


ORIGINAL ARTICLE

The prevalence of post-traumatic stress disorder (PTSD) among emergency medical services personnel in Riyadh, Saudi Arabia

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ABSTRACT

Background: Emergency medical services personnel are not aware of the significance and the prevalence of post-traumatic stress disorder (PTSD) among them and its effect on their mental well-being and the quality of patient care.

Objective: The current study aimed to assess the prevalence of PTSD and its associated factors among emergency medical services personnel in Riyadh, Saudi Arabia.

Methods: A descriptive cross-sectional study was conducted including all accessible emergency medical services personnel working at five hospitals in Riyadh during the period from November to December 2022. Data were collected using the three-phase method including identification of eligible care providers, approaching using an interview-based questionnaire, and recruitment of the questionnaires that were administered to all pre-hospital care providers.

Results: A total of 138 emergency personnel were included. A total of 74 (53.6%) were emergency specialists, 12 (8.7%) were emergency technicians, 39 (28.3%) were interns or physicians, and 13 (9.4%) were nurses or paramedics. The most endorsed symptoms included loss of interest in activities that the participants used to enjoy (45.7%), followed by feeling very upset when something reminded them of the stressful experience (44.2%), and trouble falling or staying asleep. A total of 42 (30.4%) participants experienced PTSD (95% CI: 23.1%-38.2%).

Conclusion:

The current study revealed that nearly one out of each three emergency personnel experienced symptoms coping with PTSD. The higher rate was estimated among old age and participants with higher experience years. Avoiding memories and sleep disturbance were the most reported symptoms.

Keywords: Post-traumatic stress, psychological disorders, emergency staff, prevalence, determinants.

Introduction

Emergency medical services (EMSs) are a cornerstone part of the healthcare system. The primary role of EMS is to deliver pre-hospital medical care, transport and manage injured, severely ill, or disability cases [1]. EMS has variant planes of care recommended by the need and the way of transportation.

Generally, healthcare providers are challenged by stress on a daily basis because of facing trauma, acute medical illness, disabilities, or death [2]. However, the primary role of EMS working in hospitals is not too different from those who work in pre-hospital agencies. They are also

providing emergency (ER) treatment for injured, assists in providing medical care and procedures for severely

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ill patients and dealing with patients with disabilities. Also, they are responsible for inter-facility and intra-facility patient transfer with continuous observation and management during transfer.

The experienced stress among ER healthcare providers might affect the quality of provided care [3]. These emergencies could have a significant psychological effect on EMS personnel making them at a higher risk for mental disorders including post-traumatic stress disorder (PTSD). However, most of EMS personnel did not know the signs and symptoms of PTSD and did not have the measures to handle work-related stress and PTSD [4-6].

PTSD is a psychological disorder mostly experienced in response to facing accidents and events that go with fear, frustration, and fright [7-9]. The chief symptoms of PTSD include being disturbed by annoying images and accidents besides behavioral avoidance of the situations that remind a person of those events. This disorder impairs the normal occupational functioning of the affected person [10,11].

ER care-associated stressors and sympathy for patients have significantly affected medical professionals' psychological health with high burnout rates, anxiety, depression, and PTSD [12-15]. Thus, the current study aimed to estimate the prevalence of PTSD among EMS personnel in Riyadh, Saudi Arabia, and its associated factors.

Methods

A descriptive cross-sectional study was conducted including all accessible EMS personnel working at five hospitals in Riyadh during the period from November to December 2022. A total of 138 eligible participants were included.

Data were collected using pre-structured questionnaire to minimize error and avoid bias. Data were collected using three-phase method. First was the identification of all pre-hospital care providers (physicians, paramedics, and emergency medical technicians (EMT)) in the EMS station during their shifts. Second, an interview-based questionnaire was used and the interview was conducted by three interviewers, training was done in multiple sessions which was followed by a piloting stage and final evaluation and recommendation. Third, recruitment of the questionnaire was administered to all pre-hospital care providers in Riyadh, Saudi Arabia.

