

Prevalence and Predictors of Depression, Anxiety and Stress Symptoms in Paramedics at Saudi Red Crescent Authority

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Abstract

Background: Emergency medical professionals often encounter situations when dealing with patients that can affect their mental health. In Saudi Arabia, there is paucity of data regarding the mental health of paramedics involved in prehospital care.

Objectives: To determine the prevalence and predictors of stress, anxiety and depression symptoms among paramedics working at Saudi Red Crescent Authority (SRCA) stations in Riyadh, Saudi Arabia.

Methods: This cross-sectional, questionnaire study included all paramedics working in the prehospital medical services of 21 SRCA stations in Riyadh ($N = 300$) between March and June 2017. Sociodemographic data were collected using a self-reporting questionnaire, and the Arabic version of the Depression Anxiety and Stress Scale-21 was used to identify the states of stress, anxiety and depression. Bivariate analysis using chi-square test and multivariate logistic regression analysis were performed to determine the association between sociodemographic factors and mental health.

Results: In total, 240 emergency medical professionals responded (response rate = 80%). Of these, 30.5% had stress, 40% had anxiety and 26.7% had depression. All cases of stress were of mild-to-moderate level, while 5.1% of the respondents had severe-to-extremely severe anxiety and 1.3% had severe depression; there were no cases of extremely severe depression. Number of mission calls was identified as a predictor for stress and anxiety; intake of medications for noncommunicable diseases as a predictor for stress and depression; hours of sleep/day for anxiety and depression and use of stimulant beverages other than tea, coffee and energy drinks as predictors for anxiety.

Conclusion: This study demonstrates that stress, anxiety and depressive symptoms are relatively common in paramedics working at SRCA stations in Riyadh. The authors suggest that the above-mentioned predictors should be monitored in paramedics and interventions should be made when necessary.

Keywords: Anxiety, depression, emergency medical services professionals, Saudi Red Crescent Authority, stress

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INTRODUCTION

The likeliness of depression and anxiety has been shown to increase in employees working in high-stress

occupations.^[1] Emergency medical professionals, especially those in prehospital care, are exposed to emotional stress every day. Studies have found the prevalence of stress

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among emergency medical services (EMS) professionals to range from about 6% to 80%.^[2-6] Emergency care-related stressors and empathy toward patients have been shown to affect the psychological health of medical professionals and can lead to burnout, anxiety, depression and posttraumatic stress disorder.^[2,7-12] In the United States, the prevalence of depression and anxiety among nationally certified EMS professionals is about 7% and 6%, respectively.^[2] In Saudi Arabia, a study from Riyadh found mild, moderate and severe anxiety disorders in 20.7%, 23.7% and 7.6% of emergency department health-care workers, respectively.^[9]

Reduced psychological health in medical professionals affects their quality of life and can result in poorer performances. Consequently, this can also affect the quality of medical care provided.^[9,13] Therefore, identification of factors associated with stress at work is essential in the management and prevention of psychological disorders. In EMS professionals, involvement in patient care, gender, increased workloads, duration of work, age and sleep durations have previously been identified as risk factors for increased stress, depression and anxiety.^[14-17]

In Saudi Arabia, only few studies have assessed mental health issues among emergency medical professionals.^[9,18] Therefore, this study was conducted to determine the prevalence and factors of depression, anxiety and stress among paramedics in Saudi Red Crescent Authority (SRCA) stations in Riyadh, Saudi Arabia.

METHODS

Study design and setting

This is a cross-sectional, questionnaire study that was carried out at SRCA stations in Riyadh, Kingdom of Saudi Arabia, between March and June 2017. SRCA is a humanitarian society that was established in 1963 and provides EMS in five administrative regions of Saudi Arabia. In 2009, the Society had 447 first-aid centers, run by 5507 staff members, with 1300 ambulances, which are distributed in all hospitals and centers around the country. SRCA has a particular role in providing on-the-spot first aid and uses its vehicles and Saudi Air Ambulance to take emergency cases to the nearest medical facility. SRCA offers medical service of first aid to citizens and foreigners in Saudi Arabia in both ordinary and extraordinary circumstances. SRCA contributes to relief works inside the Kingdom and abroad.

Population and sampling

The target population for this study was all paramedics working in the prehospital medical services of SRCA in Riyadh; there are 21 SRCA stations in Riyadh, where a total

of 300 paramedics were eligible for this study. The authors included all eligible paramedics from all stations so that the sample is representative of SRCA in Riyadh.

