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Research Article

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Psychological Hazards Among Emergency Medical Responders (EMRs): A cross sectional comparative study in Cairo city, Egypt

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ABSTRACT

Introduction: Up to this point, occupational health within the ambulance services has picked up for the most part little thought from masters. In the past couple of years, specialists have turned out to be progressively mindful that rescue vehicle staff might be in danger of creating business related medical issues. Aim of the current workw as to study the effect of work-related acute and chronic psychosocial stress hazards (burnout, depression, and PTSD) around emergency medical responders (EMRs) in Cairo, Egypt compared with comparative group Materials: A cross-sectional comparative study was done upon 307 EMRs and a similar number of nonemergency workers. Methods: After getting a verbal and a written consent, all participants were asked to fill in a questionnaire including demographic data, survey for job stressors, Maslach burnout inventory, Beck depression inventory, and Davidson trauma scale for PTSD. Results: In descending order, the most severe acute stressors were dealing with traumatic occasions (83.49%), serious accidents (81.8%), dealing with young victims (80.17%) and to a less extent dealing with psychological patients (43.2%). Also, the EMRs were more exposed to chronic stressors than the comparative group except for lack of social support with colleagues and supervisors. The EMR group had statistically higher levels of emotional exhaustion (EE) and depolarization (DP) than the comparative group (23.0, 7.0 and 11.7, 3.14 respectively). But there was no statistically significant difference between the two groups as regards lower personal achievement or depression symptoms. The risk for PTSD was higher in those who had higher stress levels from death of colleagues, exposure to physical or verbal assault and dealing with psychiatric. In Conclusion: The EMRs were more exposed to acute and chronic work-related stressors than the comparative group. Also, they had higher levels of EE, DP and PTSD compared to the comparative group.so; the EMR group is in need for stress management program to prevent these job-stress related hazards.

Keywords: *Psychological, Hazards, Emergency Medical Responders*

INTRODUCTION

Up to this point, occupational health within the ambulance services has picked up for the most part little thought from masters. In the past couple of years, specialists have turned out to be progressively mindful that rescue vehicle staff might be in danger of creating business related medical issues [1, 2].

Little studies intentionally looked at those level of symptoms and prevalence of occasions between rescue vehicle laborers and the normal working populace. Past studies comparing health status among ambulance personnel with that of general populations has not acknowledged the healthy worker impact [3].

In the field of occupational health psychology, researchers have fundamentally kept their thoughts ahead on the negative impacts of long term work characteristics, specifically chronic work-related stressors, for example, job overload, shift work, role conflict, and lack of social support. Suggestions about these hotspots for work related

stresses fuse the impacts on labourer fulfillment and profitability, mental and also physical health, absenteeism, and the likelihood for manager risk. Nonetheless, the role of intense and serious stressors is frequently expelled [4].

Exposure to traumatic stressors is fundamental to emergency service personnel. Traumatic stressors, or critical incidents are those in which faculty are presented to death or life-undermining hurt. In addition to the hazard of mortality [5], genuine mental health and behavioural issues are associated with such traumatic exposures such as posttraumatic stress disorder (PTSD), anxiety, and depression [1].

Burnout and stress are common-related issues in health service workers [6]. Maslach and Jackson [7] defined burn out as a physical, emotional, and intellectual exhaustion syndrome manifested by adverse attitude to professional life and other people with the development of a negative self-esteem in the individual experiencing chronic fatigue and feelings of helplessness and hopelessness. At the same time, persons working in clinical diagnostic laboratories face risks since they are exposed to various microbes during their work period. [8]

Aim of The Work

The aim of the current work was to study the effect of work-related acute and chronic psychosocial stress hazards (burnout, depression, and PTSD) around emergency medical responders (EMRs) in Cairo, Egypt compared with comparative group.

MATERIALS AND METHODS

Study outline

Between February, 2016 and December, 2017 a total number of 614 EMR and matched comparative group were chosen for this cross-sectional comparative study in Cairo city, Egypt.

The (614) male subjects utilized on this study (from Cairo ambulance service) were classified into two equal groups (307 each), EMR group and comparative group of nonemergency workers.

Included in the study all EMRs that have been employed for more than one year and those who are not with any known psychic background.

EMR group assembly

They were 307 males, of those 153 were emergency medical technicians (EMTs) and 154 were emergency drivers. The average age for this group was 34±1.4 years (range 23-45 years) and 38±3.7 years (range 22-57 years) respectively, and the average duration of employment was 9.3 ± 8.2 years (range 2-22 years) and 12.1± 2.8 years (range 5-25 years) respectively (Table 1).