A pilot study including 15 participants was conducted to assess questionnaire validity and reliability where α -Cronbach's was estimated to be 0.71.

The data were collected, reviewed, and then fed to Statistical Package for Social Sciences version 21 (SPSS: An IBM Company). All statistical methods used were two-tailed with an alpha level of 0.05 considering significance if p value less than or equal to 0.05.

As for PTSD, the participant was considered to experience the symptom if they rated the symptom severity moderate or above reference to the scale manual. PTSD was detected when the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5)

symptom severity scores were obtained by summing the scores for the 20 items that ranged from 0 to 80.

Initial research suggested that a PCL-5 cutoff score from 31 to 33, which is indicative of probable PTSD across samples where cut-off point 32 was used. Descriptive analysis was done by prescribing frequency distribution and percentage for study variables including participants' bio-demographic data, work hours, specialty, and experience years. DSM-5 symptom severity scores among EMS personnel were also tabulated while PTSD was graphed. Cross tabulation for showing factors associated with experiencing PTSD was used based on the Pearson chi-square test for significance and exact probability test if there were small frequency distributions.

Results

A total of 138 ER personnel were included. A total of 74 (53.6%) were ER specialists, 12 (8.7%) were ER technicians, 39 (28.3%) were interns or physicians, and 13 (9.4%) were nurses or paramedics. Participants' ages ranged from 20 to 60 years with mean age of 25.1 ± 15.6 years. A total of 91 (65.9%) were females and 130 (94.2%) were Saudi. As for work hours, 51 (37%) work for 40 hours or less per week, 74 (53.6%) work for 41-50 hours weekly while only 3 (2.2%) work for 61-70 hours weekly. Considering experience years, 99 (71.7%) had experience for less than 5 years, 22 (15.9%) had experience for 5-10 years, and 17 (12.3%) had experience of more than 10 years (Table 1).

The most endorsed symptoms included loss of interest in activities that you used to enjoy (45.7%), followed by feeling very upset when something reminded them of the stressful experience (44.2%), trouble falling or staying asleep (44.2%), and feeling distant or cut off from other people (39.9%). The least endorsed symptoms included irritable behavior, angry outbursts, or acting aggressively

Table 1. Personal data of EMS personnel in Riyadh hospitals, Saudi Arabia.

Personal data	N	%
Age in years	104	75.4
20-30	31	22.5
30-40	3	2.2
>40		
Gender	91	65.9
Male	47	34.1
Female		
Nationality	130	94.2
Saudi	8	5.8
Non-Saudi		
Specialty	74	53.6
EMS-specialist	12	8.7
EMT	39	28.3
Intern student/physician	13	9.4
Others		
Work hours/week	51	37.0
40 or less	74	53.6
41-50	10	7.2
51-60	3	2.2
61-70		
Experience years	99	71.7
<5 years	22	15.9
5-10 years	17	12.3
>10 years		

Table 2. DSM-5 symptom severity scores among EMS personnel in Riyadh hospitals, Saudi Arabia.

Symptoms	No symptom		Symptom endorsed	
	No	%	No	%
Repeated, disturbing, and unwanted memories of the stressful experience?	86	62.3	52	37.7
Repeated, disturbing dreams of the stressful experience?	106	76.8	32	23.2
Suddenly feeling or acting as if the stressful experience were actually happening again	89	64.5	49	35.5
Feeling very upset when something reminded you of the stressful experience?	77	55.8	61	44.2
Having strong physical reactions when something reminded you of the stressful experience	100	72.5	38	27.5
Avoiding memories, thoughts, or feelings related to the stressful experience?	85	61.6	53	38.4
Avoiding external reminders of the stressful experience	86	62.3	52	37.7
Trouble remembering important parts of the stressful experience?	96	69.6	42	30.4
Having strong negative beliefs about yourself, other people, or the world?	96	69.6	42	30.4
Blaming yourself or someone else for the stressful experience or what happened after it?	94	68.1	44	31.9
Having strong negative feelings such as fear, horror, anger, guilt, or shame?	92	66.7	46	33.3
Loss of interest in activities that you used to enjoy?	75	54.3	63	45.7
Feeling distant or cut off from other people?	83	60.1	55	39.9
Trouble experiencing positive feelings	85	61.6	53	38.4
Irritable behavior, angry outbursts, or acting aggressively?	111	80.4	27	19.6
Taking too many risks or doing things that could cause you harm?	101	73.2	37	26.8
Being "super alert" or watchful or on guard?	90	65.2	48	34.8
Feeling jumpy or easily startled?	92	66.7	46	33.3
Having difficulty concentrating?	88	63.8	50	36.2
Trouble falling or staying asleep?	77	55.8	61	44.2