Paramedics are often exposed to difficult circumstances, and their duty involves prioritizing care for emergency patients over their personal needs such as sleeping and eating. In addition, they are also likely to feel emotional distress when faced with difficult situations in attending patients. Therefore, being in a demanding occupation makes paramedics candidates for this study's psychological health assessment.

For inclusion in this study, the paramedic should have been certified, working in the field in Riyadh, have >1-year experience in the field and provide informed consent for participation. Those in administrative jobs, trainees not yet certified as paramedics and volunteers were all excluded from this study.

Data collection

The authors developed a questionnaire to elicit information on demographics, such as age, marital status, education level, years of experience and monthly income, as well as lifestyle habits, such as smoking status, medications and intake of stimulant beverages in the past 3 months. For stress, anxiety and depression, the data collection tool in this study is the Arabic version of the Depression Anxiety and Stress Scale-21 (DASS-21).^[19] DASS-21 is a self-reporting, 21-item questionnaire where seven questions each elicit information regarding depression, anxiety and stress subscales. In this tool, a 4-point severity/frequency scale is used for assessing the state of the participants in the three subscales over the past week. Each score is multiplied by 2, and the final scores were assessed against the DASS severity ratings [Table 1]. The Arabic version of the DASS-21 scale has been found to have an acceptable reliability for all three subscales.^[20,21]

Data were collected using a self-administered paper questionnaire distributed by the researchers at each station. Before administration of the questionnaire, the purpose of the study was briefly and clearly described to the paramedic. The participants were informed that they have a right to not participate or withdraw at any time without giving a reason

Table 1: Depression Anxiety and Stress Scale severity ratings

Severity	Depression	Anxiety	Stress
Normal	0-9	0-7	0-14
Mild	10-13	8-9	15-18
Moderate	14-20	10-14	19-25
Severe	21-27	15-19	26-33
Extremely severe	>28	>20	>34

and with no consequences. Each participant provided a verbal informed consent before the questionnaire was administered. The authors were informed that no financial incentives would be provided and that participation was voluntary.

Ethical approvals

This study was approved by the Research Ethics Committee of Prince Sultan Military Medical City (Ref no. 662), Riyadh, on March 9, 2015, and by the Research Ethic Committee of SRCA, Riyadh, on March 10, 2015.

Data analysis

Data analysis was conducted using the Statistical Package for the Social Sciences (IBM SPSS, New York, NY, USA). The data were coded and managed in a robust manner. Frequency and percentage were applied to describe variables. Only responses where all 21 DASS questions had been answered were included in this study. Incomplete data were excluded from the analysis. Bivariate analysis using chi-square test and multivariate logistic regression analysis were performed. $P < 0.05$ was considered statistically significant.

RESULTS

Of the total 300 participants to whom the questionnaire was administered, 240 responded (80%). The participants' demographic data are presented in Table 2. All the participants were male, and almost one-third ($n = 85$) were from the east of Riyadh station. The majority of the participants were aged 25–34 years (60.8%), had a paramedical diploma (81.2%), experience of <5 years (58.8%) and a monthly income of Saudi Arabian Riyal 8000-15,000 (76.3%).

Table 3 summarizes the lifestyle habits of the participants. In terms of smoking, 117 (49%) were smokers and 18 (7.5%) were ex-smokers. Regarding medication for noncommunicable diseases (NCDs) in the past 3 months, 18 (7.5%) patients reported intake of prescribed medication and 8 (3.3%) reported intake of nonprescribed medications. Coffee intake was reported by 173 (72.4%) participants, tea intake by 177 (74.1%), energy drinks by 85 (35.6%) and other stimulant beverages by 17 (7.1%). Most respondents had an average daily sleep duration of 6–8 h (154; 64.2%), while 57 (23.8%) and 26 (10.8%) reported sleep durations of <6 h and >8 h, respectively.

In terms of DASS-21 findings, mild-to-moderate stress was reported in 73 (30.5%) participants, with no cases of severe or extremely severe stress being observed. Ninety-six (40%) respondents were found to have anxiety: 84 (34.9%) had

Table 2: Demographic characteristics of the participants (n = 240)

