20), p < 0.01]. Bivariate analysis revealed no significant association between personal accomplishment score and the following NIOSH-GJSQ subscales; intragroup conflict, quantitative

**Table 5**  
Relationship between NIOSH-GJSQ subscales and Depersonalization score using bivariate and multivariate analyses (n = 82).

NIOSH-GJSQ subscales	Bivariate analysis			Multivariate analysis <sup>a</sup>		
	Coefficient	95% CI	P value	Coefficient	95% CI	P value
Intergroup conflict	0.90	(-2.07 to 3.87)	0.54	1.20	(-2.60 to 4.99)	0.53
Intragroup conflict	0.095	(-1.83 to 3.72)	0.49	0.61	(-3.01 to 4.23)	0.73
Perceived control	-1.93	(-4.64 to 0.77)	0.15	-0.83	(-3.6 to 2.01)	0.56
Quantitative overload	0.44	(-2.68 to 3.57)	0.77	-1.45	(-5.11 to 2.20)	0.43
Responsibility for people	-0.60	(-3.46 to 2.26)	0.67	-2.53	(-5.83 to 0.76)	0.12
Variation in workload	-3.89	(-7.40 to 0.39)	0.03	-4.19	(-7.80 to 0.57)	0.02
Skill underutilization	-2.23	(-4.95 to 0.48)	0.10	-2.37	(-5.07 to 0.32)	0.08
Job satisfaction	-2.92	(-6.59 to 0.75)	0.11	-2.02	(-5.78 to 1.74)	0.28

Abbreviation: NIOSH: National Institute of Occupational Safety and Health; GJSQ: Generic Job Stress Questionnaire; CI: confidence interval.

<sup>a</sup> Using multiple regression; results were adjusted to intergroup conflict, intragroup conflict, perceived control, quantitative overload responsibility for people, variation in workload, skill underutilization, job satisfaction duration of employment and occupation. The regression model was significant (F = 2.68, p < 0.01).

**Table 6**  
Relationship between NIOSH-GJSQ subscales and Personal Accomplishment score using bivariate and multivariate analyses (n = 82).

NIOSH GJSQ subscales	Bivariate analysis			Multivariate analysis <sup>a</sup>		
	Coefficient	95% CI	P value	Coefficient	95% CI	P value
Intergroup conflict	-5.71	(-9.23 to 2.20)	<0.01	-4.49	(-8.72 to 0.27)	0.03
Intragroup conflict	-2.44	(-5.89 to 1.01)	0.16	1.18	(-2.85 to 5.21)	0.56
Perceived control	5.05	(1.81–8.29)	<0.01	2.06	(-1.10 to 5.21)	0.19
Quantitative overload	1.99	(-1.91 to 5.89)	0.31	0.47	(-3.59 to 4.53)	0.81
Responsibility for people	7.94	(4.81–11.07)	<0.001	7.40	(3.74–11.06)	<0.001
Variation in workload	-2.65	(-7.15 to 1.84)	0.24	-1.32	(-5.34 to 2.69)	0.51
Skill underutilization	-2.24	(-5.66 to 1.19)	0.19	-1.52	(-4.52 to 1.47)	0.31
Job satisfaction	6.54	(2.09–10.99)	<0.01	4.52	(0.34–8.70)	0.03

Abbreviations: NIOSH: National Institute of Occupational Safety and Health, GJSQ: Generic Job Stress Questionnaire; CI: confidence interval.

<sup>a</sup> Using multiple regression analysis; results were adjusted to intergroup conflict, intragroup conflict, perceived control, quantitative overload responsibility for people, variation in workload, skill underutilization, job satisfaction duration of employment and occupation. The regression model was significant (F = 5.38, p < 0.001).

overload, variation in workload, and skill underutilization. In multiple regression analysis, job stressors significantly associated with personal accomplishment score were intragroup conflict, responsibility for peoples' life, and job satisfaction [diff = -4.49, 95%CI (-8.72 to 2.27), p = 0.03], [diff = 7.40, 95%CI (3.74–11.06), p < 0.001] and [diff = 4.52, 95%CI (0.34–8.70), p = <0.03] respectively. Multivariate analysis revealed no significant association between personal accomplishment score and the remaining NIOSH-GJSQ subscales; intragroup conflict, perceived control, quantitative overload, variation in workload, and skill underutilization (Table 6).