Endorsed symptoms mean the participant had a score of moderate or higher.

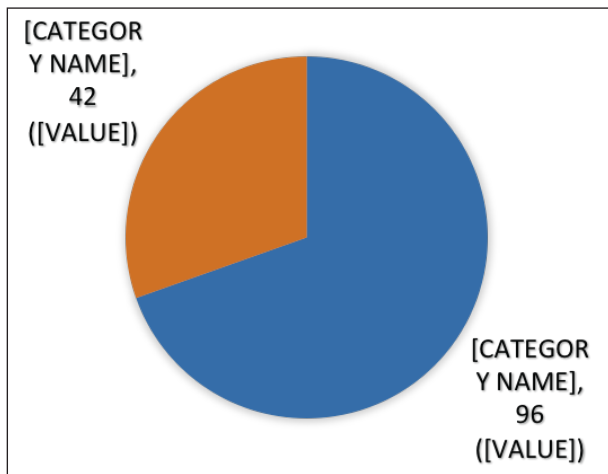


Figure 1. Overall prevalence of PTSD among EMS personnel in Riyadh hospitals, Saudi Arabia.

(19.6%), followed by repeated, disturbing dreams of the stressful experience (23.2%) (Table 2).

A total of 42 (30.4%) study participants experienced PTSD (95% CI: 23.1%-38.2%) (Figure 1).

A total of 48.4% of participants aged 30-40 years experienced PTSD in ER room versus 25% of others aged 20-30 years with recorded statistical significance ($p = 0.045$). Also, PTSD was detected among 52.9% of those with experience exceeding 10 years in comparison to 24.2% of others with experience less than 5 years ($p = 0.030$). Other factors including gender, specialty,

and work hours were insignificantly associated with experiencing PTSD (Table 3).

Discussion

Many studies in different regions have shown and assessed the job-related psychological effect on medical staff [16-18]. To comprehend the mechanism that health emergency impacts the mental health of the population, stressors could be categorized into three levels including macro, meso, and micro. The macro part links to socio-political and cultural factors, the meso level to organizational factors and the accessibility of resources, and lastly, the micro level denotes to interpersonal relations and socio-psychological factors [19].

The current study aimed to assess the prevalence of PTSD among EMS personnel in Riyadh, Saudi Arabia, and its associated factors. The study showed that nearly one-third of the ER services staff experienced PTSD. The most reported symptoms included loss of interest in activities that the participants used to enjoy, feeling very upset when something reminded them of the stressful experience, trouble falling or staying asleep, feeling distant or cut off from other people, and avoiding memories, thoughts, or feelings related to the stressful experience. The least experienced symptoms were irritable behavior, angry outbursts, or acting aggressively with repeated, disturbing dreams of the stressful experience. It is clear that most symptoms related to their memories regarding stressors with physical drawbacks and the least effect was on their behavior and reaction.

Table 3. Factors associated with experiencing PTSD among EMS personnel in Riyadh hospitals.