The Emergency Medical Responder team consists of the Emergency Medical Technicians (EMTs) and the Drivers. EMTs are emergency responders trained to provide immediate care for sick or injured people and transport them to medical facilities. They usually work as team of two responders (EMT and driver). They may ask for extra support from the police or shoot divisions. The emergency driver drives a rescue vehicle to transport sick, injured, or convalescent persons to/from a hospital or different health facility and performs different obligations identified with this primary occupation (carrying; cleaning; communicating; handling; and lifting) [9].

Most EMTs and drivers need to work 24 h a day each other day or alternately every day 8 h shift rotating between the middle of day, evening, and night shifts.

Comparative group assembly

The group comprised 307 male individuals working in nonemergency jobs at Cairo's main ambulance centre, ministry of health, and at Al-Azhar faculty of medicine, who matched EMRs in a large portion of the variables but without the danger of exposure to stress because of emergency work. They were mainly males.

Their average ages were 33. 2 ± 8 years (range 24-59 years) and their average duration of employment was 14.1 ± 2.3 years (range 5-37 years) (Table 1).

Participants in this group were office workers in Cairo ambulance centre who never functioned previously in providing emergency medical service (carrying out technical and maintenance jobs, accountant services and functional affairs), workers responsible about the maintenance and cleaning of the offices and buildings as well as laboratory and maintenance technicians in the ministry of health and the faculty of medicine in Alazhar university.

METHODS

The study group was interviewed in groups of 10s (however, it was not easy). In the meeting the aim of the study was explained, attendances were encouraged to actively participate in the study, and they were informed on how to fill in the questionnaire.

Ethical consideration

A verbal and written consent was taken from all participants, this included all the EMRs, and the directors of Cairo's main ambulance centre, ministry of health, and Al-Azhar faculty of medicine.

Participants were informed about the confidentiality of their data and about their complete freedom to withdraw from the study at any time.

Questionnaire

A questionnaire was designed to include the study group demographic data such as age, sex, residence, lifestyle (smoking, drug abuse), work related history (job description, duration of employment, shift work hours, job stress review (frequency and types) or acute stressors in the form of dealing with psychiatric patients, dying persons or junior casualties [4].The responders were required to rate how distressing might have been these stressors on a scale from1 to 4 (where 1 is not stressful and 4 is extremely stressful). Also, inquiries regarding chronic work-related stressors were included in the form of lack of employment autonomy; lack of social support from colleagues and directors [10].

Psychosocial health hazards assessment tools

Maslach Burnout Inventory (MBI)

That inventory measures the combined impacts of work-related pressurewith respect to three states: Emotional Exhaustion (EE), Depolarization (DP), and Personal Achievement (PA). Each inquiry is evaluated on a scale from 0 to 5 (where 0 is not at all and 5 is yes, absolutely).

High scores to the first two scales and low scores to the last scale are associated with burnout [11].

Beck depression inventory "Arabic version"

Depression have been evaluated as stated by Beck depression inventory (BDI) "Arabic version".This instrument contains 21 items, each item is rated on a FOUR-point scale extending from 0 to 3 with the maximum total score is 63 [12].

Davidson trauma scale (DTS) (DSM-IV) (Arabic form)

Every one study subjects finished the DTS, a 17-item scale measuring each diagnostic and statistical manual-IV symptoms of PTSD on five-point frequency and severity scales. The subjects were diagnosed for PTSD manifestations when having one of the re-experience or recall symptoms, three avoidance symptoms, and one of the arousal symptoms (Arab corporation for psychological test 2010) [13].

Statistical analysis

Information were analyzed with SPSS version 16 for Windows. The normality data were first tested with one-sample Kolmogorov-Smirnov test. Descriptive statistics, mean, median were calculated to describe central tendencies in each group. The groups were compared with Student's t test to continuous parametric variables, and Man-Whitney test (z) for nonparametric continuous variables.

Chi-square ($\chi 2$) test might have been utilized for categorical variables. Fisher's exact test might have been utilized when 50% of cells or more were less than 5. $P<0.05$ might have been considered as statistically significant.

RESULTS

Sociodemographic data of the studied group

The average age for EMRs was 34 ± 1.4 and 38 ± 3.7 and that for the comparative group was 33.2 ± 8.0. Both groups were males. The greater part of both groups were from rustic region (58.1% and 56.3%) and married (79.5% and 81.9% respectively) (Table 1).