#### 4. Discussion

ICU is a highly stressful work environment and may, therefore, be associated with a high rate of BOS among HCWs.<sup>1,6</sup> The current research examined the relationship between BOS and job stress among HCWs at the surgical ED and ICU of Critical Care department at the AUH.

The majority of participants reported high emotional exhaustion scores, variation of workload, quantitative overload and job satisfaction. According to the theory of conservation of resources (COR), strain occurs when resources are lost, threatened or invested without gain.<sup>18,19</sup> Such theory comes in agreement with the results of the present study as multivariate analysis revealed statistical significant relationship between burnout scores and variation in workload, skill underutilization, intergroup conflict, high responsibility for peoples' life or job dissatisfaction. This is also in line with the met-analysis done by Alarcon suggesting that resources, demands and organizational attitudes were all related to burnout.<sup>20</sup>

In the current study, among the three burnout domains, high levels of emotional exhaustion was reported by the majority of

participants (80%), while less than third of participants reported either high levels of depersonalization or low levels of personal accomplishment. Moreover, those with skill underutilization were more likely to have high levels of emotional exhaustion. Such finding agrees with COR theory which proposes that maladaptive coping with excessive demands and depletion of one's resources will result in emotional exhaustion first, then depersonalization and reduced personal accomplishment follow.<sup>21</sup>

In addition, the present study showed that lack of control at work place tend to increase the level of emotional exhaustion. Such finding conforms to previous studies suggesting that higher job control in the form of autonomy or decision making is associated with lower strain and higher performance.<sup>22,23</sup>

Literature suggests that demands are positively associated with depersonalization.<sup>1</sup> However, in the current study, participants who reported variation in workload had lower scores of depersonalization. This might be explained by having the chance to recover from increasing demands with high workload during the intermittent periods of low workload.

In the meta-analysis done by Alarcon, reduced personal accomplishment was negatively associated with organizational commitment and Job satisfaction.<sup>20</sup> This agrees with the present findings as higher levels of personal accomplishments were recorded with job satisfaction and responsibility for people's lives.

The present study also showed that conflict at work place may lead to lower levels of personal accomplishment. This is in line with previous literature suggesting negative effects of workplace conflict; for example, the study conducted by Leon-perez et al. (2016), found that conflict at work place was positively associated with burnout.<sup>24</sup>

Although several studies were conducted globally,<sup>20</sup> and our findings regarding estimation of job stress, BOS, and possible association between them are, in general, consistent with the results of

other studies conducted in developing and developed regions in the world,<sup>20</sup> yet, our study is one of the few studies that have been carried out in the Middle East.<sup>12,13</sup> The specific circumstances in the Arab countries including higher rates of trauma patients, increased healthcare demands and disturbed working conditions,<sup>14</sup> necessitated more attention and in-depth analysis to reveal potential job stressors in order to design evidence-based preventive strategies aiming at reducing job stress and BOS among critical care HCWs in Arab countries.

## 5. Limitations of the study

Although this study adds to the limited literature examining work stress and burnout in the country, it has been limited by the small number of participants. Participants in the current research (n = 82) represented 80.39% of all registered nurses and medical technicians, at the surgical ED and ICU of Critical Care department at the AUH, who were practicing during the field work period of the study. However, the small number of participants hindered the full exploration of important occupational factors as shift work. In addition, all study participants were females and hence gender role couldn't be explored in the current research.

## 6. Conclusion

The majority of nurses and healthcare technicians at the surgical ED and ICU of Critical Care department at the AUH reported high levels of emotional exhaustion of BOS. Potential job stressors that were significantly associated with BOS were skill underutilization, intragroup conflict, variation in workload, and job dissatisfaction. The study concluded that reducing intragroup conflict, improving skills utilization, and raising job satisfaction are crucial to reduce BOS among critical care HCWs. More studies involving larger samples of both males and females in multiple levels of care are required. More attention and psychological support should be given to those working in the healthcare sector especially with increasing healthcare demands in the region.

## Conflicts of interest

Authors declare no conflicts of interest.

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