Factors	PTSD				p-value
	Normal		PTSD		
	No	%	No	%	
Age in years					
20-30	78	75.0	26	25.0	0.045 ^s
30-40	16	51.6	15	48.4	
>40	2	66.7	1	33.3	
Gender					
Male	63	69.2	28	30.8	0.905
Female	33	70.2	14	29.8	
Nationality					
Saudi	89	68.5	41	31.5	0.256 ^s
Non-Saudi	7	87.5	1	12.5	
Specialty					
EMS-Specialist	51	68.9	23	31.1	0.985 ^s
EMT	8	66.7	4	33.3	
Intern student/physician	28	71.8	11	28.2	
Others	9	69.2	4	30.8	
Work hours/week					
40 or less	34	66.7	17	33.3	0.948
41-50	53	71.6	21	28.4	
51-60	7	70.0	3	30.0	
61-70	2	66.7	1	33.3	
Experience years					
<5 years	75	75.8	24	24.2	0.030 [*]
5-10 years	13	59.1	9	40.9	
>10 years	8	47.1	9	52.9	

P: Pearson χ^2 test.

§: Exact probability test.

* $p < 0.05$ (significant).

Similar findings were reported by Lavoie et al. [20] who estimated that at the post-traumatic stage, ER nurses showed symptoms of restoration, stimulus avoidance, dulling of general responsiveness, and hyper arousal. Lower prevalence was estimated by Alaqeel et al. [21] as 26.9% of ER staff had positive screening for PTSD. EMTs had a higher prevalence than paramedics. Another recent study estimated that 16% of ER physicians had PTSD who were victims of a previous trauma or abuse during ER care [22].

Also, Andersen et al. [23] study conducted in Sweden among paramedics in medical rescue teams showed that PTSD symptoms, depending on the instrument used, ranged from 12% to 20%. Moreover, Clohessy et al. [24] a study conducted among paramedics in the United Kingdom has shown that 21% of paramedics have met the criteria for PTSD.

According to Jonsson et al. [25] study a higher percentage (62%) of paramedics employed in ER teams experienced a traumatic event during their work which was most often associated with children's casualties. During COVID-19, healthcare workers experienced increased stress mainly ER care staff who were the first caregiver for the suspected cases [26]. This made it a higher risk for developing PTSD.

A study in Spain revealed that 36% of participants had psychological distress, 30.9% of ER medical workers potentially had PTSD, and 60.9% experienced insomnia. The number of staff showing psychological distress, possible PTSD, or insomnia increased significantly during the early phases of the pandemic [27]. Another study revealed that 22.3% of ER staff during the COVID-19 pandemic had symptoms of

stress matching with PTSD (PCL score ≥ 33). Higher PCL-5 scores were associated with age younger than 50 years and less 10 years in practice [28] in contrast to the current study finding where a higher rate of PTSD was more reported among old aged participants with experience for more than 10 years. There are many other studies which related the stress exposure among ER staff was more associated with psychological distress [29,30].

Conclusion

The current study revealed that nearly one out of every three ER personnel experienced symptoms coping with PTSD. A higher rate was estimated among old age and participants with higher experience years (who were more exposed to traumatic bad experiences with long work life). Avoiding memories and sleep disturbance were the most reported symptoms. Continuous psychological assessment and psychological support for staff providing ER services are highly recommended. Also, promoting stress-reducing activities like creating a positive work culture, practicing healthy habits at work, and streamlining stressful tasks would ease the strain and make work more enjoyable, which overall, enhances patient care.

List of Abbreviations

DSM-5	Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition
EMS	Emergency medical services
EMT	Emergency medical technician
ER	Emergency
PTSD	Posttraumatic stress disorder

Conflict of interests

The authors declare that there is no conflict of interest regarding the publication of this article.

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Ethical approval

Ethical approval was granted by Institutional Review Board letter number 21-451E dated: October 3, 2022.

