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Article

Mental Health in Emergency Medical Clinicians: Burnout, STS, Sleep Disorders. A Cross-Sectional Descriptive Multicentric Study

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Abstract: Emergency medicine specialists' mental and physical health may be threatened if they experience burnout, sleep disorders, and secondary traumatic stress (STS). We aimed to investigate whether Emergency Medical Services (EMs) professionals' mental and physical health status, depression, and anxiety are associated with burnout, STS, and sleep disorders. We hypothesized that burnout, STS, and the severity of sleep disorders would raise the risk of impaired mental, and physical health, depression, and anxiety in emergency medical clinicians. A cross-sectional multicentric study was conducted. In total,178 EMs specialists completed validated surveys to assess mental health complaints (Mental Health Inventory, MHI-5 screening test), physical health complaints (Ware scale), depression, and anxiety (Depression, Anxiety and Stress Scale-DASS), burnout (Maslach Burnout Inventory-general survey, MBI-GS), sleep disorders (Insomnia Severity Index, ISI), and STS (STS scale). This study aimed to analyze the influence that work-related factors can have on EMs specialists' mental and physical health, depression, and anxiety. Specifically, mental health was predicted by exhaustion (β = 0.16), cynicism (β = 0.21), insomnia severity (β = 0.13), and STS (β = 0.35); physical health was predicted by exhaustion (β = 0.33) and insomnia severity (β = 0.18); depression was predicted by cynicism (β = 0.21) and STS (β = 0.46); and anxiety was predicted by STS (β = 0.63) and inefficacy (β = 0.20). Work-related stress symptoms such as burnout, STS, and sleep disorders were found to predict emergency medicine clinicians' mental and physical health, as well to increase the risk of depression and anxiety. It is of most importance to develop practices to prevent such symptoms and to promote mental health and well-being among the emergency medicine personnel.

Keywords: mental health; burnout; secondary traumatic stress; emergency medicine; sleep disorders

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Introduction

Emergency Medical Services (EMs) are characterized by a high level of work-related stress due to both emotional and physical pressure. The burnout syndrome is defined as a prolonged response to chronic emotional and interpersonal stressors on the job, which involves three components: emotional exhaustion, depersonalization, and decrease in individual accomplishment [1]. Research in this field shows that increased levels of burnout are associated with greater mood disturbance, as well as poorer general health [2]. Furthermore, EMs professionals are indirectly exposed to trauma through their work and may suffer from symptoms of compassion fatigue, isolation, dissociation, anxiety, known as secondary traumatic stress (STS) or vicarious traumatization [3].

In one study, almost 13% of the EMs physicians screened positive for STS with clinical levels of intrusion, arousal, and avoidance symptom clusters, and almost 34% had at least one symptom cluster at clinical levels [4]. Research shows that providing psychosocial services to traumatized populations relative to symptoms of trauma, disrupted cognitive schema, and general psychological distress, such as anxiety and depression has an effect [5].

Exposure to severe and chronic stressors generates stress symptoms, such as burnout and sleep disorders that, in turn, may also predispose EMs professionals to a variety of mental health problems, including depression and anxiety. As one study shows emergency physicians have a higher prevalence of depression and burnout than the general population and any other healthcare specialists [6]. One study showed that sleep disorder risk and mental health problems in firefighters were associated with burnout [7]. Another study investigated the associations between mental health conditions, individual and job characteristics and sleep disturbances among firefighters and reported that psychological distress and psychosomatic disturbances were significantly associated with sleep disorders [8].

Our study aimed to investigate whether EMs professionals' mental and physical health conditions, depression, and anxiety are associated with burnout, STS, and sleep disorders. We hypothesized that the three components of burnout (exhaustion, cynicism, and inefficacy), STS and insomnia severity would raise the risk of deteriorated mental and physical health, as well as depression and anxiety. The current study provides insight into how EMs professionals' burnout, STS, and sleep disorders predict mental and physical health conditions.

Key learning points

What is already known about this subject:

- Emergency physicians experience professional burnout over three times more often than average physicians, according to a national study that compared burnout rates among specialties and between emergency physicians and workers in other fields [9].
- A timely assessment of work-related stress symptoms can contribute to the prevention and treatment of these difficulties, with a positive impact on both the emergency medical professionals and the organization.