Variable	n (%)
SRCA stations in Riyadh	
East	85 (35.4)
West	24 (10.0)
North	62 (25.8)
South	54 (22.5)
Center	8 (3.3)
Air ambulance	7 (3.0)
Age	
<25	60 (25.0)
25-34	146 (60.8)
35-44	23 (9.6)
45-54	10 (4.2)
≥55	1 (0.4)
Marital status	
Single	111 (46.3)
Married	121 (50.2)
Divorced	5 (2.1)
Widowed	2 (0.8)
Unknown	1 (0.4)
Education	
Physician	16 (6.7)
Diploma paramedic	195 (81.2)
Bachelor paramedic	29 (12.1)
Position	
Ground ambulance	224 (93.3)
Air ambulance	12 (5.0)
Unknown	4 (1.7)
Years of experience	
<5	141 (58.8)
5-9	58 (24.1)
10-14	28 (11.7)
15-19	5 (2.1)
≥20	8 (3.3)
Monthly income*	
<8000	20 (8.3)
8000-15,000	183 (76.3)
≥15,000	37 (15.4)
Place of residence	
Riyadh	188 (78.3)
Outside of Riyadh	40 (16.7)
Unknown	12 (5.0)

*In Saudi Arabian Riyal. SRCA – Saudi Red Crescent Authority

mild-to-moderate anxiety, 9 (3.8%) had severe anxiety and 3 (1.3%) had extremely severe anxiety. Depression was reported in 64 (26.7%) respondents, of which 61 (25.4%) had mild-to-moderate depression and 3 (1.3) had severe depression [Table 4].

Participants' age, marital status, educational level, position, years of experience, monthly income, place of residence, smoking status and coffee tea and energy drinks' intake were not significantly associated with stress, anxiety or depression. Table 5 presents sociodemographic factors that were found to have significant association with stress, anxiety or depression. Stress was significantly higher among those who attended higher number of mission calls ($P = 0.009$), took medications for NCDs ($P = 0.030$) and had an intake of stimulant beverages other than coffee, tea and energy drinks ($P < 0.001$). Anxiety was

Table 3: Lifestyle habits of the participants (n = 240)

Variable	n (%)
Smoking status	
Smoker	117 (48.8)
Nonsmoker	103 (42.9)
Ex-smoker	18 (7.5)
Unknown	2 (0.8)
Medications for noncommunicable diseases	
Yes, prescription medication	18 (7.5)
Yes, nonprescription medication	8 (3.3)
No noncommunicable diseases	191 (79.6)
Unknown	23 (9.6)
Coffee intake	
Yes	174 (72.5)
No	65 (27.1)
Unknown	1 (0.4)
Tea intake	
Yes	177 (73.8)
No	62 (25.8)
Unknown	1 (0.4)
Energy drinks' intake	
Yes	85 (35.5)
No	153 (63.7)
Unknown	2 (0.8)
Other stimulant beverages	
Yes	17 (7.1)
No	223 (92.9)
Hours of sleep	
<6	57 (23.8)
6-8	154 (64.2)
>8	26 (10.8)
Unknown	3 (1.2)

Table 4: Stress, anxiety and depression assessment of Saudi Red Crescent Authority paramedics (n = 240)

Psychological aspect	n (%)
Stress	
Normal	167 (69.5)
Mild	63 (26.3)
Moderate	10 (4.2)
Severe	0 (0.0)
Extremely severe	0 (0.0)
Anxiety	
Normal	144 (60.0)
Mild	50 (20.7)
Moderate	34 (14.2)
Severe	9 (3.8)
Extremely severe	3 (1.3)
Depression	
Normal	176 (73.3)
Mild	35 (14.6)
Moderate	26 (10.8)
Severe	3 (1.3)
Extremely severe	0 (0.0)

significantly higher in respondents who reported lower number of mission calls ($P = 0.005$) and slept >8 h/day ($P = 0.031$). Depression was reported to be significantly associated with taking medications for NCDs ($P = 0.050$) and sleeping >8 h/day ($P = 0.007$).

In terms of stress, the multivariate logistic regression analysis revealed that respondents attending higher number of mission calls were at almost double the risk of

stress compared to those with lower number of mission calls (adjusted odds ratio [AOR] = 2.18; 95 confidence interval [CI] = 1.02–4.64). Furthermore, compared with respondents without medication history, those on medications for NCDs were at almost fourfold higher risk for stress (AOR = 4.50; 95 CI = 1.22–16.68). In addition, respondents who did not consume “other stimulant beverages” were found to be at a significantly lower risk for stress (AOR = 0.15; 95 CI = 0.04–0.54). In terms of anxiety, this study found that those who slept for 6–8 h/day were at a significantly lower risk of anxiety compared with those who slept <6 h/day (AOR = 0.54; 95 CI = 0.28–0.98). In terms of depression, respondents on medications for NCDs in the last 3 months were at almost fourfold higher risk for depression than those without a medication history (AOR = 4.43; 95 CI = 1.24–15.79), while those with 6–8 h of sleep/day were at almost 60% lower risk for depression than those with <6 h sleep/day (AOR = 0.42; 95 CI = 0.20–0.89) [Table 6].