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References

1. Kobusingye OC, Hyder AA, Bishai D, Joshipura M, Hicks ER, Mock C. Emergency medical services. Disease control priorities in developing countries. 2nd ed. Washington, DC: The International Bank for Reconstruction and Development/The World Bank; 2006.
2. Jarvis S, Salottolo K, Berg GM, Carrick M, Caiafa R, Hamilton D, et al. Examining emergency medical services' prehospital transport times for trauma patients during COVID-19. *Am J Emerg Med.* 2021;44:33–7. <https://doi.org/10.1016/j.ajem.2021.01.091>
3. Naudé JL, Rothmann S. Occupational stress of emergency workers in Gauteng. *SA J Ind Psychol.* 2003;29(4):92–100. <https://doi.org/10.4102/sajip.v29i4.126>
4. Naudé JL, Rothmann S. Work-related well-being of emergency workers in Gauteng. *South Afr J Psychol.* 2006;36(1):63–81. <https://doi.org/10.1177/008124630603600105>
5. McCammon S, Durham TW, Allison EJ, Williamson JE. Emergency workers' cognitive appraisal and coping with traumatic events. *J Trauma Stress.* 1988;1(3):353–72. <https://doi.org/10.1002/jts.2490010307>
6. Choi MY. Mental and physical factors influencing wellbeing among south Korean emergency workers. *Int J Environ Res Public Health.* 2021;18(1):70. <https://doi.org/10.3390/ijerph18010070>
7. Mealer M, Jones J, Meek P. Factors affecting resilience and development of posttraumatic stress disorder in critical care nurses. *Am J Crit Care.* 2017;26(3):184–92. <https://doi.org/10.4037/ajcc2017798>
8. Zerach G, Shalev TB. The relations between violence exposure, posttraumatic stress symptoms, secondary traumatization, vicarious post traumatic growth and illness attribution among psychiatric nurses. *Arch Psychiat Nurs.* 2015;29(3):135–42. <https://doi.org/10.1016/j.apnu.2015.01.002>
9. Jayatunge RM, Pokorski M. Post-traumatic stress disorder: a review of therapeutic role of meditation interventions. *Adv Exp Med Biol.* 2019;1113:53–9. https://doi.org/10.1007/5584_2018_167
10. Thibaut F. Anxiety disorders: a review of current literature. *Dialogues Clin Neurosci.* 2017;19(2):87. <https://doi.org/10.31887/DCNS.2017.19.2/fthibaut>
11. Charney ME, Hellberg SN, Bui E, Simon NM. Evidenced-based treatment of posttraumatic stress disorder: an updated review of validated psychotherapeutic and pharmacological approaches. *Harv Rev Psychiatry.* 2018;26(3):99–115. <https://doi.org/10.1097/HRP.000000000000186>
12. Mishra S, Goebert D, Char E, Dukes P, Ahmed I. Trauma exposure and symptoms of post-traumatic stress disorder in emergency medical services personnel in Hawaii. *Emerg Med J.* 2010;27(9):708–11. <https://doi.org/10.1136/emj.2009.080622>
13. Wilson W, Raj JP, Narayan G, Ghiya M, Murty S, Joseph B. Quantifying burnout among emergency medicine professionals. *J Emerg, Trauma Shock.* 2017;10:199–204. https://doi.org/10.4103/JETS.JETS_36_17
14. Alharthy N, Alrajeh OA, Almutairi M, Alhajri A. Assessment of anxiety level of emergency health-care workers by generalized anxiety disorder-7 tool. *Int J Appl Basic Med Res.* 2017;7:150–4. <https://doi.org/10.4103/2229-516X.212963>
15. Yahaya SN, Wahab SF, Yusoff MS, Yasin MA, Rahman MA. Prevalence and associated factors of stress, anxiety and depression among emergency medical officers in Malaysian hospitals. *World J Emerg Med.* 2018;9:178–86. <https://doi.org/10.5847/wjem.j.1920-8642.2018.03.003>
16. Wang W, Song W, Xia Z, He Y, Tang L, Hou J, et al. Sleep disturbance and psychological profiles of medical staff and non-medical staff during the early outbreak of COVID-19 in Hubei Province, China. *Front Psychiatry.* 2020;11:733. <https://doi.org/10.3389/fpsy.2020.00733>
17. Lin CY, Peng YC, Wu YH, Chang J, Chan CH, Yang DY. The psychological effect of severe acute respiratory syndrome on emergency department staff. *Emerg Med J.* 2007;24(1):12–7. <https://doi.org/10.1136/emj.2006.035089>
18. Molassiotis A, Van den Akker OB, Boughton BJ. Psychological stress in nursing and medical staff on bone marrow transplant units. *Bone Marrow Transplant.* 1995;15(3):449–54.
19. Brugger M, Hengalova R, Stefan J. COVID-19 and the perceived stressors of Austrian long-term care workers (Doctoral dissertation, Doctoral dissertation). University of Vienna. Available from: <https://www.gpa.at/content/dam/gpa/downloads/kollektivvertrag/gesundheit,soziales,kirchen/sw%C3%B6/2021/COVID-19%20and%20the%20perceived%20Stressors%20of%20Austrian%20Long-term%20Care%20workers.Pdf>
20. Lavoie S, Talbot LR, Mathieu L. Post-traumatic stress disorder symptoms among emergency nurses: their perspective and a 'tailor-made'solution. *J Adv Nurs.* 2011;67(7):1514–22. <https://doi.org/10.1111/j.1365-2648.2010.05584.x>
21. Alaqaee MK, Algerian NA, AlNahdi MA, Almaini RY. Post-traumatic stress disorder among emergency medical services personnel: a cross-sectional study. *Asian J Med Sci.* 2019;10(4):28–31. <https://doi.org/10.3126/ajms.v10i4.23990>
22. Mills LD, Mills TJ. Symptoms of post-traumatic stress disorder among emergency medicine residents. *J Emerg Med.* 2005;28(1):1–4. <https://doi.org/10.1016/j.jemermed.2004.05.009>