What this study adds:

- Particular work-related stress symptoms are associated with mental health complaints.
- Emotional exhaustion due to one's work and screening positive for a sleep disorder, particularly insomnia, increase the risk for physical health problems, such as vague aches and pains, gastrointestinal problems and appetite changes.

- Feeling exhausted and experiencing psychological distress or reaction in response to reminders of work with traumatized patients may predict symptoms of depression and anxiety in EMs professionals.

What impact this may have on practice and policy:

- This type of research is essential in order to establish a positive organizational climate and increase emergency medicine professionals' quality of work life.
- Our results highlight the importance of stress-management training and well-being practices among Romanian emergency medicine specialists.
- The consequences of work-related stress symptoms affect EMs specialists. It is of most importance to take these findings into consideration and implement policies for positive mental health and the well-being of EMs professionals.

Material and Methods

We have surveyed emergency doctors, and medical nurses from two Emergency Departments in Romania, namely the County Emergency Clinical Hospital Pius Brinzeu Timisoara and the County Emergency Clinical Hospital Oradea. The present work is a descriptive, multi-centric, cross-sectional study, aimed to analyze data from the EMs population at a specific point in time, i.e.,-2019; all data were collected from March to July 2019. All gathered information was confidential; the participation was entirely voluntary and written informed consent was obtained from all the participants. This study was approved by the Ethics Committee of the County Emergency Clinical Hospitals. The inclusion criteria concerned the categories of personnel that have direct contact with patients, through the performed medical act, respectively, primary doctors (consultants), specialists, residents (trainees), and emergency medicine nurses. Other categories of staff and auxiliary personnel were excluded from the research. All data were collected online, via a link sent by email. The link that was sent via email requested: demographic and professional characteristics (such as gender, marital status, profession, contractual situation, etc.) and included information on the evaluation scales to be applied: Mental Health Inventory (MHI-5 screening test), Ware scale, Depression, Anxiety and Stress scale (DASS), Maslach Burnout Inventory-general survey (MBI-GS), Insomnia Severity Index (ISI), Secondary Traumatic Stress Scale (STS scale).

The burnout syndrome was evaluated based on the basis of the MBI-GS [10], an instrument designed to assess the three components of the burnout syndrome: emotional exhaustion (EE), depersonalization (DP), and reduced personal accomplishment (PA). It comprises 16 items, which are divided into 3 subscales: exhaustion (5 items, e.g., "I feel emotionally drained by my work"), cynicism (5 items, e.g., "I doubt the significance of my work"), and inefficacy (6 items, e.g., "At work, I think I am inefficient when it comes to solving problems"). Respondents were asked to evaluate the items on a seven-point scale from 0 (never) to 6 (always). The items were answered in terms of the frequency with which the respondent experiences these feelings on a 7-point, fully anchored scale (ranging from 0, "never" to 6, "every day").

The Secondary Traumatic Stress Scale [11] is a list of 17 statements made by persons who have been impacted by their work with traumatized people. The respondent is asked to circle the corresponding number next to the statement, indicating how frequently the statement was true in the past seven days (ranging from 1, "never" to 5, "very often"). The subscales include intrusion (5 items, e.g., "My heart started pounding when I thought about my work with clients."), avoidance (7 items, e.g., "I was less active than usual"), and arousal (5 items, e.g., "I expected something bad to happen").

The DASS is a self-report instrument designed to measure the three related negative emotional states of depression, anxiety, and tension/stress. We used a short version with 14 items that only measures two dimensions, namely, anxiety and depression. The depression scale assesses dysphoria, hopelessness, devaluation of life, self-deprecation, lack of interest/involvement, anhedonia, and inertia (e.g., "I couldn't seem to experience any positive feeling at all"). The anxiety scale assesses autonomic arousal, skeletal muscle effects, situational anxiety, and the subjective experience of anxious affect (e.g., "I was worried about situations in which I might panic and make a fool of myself").

The Insomnia Severity Index is composed of seven items that evaluate: (a) the severity of sleep -onset (initial), (b) sleep maintenance (middle), (c) early morning awakening (terminal) problems, (d) satisfaction with current sleep pattern, (e) interference with daily functioning, (f) noticeability of impairment attributed to the sleep problem, and (g) level of distress caused by the sleep problem. Each of these items is rated on a five-point Likert scale (from '0', "not at all, to '4', "extremely"), and the time interval is 'in the last 2 weeks'. Total scores range from 0 to 28, with high scores indicating greater insomnia severity. Total score categories are: 0–7 (no clinical insomnia), 8–14 (subthreshold insomnia), 15–21 (clinical insomnia), and 22–28 (clinical insomnia, -severe).