The EMRs group was one hundred fifty three EMT (49.83%) and one hundred fifty four drivers (50.17%), while the comparative group was140administration staff (45.6%) and167serviceworkers (54.4%). The majority of the EMR

group (53.7%) were procured with short contracts, while the greater part of comparative group (70.6%) were permanent workers with statistically significant difference (P < 0. 05). The average duration of employment was 10 ± 6.7 and 14.1 ± 2.3 for the EMR and the comparative groups respectively with no statistically significant difference (P > 0. 05). Most of EMR were 24 h shift workers, while most of the comparative group subjects were day workers only (72.2% and 53.4% respectively) with statistically significant difference (P < 0. 05) (Table 1).

Table 1. Demographic data of the studied groups

Variables	**EMRs (307)**		**Comparative group (307)**	
Subgroups	EMT	Drivers	Administration stuff	Service workers
Number	153	154	140	167
Age (years) Mean Range	34±1.4 23-45	38±3.7 22-57	33.2±8 24-59	
Duration of employment (years) Mean Range	9.3±8.2 2-22	12.1±2.8 2-25	14.1±2.3 5-37	
Type of work	53.7% short contracts		70.6% permanent work	
Shift type	24 h shift (72.2%)		Day shift (53.4%)	
Married %	79.5		81.9	
Coming from rustic areas %	58		56.3	

Acute stressors

EMR were more subjected to acute job stressors. In descending order these stressors were: dealing with traumatic occasions (83.49%), serious accidents (81.8%), dealing with young victims (80.17%) and to a less extent dealing with psychological patients (43.2%) (Table 2).

Table 2: Acute job stressors among the EMR group

Job stressor	**Percentage**
Traumatic occasions	(83.49%)
Serious accidents	(81.8%)
Young victims	(80.17%)
Psychological patients	(43.2%)

Chronic organizational stressors

EMR group was exposed to chronic job stressors more than the comparative group (100% and 58.3% respectively) with statistically significant difference (P < 0. 05). These chronic job stressors were: lack of decision control at work (34.2% and 14. 8%), lack of organizational decision control (74. 0% and 55%), poor correspondence with the organization (31.1% and 1.3%) respectively with statistically significant difference (P<0.05). Also, social support with managers was (81% and 90%respectively) and the social support with co-workers was (93.4% and 94.7% respectively) around EMRs and the comparative groups with no statistically significant difference (P >0.05). EMRs had higher levels for group moral and cohesion compared to the comparative group (97.4% and 92.2%) with statistically significant difference (P < 0. 05).

EMRs had fundamentally higher rate of physically strenuous activities (96.4%), rapid pace of work (97.3%), overtime work (66.2%), work overload (84.9%), never getting compensatory monetary rewards, lower percentage for reporting enough resources over the comparative group with statistically significant difference (P < 0. 05) (Table 3).

Table 3. Frequency of chronic organizational stressors among the studied groups

Chronic stressor	EMR group (307)	Comparative group (307)	P-value	Statistical significance
Lack of decision control at work	34.2%	14.8%	P<0.05	Significant
Lack of organizational decision control	74.0%	55.0%	P<0.05	Significant
Poor communication with the organization	31.1%	1.3%	P<0.05	significant
Social support with the supervisors	81.0%	90.0%	P>0.05	insignificant
Social support with co-workers	93.4%	94.7%	P>0.05	insignificant
Group moral and cohesion	97.4%	92.2%	P<0.05	significant

Burnout

Using Maslch burnout inventory, the EMR group was found to have higher levels of EE and DP compared with the comparative group (23%, 7% and 11.7% ,3.14%respectively) with statistically significant difference (P<0.05). Also, the EMRs group had higher levels of personal achievement (82.3%) over that found in the comparative group (75.7%) but, with no statistical significant difference (P > 0. 05) (Table 4).

Table 4. Levels of burnout subscales (Maslach burnout inventory) among the studied groups

Burnout subscales	EMR group (307)	Comparative group (307)	P-value	Statistical significance
Emotional exhaustion (EE)	33.0%	7.0%	P<0.05	significant
Depersonalization (DP)	11.7%	3.14%	P<0.05	significant
Personal achievement (PA)	82.3%	75.7%	P>0.05	insignificant

Depression and PTSDs.

No statistically significant difference (P > 0. 05) was found between the EMR group and the comparative group as regard the total BDI score and the depression grade. However, there was a statistically significant difference (P < 0.05) between the two group as regard the Median total score of Davidson scale for PTSD (5 and 0) respectively. Also, there was a statistically significant difference between the two groups as regard PTSD (15.3% and 2. 9%respectively) (P < 0. 05).

Risk factors for PTSDs.