DISCUSSION

Emergency medical professionals such as paramedics often encounter stressful situations while dealing with patients, which predisposes them to psychiatric disturbances.^[9] However, there was paucity of data regarding the stress, anxiety and depression levels in these professionals from Saudi Arabia. Accordingly, the current study was conducted, and it found that in paramedics working at SRCA stations across Riyadh, about 30.5% of the respondents had stress, 40% had anxiety and 26.7% had depression. Importantly, all cases of stress and most anxiety and depression cases were mild to moderate; only 1.3% of the respondents had severe depression and 5.1% had severe to extremely severe anxiety.

The findings of the current study are similar to those from a recent study that included health-care workers of emergency departments in Riyadh and found mild-to-moderate levels of anxiety in 44.4% of the respondents and severe anxiety in 7.6% of the respondents. In that study, EMS workers were reported to have higher anxiety scores compared with those of physicians and nurses.^[9] However, in a study on certified EMS professionals in North California, United States, the prevalence of depression (6.8%), anxiety (6%) and stress (5.9%) was much lower than that in the current study.^[2] Specifically, the prevalence of stress items of professionals has been found to drastically range from 7% to 81%;^[3-6] the rate of stress reported in the present study would be considered modest. The differences in findings between studies could likely be because of geographical differences, policies in place to deal with these conditions and different measurement tools used.

Table 5: Significant factors associated with stress, anxiety and depression among the participants

Variables	Stress		P
	No (n = 167)	Yes (n = 73)	
Number of mission calls/day (n = 237)			
≤4 (n = 66)	54 (81.8)	12 (18.2)	0.009
>4 (n = 171)	110 (64.3)	61 (35.7)	
Medication (n = 217)			
No medication (n = 191)	140 (73.3)	51 (26.7)	0.030
Medication for chronic NCDs (n = 15)	11 (73.3)	4 (26.7)	
Medication for nonchronic NCDs (n = 11)	4 (36.4)	7 (63.6)	
Other stimulant beverages (n = 240)			
Yes (n = 17)	5 (29.4)	12 (70.6)	<0.001
No (n = 223)	162 (72.6)	61 (27.4)	
Variables	Anxiety		P
	No (n = 144)	Yes (n = 96)	
Number of mission calls/day (n = 237)			
≤4 (n = 66)	30 (45.5)	36 (54.5)	0.005
>4 (n = 171)	112 (65.5)	59 (34.5)	
Sleep hours/day (n = 237)			
<6 (n = 57)	32 (56.1)	25 (43.9)	0.031
6-8 (n = 154)	100 (64.9)	54 (35.1)	
>8 (n = 26)	10 (38.5)	16 (61.5)	
Variables	Depression		P
	No (n = 176)	Yes (n = 64)	
Medication (n = 217)			
No medication (n = 191)	143 (74.9)	48 (25.1)	0.050
Medication for chronic NCDs (n = 15)	13 (86.7)	2 (13.3)	
Medication for nonchronic NCDs (n = 11)	5 (45.5)	6 (54.5)	
Sleep hours/day (n = 237)			
<6 (n = 57)	39 (68.4)	18 (31.6)	0.007
6-8 (n = 154)	121 (78.6)	33 (21.4)	
>8 (n = 26)	13 (50.0)	13 (50.0)	

NCDs – Noncommunicable diseases

In this study, anxiety, stress and depressive symptoms were associated with risk factors such as number of mission calls, history of medications for NCDs, taking “other stimulant drinks” or getting less hours of sleep. Rajabi *et al.*^[16] found that factors relating to patient care were one of the most common reasons of occupational stress in prehospital emergency staff and nurses. This could explain the number of mission calls being significantly associated with stress, as this would result in higher exposure to patients in different circumstances. Cash *et al.*^[17] reported that in EMS professionals, factors associated with work stress and incivility were female gender and increasing years of work. In the current study, all respondents were male, and thus gender-based analysis was not possible; nonetheless, increasing years of work was not found to be associated with increased stress levels.

Previous studies have shown that EMS staff are well aware about stressors and health hazards, but are often not mindful of the factors that contribute to their own general and mental health.^[21] Various coping methods

have been identified that can improve mental health; however, predictors of stress, anxiety and depression must be identified before interventional methods can be utilized.^[22,23] For example, workload may not be a drastically modifiable variable; however, paramedics in Saudi Arabia attending higher number of mission calls can be closely monitored for stress.