Mental Health Complaints were measured with the MHI-5 screening test [12]. This scale comprises five items (e.g., "During the past month, how much of the time have you felt calm and peaceful?") evaluated on a six-point scale (1 = never, 6 = always). The score for each individual therefore ranges between 5 and 30. Items 2 and 4 were recorded. A high score indicated poor mental health.

Physical Health Complaints were assessed with the four- items scale proposed by Ware [13]. Items 2 ("I am just as healthy as the other people I know") and 4 ("My health is excellent") were recorded. Answers were evaluated on a five-point scale (1 = totally disagree, 5 = totally agree). A high score (maximum 10) signified excellent physical health. Physical health complaints are common complaints including vague aches and pains—chronic joint pain, limb pain, back pain, gastrointestinal problems, fatigue, sleep disturbances, and appetite changes.

Statistical analyses were performed using SPSS 20.0. The significance level adopted was $p \leq 0.05$. Frequency and the central tendency parameters mean and standard deviation on scale variables were obtained (Table 1); a normal distribution was expected. Two-tailed correlations between all the variables were calculated. Multiple linear regression was conducted to explain the relationship between the dependent variables (mental health, physical health, depression, and anxiety) and the independent variables (exhaustion, cynicism, inefficacy, insomnia severity, and STS). To better adjust the prediction model, we only used the variables that reached significant associations.

Results

In total, 178 EMs specialists were questioned. The demographic variables characteristics of the participants are summarized in Table 1.

The correlation analysis revealed that the mental health complaints score had significant associations with exhaustion ($r(178) = 0.71$, $p < 0.01$), cynicism ($r(178) = 0.66$, $p < 0.01$), inefficacy ($r(178) = 0.67$, $p < 0.01$), insomnia severity ($r(178) = 0.63$, $p < 0.01$), and STS ($r(178) = 0.74$, $p < 0.01$). The physical health complaints score showed significant association with exhaustion ($r(178) = 0.62$, $p < 0.01$), cynicism ($r(178) = 0.51$, $p < 0.01$), inefficacy ($r(178) = 0.51$, $p < 0.01$) and insomnia severity ($r(178) = 0.54$ $p < 0.01$), and STS ($r(178) = 0.56$, $p < 0.01$). The depression score had significant associations with exhaustion ($r(178) = 0.65$, $p < 0.01$), cynicism ($r(178) = 0.65$, $p < 0.01$), inefficacy ($r(178) = 0.66$,

$p < 0.01$), insomnia severity (r(178) = 0.62, $p < 0.01$), and STS (r(178) = 0.76, $p < 0.01$). The anxiety score had significant associations with exhaustion (r(178) = 0.53, $p < 0.01$), cynicism (r(178) = 0.49, $p < 0.01$), inefficacy (r(178) = 0.55, $p < 0.01$), insomnia severity (r(178) = 0.594, $p < 0.01$), and STS (r(178) = 0.753, $p < 0.01$) (Table 2).

Table 1. Demographic and professional characteristics of Emergency Medical clinicians.

		Frequency	Percents
Gender	Male	56	31.4
	Female	122	68.6
	Total	178	100.0
Marital status	Single	75	42.1
	Married	88	49.4
	Divorced	15	8.4
	Widower	0	0.0
	Total	178	100.0
Profession	Physician	103	57.8
	Nurse	75	42.2
	Total	178	100.0
Academic qualifications	Bachelor	44	24.7
	Higher education	124	69.6
	Master	5	2.8
	PhD	5	2.8
	Total	178	100.0
Number of working hours per week	under 36 h	2	1.1
	36 h	22	12.3
	48 h	121	67.9
	72 h	33	18.5
	Total	178	100.0
Contractual situation	Fixed-term contract	55	30.8
	Effective staff member	120	67.4
	Other	3	1.8
	Total	178	100.0

Table 2. Correlations and Descriptive Statistics.