There was no statistically significant difference between EMR with PTSD and EMR without PTSD as regard exposure to acute stressors (P > 0. 05). However, there was increased risk of PTSD for the individuals who had higher stress levels from death of colleagues (OR) (95% CI) = 2.2 (0.7-7. 6), exposure to verbal or physical insult OR (95% CI) = 1. 6(0. 5-4. 4), or dealing with psychiatric people OR (95% CI) = 1.4 (0.5-3.7).

Burnout and PTSD among EMRs

EMR with PTSD had higher levels of EE (42.1% and 16.5%) and PA(36.8% and 16.5%) than those individuals without PTSD(P < 0. 05) OR (3. 6) (95% CI: 1. 3-10. 28)and OR (2. 9) (95% CI: 1.03-8.4) (P < 0. 05) respectively. However, DPwas more frequent (9. 9%) among responders with no PTSD compared with (5. 3%) EMR with PTSD with no statistically significant difference (P > 0. 05). EE was found to be independently associated with the likelihood of having posttraumatic stress symptoms (OR=4.6) (Table 5).

Table 5. Burnout and posttraumatic stress disorder among emergency medical responders

Burnout subscales	EMRs With PTSD (42)	EMRs Without PTSD (265)	P-value	Statistical significance
Emotional exhaustion (EE)	42.1%	16.5%	P<0.05	significant
Depersonalization (DP)	5.3%	9.9%	P>0.05	insignificant
Personal achievement (PA)	36.8%	16.5%	P<0.05	significant

DISCUSSION

Emergency responders, including EMS personnel, fire fighters, and law requirement officers, risk their health and safety to assist in medical emergencies like motor vehicle incidents, buildings and wild-land fires, dangerous material spills, crimes and public disturbances, search and rescue and natural and Human-caused disasters [14].

In the current study there was a statistically significant difference (P < 0. 05) between the EMR group and the comparative group (100% and 58.3% respectively) as regards exposure to acute and chronic jobs stressors.

Rescue vehicle particular stressors were reported as significantly more severe than the general organizational stressors. Serious operational demands were reported as the vast majority extreme stressor [15, 16] and physical demands were the second most severe stressor [15, 17].

In the present study, the severity and the frequency of acute and chronic stressors were evaluated. It was found that EMRs were exposed to the following acute job stressors in descending order: dealing with traumatic occasions (83.49%), serious accidents (81.8%), dealing with young victims (80.17%) and to a less extent dealing with psychological patients (43.2%).

Ambulance-specific stressors were identified as the most extreme stressors. Serious operational tasks, and the items 'dealing with seriously harmed friends and individuals you know' and 'dealing with genuinely harmed children' in particular, were rated as the most severe stressors (a higher mean score than the two general stressors with pressure and challenging job tasks) [18].

Also, the frequency of chronic organizational stressors have been assessed, rapid pace of work (97.3%), physically strenuous activities (96.4%), work overload (84.9%) and overtime work (66.2%), were the commonest stressors among EMRs compared with the comparative group (49.1%, 72.1%, 59.1% and 12.3% respectively) with statistically significant difference (P < 0. 05).

Our results are similar to that of Stured et al., [18] who reported that physical demands were the most frequent stressors and second most severe compared to all other stressors. The authors explained their finding by much heavy lifting and carrying under difficult on ditions. In addition, this concurs with other studies, which have found that ambulance personnel report higher levels of musculoskeletal strain than employees in other health services [4] and that ambulance personnel self-report more musculoskeletal and physical health problems than the general population [19, 20].

Also, Ploeg and Kleberg [4] reported that ambulance workers accounted a greater amount of chronic work-related stressors than reference group.

Moreover, EMRs in Cairo reported poorer communication with their organization than the comparative group with statistically significant difference (P < 0. 05). These outcomes went in agreement with Ploeg and Kleber [4] that accounted for fundamentally higher mean levels about poor communication among ambulance workers compared with reference group.

In the current study, social support with supervisors and social support with co-workers among EMR was less than that accounted for the comparative group with no statistically significant difference (P > 0. 05). The EMR group had higher levels of group moral and cohesion compared with the comparative group with statistically significant difference (P < 0. 05).

The levels of social support with supervisors and co-workers in the current study were satisfactory in comparison with the results of Stured et al., [18] and loeg and Kleber [4] who reported that lack of social support from co-worker and leaders was the second most frequent stressor after physical demand and most severe general stressors.

Emergency work is both rewarding and demanding in that little control over patient-mixexists, compounded by the fact that life and death decisions have to be made quickly [21].