Inadequate sleep has been found to affect the quality of life, energy level, motivation and emotions.^[24,25] In fact, in a meta-analysis, insomnia has been found to significantly increase the risk of depression and anxiety.^[26] Our study results are in line with these findings. In terms of beverage use, there is discrepancy in the literature regarding the association between intake of stimulant beverages such as coffee, tea and energy drinks and mental health in the general population.^[27] Some studies on general populations have observed positive effects of these stimulant beverage consumption on mood and well-being,^[28-31] whereas others have reported negative effects on mental health and well-being.^[32,33] In contrast, some studies have also observed no impacts on mood and stress.^[34,35] In the present study, coffee, tea and energy drink consumption was not found to be associated with stress in paramedics, but consuming “other stimulant beverages” such as soft drinks was associated with stress, even after controlling for confounding effect in the multivariate analysis.

The present study revealed that employees on medications for NCDs were at higher risk for both stress and depression. These results are unsurprising given that NCDs such as diabetes and coronary artery diseases are associated with stress and represent a major health crisis in the 21st century.^[36] According to the Centers for Disease Control and Prevention,^[37] NCDs are often preceded by stress-related metabolic syndrome (truncal obesity, hypertension, high cholesterol and reduced responsiveness to insulin). In addition, NCDs can result in severe consequences with coexistence of depression.^[38] Therefore, the authors recommend that paramedics on medications for NCDs should be closely monitored to avoid spiraling circumstances.

It should be noted that the generalizability of this finding is limited to on-field emergency medical professionals of SRCA, Riyadh, as other health-care professions were not included. A limitation of this study is that due to the cross-sectional design, a temporal relationship between risk factors and the outcome could not be assessed. In addition, the sample of this study is very specific; this limits its direct comparisons with other studies and also its consequent cumulative effect. Despite those limitations, the study could have a public health importance in exploring this important

Table 6: Predictors for stress, depression and anxiety among Saudi Red Crescent Authority paramedics: Results of multivariate logistic regression analysis

Variables	B	SE	AOR	95% CI	P
Stress					
Number of mission calls/day			1.0	-	-
≤4 (n = 62) ^a					
>4 (n = 154)	0.777	0.387	2.18	1.02-4.64	0.045
Medication (n = 217)			1.0	-	-
No medication (n = 191) ^a					
Medication for chronic NCDs (n = 15)	-0.515	0.680	0.60	0.16-2.27	0.449
Medication for nonchronic NCDs (n = 11)	1.505	0.668	4.50	1.22-16.68	0.024
Other stimulant beverages			1.0	-	-
Yes (n = 13) ^a					
No (n = 203)	-1.902	0.653	0.15	0.04-0.54	0.004
Anxiety					
Sleep hours/day			1.0	-	-
<6 (n = 57) ^a					
6-8 (n = 151)	-0.618	0.335	0.54	0.28-0.98	0.045
>8 (n = 26)	0.523	0.500	1.69	0.63-4.50	0.296
Depression					
Medication (n = 217)			1.0	-	-
No medication (n = 191)					
Medication for chronic NCDs (n = 15)	-0.857	0.797	0.42	0.09-2.02	0.282
Medication for nonchronic NCDs (n = 11)	1.489	0.648	4.43	1.24-15.79	0.022
Sleep hours/day			1.0	-	-
<6 (n = 51)					
6-8 (n = 140)	-0.858	0.378	0.42	0.20-0.89	0.023
>8 (n = 24)	0.401	0.517	1.49	0.54-4.11	0.438

^aReference category. AOR – Adjusted odds ratio; CI – Confidence interval; SE – Standard error; NCDs – Noncommunicable diseases

issue in Saudi Arabia, which also can impact the quality of care delivered to emergency patients.

CONCLUSION

This study demonstrates that stress, anxiety and depression are relatively common among paramedics working in SRCA, Riyadh, but are mostly of mild-to-moderate level. Further, these symptoms were found to be associated with number of mission calls, medication for NCDs, hours of sleep and intake of stimulant beverages other than tea, coffee and energy drinks. The authors recommend that future studies should prospectively assess EMS professionals to determine work-related factors associated with stress, anxiety and depression.

Ethical considerations

This study was approved by the Research Ethics Committee of Prince Sultan Military Medical City (Ref no. 662), Riyadh, on March 9, 2015, and by the Research Ethic Committee of SRCA, Riyadh, on March 10, 2015. All the participants provided a verbal informed consent for participation in this study. This study was conducted in accordance with the ethical standards given in the Declaration of Helsinki, as revised in 2013.

Peer review

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Conflicts of interest

There are no conflicts of interest.

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