Variables	Mean	Std. Deviation	1.	2.	3.	4.	5.	6.	7.	8.	9.
1. Exhaustion	13.06	6.41	(0.90)								
2. Cynicism	9.49	5.54	0.71 **	(0.79)							
3. Inefficacy	10.90	5.46	0.75 **	0.82 **	(0.86)						
4. Insomnia severity	17.11	6.24	0.66 **	0.44 **	0.52 **	(0.88)					
5. STS	32.81	11.27	0.70 **	0.59 **	0.63 **	0.73 **	(0.93)				
6. Anxiety	9.95	3.18	0.53 **	0.49 **	0.55 **	0.59 **	0.75 **	(0.87)			
7. Depression	10.44	3.63	0.65 **	0.65 **	0.66 **	0.62 **	0.76 **	0.68 **	(0.89)		
8. Mental health complaints	11.17	4.37	0.71 **	0.66 **	0.67 ***	0.63 **	0.74 **	0.64 **	0.73 **	(0.87)	
9. Physical health	8.51	3.18	0.62 **	0.51 **	0.51 **	0.54 **	0.56 **	0.53 **	0.49 **	0.56 **	(0.73)

N = 178; Internal consistency alphas are displayed in the diagonal. Abbreviations: STS—Secondary Traumatic Stress.

Overall, it can be concluded that significant relationships exist between emergency service professionals' mental and physical health, and burnout dimensions, exhaustion, cynicism, and inefficacy. Mental and physical health complaints, were also significantly associated with insomnia severity and secondary traumatic stress. Finally, we identified significant associations between depression and, secondary traumatic stress and insomnia severity, as well as between anxiety and secondary traumatic stress and insomnia severity.

The results obtained in this study emphasize that EMs' mental and physical health are affected by burnout, insomnia severity, and STS. Furthermore, depression and anxiety are affected by the same work-related symptoms.

After significant associations between the three components of the burnout syndrome, secondary traumatic stress, and insomnia severity with mental and physical health, anxiety, and depression were identified, we analyzed the predictive capacity of the three variables burnout, STS, and insomnia severity on mental and physical health, as well as on anxiety and depression.

The results from the multiple linear regression that was applied to mental health complaints revealed that inefficacy was not a significant predictor (β = 0.07, p = 0.37) in the model. However, four independent variables were significant predictors: exhaustion (β = 0.16, p = 0.04), cynicism (β = 0.21, p = 0.01), insomnia severity (β = 0.13, p = 0.04), and STS (β = 0.35, p = 0.00) (Table 3). Multiple regression analysis showed that the model explained 64.9% of the variance in mental health complaints and the independent variables exhaustion, cynicism, insomnia severity, and STS were significant predictors of emergency medicine specialists' mental health complaints.

Table 3. Multiple linear regression analysis of selected variables.

	Mental Health Complaints			**Physical Health Complaints**			**Depression**			**Anxiety**		
Independent Variables	***B***	***t***	***p***	β	***t***	***p***	β	***t***	***p***	β	***t***	***p***
Exhaustion	0.16	2.03	0.04	0.33	3.18	0.00	−0.00	−0.04	0.96	0.17	−1.36	0.173
Cynicism	0.21	2.56	0.01	0.16	1.5	0.11	0.21	2.51	0.01	−0.00	−0.08	0.932
Insomnia severity	0.13	2.00	0.04	0.18	2.09	0.03	0.10	1.51	0.13	0.10	1.35	0.178
STS	0.35	4.78	0.00	0.13	1.37	0.17	0.46	6.15	0.00	0.63	7.60	0.00
Inefficacy	0.07	0.82	0.37	−0.05	−0.50	0.61	0.14	1.69	0.09	0.20	2.07	0.03
F	66.53			26.91			63.05			45.45		
R	0.81			0.66			0.80			0.75		
R^2	0.65			0.43			0.64			0.56		
Adjusted R^2	0.64			0.42			0.63			0.55		
p	<0.00			<0.00			<0.00			<0.00		

Abbreviations: STS—Secondary Traumatic Stress.

The results from the multiple linear regression applied to physical health complaints revealed that cynicism (β = 0.16, p = 0.11), STS (β = 0.13, p = 0.17), and inefficacy (β = 0.05, p = 0.61) were not significant predictors. Two remaining independent variables were significant predictors: exhaustion (β = 0.33, p = 0.00) and insomnia severity (β = 0.18, p = 0.03) (Table 3). Multiple regression showed that the model explained 42.3% of the variance in physical health complaints, and the independent variables exhaustion and insomnia severity were significant predictors of emergency medicine specialists' physical health complaints.