Results of the current study revealed that, lack of decision control at work and lack of organizational decision control were more commonly reported (34.2% and 74.0%) among EMRs compared with comparative group (14.8% and 55%) respectively with statistically significant difference ($P < 0.05$).

Ploeg and Kleber [4] reported higher mean levels for lack of job autonomy among ambulance workers than reference group with statistically significant difference ($P < 0.001$).

Alexander and Klein [22] reported high levels of job satisfaction among ambulance workers. However, a distinction between satisfaction with regard to the job and satisfaction with regard to the organization can be made. Expressed job satisfaction does not mean that the organization does not have to concern about the well-being of its employees. Dissatisfaction with organizational aspects has a price: A price to be measured in terms of the levels of general psychopathology, burnout, and posttraumatic symptoms. Current study results revealed that lack of organizational decision control among EMRs can be important source for organizational dissatisfaction and psychopathological diseases among studied population.

The levels for burnout subscales in the form of EE and DP were higher among EMR compared with the comparative group with statistically significant difference ($P > 0.001$). The rate of the workers with high score on separate subscales were (23%) for EE, (11.7%) for DP, and (12.1%) for low PA.

Ploeg and Kleber [4] used the MBI to investigate the prevalence of burnout in workers from 10 regions and found a higher risk for burnout in ambulance workers (8.6%) than in the general working population (5.3%).The percentages of workers with high scores on the separate dimensions were reported as 12% for EE, 18% for DP, and 16% for low PA. Weiss SJ et al [23]., in a study from a single service in the USA reported an opposite result andconcluded that theaverage burnout scores in ambulance workers were slightly but not significantly lower than the national average [23].

However, this conclusion was based on as mall and non-representative sample. A study from a Scottish regional ambulance service reported the percentages of workers with high scores on the MBI for the separate scales as 26% for EE, 36% for low PA, and 22% for DP, but did not report confidence intervals [22].

The current study reported comparable levels of depression symptoms according to the BDI among EMR and the comparative group. The prevalence of depression was 3.9% among EMRs and 3.1% among the comparative group with no statistically significant difference ($P > 0.05$).

A lower prevalence (2.1%) of severe symptoms, as measured with BDI, was reported in a study from a single ambulance service in Canada [24]. Three other studies reported a similarly high prevalence of psychological distress (>20%), as measured by the General Health Questionnaire (GHQ-12) [22, 25, 26]. The median to talscore of Davidson scale for PTSD was higher among EMR group compared with the comparative group (5 and 0) respectively with statistically significant difference ($P < 0.05$). Also, 15.3% of EMRs had PTSD compared with 2.9% from the comparative group with statistically significant difference ($P < 0.05$).

Those predominance for posttraumatic stress symptoms was also high in some studies [1,27,28] in spite of the fact that these studies used different evaluation scales for assessment of PTSD. However, these findings should be interrupted with caution, especially because the high PTSD symptom scores in the rescue vehicle benefits may reflect that, when asked to report on a traumatic incident, rescue vehicle workers might need alarge reservoir for potentially traumatic memories to choose from the general population. Hence, rescue vehicle work force might score much higher on the PTSD scales over other population without fundamentally having more problems. Therefore, more investigations should be done to focus on sleeping problems, intrusion, and hyperarousal among rescue vehicle faculty [16].

CONCLUSION

The EMRs are exposed to severe acute stressors when dealing with traumatic occasions and serious accidents.

There were statistically significant difference between EMRs and the comparative group in respects most of chronic work-related stressors except for lack of social support with colleagues and supervisors.

EMRs had higher mean levels of emotional exhaustion and depersonalization compared with comparative group. In addition, EMRs had higher clinical levels of PTSD compared with the comparative group.

Emotional exhaustion was significantly found among EMRs with PTS D compared with those without PTSD. However there was no statistically significant difference between the two groups as regard depression score. According to these results, emergency responders are in urgent need for stress management

and debriefing programs for prevention and alleviation of the psychosocial health hazards with particular stress on organizational role in enhancing levels of satisfaction among emergency responders.

Strengths and constraints

The strengths of the study:

1-The ability to compare the frequency of psychosocial hazards among EMR group and a sample of work in gpopulation as control group.Mostofprevious studies focused on emergencyworkersonlyorcompared with generalpo pulation which isdifferent from working healthy population.

2- There is little public awareness that EMTs' job is the host of many occupational hazards especially in developing countries. 3- Burnout and depression among EMRs are still an open question due to conflicting results reported by previous studies.

Constraints of the study:

No clear delineation was reported in current research as regards the impact of burnout and PTSD.

The drug abuse as a consequence of job stress especially among emergency drivers.

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