23. Andersen HS, Christensen AK, Peterson GO. Posttraumatic stress reaction among rescue workers after a major rail accident. *Anx Res.* 2007;4(3):245–51. <https://doi.org/10.1080/08917779108248778>
24. Clohessy S, Ehlers A. PTSD symptoms, response to intrusive memories and coping in ambulance service workers. *Br J Clin Psychol.* 1999;38(3):251–65. <https://doi.org/10.1348/014466599162836>
25. Jonsson A, Segesten K, Mattsson B. Post-traumatic stress among Swedish ambulance personnel. *Emerg Med J.* 2003;20(1):79–84. <https://doi.org/10.1136/emj.20.1.79>
26. Mong M, Noguchi K. Emergency room physicians' levels of anxiety, depression, burnout, and coping methods during the COVID-19 pandemic. *J Loss Trauma.* 2022;27(3):212–28. <https://doi.org/10.1080/15325024.2021.1932127>
27. Martínez-Caballero CM, Cárdbaga-García RM, Varas-Manovel R, García-Sanz LM, Martínez-Piedra J, Fernández-Carbajo JJ, et al. Analyzing the impact of COVID-19 trauma on developing post-traumatic stress disorder among emergency medical workers in Spain. *Int J Environ Res Public Health.* 2021;18(17):9132. <https://doi.org/10.3390/ijerph18179132>
28. Marco CA, Larkin GL, Feeser VR, Monti JE, Vearrier L, ACEP Ethics Committee. Post-traumatic stress and stress disorders during the COVID-19 pandemic: survey of emergency physicians. *J Am Coll Emerg Physicians Open.* 2020;1(6):1594–601. <https://doi.org/10.1002/emp2.12305>
29. Minnotte KL, Gravelle M, Minnotte MC. Workplace characteristics, work-to-life conflict, and psychological distress among medical workers. *Soc Sci J.* 2013;50(4):408–17. <https://doi.org/10.1016/j.soscij.2013.08.001>
30. Palmer J, Ku M, Wang H, Crosse K, Bennett A, Lee E, et al. Public health emergency and psychological distress among healthcare workers: a scoping review. *BMC Public Health.* 2022;22(1):1–7. <https://doi.org/10.1186/s12889-022-13761-1>