The results from the multiple linear regression applied to depression revealed that exhaustion (β = 0.00, p = 0.96), insomnia severity (β = 0.10, p = 0.13) and inefficacy (β = 0.14, p = 0.09) were not significant predictors. Two remaining independent variables were significant predictors: cynicism (β = 0.21, p = 0.01) and STS (β = 0.46, p=00) (Table 3). Multiple regression showed that the model explained 63.7% of the variance in depression, and the independent variables cynicism and secondary traumatic stress were significant predictors of emergency medicine clinicians' symptoms of depression.

The results from the multiple linear regression that was applied to anxiety revealed that exhaustion (β = 0.12, p = 0.17), cynicism (β = 0.00, p = 0.93), and insomnia severity (β = 0.10, p = 0.17) were not significant predictors. Two remaining independent variables were significant predictors: STS (β = 0.63, p = 0.00) and inefficacy (β =20, p = 0.03) (Table 3).

Multiple regression showed that the model explained 55.7% of the variance in anxiety, and the independent variables secondary traumatic stress and inefficacy were significant predictors of emergency medicine clinicians' symptoms of anxiety.

Discussion

The present study aimed to analyze the influence that several work-related factors can have on emergency medicine clinicians' mental and physical health, as well as on symptoms of depression and anxiety. Past research showed that work-related stress symptoms might have a negative impact on a healthcare professional's well-being. Our findings confirm that work-related stress plays an essential role in mental health.

The results indicate that among the work-related stress symptoms that are predictors of EMs specialists' mental health complaints, being emotionally exhausted at work, having impersonal feelings about patients, experiencing sleep disorders, and presenting symptoms of secondary traumatic stress, such as intrusion, avoidance, and arousal, play an essential role. These results are in accordance with other studies that revealed the prevalence of work-related stress symptoms across different emergency medicine specialist departments [14].

Regarding the physical health complaints, little is known of the factors that may predict healthcare specialists' physical well-being. Our study emphasizes that feelings of being exhausted by one's work and of distress caused by a sleep problem may predict the physical health status of emergency medicine specialists. Studies indicate that professional stress is associated with inflammatory markers among physicians [15] and with increased risk of cardiovascular diseases [16].

Within the work-related stress variables that best explained possible symptoms of depression in emergency medical workers, cynicism and compassion fatigue play an important role. Also, secondary traumatic stress and inefficacy are significant predictors of EMs clinicians' anxiety. On the other hand, the particular type of distress mainly characterized by experienced with intrusive thoughts and feelings related to working with traumatized patients, as well as by decreased feelings of competency and dissatisfaction, may lead to anxiety disorders in EMs personnel. The literature also indicates that burnout is associated with depression [17] and anxiety [18] in healthcare professionals.

Conclusions

Our results identified a set of work-related stress symptoms that have a significant association with and influence on emergency medicine specialists' mental and physical health as well as experienced symptoms of depression and anxiety.

We suggest that work-related stress symptoms should be an essential area of occupational health studies. Emergency medicine clinicians' mental health and well-being must become a permanent concern for the governments, health systems, and specific EMs. We think that a holistic approach must be considered when different legislative measures regarding emergency medical specialists are taken into consideration. In our opinion, in order to promote mental and physical health among EMs clinicians, researchers must continue to study the various psychosocial work-related factors and symptoms that may influence the well-being of the emergency medical personnel.

Our study is a cross-sectional study and could not assess if there will be a change in the variables over time. Also, it could prove a cause effect relationship between the studied variables. Our research was a multicentric study, but the sample size was too small to assume that our predictive model fits all emergency medicine clinicians' situations. Further research

with a larger sample of participants, such as a nation-wide study should be performed, in order to obtain a complete picture of all the opportunities and challenges that emergency medicine physicians and nurses face in their current work with traumatized patients. It must be considered that this is a heterogenous population and aspect may influence the results.

In conclusion, identifying strategies to prevent and treat these issues is essential to ensure EMs clinicians' well-being, professional satisfaction, and improved work environments.

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Abbreviations

STS	secondary traumatic stress
Ems	Emergency Medicine Services
EE	emotional exhaustion
DP	depersonalization
PA	reduced personal accomplishment

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